

**ADVERTISEMENT  
SPRINGFIELD WATER AND SEWER COMMISSION  
CHIEF PROCUREMENT OFFICER  
SWSC Bid No. 25-08  
NORTH BRANCH INTERCEPTOR REHABILITATION  
CAPITAL PROJECT**

Sealed bids for a Prime Contractor contract are requested by the Springfield Water and Sewer Commission’s (SWSC) Chief Procurement Officer. Bidding procedures are per Massachusetts General Laws (MGL) Chapter 30§39M as amended and other applicable statutes. This project is funded in part by the Water Infrastructure Financing and Innovation Act (WIFIA), and Contractors attention is drawn to the WIFIA requirements contained in the bidding documents.

Bids for Prime/General Contractor will be accepted by the Chief Procurement Officer at the Springfield Water and Sewer Commission John J. Lyons Administration Building, 250 M Street Ext., Agawam, MA until **2:00PM EST** on **May 13, 2025**, at which time they will be publicly opened and read.

**Project Description.** CIPP lining of approximately 450 linear feet of 39-inch clay tile pipe and 2,600 linear feet of 36-inch clay tile pipe of the existing North Branch Sewer Interceptor pipe between Wilbraham Road and SMH 4349. Selective demolition of approximate eight (8) manhole corbels as required for pipeline access to carry out CIPP lining operations. Rehabilitation of approximate thirteen (13) manholes with cementitious lining. Temporary sewer system bypass. Construction of a permanent gravel access road between Riverton Road and the existing maintenance area within St. Michael’s Cemetery. Site Restoration. The time for completion of this project is **180 calendar days** from the date of the written Notice to Proceed. The Project is estimated not to exceed **\$4,000,000.00.**

An optional pre-bid meeting has been scheduled for **April 22, 2025, at 10:00 A.M., on site at St. Michael’s Cemetery, 1601 State St., Springfield MA.** Bidders are strongly encouraged to attend the pre-bid meeting.

**Bid Forms and Contract Documents will be available through BidDocs on April 9, 2025, online at [www.biddocsonline.com](http://www.biddocsonline.com) (may be viewed electronically and hard copy requested) or at Nashoba Blue, Inc. at 433 Main Street, Hudson, MA 01749 (978-568-1167). Bidders requesting Contract Documents to be mailed to them shall include a separate check for \$40.00 per set for UPS Ground (or \$65.00 per set for UPS overnight), payable to BidDocs ONLINE Inc. to cover mail handling costs (these costs are estimated and are subject to increase).**

Contractor must agree to pay Davis Bacon wage rates or MA Prevailing Wage rates whenever applicable. The SWSC reserves the right to waive any informality in, or to revoke, any or all bids, if in the public interest to do so. All questions regarding bid or its specifications must be made in writing and received by the Chief Procurement Officer by **April 29, 2025**, in order to be considered (contact: [edward.sweeney@waterandsewer.org](mailto:edward.sweeney@waterandsewer.org)).

Edward J. Sweeney, Chief Procurement Officer  
Springfield Water and Sewer Commission

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**Note to Newspaper:** Please publish the above only under the heading "Legal Advertisements" on the following date: April 9, 2025. Please refer to SWSC Bid No. 25-08 when invoicing.

Last Modified: 04/09/2025 at 10:39AM EDT

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**SPRINGFIELD WATER AND SEWER COMMISSION**



**PROJECT MANUAL**

**FOR**

**NORTH BRANCH INTERCEPTOR REHABILITATION**

**BID NO. 25-08**

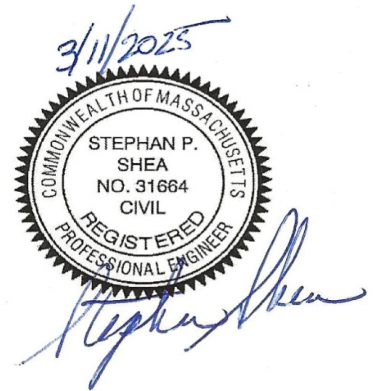
**Issue Date: 4/9/2025**

**General Bid Deadline Date: 5/13/2025**



**COMMISSIONERS**

Daniel Rodriguez, Chairman  
Vanessa Otero, Commissioner  
Matthew Donnellan, Commissioner



Joshua D. Schimmel, Executive Director

Edward J. Sweeney, Chief Procurement Officer

**KLEINFELDER**

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**SECTION 00020**

**INVITATION FOR BIDS**

**North Branch Interceptor Rehabilitation  
SWSC Bid No. 25-08**

The Springfield Water and Sewer Commission, Springfield, Massachusetts, “Commission, “Owner”, “SWSC” or the “Awarding Authority”), is seeking sealed bids for the Project: **North Branch Interceptor Rehabilitation (SWSC Bid No. 25-08)**, in the City of Springfield, Massachusetts.

Sealed bids will be received at the Offices of the Springfield Water and Sewer Commission, 250 M Street Extension, Agawam, MA 01101 or by mail at the Springfield Water and Sewer Commission, 250 M Street Extension, Agawam, MA 01101 until **May 13, 2025 at 2:00 PM EDT** at which time all bids will be publicly opened and read aloud.

An optional pre-bid meeting has been scheduled for April 22, 2025 at 10:00 AM. The pre-bid meeting will be held on-site at St. Michael’s Cemetery, 1601 State Street, Springfield, MA.

The bidding and award of the Contract shall be in full compliance with Sections 3039M of the General Laws of the Commonwealth of Massachusetts as last revised. Complete instructions for filing Bids are included in the Instructions to Bidders.

Bidders shall note that the United States Postal Service and major commercial delivery or package express companies deliver to the business office at 250 M Street Extension. It is the Bidder’s responsibility to ensure that their proposal is received at the office of the Commission by the closing date and time.

Contract Documents will be available on **April 9, 2025**. Contract Documents will be available for pick-up at [www.biddocsonline.com](http://www.biddocsonline.com) online at [www.biddocsonline.com](http://www.biddocsonline.com) (may be viewed electronically and hard copy requested). Bidders requesting Contract Documents to be mailed to them shall include a separate check for \$40.00 per set for UPS Ground (or \$65.00 per set for UPS overnight), payable to BidDocs ONLINE Inc. to cover mail handling costs (these costs are estimated and are subject to increase).

**Nature and scope of work:** CIPP lining of approximately 450 linear feet of 39-inch clay tile pipe and 2,600 linear feet of 36-inch clay tile pipe of the existing North Branch Sewer Interceptor pipe between Wilbraham Road and SMH 4349. Selective demolition of approximate eight (8) manhole corbels as required for pipeline access to carry out CIPP lining operations. Rehabilitation of approximate thirteen (13) manholes with cementitious lining. Temporary sewer system bypass. Construction of a permanent gravel access road between Riverton Road and the existing maintenance area within St. Michael’s

Cemetery. Site Restoration. See section 01010 SUMMARY OF WORK for more information.

The time for completion of this project is **180** calendar days from the date of the written Notice to Proceed.

The estimated project value is: **\$4,000,000.**

All questions must be made in writing and received by the SWSC Chief Procurement Officer, Edward J. Sweeney, no later than April 29, 2025, by 4:00 PM EDT, via the following contact: [edward.sweeney@waterandsewer.org](mailto:edward.sweeney@waterandsewer.org).

All bids shall be accompanied by a bid deposit in an amount no less than five percent (5%) of the value of the bid, in the form of a certified, cashier's or treasurer's check issued by a responsible bank or trust company made payable to the Springfield Water and Sewer Commission or a bid bond.

A performance bond in an amount equal to 100 percent of the total amount of the bid will be required for faithful performance of the contract as well as Labor and Materials bond in an amount equal to 100 percent of the total bid amount. The surety company must be qualified to do business in the Commonwealth of Massachusetts, and the form of surety must be satisfactory to the Springfield Water and Sewer Commission.

Every bid bond, performance bond, and payment bond issued for any construction work in the Commonwealth of Massachusetts shall be the bond of a surety company organized pursuant to Section 105 of Chapter 175 or of a surety company authorized to do business in the Commonwealth under the provisions of Section 106 of said Chapter 175 and be approved by the U.S. Department of Treasury and are acceptable as sureties and reinsurers on federal bonds under Title 31 of the United States Code, sections 9304 to 9308.

The Springfield Water and Sewer Commission reserves the right to reject any or all bids if it is in the public interest to do so. The Springfield Water and Sewer Commission reserves the right to waive any informality in if deemed it its best interest to do so as may be allowed by statute.

General Contractors shall be required to comply with all applicable Massachusetts General Laws. Bidders may not withdraw their Bids for a period of thirty days, excluding Saturdays, Sundays, and legal holidays after the actual date of the opening of the Bids.

Minimum Wage Rates as determined by the Executive Office of Labor and Workforce Development under the provision of the Massachusetts General Laws, Chapter 149, Sections 26 to 27D, as amended, apply to this project. It is the responsibility of the bidder, before bid opening, to request, if necessary, any additional information on Minimum Wage Rates for those trades people who may be employed for the proposed

INVITATION FOR BIDS

North Branch Interceptor Rehabilitation

00020-2

work under this contract. Federal Minimum Wage Rates as determined by the United States Department of Labor under the Davis-Bacon Act also apply to this project.

Disadvantaged Business Enterprise (DBE) goals are applicable to the total dollars paid to the construction contract. The goals for this project are a minimum of **4.8 percent D/MBE participation and 6.9 percent D/WBE** participation by certified DBEs. The two low bidders shall submit completed DBE forms (EEO-DEP-190C, EEO-DEP-191C and the DBE Certification of United States Citizenship form) by the close of business on the third business day after bid opening. Failure to comply with the requirements of this paragraph may be deemed to render a proposal non-responsive. The Awarding authority requests copies of these form also be sent to its attention ([edward.sweeney@waterandsewer.org](mailto:edward.sweeney@waterandsewer.org)).

The project requires compliance with the Department of Environmental Protection's Diesel Retrofit Program by use of after-engine emission controls that are EPA certified, or their equivalent, on all of the off-road (non-registered) diesel vehicles/equipment used at the job site.

EDWARD J. SWEENEY.  
CHIEF PROCUREMENT OFFICER  
SPRINGFIELD WATER AND SEWER COMMISSION  
250 M STREET EXTENSION  
AGAWAM, MASSACHUSETTS 01001

END OF SECTION 00020



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## **ESTIMATED BIDDING SCHEDULE**

### **NORTH BRANCH INTERCEPTOR REHABILITATION PROJECT**

#### **SWSC Bid No. 25-08**

- 4/3/2025**      **Ad Sent to the Central Register**
- 4/9/2025**      **Published in the Republican**
- 4/9/2025**      **Bid Packages are Available ([www.biddocsonline.com](http://www.biddocsonline.com))**
- 4/22/2025**      **Optional Pre-Bid Meeting. 10:00 A.M. EDT: St. Michael's Cemetery, 1601 State St. Springfield, MA.**
- 4/29/2025**      **Written Questions Due to the CPO by 4:00 PM EDT ([edward.sweeney@waterandsewer.org](mailto:edward.sweeney@waterandsewer.org))**
- 5/13/2025**      **GC Bids are due by 2:00 PM EDT and will be opened**
- Substantial Completion Date: 180 Calendar Days from Receipt of NTP**

SWSC Bid No. 25-08

WEST PARISH FILTERS (WPF) RESIDUALS MANAGEMENT PROJECT  
ESTIMATED PROCUREMENT SCHEDULE



## INFORMATION TO BIDDERS

### ARTICLE 1 RECEIPT AND OPENING OF BIDS:

The Springfield Water and Sewer Commission, Springfield, Massachusetts, (herein called the "Owner"), invites bids on the form attached hereto, all blanks of which must be appropriately filled in. Bids will be received by the Owner at the Office of the Springfield Water and Sewer Commission, Springfield, Massachusetts, 250 M Street Extension, Agawam, MA 01101, as stated in the Invitation for Bids, at which time they will be publicly opened and read aloud (via remote bid opening). The envelopes containing the bids must be sealed, addressed to the attention of the Springfield Water and Sewer Commission, Attention: Chief Procurement Officer, 250 M Street Extension, Agawam, MA 01101 and designated as "**SWSC Bid No. 25-08, North Branch Interceptor Rehabilitation.**" Any hand delivered Bid received after the deadline will not be accepted. Any other Bid received after the deadline will be returned to the addressee. Any Bid submitted to and received by the Springfield Water and Sewer Commission after the deadline for receipt of Bids will not be accepted. It is the responsibility of the Bidder to ensure that its Bid is received by the Springfield Water and Sewer Department in a timely fashion. The deadline for receipt of Bids can be extended by written Addendum only. Bids may not be submitted orally, by facsimile, by email, by telephone, or any other method except for the methods described above. A Bid may be modified only by submitting any such modification in the form of a document executed in the same manner as a Bid, delivered in a sealed envelope in the same manner as a Bid, designated as a modification to the original Bid and submitted to the Springfield Water and Sewer Commission prior to the time designated for the opening of Bids.

The Owner may waive any informalities or may reject any and all bids.

Any bid may be withdrawn prior to the scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified shall not be considered.

The time period for holding bids, where Federal approval is not required is 90 days, Saturdays, Sundays, and legal holidays excluded, after the opening of bids and where Federal approval is required, the time period for holding bids is 90 days, Saturdays, Sundays, and holidays excluded after such approval.

#### Public Bid Review and Inspection:

1. Upon opening, all Bids become public records except for portions thereof that are not subject to public disclosure as a matter of law.
2. Bids may be reviewed by the public in a manner set forth by the Owner.

## ARTICLE 2 PREPARATION OF BID:

Each bid must be submitted on the prescribed form. All blank spaces for bid prices must be filled in, in ink or typewritten, both in words and figures. All bids must be prepared in conformity with and shall be based upon and submitted subject to all requirements of the Specifications and Drawings together with all addenda thereto.

Each bid must be submitted in sealed inner and outer envelopes bearing on the outside of each envelope the name of the bidder, his address, and the name of the project for which the bid is submitted. Both envelopes shall be clearly labeled "BID DOCUMENTS" so as to guard against opening prior to the time set therefore, and no blame shall be attached to any agent or employee of the Springfield Water and Sewer Commission for the opening of any bid not so marked.

In submitting a Bid, the Bidder represents that:

1. It has read and examined the Specifications, Details, Drawings, and Bidding Documents thoroughly;
2. It understands the Specifications, Details, Drawings, and Bidding Documents;
3. The Bid is made in accordance with the Specifications, Details, Drawings, and Bidding Documents;
4. It has visited the site, has become familiar with the conditions of the site and the surrounding area, and has familiarized itself with the local conditions that may in any manner affect cost, progress, or performance of Work;
5. It has correlated its own observations with the Specifications, Details, Drawings, and Bidding Documents;
6. It has found no errors, conflicts, ambiguities, or omissions in the Specifications, Details, Drawings, and Bidding Documents, except for those that it has brought to the Owner's attention in writing at least seven calendar days prior to submitting the Bid.
7. It is familiar with all applicable Federal, State, City and Springfield Water and Sewer Commission laws, rules, regulations, and procedures affecting its Bid and its Bid is in conformity with those laws, rules, regulations and procedures, specifically the WIFIA requirements and associated documents; and
8. The Bidder has complied with every requirement of these Instructions and

that the Specifications, Details, Drawings, and Bidding Documents are sufficient in scope and detail to indicate and convey an understanding of all terms and conditions for the performance of the Work.

### ARTICLE 3 WITHDRAWAL OF BIDS:

Prior to Bid opening. A Bid may be withdrawn before the time designated for opening Bids. The Bidder requesting such withdrawal must make the request in writing and in a specific manner designated by the Owner if the Owner so requires. Withdrawal of a Bid prior to the Bid opening time will not prejudice the right of a Bidder to resubmit a Bid. A Bid cannot be withdrawn after the Bid opening time except as provided by law.

After Bid opening. In the case of death, disability, bona fide clerical error or mechanical error of a substantial nature or other unforeseen circumstances affecting a Bidder, a Bidder may withdraw its Bid after the time designated for the Bid opening, if within five days of the date designated for opening its Bid, such Bidder submits a statement under the penalties of perjury to the Springfield Water and Sewer Commission detailing the basis for withdrawal. The Owner will then make a determination as to whether such Bidder had satisfied both the statutory and Owner requirements for such withdrawal. If the Owner is satisfied, the Bid Deposit will be returned to such Bidder.

### ARTICLE 4 METHOD OF BIDDING:

The Owner invites a bid for the complete construction of the project, together with all related incidental and appurtenant work as described in these Specifications and/or outlined or shown on the Drawings.

### ARTICLE 5 QUALIFICATIONS OF BIDDER:

The Bidder is directed to review Section 00200 A6 – STATEMENT OF BIDDER’S QUALIFICATIONS. The Bidder shall complete statement of bidder’s qualifications and submit with the bid. Conditional bids will not be accepted.

The Bidder is directed to Items # 16, 17, and 18 of Section 00200 A6:

The Owner reserves the right to reject the Bid of any Bidder who the Owner has determined has not completed relevant prior projects, whether with the Springfield Water and Sewer Commission or elsewhere, because of the fault of the Bidder, its Subcontractors or employees; has been declared in default on a prior contract whether with the Springfield Water and Sewer Commission or elsewhere; has failed to complete a prior project in a timely fashion whether with the Springfield Water and Sewer Commission or elsewhere; based on its work record, is not capable of performing the Work within Contract whether due to lack of sufficient prior experience, as determined by the Owner, or for any reason; does not meet the minimum qualifications and experience requirements stated above and elsewhere; has not completed three projects in the last five years which included coordination and work of a comparable scope and

complexity as this Project; has a work record of its Subcontractors demanding direct payment from the Owner or other awarding authority; has a work record of its Subcontractors, employees or material suppliers complaining to the Owner or other awarding authority regarding the Bidder's failure to pay them; has a record of complaints made to the Owner or other awarding authority by persons offended by the behavior of the Bidder, its Subcontractors or employees; is currently in litigation with the Owner; or has a record of its failure to comply with the Commonwealth and/or Springfield Water and Sewer Commission laws or requirements. "Work record" or "record" constitutes a minimum of one event in the work history of the Bidder.

ARTICLE 6 BID SECURITY:

Each bid must be accompanied by treasurer's certified check or bank check of the bidder, or a bid bond prepared on the form of bid bond attached hereto, duly executed by the bidder as principal and having as Surety thereon a surety company meeting the statutory requirements below, in the amount of 5 percent of the bid. Such check or bid bond will be returned to all except the three lowest bidders within five days after the opening of bids, and the remaining checks or bid bonds will be returned promptly after the Owner and the accepted bidder have executed the Contract; or if no award has been made within 30 days after the date of the opening of bids, upon demand of the bidder at any time thereafter, so long as bidder has not been notified of the acceptance of its bid. The applicable requirements pertaining to the bid bond shall also apply to the certified check.

Every bid bond, every performance bond and every payment bond issued for any construction work in the Commonwealth of Massachusetts shall be the bond of a surety company organized pursuant to Section 105 of Chapter 175 or of a surety company authorized to do business in the Commonwealth under the provisions of Section 106 of said Chapter 175 and be approved by the U.S. Department of Treasury and are acceptable as sureties and reinsurers on federal bonds under Title 31 of the United States Code, sections 9304 to 9308.

The Owner shall reject every Bid that is not accompanied by a Bid deposit.

ARTICLE 7 LIQUIDATED DAMAGES FOR FAILURE TO ENTER INTO CONTRACT:

The successful bidder, upon its failure or refusal to execute and deliver the Contract and Bonds required within 10 days after bidder has received notice of the acceptance of its bid, shall forfeit to the Owner as liquidated damages for such failure or refusal the security deposited with its bid.

ARTICLE 8 TIME OF COMPLETION AND LIQUIDATED DAMAGES:

The bidder must agree to commence work on or before a date to be specified in a written notice to proceed by the Owner, and to fully complete the project within the period specified in the Bid. Bidder must also agree to pay as liquidated damages a minimum of

\$1,500.00 for each consecutive calendar day thereafter as hereinafter provided in the General Conditions.

ARTICLE 9 CONDITIONS OF WORK:

All bidders shall inform themselves fully of the conditions relating to the Specifications, Details, Drawings, and Bidding Documents; construction; and labor, under which the work is now or will be performed; including personal examination of the sites. Failure to do so will not relieve the successful bidder of its obligation to furnish all material and all labor necessary to carry out the provisions of the Contract Documents, and to complete the contemplated work for the consideration set forth in their bid.

ARTICLE 10 ADDENDA AND INTERPRETATIONS:

No interpretation of the meaning of the Drawings, Specifications, or other pre-bid documents will be made to any bidder orally. Every request for such interpretations shall be made in writing addressed to Edward J. Sweeney, Chief Procurement, Springfield Water and Sewer Commission, 250 M Street Extension, Agawam, MA 01101 ([edward.sweeney@waterandsewer.org](mailto:edward.sweeney@waterandsewer.org)), and to be given consideration must be received by the date indicated in SECTION 00020 – INVITATION TO BID. Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the Specifications; which, if issued, will be distributed to all prospective bidders, not later than 3 days prior to the date fixed for the opening of bids. Failure of any bidder to receive any such addendum or interpretations shall not relieve such bidder from any obligation under his bid as submitted. All addenda so issued shall become part of the Contract Documents.

Oral clarifications or interpretations will be without legal effect. Addenda will either be emailed to all persons having received Bidding Documents from the Springfield Water and Sewer Commission. Each Bidder shall be responsible for determining that it has received all Addenda issued.

Acknowledgment of Addenda: Each Bidder is required to acknowledge the receipt of all Addenda (the numbers of which are to be filled in on the Bid form by the Bidder).

ARTICLE 11 CONTRACT SECURITY:

Simultaneously with the delivery of the executed Contract, the General Contractor shall furnish the Owner with a Performance Bond and a Payment Bond in penal sums equal to the amount of the Contract price, conditioned upon the performance by the Contractor of all undertakings, covenants, terms, conditions and agreements of the Contract Documents, and upon the prompt payment by the Contractor to all persons supplying labor and materials in the prosecution of the work provided by the Contract Documents. Such bonds shall be executed by the Contractor and a corporate bonding company licensed to transact such business in the state in which the work is to be performed and named on the current list of "Surety Companies Acceptable on Federal Bonds" as



published in the Treasury Department Circular No. 570. The expense of these bonds shall be borne by the Contractor. If at any time a surety on any such bond is declared a bankrupt or loses its right to do business in the state in which the work is to be performed, or is removed from the list of Surety Companies accepted on Federal bonds, the Contractor shall immediately notify the Owner and shall, within ten (10) days after notice from the Owner to do so, substitute an acceptable bond (or bonds) in such form and sum and signed by such other Surety or Sureties as may be satisfactory to the Owner. The premiums on such bond shall be paid by the Contractor. No further payments shall be deemed due nor shall they be made until the new Surety or Sureties shall have furnished an acceptable Bond to the Owner.

Every bid bond, every performance bond and every payment bond issued for any construction work in the Commonwealth of Massachusetts shall be the bond of a surety company organized pursuant to Section 105 of Chapter 175 or of a surety company authorized to do business in the Commonwealth under the provisions of Section 106 of said Chapter 175 and be approved by the U.S. Department of Treasury and are acceptable as sureties and reinsurers on federal bonds under Title 31 of the United States Code, sections 9304 to 9308.

#### ARTICLE 12 POWER OF ATTORNEY:

Attorneys-in-fact who sign bid bonds or contract bonds must file with each bond a certified and effectively dated copy of their power of attorney.

#### ARTICLE 13 LAWS AND REGULATIONS:

The bidder's attention is directed to the fact that all applicable Federal and State laws, including Commonwealth of Massachusetts General Laws, requiring fair competition of bidders for the construction, reconstruction, alteration, remodeling, repair or demolition of public works, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the Contract throughout, including Chapter 30, Sections 39L through 39P, Section 39R and Chapter 82, Section 40, Amendments, and they will be deemed to be included in the Contract the same as though herein written out in full.

Applicable provisions of Massachusetts General Laws and Regulations and/or the United States Code and Code of Federal Regulations govern this Contract and any provision in violation of the foregoing shall be deemed null, void and of no effect. Where conflict between Code of Federal Regulations and State Laws and Regulations exist, the more stringent requirement shall apply.

#### ARTICLE 14 METHOD OF AWARD-LOWEST RESPONSIBLE BIDDER:

Bids will be compared on the basis of the experience and competence of the bidder and on the basis of the totals of the quantities listed in the proposal under the enumerated items at the unit prices or lump sums bid for these items. The contract will be awarded to

the lowest responsible and eligible bidder meeting the minimum qualifications and experience requirements. However, the Owner may reject any and all bids if it is in the public interest to do so.

The Owner shall award the contract to the lowest responsible (in Owner's sound discretion demonstrably possessing the skill, ability, qualifications, experience and integrity necessary to faithfully perform the work called for by the Contract, based upon determination of competent workmanship and financial soundness) and eligible (able to meet the requirements set forth in the Bidding Documents) Bidder within 30 Business Days after the date of the opening of the Bids. If the Bidder selected as the contractor fails to perform its agreement to execute a contract in accordance with the terms of its Bid and furnish a performance bond and a labor and materials or payment bond, as required by the Bidding Documents, an award shall be made to the next lowest responsible and eligible Bidder. The ninety day time limit shall not be applicable to a second or subsequent award made after the expiration of the time limit with the consent of the next lowest responsible and eligible bidder, and made because the original award made within the time limit was invalid, or because a bidder failed to execute the Agreement or to provide a performance and labor and materials or payment bond.

Any Bidder who fails to perform its agreement to execute a contract and furnish a performance bond and labor and materials or payment bond shall forfeit its Bid deposit which shall become property of the Owner, but shall not exceed the difference between its Bid price and the Bid price of the next lowest responsible and eligible bidder.

The Owner will notify the selected Bidder and all other Bidders of the award.

The Owner will submit, to the selected Bidder, a Notice of Award and at least six unsigned copies of the agreement between the Springfield Water and Sewer Commission and the Contractor. The selected Bidder will be required to return to the Springfield Water and Sewer Commission within ten (10) business days of the date of notice of award, all copies of the Agreement between the Springfield Water and Sewer Commission and the Contractor executed by the Contractor together with, its performance bond, its labor and materials or payment bond; all required certificates of insurance; and any other required forms.

Failure of the Bidder to submit all the required documents in a timely fashion may result in the withdrawal of the award. The Owner will return one fully signed copy of the Agreement to the Contractor. Time is of the essence in the performance of the Agreement.

In the event there is a discrepancy between the unit prices and the extended totals, the unit prices shall govern. In the event that there is a discrepancy between the unit prices written in words and written in figures, the unit prices written in words shall govern. No bid will be accepted which does not contain a unit price or lump sum as indicated for each of the applicable items enumerated in the proposal form.

Bids for any item of work contained in the bid proposal which are abnormally high or low may be cause for rejection by the Owner of the total bid. Due to the nature of this contract where the exact scope of work cannot be exactly defined, unbalanced bids may not be acceptable and therefore may be rejected.

ARTICLE 15 AFFIRMATIVE ACTION PROGRAM:

Minimum Wage Rates as determined by the Executive Office of Labor and Workforce Development under the provision of the Massachusetts General Laws, Chapter 149, Sections 26 to 27D, as amended, apply to this project. It is the responsibility of the contractor, before bid opening, to request if necessary, any additional information on Minimum Wage Rates for those trades people who may be employed for the proposed work under this contract. Federal Minimum Wage Rates as determined by the United States Department of Labor under the Davis-Bacon Act also apply to this project.

Disadvantaged Business Enterprise (DBE) goals are applicable to the total dollars paid to the construction contract. The goals for this project are a minimum of **4.8 percent D/MBE participation and 6.9 percent D/WBE participation by certified DBEs**. The two low bidders shall submit completed DBE forms (EEO-DEP-190C, EEO-DEP-191C and the DBE Certification of United States Citizenship form) by the close of business on the third business day after bid opening. Failure to comply with the requirements of this paragraph may be deemed to render a proposal non-responsive.

ARTICLE 16 ITEMS NOT LISTED IN THE BID:

The lump sum and unit price items listed in the bid form are intended to cover all items of work to be done and materials and work to be furnished to fully complete the work in accordance with the Specifications, Details, and Drawings. Appurtenant items of work shown on the Drawings or Details or specified or required, and parts of the work, materials, and equipment not listed separately and not shown or specified but necessary to complete the work but not listed separately under list of items in the bid, shall be provided and shall be considered and included in the cost of payment under the various applicable bid items of work, and no separate payment will be made for such items. It shall be the responsibility of the Contractor to verify any missing or incomplete data.

ARTICLE 17 BALANCED BIDDING:

Bids should be made on each separate item of work shown in the bid (proposal) with reasonable relation to the probable cost of doing the work included in such items, and the right is reserved to reject wholly any bid in case an item or items thereof are obviously unbalanced or appear to the Owner to be so unbalanced as to affect or to be liable to affect adversely any interests of the Owner. The attention of the bidder is called to the fact that unbalancing of bids may adversely affect the Contractor if certain portions of the work are increased or decreased as provided in the Specifications, Details, and Drawings.

## ARTICLE 18 PRICES:

Bidder shall state the proposed price for the work; which price is to cover all the expenses incidental to the completion of the work in full conformity with the Contract, Specifications and Details, Special Provisions, and Drawings.

In the event that there is a discrepancy between the unit prices and the extended totals, the unit prices shall govern. In the event that there is a discrepancy between the unit prices written in words and written in figures, the unit prices written in words shall govern. No bid will be accepted which does not contain a unit price or lump sum as indicated for each of the applicable items enumerated in the Proposal Form.

## ARTICLE 19 UNCERTAINTY OF QUANTITIES:

The quantities listed in the bid (Proposal) are approximate and are given only for use in comparing bids and to indicate approximately the total amount of the Contract, and the Owner does not expressly or by implication represent that the actual amounts of work will even approximately correspond therewith, but does call particular attention to the uncertainty in the quantities of the work involved which cannot be predicted in advance. The work under certain items may be materially greater or less than those given in the bid as may be necessary in the judgment of the Owner to complete the work contemplated in the Contract. Attention is particularly called to the fact that the quantity of work to be done under some bid items may be largely dependent on subsurface ground conditions encountered and, therefore, the quantities of work to be done under the various items may vary substantially from the estimated quantities or may even be omitted.

Under the Contract, the Owner reserves the right to increase or decrease the approximate quantities for, or to omit entirely any of the items as listed in the bid.

Only such quantities of the respective items of work actually performed and accepted will be paid for.

## ARTICLE 20 ACCESS TO SITE:

Representatives of the Owner shall have access to the work wherever it is in preparation or progress, and the Contractor shall provide proper facilities for such access and inspection.

## ARTICLE 21 CONTRACT:

A contract in the form set forth hereinafter will be required to be executed by the successful bidder and the Springfield Water and Sewer Commission. The attention of all bidders, therefore, is called to the form of said proposed contract and the provisions thereof. Two (2) executed original counterparts of the contract security bonds will be required.

ARTICLE 22 WORK ON STATE MUNICIPAL, AND PRIVATE PROPERTY:

Particular attention is hereby directed to the fact that portions of the work included under this Contract may be done within the limits of properties that are State-owned, municipally-owned, and/or privately-owned. The Contractor shall be responsible for coordinating the prosecution of the work of this Contract with the various property owners, and for providing the work in accordance with any additional requirements as specified herein.

ARTICLE 23 PAYMENT FOR DRAWINGS AND DOCUMENTS:

See Invitation to Bid.

ARTICLE 24 CORRECTIONS:

Erasures or other changes in the bid must be explained or noted over the signature of the bidder.

ARTICLE 25 INSURANCE REQUIREMENTS:

The Contractor agrees to indemnify and defend the Springfield Water and Sewer Commission and Kleinfelder, Inc., their agents, and employees, and hold them harmless from loss, liability, damage, claims, demands and costs and expenses and reasonable in-house and outside attorney's fees, of any person or persons arising out of, or based upon, personal injury, death or property damage resulting directly from any negligent act or omission on the part of the Contractor, its agents, employees, subcontractors, and licensees in connection with this contract. The Owner and Engineer reserves the right to select outside counsel, subject to the approval of the Contractor and not to be unreasonably withheld or delayed, to defend any such actions.

The Springfield Water and Sewer Commission, as well as its Engineer, Kleinfelder, Inc. shall be named as an ADDITIONAL INSURED and as a certificate holder on each of the insurance policies obtained pursuant to this contract.

Upon execution of the contract, the Contractor will provide copies of certificate of insurance to the Springfield Water and Sewer Commission.

The Bidder's attention is directed to Article 5 "BONDS AND INSURANCE" contained in the General Conditions and in the Supplementary Conditions.

ARTICLE 26 REQUIREMENTS FOR FOREIGN CORPORATIONS:

The attention of all bidders is called to the provision of the General Laws, Chapter 30, Section 39L, as amended by Chapter 3 of the Acts of 1967, which provides that awarding authority may not enter into a contract for construction work and may not approve as a subcontractor furnishing labor and materials for a part of any such work a foreign

corporation which has not filed with the awarding authority a certificate of the State Secretary of the Commonwealth of Massachusetts stating that such corporation has complied with Sections 3 and 5 of Chapter 181 and the date of such compliance. The term "foreign corporation" means a corporation not incorporated under the laws of the Commonwealth of Massachusetts.

ARTICLE 27 PRE-CONSTRUCTION CONFERENCE:

The Contractor shall attend a pre-construction conference scheduled by the Owner after award of the contract, but prior to the actual commencement of work at the site. One item of discussion will be the Contractor's construction schedule.

In planning the Contractor's construction schedule the Contractor is invited to attend other pre-construction conferences which the Owner may conduct for other contiguous construction projects.

ARTICLE 28 TRAFFIC CONTROL AND PEDESTRIAN SAFETY:

The Bidder's attention is directed to the Contract requirements set forth in Section 01570 – MAINTENANCE AND PROTECTION OF TRAFFIC of the Technical Specifications.

ARTICLE 29 MINIMUM WAGE RATES

Minimum Wage Rates as determined by the Commissioner of Department of Workforce Development under the provision of the Massachusetts General Laws, Chapter 149, Sections 26 to 27D, as amended, apply to this project. It is the responsibility of the contractor, before bid opening, to request if necessary, any additional information on Minimum Wage Rates for those trades people who may be employed for the proposed work under this contract. Federal Minimum Wage Rates as determined by the United States Department of Labor under the Davis-Bacon Act also apply to this project. Added by St. 1973, c. 1164.

**IMPORTANT - READ CAREFULLY**

If the bidder is NOT subject to the Massachusetts Workers' Compensation Law, M.G.L. c. 152, the bidder MUST complete and submit with its bid the following affidavit entitled "WORKERS' COMPENSATION INSURANCE COVERAGE." (See page 00100-16)

**FAILURE TO SUBMIT THE AFFIDAVIT MAY RESULT IN THE REJECTION OF  
YOUR BID.**

ARTICLE 30 GUARANTEE

The contractor guarantees that the Work and Services to be performed under the Contract, and all workmanship, materials and equipment performed, furnished, used or installed in the construction of the same shall be free from defects and flaws, and shall be performed and furnished in strict accordance with the Drawings, Specifications, and other

contract documents, that the strength of all parts of all manufactured equipment shall be adequate and as specified and that the performance test requirements of the Contract shall be fulfilled. This guarantee shall be for a period of one year from and after the date of completion and acceptance of the Work as stated in the final estimate. If part of the Work is accepted in accordance with that subsection of this AGREEMENT titled "Partial Acceptance", the guarantee for that part of the Work shall be for a period of one year from the date fixed for such acceptance.

If at any time within the said period of guarantee any part of the Work requires repairing, correction or replacement, the Owner may notify the contractor in writing to make the required repairs, correction or replacements. If the Contractor neglects to commence making such repairs, corrections or replacements to the satisfaction of the Owner within seven (7) days from the date of receipt of such notice, or having commenced fails to prosecute such Work with diligence, the Owner may employ other persons to make said repairs, correction or replacements, and charge the costs, including compensation for additional professional services, to the Contractor.

ARTICLE 31 MANUFACTURER’S EXPERIENCE:

Whenever it is written that an equipment manufacturer must have a specified period of experience with his product, equipment which does not meet the specified experience period can be considered if the equipment supplier or manufacturer is willing to provide an "Efficiency Guarantee Bond" or cash deposit for the duration of the specified time period which will guarantee replacement of that equipment in the event of failure.

ARTICLE 32 MASSACHUSETTS SALES TAX AND USE TAX:

Materials and equipment purchased and installed for this project is exempt from Massachusetts Sales and Use Tax. The Bidder shall take this into account when calculating the bid. A tax exemption number will be provided to the Contractor.

ARTICLE 33 SAFETY AND HEALTH REGULATIONS:

This project is subject to the Safety and Health Regulations of the U.S. Department of Labor set forth in Title 29 CFR, Part 1926 and to all subsequent amendments, and to any applicable Massachusetts regulations. Contractors shall be familiar with the requirements of these regulations.

ARTICLE 34 OSHA SAFETY TRAINING – CHAPTER 306 OF THE ACTS OF 2004

All Contractor employees and sub-contractor employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is a least 10 hours in duration at the time the employee begins work and shall furnish documentation of successful completion of said course with the first certified payroll report for each employee.

ARTICLE 35 AMERICAN IRON AND STEEL REQUIREMENTS:

This project is subject to the American Iron and Steel requirements of P.L. 113-76, the Consolidated Appropriations Act of 2014.

ARTICLE 36 PRICE ADJUSTMENTS:

This Contract contains Base Prices for Diesel Fuel and Gasoline; Liquid Asphalt; and Portland Cement and provisions for price adjustments for those commodities in accordance with Chapter 30, Section 39M of the Massachusetts General Laws. Reference Sections 00811, 00812, 00814 for Price Adjustment Clauses.

The Base Price(s) are specified below and will be updated five days prior to the final bid opening date.

Price adjustments will be paid only when the variance between the Base Price and the Period Price for the month during which the cost is incurred exceeds plus or minus five percent (5%). A price adjustment will either result in additional compensation to the Contractor or repayment to the Commission, depending on whether there is an increase or decrease.

Price adjustments will be based on the actual quantity included in a monthly Application for Payment, as supported by paid invoices, and will be made after the work has been performed, using the applicable Period Price.

The Contractor will be compensated for price adjustments from the allowance bid item 00800.1 in the Bid Items List in Section 00300.

The Commission will be repaid from retainage.

The entire difference between the Base Price and Period Price for the month in which the cost was incurred will be paid.

Base Prices and basis of payment are as follows:

A. Diesel Fuel and Gasoline

Diesel Fuel - Base Price: \$2.986 PER GALLON (including state tax)

Gasoline - Base Price: \$2.404 PER GALLON (including state tax)

1. Price adjustments will be based on the Period Price of Gasoline and Diesel Fuel for each monthly period as it appears on the Massachusetts Department of Transportation (MassDOT) website [<https://www.mass.gov/info-details/massdot-current-contract-price-adjustments>].



2. The price adjustment only applies to actual fuel usage during each month for site dedicated equipment requiring gasoline or diesel fuel, including but not limited to construction equipment, trucks, and bypass pumps.

3. The price adjustment will be determined by multiplying the number of gallons used during the applicable monthly period times the difference between the Base Price and the Period Price of Diesel Fuel or Gasoline.

B. Liquid Asphalt

Base Price - \$622.50 PER TON

1. Price adjustments will be based on the New Asphalt Period Price for each monthly period as it appears on the MassDOT website. The Period Price will be posted on the MassDOT website within two (2) business days following receipt of this issue.

2. The Price Adjustment only applies to the actual virgin liquid asphalt content in the mixture placed.

3. The Price Adjustment will be determined by multiplying the number of tons of hot mix asphalt mixtures placed during the applicable monthly period times the liquid asphalt content percentage times the difference between the Base Price and the Period Price of Liquid Asphalt.

C. Portland Cement

Base Price - \$425.53 PER TON

1. Price adjustments will only be made on contracts using greater than 100 cubic yards of concrete containing Portland cement.

2. Price adjustments will be based on the Period Price of Portland cement for each monthly period as it appears on the MassDOT website. The Period Price will be posted on the MassDOT website the Wednesday immediately following the publication of the monthly price in ENR.

3. The price adjustment only applies to the actual Portland cement content in the mix placed based on the approved concrete mix design. No adjustments will be made for any cement replacement materials such as fly ash or ground granulated blast furnace slag.

4. The price adjustment will be based on the variance between the Base Price and the Period Price for the Portland cement component only and will not include transportation or other charges.

5. The price adjustment will be determined by multiplying the number of cubic yards of

Portland cement concrete placed during each month times the Portland cement content percentage times the variance between the Base Price and the Period Price of Portland cement.

AFFIDAVIT  
WORKERS' COMPENSATION INSURANCE COVERAGE

RE: Contract for \_\_\_\_\_

Bidder: \_\_\_\_\_ ("the BIDDER")

I, \_\_\_\_\_, \_\_\_\_\_, do hereby state that:  
(print name) (title)

1. I am authorized to sign this document on behalf of the BIDDER and bind the BIDDER hereto;
2. the BIDDER is not subject to the Commonwealth of Massachusetts Workers' Compensation Law, M.G.L. c. 152;
3. in the event the BIDDER is awarded this contract and hires any employees for this contract which would subject it to such insurance law, the BIDDER shall provide the Springfield Water and Sewer Commission with a certificate of insurance indicating workers' compensation insurance coverage pursuant to the specification requirements prior to the commencement of work by those employees; and
4. the BIDDER understands that its failure to comply with the requirement set forth in paragraph 3 may result in the termination of its contract with the Springfield Water and Sewer Commission.

Signed under the penalties of perjury.

Dated: \_\_\_\_\_

\_\_\_\_\_

(Signature)

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SECTION 00200

REQUIRED FORMS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The checklist below is included for the bidders' convenience and in no way waive or abridge the Owner's right to reject any or all bids. Bidders are cautioned to include these required form(s):

1. Sealed Bid
  - a. Bid Form (Copy provided under Bid Form Section)
  - b. Certificate of Authority (Copy provided under Bid Form Section)
  - c. Sub-Contractor List (Copy provided under Bid Form Section)
2. Contractor's Bid Bond
  - a. To be provided by Contractor (5%)
3. Equal Employment Opportunity Statement (SWSC form appended herein)
4. Tax Certification and Affidavit (SWSC blank form appended herein)
5. Corporate Certificate (SWSC blank form appended herein)
6. Certificate of Non-Collusion (SWSC blank form appended herein)
7. DBE Forms (EEO-DEP Forms)
8. Debarment Disclosure Form (SWSC blank form appended herein)
9. OSHA Safety Training Certification (SWSC blank form appended herein)
10. Diesel Retrofit Program Statement of Intent to Comply
11. Projected Workforce Certification
12. Commonwealth of Massachusetts Worker's Compensation Law, MGL c. 152, Worker's Compensation Insurance Affidavit (if applicable).
13. Statement of Bidder's Qualifications
  - a. To be provided by Contractor to demonstrate compliance with Bidder's Eligibility requirements detailed in Invitation to Bidders Section

REQUIRED FORMS

SECTION 00200

REQUIRED FORMS

- B. In order to be determined to be a Successful Bidder, the Bidder must:
  - 1. Present clearly defined submittals as required, with completed required forms.
- C. The following forms must be submitted to the Commission before the Commission can enter into a formal Contract Agreement with the successful Bidder:
  - 1. Signed Agreement
  - 2. Contractor's Performance Bond (100%)
  - 3. Contractor's Payment Bond (100%)
  - 4. Certificate of Insurance- Naming Commission as "additional insured"

END OF SECTION

# TAX CERTIFICATION AFFIDAVIT FOR CONTRACTS

\_\_\_\_\_  
Individual Social Security Number

\_\_\_\_\_  
State Identification Number

\_\_\_\_\_  
Federal Identification Number

Pursuant to M.G.L. Ch. 62c. sec. 49a.

**Company:** \_\_\_\_\_

**P.O. Box (if any):** \_\_\_\_\_ **Street Address Only:** \_\_\_\_\_

**City/State/Zip Code:** \_\_\_\_\_

**Telephone Number:** \_\_\_\_\_ **Fax Number:** \_\_\_\_\_

**Please Identify if the bidder/proposer is a:**

**Corporation** \_\_\_\_\_

**Individual** \_\_\_\_\_ **Name of Individual:** \_\_\_\_\_

**Partnership** \_\_\_\_\_ **Names of all Partners:** \_\_\_\_\_

**Limited Liability Company** \_\_\_\_\_ **Names of all Managers:** \_\_\_\_\_

**Limited Liability Partnership** \_\_\_\_\_ **Names of Partners:** \_\_\_\_\_

**Limited Partnership** \_\_\_\_\_ **Names of all General Partners:** \_\_\_\_\_

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Pursuant to M.G.L. c. 62C, Section 49A, I/WE certify under penalties of perjury that I/WE, to my/our best knowledge and belief, have filed all Massachusetts tax returns and paid all Massachusetts taxes as required under law, as well as paid all contributions and payments in lieu of contributions pursuant to M.G.L., c. 151A, Section 19A(b).

I/WE further certify that I/WE have complied with all federal, state and local laws relating to taxes, including but not limited to the withholding and reporting of any income taxes for employees and contractors, and the withholding and remittance of child support.

The contractor must be in compliance **at the time it submits its bid and afterwards if selected as the contractor**, with all Federal, Commonwealth of Massachusetts and Local Tax Laws.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Social Security or Federal ID No.

\_\_\_\_\_  
Date

**YOU MUST FILL THIS FORM OUT COMPLETELY AND YOU MUST FILE THIS FORM WITH YOUR BID/CONTRACT SUBMISSION. TAX AFFIDAVITS THAT ARE NOT SIGNED WILL BE REJECTED.**

Last Modified: 04/09/2025 at 10:39AM EDT



## COLLUSION OR FRAUD STATEMENT FOR PUBLIC CONTRACTS

The undersigned certifies under penalties of perjury that this bid or proposal is in all respects bona fide, fair, and made in good faith without collusion or fraud with any other person. As used in this section the word "person" shall mean any natural person, business, joint venture, partnership, corporation, union, committee, club, any other organization, entity or legal entity, or group of individuals.

By: \_\_\_\_\_  
(Printed Authorized Person's Name)

By: \_\_\_\_\_  
(Authorized Person's Signature)

Its: \_\_\_\_\_  
(Corporate Title)

\_\_\_\_\_  
(Corporate Name)

Date: \_\_\_\_\_

**DEBARMENT DISCLOSURE FORM**

**PUBLIC CONTRACTS - DEBARMENT  
CHAPTER 550, ACTS OF 1991**

The said undersigned certifies under penalties of perjury that the said undersigned is not presently debarred from doing public construction work in the Commonwealth of Massachusetts under the provisions of Section 29F of Chapter 29 of the General Laws, or any other applicable debarment provisions of any other Chapter of the General Laws, or any Rule or Regulation promulgated thereunder.

Date: \_\_\_\_\_

Name of Bidder: \_\_\_\_\_

By: \_\_\_\_\_  
Signature

\_\_\_\_\_  
Print Name & Title of Person Signing

\_\_\_\_\_  
Address

\_\_\_\_\_  
City, State, ZIP

**THIS FORM MUST BE SIGNED & RETURNED WITH YOUR BID OFFER.**

**EQUAL EMPLOYMENT OPPORTUNITY STATEMENT**

It is the policy of the Springfield Water and Sewer Commission not to discriminate against any employee or applicant for employment because of age, race, color, religion, sex, national origin, disability, or political affiliation.

The Springfield Water and Sewer Commission shall insure that applicants are employed and that employees are treated, during employment, without discrimination based on age, race, color, religion, sex, national origin, disability, or political affiliation. Such action shall include, but not limited to, the following: employment, promotion, transfer, recruitment advertising, layoff or termination, rate of pay or other forms of compensation, medical and other benefits, and selection of training, including apprenticeships.

Unanimously Voted May 1, 1997  
Springfield Water and Sewer Commission

**MASSACHUSETTS STATE REVOLVING FUND  
AFFIRMATIVE ACTION (MBE/WBE) REQUIREMENTS**

The Bidder/Proposer shall comply with Minority Business Enterprise / Women Business Enterprise (MBE / WBE) requirements of the Massachusetts State Revolving Fund agreements.

The undersigned certifies that the Bidder/Proposer has read the above Springfield Water and Sewer Commission Equal Opportunity Employment Statement and Massachusetts Affirmative Action requirements:

By: \_\_\_\_\_  
(Printed Authorized Person's Name)

By: \_\_\_\_\_  
(Authorized Person's Signature)

Its: \_\_\_\_\_  
(Corporate Title)

\_\_\_\_\_  
(Corporate Name)

Date: \_\_\_\_\_

Last Modified: 04/09/2025 at 10:39AM EDT

# Springfield Water And Sewer Commission

Last Modified: 04/09/2025 at 10:39AM EDT

**This Form Shall Be Completely Filled Out And Returned With The Bid/Proposal. Failure To Do So May Subject The Bidder To Disqualification**

OSHA SAFETY TRAINING CERTIFICATION

**Chapter 306 of the Acts of 2004  
An Act Relative to the Health and Safety on Construction Projects**

GENERAL CONTRACTOR'S CERTIFICATION - BID FORM

\_\_\_\_\_ (Name of General Bidder) hereby certifies that it, and all its subcontractors who are not filed subbidders shall:

(1) who shall certify that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee.

Signed under the penalties of perjury. \_\_\_\_\_ (date)

\_\_\_\_\_  
Signature of authorized representative of contractor

\_\_\_\_\_  
Print name of authorized representative of contractor

**RETURN THIS FORM WITH YOUR BID**

OSHA SAFETY TRAINING  
CERTIFICATION  
00200 A5-1

North Branch Interceptor Rehabilitation

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**STATEMENT OF BIDDER'S QUALIFICATIONS**

All questions must be answered and the data given must be clear and comprehensive. This statement must be notarized. If necessary, questions may be answered on separate attached sheets. The Bidder may submit any additional information it desires.

The bidder must provide references including telephone number and contact names in response to the questions in this section. References will be used in determining the responsibility of the bidder. The city reserves the right to use itself as a reference.

1. Name of Bidder

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2. Business Address

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3. The names, titles, residences and Social Security numbers of all persons and parties interested in this Proposal as principals are as follows:

Note: Give the first and last names in full. In the case of corporation, give names of officers and directors; in the case of a partnership, give names of all partners.

IMPORTANT: Be sure residences and Social Security Numbers are listed below.

Name	Title	Home Address	Social Security #
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Bidder's Name \_\_\_\_\_

Last Modified: 04/09/2025 at 10:39AM EDT

4. The date the company was organized.

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5. If a corporation, where incorporated.

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6. How many years have you been engaged in the **construction of sewerage and rehabilitation of sewer systems** under your present firm or trade name?

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7. Please explain the general character of work performed by your company.

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8. List all projects that your organization are currently performing or have been awarded at the time of this bid? Provide the following information:

Name and Address of Owner for Whom Work is Being Done	Whether Work Being Done as Contractor or Sub-contractor	Description of Work	Approximate Amount of Contract	Approximate Completion Date of Work
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Bidder's Name \_\_\_\_\_



9. What is your annual gross revenue (last year and projected for the next two years), what is your current revenue commitment (in dollars)?

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10. Has your present organization ever failed to complete any work awarded to it? If so, state when, where, and why.

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11. Has your present organization ever defaulted on a contract? If so, state when, where, and why.

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12. Submit a preliminary project schedule with number of crews and construction sequencing proposed for the project.

Bidder's Name \_\_\_\_\_

13. What project(s) has/have your organization completed of character similar to this project? Provide the following information:

Name and Address of Owner for Whom Work Was Done	State Whether Work Was Done as Contractor or Sub-Description of Work	Approximate Amount of Contract	Approximate Completion Date of Work
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

14. Describe equipment available for the performance of this contract by setting forth make, model and year, size, number, and type for each such piece of equipment (a) owned, (b) currently rented or (c) to be rented. Bidder must set forth description of all equipment it plans to use whether rented or owned.

(a) Owned

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Bidder's Name \_\_\_\_\_

(b, c) Rented

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15. Describe the background and experience of the principal members of your organization, including the officers.

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16. Provide three (3) similar, successfully completed projects within the past five (5) years, involving the construction of sewerage, combined sewerage and storm drainage systems of a similar size and scope of the Project including large cast-in-place concrete structures. State specific information (size and complexity) including referral and contact information.

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Bidder's Name \_\_\_\_\_

17. Provide three (3) similar, successfully completed projects within the past five (5) years, involving the construction of structural cementitious rehabilitation of large sewer manholes and chambers of a similar size and scope of the Project. State specific information (size and complexity) including referral and contact information.

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18. Provide three (3) similar, successfully completed projects within the past five (5) years, involving the rehabilitation of large diameter pipe using cured-in-place pipelining of a similar size and scope of the Project. State specific information (size and complexity) including referral and contact information.

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19. Who will be the contractor's project manager? State such person's qualifications. Also list names of any other key and/or supervisory employees who will be participating in this contract and their qualifications (years of experience, etc.).

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Bidder's Name \_\_\_\_\_

20. Who will be the contractor's full time on-site superintendent? Submit such person's resume for review by Owner/Engineer. The Project Superintendent must have a minimum of 10 years construction experience; demonstrate ability to manage a budget, schedule, and crew coordination; demonstrate experience in traffic management, community relations with local residents, utility coordination, contaminated soil management, and permit compliance. Also list names of other key and/or supervisory employees who will be participating in this contract and their qualifications (years of experience, etc.).

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21. Submit the number, size and equipment of crews to be established to complete the work as specified.

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22. Give below the name and address of one or more banks and the contact person's name(s) and phone number(s), at the bank(s), which have information that would enable them to advise regarding the financial ability of your company.

Name of Bank / Contact Person

Address / Phone Number

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23. The apparent low bidder shall furnish a detailed financial statement and furnish any other information that may be required by the Springfield Water and Sewer Commission.

Bidder's Name \_\_\_\_\_

24. What is your available credit? The apparent low bidder shall furnish written evidence.

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25. Employer Identification No. (Treasurer's No.)

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26. Give below the name and address of the bidder's Surety / Bonding company and the contact person's name and phone number, at the Surety / Bonding company, which has information that would enable them to advise regarding the status of existing bonds and bonding capability of your company.

Name of Surety or Bonding Company / Contact Person Number	Address / Phone
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27. Give below the name, company (or owner), address and phone number of at least five references (Owner or Engineer/Architect) who have information that would enable them to report your performance on past or existing projects of the general nature similar to this Project.

Name of Owner or Company / Contact Person	Address / Phone Number
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Bidder's Name \_\_\_\_\_

28. Is your organization currently or has your organization been previously involved in any lawsuits regarding work performed within the last three years? If so, please provide the approximate value of dispute, and name(s) and address(s) of opposing party.

Name of Opposing Party / Contact Person    Address / Phone Number

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29. Name, Signature, Social Security number and Title of officer preparing this proposal.

Name \_\_\_\_\_

Signature \_\_\_\_\_

Social Security  
Number \_\_\_\_\_ Title \_\_\_\_\_

Bidder's Name \_\_\_\_\_

30. The undersigned hereby authorizes and requests any person, firm or corporation to furnish any information requested by the Springfield Water and Sewer Commission in verification of the recitals comprising this Statement of Bidder's Qualifications.

Dated at \_\_\_\_\_ this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_

\_\_\_\_\_  
(Signature)

Tel. No. \_\_\_\_\_

By \_\_\_\_\_

Title \_\_\_\_\_

State of \_\_\_\_\_ )

County of \_\_\_\_\_ )

\_\_\_\_\_, being duly sworn,

deposes and says that he/she is

\_\_\_\_\_ of

\_\_\_\_\_  
(Name of Organization)

and that the answers to the foregoing questions and all statements therein contained are true and correct.

Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_

\_\_\_\_\_  
(Notary Public)

My commission expires \_\_\_\_\_, 20\_\_\_\_\_

Bidder's Name \_\_\_\_\_



## AMERICANS WITH DISABILITIES ACT

### Americans With Disabilities Act (42 U.S.C. 12131) Section 504 of the Rehabilitation Act of 1973

The Americans with Disabilities Act (the "Act") applies to all employers of fifteen or more employees. All contractors that are subject to the Act must comply with its provisions. In further compliance with the Act, all Contractors who enter into contracts with the Springfield Water and Sewer Commission are prohibited from discrimination against the Springfield Water and Sewer Commission's employees, regardless of the size of the Contractor.

The Act protects against discrimination on the basis of "disability", which is defined as a physical or mental impairment that substantially limits at least one "major life activity"; discrimination against a person having a history or record of such impairment; and discrimination against an individual regarded - even if inaccurately - as having such an impairment. The Act also expressly prohibits discrimination that is based on an individual's relationship or association with a disabled person.

The bidder shall not discriminate against any qualified employee or job applicant with a disability. A "qualified" employee or job applicant is an individual with a disability who satisfies the requisite skill, experience, education and other job-related requirements of the employment position such individual holds or desires, and who with or without reasonable accommodations, is able to perform the essential functions of the job.

By submitting its bid, the bidder certifies to the Springfield Water and Sewer Commission that it understands and will comply with all applicable provisions of the Act, including compliance with applicable provisions of Section 504 of the Rehabilitation Act of 1973, if the bidder is receiving federal funds.

END OF SECTION

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# CORPORATE CERTIFICATION

I \_\_\_\_\_ a resident of \_\_\_\_\_ in the  
\*\* (Clerk/Secretary) (City/Town)  
State of \_\_\_\_\_ **DO HEREBY CERTIFY** that I am the Clerk/Secretary of  
(State)  
\_\_\_\_\_ a Corporation duly organized and existing under and  
(Bidder/Proposer)  
by virtue of the laws of the State of \_\_\_\_\_ and that I have custody of the  
(State)  
records of such Corporation; and that as of the date herein below recited  
\_\_\_\_\_ is the \_\_\_\_\_  
\* (Printed Authorized Person's Name) (Corporate Office)  
authorized to execute and deliver in the name and on behalf of the Corporation the following:

\_\_\_\_\_  
\_\_\_\_\_

**IN WITNESS WHEREOF**, I have hereunto set my hand and affixed the Corporate Seal of such Corporation the \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.

(Affix  
Seal  
Here)

By: \_\_\_\_\_  
\*\* (Clerk / Secretary)

- \* This must be the name of the person authorized in the Firm's by-laws to sign contracts.
- \*\* Since an Officer of the Firm cannot certify himself / herself this document must be signed someone other than the person signing the Contract Agreement.

GENERAL CONTRACTOR'S CERTIFICATION

A contractor will not be eligible for award of a contract unless such contractor has submitted the following certification, which is deemed a part of the resulting contract:

\_\_\_\_\_  
(Contractor Name)

Certifies that they:

- 1. Will not discriminate in their employment practices;
- 2. Intend to use the following listed construction trades in the work under the contract:

\_\_\_\_\_  
\_\_\_\_\_

and

- 3. Will make good faith efforts to comply with the minority employee and women employee workforce participation ratio goals and specific affirmative action steps contained herein; and
- 4. Are in compliance with all applicable federal and state laws, rules, and regulations governing fair labor and employment practices; and
- 5. Will provide the provisions of the "Supplemental Equal Employment Opportunity, Non-Discrimination and Affirmative Action Program" to each and every subcontractor employed on the Project and will incorporate the terms of this Section into all subcontracts and work orders entered into on the Project.
- 6. Agree to comply with all provisions contained herein.

\_\_\_\_\_  
Signature of authorized representative of Contractor

\_\_\_\_\_  
Date

\_\_\_\_\_  
Printed name of authorized representative of Contractor

Last Modified: 04/09/2025 at 10:39AM EDT

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Last Modified: 04/09/2025 at 10:39AM EDT

PROJECTED WORKFORCE CERTIFICATION

THIS FORM MUST BE SUBMITTED WITH YOUR BID

I,

\_\_\_\_\_

Certify that the following is my projected workforce for this contract:

“North Branch Interceptor Rehabilitation”, Springfield, MA

GENERAL CONTRACTOR ESTIMATED # OF NEW HIRES

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

SUBTRADE ESTIMATED # OF NEW HIRES

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Signed under penalties of perjury,

\_\_\_\_\_

Bidder’s Name \_\_\_\_\_

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**DIESEL RETROFIT PROGRAM**

**STATEMENT OF INTENT TO COMPLY**

*This form must be signed and submitted by the bidder as part of the bid.*

**Local Government Unit:** Springfield Water and Sewer Commission

**WIFIA Program No.:** WIFIA-N20102MA

**Contract No.:** XX      **Contract Title:** North Branch Interceptor Rehabilitation

**Bidder:** \_\_\_\_\_

The undersigned, on behalf of the above-named Bidder, agrees that, if awarded the Contract:

1. the Bidder shall comply with the Massachusetts Department of Environmental Protection's ("MassDEP") Diesel Retrofit Program by ensuring that all diesel powered non-road construction equipment and vehicles greater than 50 brake horsepower which will be used in the performance of the work under the Contract are equipped or retrofitted with a pollution control device in accordance with the Diesel Retrofit Program Standard;
2. the Bidder shall require all Subcontractors to comply with MassDEP's Diesel Retrofit Program by ensuring all diesel powered non-road construction equipment and vehicles greater than 50 brake horsepower which will be used in the performance of the work under the Contract are equipped or retrofitted with a pollution control device in accordance with the Diesel Retrofit Program Standard; and
3. The Bidder shall submit and shall require each Subcontractor to submit a Diesel Retrofit Program Contractor Certification (form attached) with a Diesel Retrofit List to MassDEP Municipal Services and the Bidder within 10 days of the bidder being notified that it has been awarded the Contract. The Bidder shall require each Subcontractor to update such Certification and List within 2 days of using additional Diesel Construction Equipment on the project under the Contract.

\_\_\_\_\_  
(Signature of Bidder's Authorized Representative)

\_\_\_\_\_  
(Date)

DEP-DMS-B

DIESEL RETROFIT  
CERTIFICATION  
00200 A11-1

North Branch Interceptor Rehabilitation

Last Modified: 04/09/2025 at 10:39AM EDT



**DIESEL RETROFIT PROGRAM CONTRACTOR CERTIFICATION**

*Each Contractor and its Subcontractor(s) must sign and email this form to the **DEP DMS** project engineer, within 10 days after the contractor is awarded.*

**Local Government Unit:** Springfield Water and Sewer Commission

**WIFIA Program No.:** WIFIA-N20102MA

**Contract No.:** XX

**Contract Title:** North Branch Interceptor Rehabilitation

**Contractor** \_\_\_\_\_

I, \_\_\_\_\_, an authorized signatory for \_\_\_\_\_ whose principal place of business is at \_\_\_\_\_ do hereby certify that any and all diesel-powered non-road construction equipment and vehicles greater than 50 brake horsepower which will be used in the performance of the work under the Contract (hereinafter "Diesel Construction Equipment") have pollution control devices, such as oxidation catalysts or particulate filters, installed on the exhaust system side of the diesel combustion engine equipment in accordance with the Diesel Retrofit Program Standard.

I am submitting on behalf of \_\_\_\_\_ a list of all said Diesel Construction Equipment, labeled "Diesel Retrofit List," that will be used in connection with this Contract by \_\_\_\_\_. I hereby certify that the information on the attached Diesel Retrofit List is correct and accurate as of the date of signature. The List includes the following information for each piece of Diesel Construction Equipment:

1. Equipment type, make, model;
2. Vehicle Identification Number or VIN;
3. Engine model and year of manufacture;
4. Engine HP rating;
5. Emission Control Device ("ECO") type (Diesel Oxidation Catalyst or Diesel Particulate Filter);
6. ECO make, model, and manufacturer;
7. ECO EPA or CARB Verification Number or manufacturer's certification that the DOC or DPF meets or exceeds emission reductions provided by similar emission control technology verified by EPA or CARB;
8. ECO installation date;
9. Type of fuel to be used; and
10. Whether the equipment is owned or rented.

## DIESEL RETROFIT PROGRAM CONTRACTOR CERTIFICATION

\_\_\_\_\_ shall notify DEP within 48 hours of any new Diesel Construction Equipment brought onto the Contract site. \_\_\_\_\_ shall maintain detailed records of all Diesel Construction Equipment used at the Contract site, including the dates and duration times the Diesel Construction Equipment is used at the Contract site. \_\_\_\_\_ shall make such records available for inspection by DEP. \_\_\_\_\_ shall ensure that the emissions control technology for each piece of Diesel Construction Equipment is operated, maintained, and serviced as recommended by the manufacturer. \_\_\_\_\_ shall retrofit prior to the end of the Contract any Diesel Construction Equipment no longer exempt from meeting the Diesel Construction Equipment Standard under exemption 3 (because it had an engine that met the EPA particulate matter (PM) Tier emission standards currently in effect at the start of the Contract for non-road diesel engines for the applicable engine power group and such emissions standards were superseded during the Contract).

I acknowledge that this certificate is being furnished as a requirement under this Contract and is subject to applicable State and federal laws, both criminal and civil. Signed under pains and penalty of perjury on this date \_\_\_\_\_.

Signature \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Last Modified: 04/09/2025 at 10:39AM EDT

DEP-DMS-B

DIESEL RETROFIT  
CERTIFICATION  
00200 A11-3

North Branch Interceptor Rehabilitation

SECTION 00300

FORMS FOR GENERAL BID

PLACE: \_\_\_\_\_

DATE: \_\_\_\_\_

Proposal of \_\_\_\_\_ (hereinafter called "BIDDER")\*  
(Name of Proposer)

A corporation organized and existing under the laws of the State of \_\_\_\_\_,\*  
a partnership, or an individual doing business as \_\_\_\_\_.

To the SPRINGFIELD WATER AND SEWER COMMISSION, hereinafter called the "Owner."

Gentlemen:

**North Branch Interceptor Rehabilitation**  
**SWSC Bid No. 25-08**

The BIDDER, in compliance with your Invitation to Bid for the Springfield Water and Sewer Commission project entitled: **“North Branch Interceptor Rehabilitation”**, Springfield, Massachusetts, having examined the Plans and Specifications with related documents and the site of the proposed Project and being familiar with all of the conditions surrounding the construction of the proposed project, including the availability of materials and labor, hereby proposes to furnish all labor, materials, and supplies and to construct the project in accordance with the Contract Documents within the time set forth therein, and at the prices stated below. These prices are to cover all expenses incurred in performing the work required under the Contract Documents of which this Proposal is a part.

BIDDER hereby agrees to commence work under this Contract on or before a date to be specified, in a written "Notice To Proceed", by the Owner, and to fully complete the project within 180 Calendar Days thereafter as stipulated in the Specifications. No work on holidays will be allowed. Work on Saturdays and/or Sundays will only be allowed with prior City of Springfield and Owner approval and with adequate Police Detail Protection. Night work will only be allowed with prior City of Springfield and Owner approval and with adequate Police Detail protection. BIDDER further agrees to pay as liquidated damages the minimum sum of \$1,500.00 for each consecutive calendar day thereafter until the Project is Substantially Complete.

A Labor and Material or Payment Bond in the amount of 100% of the total Contract Price must be provided by the General Contractor.

A Performance Bond in the amount of 100% of the total Contract Price must be provided by the General Contractor.

Bidder acknowledges receipt of the following addenda:

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\*Insert corporation, partnership, or individual as applicable.

Unit and lump sum prices and extended amounts are to be shown in both words and figures. In case of discrepancy, the amount shown in words will govern.

BASE BID ITEMS

Item #	Estimated Quantity	Units	Description of the Work and Unit Price Bid Written in Words and Numbers	Amount
00800.1	1	AL	Price Adjustments for Fuel, Liquid Asphalt, and Portland Cement <u>Ten Thousand Dollars</u>	<u>\$10,000.00</u>
01025.1	1	AL	Misc. Infrastructure Improvements <u>Two Hundred Thousand Dollars</u>	<u>\$200,000.00</u>
01200.1	1	Lump Sum	Survey: Construction Baseline Layout and As-Builts _____ Dollars ( _____ ) Lump Sum	\$ _____
01390.1	1	Lump Sum	Pre-Construction Survey _____ Dollars ( _____ ) Lump Sum	\$ _____
01505.1	1	Lump Sum	Mobilization _____ Dollars ( _____ ) Lump Sum	\$ _____
01568.1	1	Lump Sum	Sedimentation and Erosion Control _____ Dollars ( _____ ) Lump Sum	\$ _____

Item #	Estimated Quantity	Units	Description of the Work and Unit Price Bid Written in Words and Numbers	Amount
01570.1	1	Lump Sum	Traffic Management _____ Dollars ( _____ ) Lump Sum	\$ _____
01570.4	1	AL	Uniform Police and Traffic Control <u>Twelve Thousand Dollars</u>	<u>\$12,000.00</u>
02051.1	1	Lump Sum	Demolition, Modification and Abandonment _____ Dollars ( _____ ) Lump Sum	\$ _____
02051.2	33	Vertical Feet	Demolition and Reconstruction of Brick Sewer Manhole Chimney _____ Dollars ( _____ ) Per Vertical Feet	\$ _____
02110.1	11,924	Square Yard	Clearing and Grubbing _____ Dollars ( _____ ) Per Square Yard	\$ _____
02210.1	1	Lump Sum	Roadway Grading and Construction _____ Dollars ( _____ ) Lump Sum	\$ _____
02252.1	1	Lump Sum	8-Foot Diameter Manhole _____ Dollars ( _____ ) Lump Sum	\$ _____

Item #	Estimated Quantity	Units	Description of the Work and Unit Price Bid Written in Words and Numbers	Amount
02252.7	14	Each	Manhole Frame and Covers _____ Dollars ( _____ ) Each	\$ _____
02498.1	1	Lump Sum	Easement Restoration _____ Dollars ( _____ ) Lump Sum	\$ _____
02500.1	227	Square Yard	Bituminous Concrete Trench Pavement _____ Dollars ( _____ ) Per Square Yard	\$ _____
02623.1	55	Linear Feet	36" Polyvinyl Chloride Pipe _____ Dollars ( _____ ) Per Linear Feet	\$ _____
02623.2	35	Linear Feet	24" Polyvinyl Chloride Pipe _____ Dollars ( _____ ) Per Linear Feet	\$ _____
02760.1	3,120	Linear Feet	Pipeline Heavy Cleaning of Interceptor Pipelines _____ Dollars ( _____ ) Per Linear Feet	\$ _____
02761.1	1	Lump Sum	Bypass Flow Handling _____ Dollars ( _____ ) Lump Sum	\$ _____

Item #	Estimated Quantity	Units	Description of the Work and Unit Price Bid Written in Words and Numbers	Amount
02767.1	2,630	Linear Feet	36" Cured-in-Place-Pipelining _____ Dollars ( _____ ) Per Linear Feet	\$ _____
02767.2	490	Linear Feet	39" Cured-in-Place-Pipelining _____ Dollars ( _____ ) Per Linear Feet	\$ _____
02770.1	140	Vertical Feet	Sewer Manhole Rehabilitation _____ Dollars ( _____ ) Vertical Feet	\$ _____
03300.1	3	Each	Cast-In-Place Concrete Field Collar _____ Dollars ( _____ ) Each	\$ _____

Total amount of Base Bid based on Engineer's estimate of quantities for Items 00100.1 through 03300.1.

\_\_\_\_\_ \$ \_\_\_\_\_  
 (Amount in Words) (Amount in Figures)



The above unit and lump sum prices shall include all labor, equipment, materials, overhead, profit, insurance, and other costs to cover the finished work of the several kinds called for.

**Basis of award will be determined in the following manner and at the sole discretion of the Owner. First, bids for the Base Bid will be compared against available funds (as determined by the Owner). If available funds remain following that comparison, the Alternate Bid items may be added to the Base Bid at the Owner's discretion. The lowest responsible bidder will be determined based on the selected Base Bid plus selected Alternate Bid item(s), if any. Failure to provide a cost for the Alternate Bid items may be basis for rejection of the bid.**

NOTE: The award will be based upon the Proposed Contract Price and will be made in accordance with the provisions of MGL Chapter 30, Section 39M. The quantities designated throughout the Bid Schedule, however, are estimates only, and the Unit Price provided for a category of Work shall be the basis for the entire term of the Contract, for additions to or deletions from the Total Contract Price for Work of the category, so long as the number of units of work remains within fifteen percent (15%) of the estimated quantity or twenty five (25)% of the estimated quantity for items relating to soil management, handling, and/or disposal (Items 1 through 10).

This project is being bid under Chapter 30, Section 39M of the Massachusetts General Laws. The Bidder understands that the Owner reserves the right to reject any or all bids and to waive any informalities in the bidding. The Bidder understands that the Owner shall determine if this bid is responsible and eligible in accordance with M.G.L. c.30, s39M based in part on information contained in the Statement of Bidder's Qualifications submitted as part of this bid form.

The time period for holding bids, where Federal approval is not required is 30 days, Saturdays, Sundays and legal holidays excluded, after the opening of bids and where Federal approval is required, the time period for holding bids is 30 days, Saturdays, Sundays and holidays excluded after Federal approval. Upon receipt of written notice of the acceptance of this bid, Bidder shall execute the formal Contract attached within 10 calendar days and deliver a Performance and Payment Surety Bonds as required in the General Conditions. The Bid Security (5% of Bid) attached in the sum of \_\_\_\_\_ Dollars, (\$ \_\_\_\_\_) is to become the property of the Owner in the event the Contract and Bond are not executed within the time above set forth as liquidated damages for the delay and additional expense to the Owner caused thereby.

The undersigned hereby declares that he has carefully examined the site of the proposed Work and fully informed and satisfied himself as to the conditions there existing, the character and requirements of the proposed Work, the difficulties attendant upon its execution and the accuracy of all estimated quantities stated in this FORMS FOR GENERAL BID, and he has carefully read and examined the Drawings, the annexed proposed CONTRACT and the Specifications and other Contract Documents therein referred to and knows and understands the terms and provisions thereof.

The undersigned hereby declares that he understands that information relative to subsurface and other conditions, natural phenomena, existing pipes and other structures (surface and/or subsurface) has been furnished only for his information and convenience without any warranty or guarantee, expressed or implied, that the subsurface and/or other conditions, natural phenomena, existing pipes and other structures (surface and/or subsurface) actually encountered will be the same as those shown on the Drawings or in any of the other Contract Documents and he agrees that he shall not use or be entitled to use any such information made available to him through the Contract Documents or otherwise or obtained by him in his own examination of the site, as a basis of or ground for any claim against the Owner or the Engineer arising from or by reason of any variance which may exist between the aforesaid information made available to or acquired by him and the subsurface and/or other conditions, natural phenomena, existing pipes and other structures (surface and/or subsurface) actually encountered during the construction work, and he has made due allowance therefore in this Bid.

The undersigned hereby declares that he understands that the quantities of work tabulated in this Bid or indicated on the Drawings or in the Specifications or other Contract Documents are only approximate and are subject to increase or decrease as deemed necessary by the Engineer.

The undersigned agrees that, if this Bid is accepted he will contract with the Owner, as provided in the copy of the Contract Documents deposited in the office of the Engineer, this FORMS FOR GENERAL BID being part of said Contract Documents, and that he will perform all the work and furnish all the materials and equipment, and provide all labor, services, plant, machinery, apparatus, appliances, tools, supplies and all other things required by the Contract Documents in the manner and within the time therein prescribed and according to the requirements of the Engineer as therein set forth, and that he will take in full payment therefore the lump sum or unit price applicable to each item of the Work as stated in the schedule below.

The undersigned certifies under penalties of perjury that no officer, agent, or employee of the Owner is directly or indirectly interested in this BID.

The undersigned certifies under penalties of perjury that this bid is in all respects bona fide, fair and made without collusion or fraud with any other person. As used in this paragraph the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity.

The undersigned hereby certifies that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the work.

Applicable provisions of Massachusetts General Laws and Regulations and/or the United States Code and Code of Federal Regulations govern this Contract and any provision violation of the foregoing shall be deemed null, void and of no effect. Where conflict between Code of Federal Regulations and State Laws and Regulations exist, the more stringent requirement shall apply.

Pursuant to M.G.L.c.62C, s49A the undersigned certifies under the penalties of perjury that the Bidder, to the Bidder's best knowledge and belief, has filed all state tax returns and paid all State Taxes required under law

The undersigned bidder hereby certifies he/she will comply with the specific affirmative action steps contained in the EEO/AA provisions of this Contract, including compliance with the Disadvantaged Business Enterprise provisions as required under these contract provisions. The contractor receiving the award of the contract shall incorporate the EEO/AA provisions of this contract into all subcontracts and purchase orders so that such provisions will be binding upon each subcontractor or vendor.

The undersigned further certifies under penalty of perjury that the said undersigned is not presently debarred from doing public construction work in the Commonwealth under the provisions of Section Twenty-Nine F of Chapter Twenty-Nine, or any other applicable debarment provisions of any other Chapter of the General Laws or any rule or regulation promulgated thereunder; and is not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency.

Bidders must fully comply with Subpart C of 2 CFR Part 180 and 2 CFR Part 1532, entitled responsibilities of Participants Regarding transactions (Doing Business with Other Persons). Contractors, subcontractors, or suppliers that appear in the Data Services > Exclusions file “Public V2” at <https://sam.gov/data-services/Exclusions?privacy=Public> are not eligible for award of any contracts funded by the Massachusetts State Revolving Fund.

The undersigned bidder agrees that the undersigned will fully comply with Subpart C of 2 CFR Part 180 and 2 CFR Part 1532, entitled Responsibilities of Participants Regarding Transactions (Doing Business with Other Persons). The undersigned shall not award any subcontracts or purchase any materials from suppliers that appear on the Excluded Parties List System. The undersigned shall include this requirement in each subcontract and require it to be included in all subcontracts regardless of tier. The undersigned shall maintain reasonable records to demonstrate compliance with these requirements.

Respectfully submitted,

Date: \_\_\_\_\_ Name of General Bidder: \_\_\_\_\_

Federal Employer Identification Number : \_\_\_\_\_

By (signature) : \_\_\_\_\_

Title and Name of Person Signing the Bid : \_\_\_\_\_

Business Address : \_\_\_\_\_

City, State, and Zip Code : \_\_\_\_\_

**CERTIFICATE OF AUTHORITY**

At a duly authorized meeting of the Board of Directors of the \_\_\_\_\_  
(name of corporation)

held on \_\_\_\_\_ Directors were present or waived notice, it was voted that \_\_\_\_\_  
(date)

\_\_\_\_\_ of this company be and hereby is authorized to execute contracts and bonds  
(name and title)

in the name and behalf of said company, and affix its Corporate Seal thereto, and such execution  
of any contract or bond of obligation in this company's name on its behalf of such \_\_\_\_\_  
(OFFICER)  
under seal of the company shall be valid and binding upon this company.

A TRUE COPY,

ATTEST: \_\_\_\_\_

Place of Business:

\_\_\_\_\_  
\_\_\_\_\_

I hereby certify that I am the \_\_\_\_\_ of the \_\_\_\_\_  
(Title) (Name of Corporation)

that \_\_\_\_\_ is the duly elected \_\_\_\_\_ of said  
(Name of Officer) (Title)

company, and the above vote has not been amended or rescinded and remains in full force and  
effect as of the date of this contract.

Signature: \_\_\_\_\_

(Corporate Seal)

Name/Title: \_\_\_\_\_

Date: \_\_\_\_\_

COMMONWEALTH OF MASSACHUSETTS, SS. \_\_\_\_\_, 2025

Last Modified: 04/09/2025 at 10:39AM EDT

Then personally appeared the above named \_\_\_\_\_ and acknowledged the foregoing instrument to be his/her free act and deed before me.

NOTARY PUBLIC \_\_\_\_\_

My commission expires: \_\_\_\_\_

**THE BIDDER SHALL STATE THE NAMES OF ALL SUBCONTRACTORS THAT HE/SHE PROPOSES TO USE**

PROPOSED SUBCONTRACTORS

If none, write "none" \_\_\_\_\_.

\*Description of Work \_\_\_\_\_

Proposed Subcontractor  
Name \_\_\_\_\_

Address \_\_\_\_\_

\*Description of Work \_\_\_\_\_

Proposed Subcontractor  
Name \_\_\_\_\_

Address \_\_\_\_\_

\*Description of Work \_\_\_\_\_

Proposed Subcontractor  
Name \_\_\_\_\_

Address \_\_\_\_\_

\*Description of Work \_\_\_\_\_

Proposed Subcontractor  
Name \_\_\_\_\_

Address \_\_\_\_\_

\*Insert description of work and subcontractors' names as may be required.

This is to certify that the names of the above-mentioned subcontractors are submitted with full knowledge and consent of the respective parties. The Bidder warrants that none of the proposed subcontractors have any conflict of interest as respects this Contract.

Bidder \_\_\_\_\_  
(Name)

By \_\_\_\_\_  
(Signature and Title)

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**SPRINGFIELD WATER AND SEWER COMMISSION**  
**SPRINGFIELD, MASSACHUSETTS**  
**North Branch Interceptor Rehabilitation**  
**SWSC Contract No. 2025XXXX**  
**AGREEMENT**

THIS AGREEMENT is dated as of the \_\_\_\_ day of \_\_\_\_\_ in the year \_\_\_\_ by and between Springfield Water and Sewer Commission acting by and through its Board of Water Commissioners (hereinafter called COMMISSION, SWSC or OWNER), duly authorized therefor, acting herein solely for said Commission and without personal liability to the City/Town, and \_\_\_\_\_ (hereinafter called CONTRACTOR). COMMISSION AND CONTRACTOR, in consideration of the mutual covenants hereinafter set forth, agree as follows:

**ARTICLE 1. WORK**

- 1.1 CONTRACTOR shall perform the Work as specified or indicated in these Contract Documents. The scope of work is summarized in Section “Summary of Work” and described herein these specifications.

**ARTICLE 2. OWNER AND ENGINEER**

- 2.1 The Project has been designed by that Kleinfelder, Inc., One Beacon Street, Suite 8100, Boston, MA 02108 who is hereinafter called ENGINEER and who is to act as COMMISSION'S representative, assume all duties and responsibilities, and have the rights and authority assigned to ENGINEER in the Contract Documents in connection with completion of the Work in accordance with the Contract Documents.

**ARTICLE 3. CONTRACT TIMES**

- 3.1 The Work will be substantially completed within 180 days from the date of the Notice to Proceed and completed and ready for final payment in accordance with the General Conditions no later than December 31, 2025.
- 3.2 Project Schedule: Contractor shall submit a work schedule within 7 calendar days of receipt of signed Agreement.
- 3.3 CONTRACTOR agrees that the Work shall be prosecuted diligently and uninterruptedly and at such rate of progress as will ensure full completion thereof within the Contract Time stated above. It is expressly understood and agreed, by and between CONTRACTOR and OWNER, that the Contract Time is reasonable for the completion of the Work.



3.4 Work hours shall be defined as follows:

3.4.1 Normal work hours: Monday-Friday, 7:00 a.m. to 3:30 p.m.

3.4.2 Extended work hours: Monday-Friday, 7:00 a.m. to 5:00 p.m.

3.4.3 No work on Saturdays unless authorized by SWSC in writing.

3.4.4 No work is allowed on Sundays or Commission observed holidays.

#### **ARTICLE 4. CONTRACT PRICE**

4.1 COMMISSION shall pay CONTRACTOR for completion of the Work in accordance with the Contract Documents an amount in current funds equal to the prices stipulated in the CONTRACTOR's BID Form attached to this Agreement.

#### **ARTICLE 5. APPLICATION FOR PAYMENT**

CONTRACTOR shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be reviewed and certified by ENGINEER as provided in the General Conditions.

5.1 CONTRACTOR shall prepare a Schedule of Values (SOV) and submit it for ENGINEER and OWNER's review and approval. The SOV shall be broken down into sufficient work tasks that detail the sequence of work. Applications for Payments shall be based on the Approved SOV.

5.2 CONTRACTOR shall submit Applications for Payment in accordance with the approved SOV. Applications for Payment will be reviewed by the Engineer and processed by OWNER as provided in the Conditions of the Contract.

5.3 Retainage shall be held in the amount of 5% until satisfactory substantial completion of the Work. Upon substantial completion the OWNER shall pay the CONTRACTOR the entire balance due on the contract less (1) a retention based on its estimate of the fair value of its claims against the CONTRACTOR and of the cost of completing the incomplete and unsatisfactory items of work and less (2) a retention for direct payments to work and less (2) a retention for direct payments to subcontractors based on demands for same in accordance with the provisions of M.G.L. Chapter 30, Section 39F, or based on the record of payments by the CONTRACTOR to the subcontractors under this Contract if such record of payment indicates that the CONTRACTOR has not paid subcontractors as provided in Section 39F.

## ARTICLE 6. PROGRESS AND FINAL PAYMENTS

- 6.1 OWNER will make payments on account of the Contract Price on the basis of CONTRACTOR's Applications for Payment. All payments will be on the basis of the progress of the Work measured by the approved SOV and certified by the ENGINEER. No payment can be reviewed or approved without an agreeable SOV.
- 6.2 OWNER will make progress and final payments after review and acceptance of the received applications for payment, in accordance with the applicable Massachusetts General Law.
- 6.3 Progress payments will be made for the approved amounts less 5% retainage.

## ARTICLE 7. LIQUIDATED DAMAGES

- 7.1 CONTRACTOR and OWNER recognize that time is of the essence and that Owner will suffer financial and other losses if the Work is not completed within the times specified in Paragraph 3.1 above, plus any extensions thereof allowed in accordance with the Contract. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by OWNER if the Work is not completed on time. Accordingly, instead of requiring any such proof, OWNER and CONTRACTOR agree that as liquidated damages for delay (but not as a penalty), Contractor shall pay Owner **One Thousand Five Hundred Dollars and 00/100 (\$1,500.00)** for each day that expires after the time (as duly adjusted pursuant to the Contract) specified in Paragraph 3.1 above for Substantial Completion until the Work is substantially complete.

## ARTICLE 8. ASSURANCE

- 8.1 CONTRACTOR has familiarized himself/herself with the nature and extent of the Contract Documents, Work, locality, and with all local conditions and Federal, State and local laws, ordinances, rules and regulations that in any manner may affect cost, progress or performance of the Work.
- 8.2 CONTRACTOR has studied carefully all and the physical conditions at the site or otherwise affecting cost, progress or performance of the Work which were relied upon by OWNER in the preparation of the Drawings and Specifications and which have been identified in Article 4 of the Supplementary Conditions.
- 8.3 CONTRACTOR has made or caused to be made examinations, investigations and tests and studies of such reports and related data in addition to those referred to in

the above paragraph as CONTRACTOR deems necessary for the performance of the Work at the Contract Price within the Contract Time and in accordance with the other terms and conditions of the Contract Documents; and no additional examinations, investigations, tests, reports or similar data are or will be required for such purposes.

- 8.4 CONTRACTOR has correlated the results of all such observations, examinations, investigations, tests, reports and data with the terms and conditions of the Contract Documents.
- 8.5 CONTRACTOR has given OWNER written notice of any conflict, error or discrepancy that CONTRACTOR has discovered in the Contract Documents and the written resolution thereof by OWNER is acceptable to CONTRACTOR.
- 8.6 CONTRACTOR agrees that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance of the Work.

## **ARTICLE 9. CONTRACT DOCUMENTS**

The Contract Documents which comprise the entire agreement between COMMISSION and CONTRACTOR concerning the Work consist of the following:

- 9.1 Invitation to Bid.
- 9.2 Instructions to Bidders.
- 9.3 CONTRACTOR's Bid Form.
- 9.4 This Agreement.
- 9.5 Performance Bond, EJCDC Document C-610, 2007 edition, Performance Bond; EJCDC Document C610, 2007.
- 9.6 Payment Bond, EJCDC Document C-615, 2007 edition, Payment Bond; EJCDC Document C615, 2007.
- 9.7 Standard General Conditions of the Construction Contract, EJCDC Document C-700, 2007 edition.
- 9.8 Certificate(s) of Insurance
- 9.9 Supplementary Conditions
- 9.9 Technical Specifications (Included in these Contract Documents).

- 9.10 Contract Documents
- 9.11 Addenda numbers \_\_\_\_\_ to \_\_\_\_\_, inclusive.
- 9.12 WIFIA Documentation, Requirements, and Associated Forms.
- 9.13 Drawings prepared by Kleinfelder, Inc.
- 9.14 All employment requirements specified in these documents.
- 9.15. Davis Bacon and Massachusetts Wage Rates.
- 9.12 Any modification, including Change Orders, duly delivered after execution of Agreement.

**ARTICLE 10. MISCELLANEOUS**

- 10.1 Terms used in this Agreement which are defined in Article 1 of the General Conditions will have the meanings indicated in the General Conditions.
- 10.2 Neither OWNER nor CONTRACTOR shall, without the prior written consent of the other, assign or sublet in whole or in part any interest under any of the Contract Documents; and, specifically but without limitation, CONTRACTOR shall not assign any monies due or to become due without the prior written consent of OWNER. In case CONTRACTOR assigns all or any part of any monies due or to become due under this Contract, the instrument of assignment shall contain a clause substantially to the effect that it is agreed that the right of the assignee in and to any monies due or to become due to CONTRACTOR shall be subject to prior claims of all persons, firms and corporations for services rendered or materials supplied for the performance of the Work called for in this Contract.
- 10.3 COMMISSION and CONTRACTOR each binds itself, its partners, successors, assigns, and legal representatives to all covenants, agreements, and obligations contained in the Contract Documents.
- 10.4 The Contract Documents constitute the entire agreement between OWNER and CONTRACTOR and may only be altered, amended or repealed by a Modification.
- 10.5 The Contractor warrants that any products developed hereunder do not infringe upon or violate any patent, copyright, trade secret, or any other propriety right of any third party. In the event of any claim alleging the aforementioned against the Owner, the Owner shall promptly notify Contractor and the Contractor shall defend such claim, in the Owner's name but at Contractor's expense, and shall indemnify the Owner against any loss, cost, expense or liability arising out of such

claim, whether or not such claim is successful.

- 10.6 The Contractor, its employees and its subcontractors shall keep confidential all propriety information and material to which its employees, or its subcontractors may be exposed in the course of work hereunder, including, but not limited to, proprietary information of third parties.
- 10.7 The Contractor shall defend, indemnify and hold the Owner harmless from and against any loss, cost, liability or expense (including reasonable counsel fees) arising out of any breach or claimed breach of this provision.
- 10.8 Contractor agrees that all reports, studies, analysis, specifications, recommendations and all other materials of whatsoever nature, prepared by Contractor for use under this project, or furnished the Contractor by the Owner for use under this project, are to be considered confidential, and that Contractor will neither publish, circulate, nor use any of the foregoing, without first obtaining the written approval of the Owner.
- 10.9 The Contractor agrees that it will not issue any news releases to the public press or any publications wholly or partly related to its Work under this Agreement without first obtaining the prior written consent of the Owner. The Contractor further agrees that it will not make speeches, engage in public appearances, publish articles or otherwise publicize its Work under this Agreement without prior written approval of the Owner.
- 10.10 No action shall lie or be maintained against the Owner on any claim based upon this Agreement, or arising out of this Agreement, or out of anything in connection with this Agreement unless such action shall be commenced within four (4) months from completion of the Work hereunder or the earlier termination of this Agreement. Any justifiable dispute arising hereunder shall be brought in a state court located in Hampden County, in the City of Springfield, Massachusetts or federal court of competent jurisdiction located in the City of Springfield. The parties agree that this Contract shall be construed under, and enforced in accordance with the laws of the Commonwealth of Massachusetts, without regard of conflict of law principles.
- 10.11 The Contractor represents that it, its employees, and its subcontractors possess the professional and technical expertise necessary to perform the Work hereunder.
- 10.12 The Contractor shall be liable to and hereby agrees to indemnify, defend and hold harmless the Owner and each member, officer, agent, and employee of the Owner against all claims against any of them for bodily injury or wrongful death or property damage including that which may be sustained by him or

caused by any error, omission, negligent act or intentional act of the Contractor or anyone employed by the Contractor in the execution or performance of this Agreement.

- 10.13 All Work to be performed under this Agreement shall be performed with the Contractor's own employees, except that the Contractor may be permitted, as provided herein, to subcontract any area of services to be performed.
- 10.13.1 None of the services performed hereunder may be subcontracted nor may this Agreement or the rights or obligations hereunder be assigned without the prior written consent of the Owner, such consent shall not be unreasonably withheld.
- 10.14 No member of the Commission or any officer or employee of the Owner shall be liable personally under or by reason of this Agreement or any of its provisions.
- 10.15 In the event that any claim is made, action is brought, proceeding is instituted, or hearing is called which is in any way related to the subject matter of this Agreement or to the Work Products produced or findings, methods or conclusions made or utilized by the Contractor as a result thereof, the Contractor shall diligently render to the Owner any and all assistance, including testimony, which the Owner may require of the Contractor. The parties understand and acknowledge that any fee paid hereunder to the Contractor does not include such assistance or testimony, and that in the event that Contractor is required to perform such services it will be reasonable compensated therefore.
- 10.16 The Contractor covenants that neither it nor any officer of the corporation nor any partner of the partnership, as the case may be, has any interest nor shall it acquire any interest, directly or indirectly, which would conflict in any manner or degree with the performance of the Work hereunder. The Contractor further covenants that, in the performance of this Agreement, no person having such interest shall be employed by it. It is expressly understood that breach of any of the covenants contained herein is a material breach of this Agreement and shall entitle the Owner to recover immediate damages.
- 10.17 The relationship of the Contractor to the Owner is that of an independent contractor. In accordance with its status as such, the Contractor covenants that it, its employees, and its subcontractors will conduct themselves consistent with such status; will neither hold themselves out as nor claim to be an officer or employee of the Owner by reason hereof; and will not, by reason hereof, make any claim, demand or application to or for any right or privilege applicable to an officer or employee of the Owner, including, but not limited to, Worker's Compensation coverage, unemployment insurance benefits, Social Security coverage, or

retirement membership or credit.

- 10.18 The Contractor hereby represents that to the best of its knowledge neither it nor any of its personnel has been the subject of any investigation, nor have any of them been convicted or indicted for commission of any crime involving misconduct, corruption, bribery, or fraud in connection with any public contract in the Commonwealth of Massachusetts or any other jurisdiction, except as has been specifically disclosed in writing to the Owner, and that should any such conviction or indictment be obtained or any such investigation commenced prior to the expirations of the term hereof, regardless of the date of the occurrence giving rise to the subject matter of such conviction, indictment or investigation, it will be disclosed in writing to the Owner. Breach of this provision is expressly understood to constitute a material breach of this Agreement.

IN WITNESS WHEREOF, the SPRINGFIELD WATER AND SEWER COMMISSION, acting by and through the Board of Water Commissioners, with the approval of the Executive Director, and \_\_\_\_\_, **CONTRACTOR** have executed this Agreement. All portions of the Contract Documents have been signed, initialed, or identified by COMMISSION and CONTRACTOR or identified by ENGINEER on their behalf.

This Agreement will be effective on \_\_\_\_\_, \_\_\_\_\_, 2025 (which is the Effective Date of the Agreement as a sealed instrument on the day and year the same is signed by all parties hereto, on the date noted).

**THE CONTRACTOR:**

\_\_\_\_\_:

**Sign:** \_\_\_\_\_

**Print:** \_\_\_\_\_

**Title:** \_\_\_\_\_

**Date Signed:** \_\_\_\_\_



SPRINGFIELD WATER AND SEWER COMMISSION:

Approved:

\_\_\_\_\_  
JOSHUA D. SCHIMMEL, EXECUTIVE DIRECTOR      DATE

Reviewed:

\_\_\_\_\_  
DIRECTOR OF LEGAL AFFAIRS      DATE

Approved as to Appropriation:

\_\_\_\_\_  
COMPTROLLER      DATE

Approved:

\_\_\_\_\_  
CHIEF PROCUREMENT OFFICER      DATE



SPRINGFIELD WATER AND SEWER COMMISSION:

\_\_\_\_\_  
DANIEL RODRIGUEZ, COMMISSIONER

\_\_\_\_\_  
DATE

\_\_\_\_\_  
WILLIAM E. LEONARD, COMMISSIONER

\_\_\_\_\_  
DATE

\_\_\_\_\_  
VANESSA OTERO, COMMISSIONER

\_\_\_\_\_  
DATE

APPROVED AS TO FORM:

\_\_\_\_\_  
COMMISSION COUNSEL

\_\_\_\_\_  
DATE

ADDRESS FOR GIVING NOTICES:

SPRINGFIELD WATER AND SEWER COMMISSION  
250 M STREET EXTENSION  
AGAWAM, MA 01001

Note: If CONTRACTOR is a corporation, an affidavit giving the principal the right to sign the Agreement must accompany the executed Agreement.

END OF SECTION

NOTICE OF AWARD

TO: \_\_\_\_\_  
\_\_\_\_\_

PROJECT DESCRIPTION: \_\_\_\_\_  
\_\_\_\_\_

The Owner has considered the Proposal submitted by you for the above described Work on \_\_\_\_\_ 20\_\_ in response to its Advertisement for Bids and Instructions to Bidders.

You are hereby notified that your Proposal has been accepted for Items totalling the amount of \$\_\_\_\_\_.

You are required to provide written verification of receipt of this Notice Of Award within 5 days of the date included below.

You are required by the Instructions to Bidders to execute the Contract Agreement and furnish the required Contractor's Performance Bond, Payment Bond and certificates of insurance within ten (10) days from the date of this Notice of Award.

If you fail to execute said Agreement and to furnish said Bonds and Insurance within ten (10) days from the date of this Notice, said Owner will be entitled to consider all your rights arising out of the Owner's acceptance of your Proposal as abandoned and as a forfeiture of your Bid Bond. The Owner will be entitled to such other rights as may be granted by law.

Dated this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_.

\_\_\_\_\_  
(Owner)

By \_\_\_\_\_

Title \_\_\_\_\_

Last Modified: 04/09/2025 at 10:39AM EDT

ACCEPTANCE OF NOTICE

Receipt of the above Notice of Award is hereby acknowledged, this the \_\_\_\_\_ day  
of \_\_\_\_\_, 20\_\_\_\_\_.

By \_\_\_\_\_

Title \_\_\_\_\_

NOTICE TO PROCEED

To: \_\_\_\_\_ Date: \_\_\_\_\_  
(Contractor) \_\_\_\_\_  
\_\_\_\_\_ Project: \_\_\_\_\_  
\_\_\_\_\_ \_\_\_\_\_  
\_\_\_\_\_ \_\_\_\_\_

You are hereby notified to commence the Work in accordance with the Agreement dated \_\_\_\_\_, 20\_\_, on or before \_\_\_\_\_, 20\_\_, and you are to complete all work within 180 calendar days thereafter. The date of completion of all work is therefore, \_\_\_\_\_, 20\_\_.

You are required to provide written verification of receipt of this Notice To Proceed within 5 days of the date included below.

\_\_\_\_\_  
(Owner)  
By \_\_\_\_\_  
Title \_\_\_\_\_

ACCEPTANCE OF NOTICE

Receipt of the above Notice to Proceed is hereby acknowledged, this the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

By \_\_\_\_\_  
Title \_\_\_\_\_

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# PERFORMANCE BOND

Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

---

CONTRACTOR (*Name and Address*):                      SURETY (*Name, and Address of Principal Place of Business*):

OWNER (*Name and Address*):

## CONTRACT

Effective Date of Agreement:  
Amount:  
Description (*Name and Location*):

## BOND

Bond Number:  
Date (*Not earlier than Effective Date of Agreement*):  
Amount:  
Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.

## CONTRACTOR AS PRINCIPAL

## SURETY

\_\_\_\_\_  
Contractor's Name and Corporate Seal (Seal)

\_\_\_\_\_  
Surety's Name and Corporate Seal (Seal)

By: \_\_\_\_\_  
Signature

By: \_\_\_\_\_  
Signature (Attach Power of Attorney)

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

Attest: \_\_\_\_\_  
Signature

Attest: \_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

*Note: Provide execution by additional parties, such as joint venturers, if necessary.*



Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner for the performance of the Contract, which is incorporated herein by reference.

1. If Contractor performs the Contract, Surety and Contractor have no obligation under this Bond, except to participate in conferences as provided in Paragraph 2.1.
2. If there is no Owner Default, Surety's obligation under this Bond shall arise after:
  - 2.1 Owner has notified Contractor and Surety, at the addresses described in Paragraph 9 below, that Owner is considering declaring a Contractor Default and has requested and attempted to arrange a conference with Contractor and Surety to be held not later than 15 days after receipt of such notice to discuss methods of performing the Contract. If Owner, Contractor, and Surety agree, Contractor shall be allowed a reasonable time to perform the Contract, but such an agreement shall not waive Owner's right, if any, subsequently to declare a Contractor Default; and
  - 2.2 Owner has declared a Contractor Default and formally terminated Contractor's right to complete the Contract. Such Contractor Default shall not be declared earlier than 20 days after Contractor and Surety have received notice as provided in Paragraph 2.1; and
  - 2.3 Owner has agreed to pay the Balance of the Contract Price to:
    1. Surety in accordance with the terms of the Contract; or
    2. Another contractor selected pursuant to Paragraph 3.3 to perform the Contract.
3. When Owner has satisfied the conditions of Paragraph 2, Surety shall promptly, and at Surety's expense, take one of the following actions:
  - 3.1 Arrange for Contractor, with consent of Owner, to perform and complete the Contract; or
  - 3.2 Undertake to perform and complete the Contract itself, through its agents or through independent contractors; or
  - 3.3 Obtain bids or negotiated proposals from qualified contractors acceptable to Owner for a contract for performance and completion of the Contract, arrange for a contract to be prepared for execution by Owner and contractor selected with Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Contract, and pay to Owner the amount of damages as described in Paragraph 5 in excess of the Balance of the Contract Price incurred by Owner resulting from Contractor Default; or
  - 3.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:
    1. After investigation, determine the amount for which it may be liable to Owner and, as soon as practicable after the amount is determined, tender payment therefor to Owner; or
    2. Deny liability in whole or in part and notify Owner citing reasons therefor.
4. If Surety does not proceed as provided in Paragraph 3 with reasonable promptness, Surety shall be deemed to be in default on this Bond 15 days after receipt of an additional written notice from Owner to Surety demanding that Surety perform its obligations under this Bond, and Owner shall be entitled to enforce any remedy available to Owner. If Surety proceeds as provided in Paragraph 3.4, and Owner refuses the payment tendered or Surety has denied liability, in whole or in part, without further notice Owner shall be entitled to enforce any remedy available to Owner.

Last Modified: 04/09/2025 at 10:39AM EDT

5. After Owner has terminated Contractor's right to complete the Contract, and if Surety elects to act under Paragraph 3.1, 3.2, or 3.3 above, then the responsibilities of Surety to Owner shall not be greater than those of Contractor under the Contract, and the responsibilities of Owner to Surety shall not be greater than those of Owner under the Contract. To the limit of the amount of this Bond, but subject to commitment by Owner of the Balance of the Contract Price to mitigation of costs and damages on the Contract, Surety is obligated without duplication for:

- 5.1 The responsibilities of Contractor for correction of defective Work and completion of the Contract;
- 5.2 Additional legal, design professional, and delay costs resulting from Contractor's Default, and resulting from the actions of or failure to act of Surety under Paragraph 3; and
- 5.3 Liquidated damages, or if no liquidated damages are specified in the Contract, actual damages caused by delayed performance or non-performance of Contractor.

6. Surety shall not be liable to Owner or others for obligations of Contractor that are unrelated to the Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than Owner or its heirs, executors, administrators, or successors.

7. Surety hereby waives notice of any change, including changes of time, to Contract or to related subcontracts, purchase orders, and other obligations.

8. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the Work or part of the Work is located, and shall be instituted within two years after Contractor Default or within two years after Contractor ceased working or within two years after Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

9. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the address shown on the signature page.

10. When this Bond has been furnished to comply with a statutory requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

## 11. Definitions.

- 11.1 Balance of the Contract Price: The total amount payable by Owner to Contractor under the Contract after all proper adjustments have been made, including allowance to Contractor of any amounts received or to be received by Owner in settlement of insurance or other Claims for damages to which Contractor is entitled, reduced by all valid and proper payments made to or on behalf of Contractor under the Contract.
- 11.2 Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.
- 11.3 Contractor Default: Failure of Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Contract.
- 11.4 Owner Default: Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract or to perform and complete or otherwise comply with the other terms thereof.

FOR INFORMATION ONLY – *(Name, Address and Telephone)*

Surety Agency or Broker:

Owner's Representative *(Engineer or other party)*:

Last Modified: 04/09/2025 at 10:39AM EDT

# PAYMENT BOND

Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

---

CONTRACTOR (*Name and Address*):

SURETY (*Name, and Address of Principal Place of Business*):

OWNER (*Name and Address*):

## CONTRACT

Effective Date of Agreement:

Amount:

Description (*Name and Location*):

## BOND

Bond Number:

Date (*Not earlier than Effective Date of Agreement*):

Amount:

Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.

## CONTRACTOR AS PRINCIPAL

## SURETY

\_\_\_\_\_  
Contractor's Name and Corporate Seal

\_\_\_\_\_  
Surety's Name and Corporate Seal

By: \_\_\_\_\_  
Signature

By: \_\_\_\_\_  
Signature (Attach Power of Attorney)

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

Attest: \_\_\_\_\_  
Signature

Attest: \_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

*Note: Provide execution by additional parties, such as joint venturers, if necessary.*

1. Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner to pay for labor, materials, and equipment furnished by Claimants for use in the performance of the Contract, which is incorporated herein by reference.
2. With respect to Owner, this obligation shall be null and void if Contractor:
  - 2.1 Promptly makes payment, directly or indirectly, for all sums due Claimants, and
  - 2.2 Defends, indemnifies, and holds harmless Owner from all claims, demands, liens, or suits alleging non-payment by Contractor by any person or entity who furnished labor, materials, or equipment for use in the performance of the Contract, provided Owner has promptly notified Contractor and Surety (at the addresses described in Paragraph 12) of any claims, demands, liens, or suits and tendered defense of such claims, demands, liens, or suits to Contractor and Surety, and provided there is no Owner Default.
3. With respect to Claimants, this obligation shall be null and void if Contractor promptly makes payment, directly or indirectly, for all sums due.
4. Surety shall have no obligation to Claimants under this Bond until:
  - 4.1 Claimants who are employed by or have a direct contract with Contractor have given notice to Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.
  - 4.2 Claimants who do not have a direct contract with Contractor:
    1. Have furnished written notice to Contractor and sent a copy, or notice thereof, to Owner, within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials or equipment were furnished or supplied, or for whom the labor was done or performed; and
    2. Have either received a rejection in whole or in part from Contractor, or not received within 30 days of furnishing the above notice any communication from Contractor by which Contractor had indicated the claim will be paid directly or indirectly; and
    3. Not having been paid within the above 30 days, have sent a written notice to Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to Contractor.
5. If a notice by a Claimant required by Paragraph 4 is provided by Owner to Contractor or to Surety, that is sufficient compliance.
6. When a Claimant has satisfied the conditions of Paragraph 4, the Surety shall promptly and at Surety's expense take the following actions:
  - 6.1 Send an answer to that Claimant, with a copy to Owner, within 45 days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed.
  - 6.2 Pay or arrange for payment of any undisputed amounts.
7. Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by Surety.
8. Amounts owed by Owner to Contractor under the Contract shall be used for the performance of the Contract and to satisfy claims, if any, under any performance bond. By Contractor furnishing and Owner accepting this Bond, they agree that all funds earned by Contractor in the performance of the Contract are dedicated to satisfy obligations of Contractor and Surety under this Bond, subject to Owner's priority to use

the funds for the completion of the Work.

9. Surety shall not be liable to Owner, Claimants, or others for obligations of Contractor that are unrelated to the Contract. Owner shall not be liable for payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.

10. Surety hereby waives notice of any change, including changes of time, to the Contract or to related subcontracts, purchase orders, and other obligations.

11. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the location in which the Work or part of the Work is located or after the expiration of one year from the date (1) on which the Claimant gave the notice required by Paragraph 4.1 or Paragraph 4.2.3, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the addresses shown on the signature page. Actual receipt of notice by Surety, Owner, or Contractor, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.

13. When this Bond has been furnished to comply with a statutory requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory Bond and not as a common law bond.

14. Upon request of any person or entity appearing to be a potential beneficiary of this Bond, Contractor shall promptly furnish a copy of this Bond or shall permit a copy to be made.

15. Definitions

15.1 Claimant: An individual or entity having a direct contract with Contractor, or with a first-tier subcontractor of Contractor, to furnish labor, materials, or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms “labor, materials or equipment” that part of water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Contract, architectural and engineering services required for performance of the Work of Contractor and Contractor’s subcontractors, and all other items for which a mechanic’s lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

15.2 Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.

15.3 Owner Default: Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract, or to perform and complete or otherwise comply with the other terms thereof.

FOR INFORMATION ONLY – *(Name, Address, and Telephone)*

Surety Agency or Broker:

Owner’s Representative *(Engineer or other)*:

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**CHANGE ORDER**

Project Name: SWSC North Branch Interceptor Rehabilitation  
CWSRF Number: CWSRF-6770  
SWSC Project Number: \_\_\_\_\_  
Change Order Number: \_\_\_\_\_ # \_\_\_\_\_

Contract Amount (As Bid): \$ ##,###,###.##  
Change in Contract Price (previous change orders): \$ 0  
Change in Contract Price (this change order): \$ ##,###.##  
Adjusted Contract Price (including this change order  
and all other change orders): \$ ##,###,###.##

Change order extends the time to complete the work by   #   calendar days.  
Completion date is   [month day, year]  .

Change order check by: \_\_\_\_\_  
Resident Engineer Date

Change order is requested by:   Springfield Water and Sewer Commission    
Change order is recommended by:   Kleinfelder, Inc  

\_\_\_\_\_  
Consultant Engineer Date

The undersigned agree to the terms of the change order.

\_\_\_\_\_  
Contractor Date

\_\_\_\_\_  
Owner Date

Certification of Appropriation under M.G.L. c.44, s.31C: Adequate funding in an amount sufficient to cover the total cost of this change order is available.

\_\_\_\_\_  
Certification Officer Date

**Reviewed and Approved  
in accordance with the  
Department of Environmental Protection  
Bureau of Resource Protection  
Division of Municipal Services**

\_\_\_\_\_  
**Construction Inspector** Date

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**Engineers Joint Documents Committee  
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Fax: (703) 836-4875  
e-mail: aschwartz@nspe.org

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This Agreement shall be governed by the laws of the State of Virginia. Should you have any questions concerning this Agreement, you may contact EJCDC by writing to:

Arthur Schwartz, Esq.  
General Counsel  
National Society of Professional Engineers  
1420 King Street  
Alexandria, VA 22314

Phone: (703) 684-2845

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This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the controlling Laws and Regulations.

# STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

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and

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These General Conditions have been prepared for use with the Suggested Forms of Agreement Between Owner and Contractor (EJCDC C-520 or C-525, 2007 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other. Comments concerning their usage are contained in the Narrative Guide to the EJCDC Construction Documents (EJCDC C-001, 2007 Edition). For guidance in the preparation of Supplementary Conditions, see Guide to the Preparation of Supplementary Conditions (EJCDC C-800, 2007 Edition).

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## ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

### 1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
  2. *Agreement*—The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.
  3. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
  4. *Asbestos*—Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.
  5. *Bid*—The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
  6. *Bidder*—The individual or entity who submits a Bid directly to Owner.
  7. *Bidding Documents*—The Bidding Requirements and the proposed Contract Documents (including all Addenda).
  8. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid security of acceptable form, if any, and the Bid Form with any supplements.
  9. *Change Order*—A document recommended by Engineer which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.
  10. *Claim*—A demand or assertion by Owner or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.
  11. *Contract*—The entire and integrated written agreement between the Owner and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.



12. *Contract Documents*—Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents. Approved Shop Drawings, other Contractor submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.
13. *Contract Price*—The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.03 in the case of Unit Price Work).
14. *Contract Times*—The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any; (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Engineer’s written recommendation of final payment.
15. *Contractor*—The individual or entity with whom Owner has entered into the Agreement.
16. *Cost of the Work*—See Paragraph 11.01 for definition.
17. *Drawings*—That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.
18. *Effective Date of the Agreement*—The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.
19. *Engineer*—The individual or entity named as such in the Agreement.
20. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.
21. *General Requirements*—Sections of Division 1 of the Specifications.
22. *Hazardous Environmental Condition*—The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto.
23. *Hazardous Waste*—The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.
24. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
25. *Liens*—Charges, security interests, or encumbrances upon Project funds, real property, or personal property.
26. *Milestone*—A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

27. *Notice of Award*—The written notice by Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Owner will sign and deliver the Agreement.
28. *Notice to Proceed*—A written notice given by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents.
29. *Owner*—The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed.
30. *PCBs*—Polychlorinated biphenyls.
31. *Petroleum*—Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.
32. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor’s plan to accomplish the Work within the Contract Times.
33. *Project*—The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.
34. *Project Manual*—The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.
35. *Radioactive Material*—Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.
36. *Resident Project Representative*—The authorized representative of Engineer who may be assigned to the Site or any part thereof.
37. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.
38. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.
39. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor’s Applications for Payment.

40. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.
41. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.
42. *Specifications*—That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto.
43. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.
44. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion thereof.
45. *Successful Bidder*—The Bidder submitting a responsive Bid to whom Owner makes an award.
46. *Supplementary Conditions*—That part of the Contract Documents which amends or supplements these General Conditions.
47. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or Subcontractor.
48. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
49. *Unit Price Work*—Work to be paid for on the basis of unit prices.
50. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.
51. *Work Change Directive*—A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Owner and recommended by Engineer ordering an

addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

## 1.02 *Terminology*

A. The words and terms discussed in Paragraph 1.02.B through F are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.

### B. *Intent of Certain Terms or Adjectives:*

1. The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.09 or any other provision of the Contract Documents.

### C. *Day:*

1. The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.

### D. *Defective:*

1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
  - a. does not conform to the Contract Documents; or
  - b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
  - c. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 14.04 or 14.05).

### E. *Furnish, Install, Perform, Provide:*

1. The word “furnish,” when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
  2. The word “install,” when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.
  3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.
  4. When “furnish,” “install,” “perform,” or “provide” is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, “provide” is implied.
- F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

## ARTICLE 2 – PRELIMINARY MATTERS

### 2.01 *Delivery of Bonds and Evidence of Insurance*

- A. When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.
- B. *Evidence of Insurance:* Before any Work at the Site is started, Contractor and Owner shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Contractor and Owner respectively are required to purchase and maintain in accordance with Article 5.

### 2.02 *Copies of Documents*

- A. Owner shall furnish to Contractor up to ten printed or hard copies of the Drawings and Project Manual. Additional copies will be furnished upon request at the cost of reproduction.

### 2.03 *Commencement of Contract Times; Notice to Proceed*

- A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Agreement. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

## 2.04 *Starting the Work*

- A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.

## 2.05 *Before Starting Construction*

- A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), Contractor shall submit to Engineer for timely review:
  - 1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;
  - 2. a preliminary Schedule of Submittals; and
  - 3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

## 2.06 *Preconstruction Conference; Designation of Authorized Representatives*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.05.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.
- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit instructions, receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

## 2.07 *Initial Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference attended by Contractor, Engineer, and others as appropriate will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.05.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.
  - 1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of

the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.

2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

### **ARTICLE 3 – CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE**

#### **3.01 *Intent***

- A. The Contract Documents are complementary; what is required by one is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that reasonably may be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the indicated result will be provided whether or not specifically called for, at no additional cost to Owner.
- C. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in Article 9.

#### **3.02 *Reference Standards***

- A. Standards, Specifications, Codes, Laws, and Regulations
  1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
  2. No provision of any such standard, specification, manual, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

#### **3.03 *Reporting and Resolving Discrepancies***

- A. *Reporting Discrepancies:*

1. *Contractor's Review of Contract Documents Before Starting Work:* Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Contractor discovers, or has actual knowledge of, and shall obtain a written interpretation or clarification from Engineer before proceeding with any Work affected thereby.
2. *Contractor's Review of Contract Documents During Performance of Work:* If, during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) any standard, specification, manual, or code, or (c) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04.
3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies:*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:
  - a. the provisions of any standard, specification, manual, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference in the Contract Documents); or
  - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Amending and Supplementing Contract Documents*

- A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by either a Change Order or a Work Change Directive.
- B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways:
  1. A Field Order;
  2. Engineer's approval of a Shop Drawing or Sample (subject to the provisions of Paragraph 6.17.D.3); or



3. Engineer's written interpretation or clarification.

### 3.05 *Reuse of Documents*

- A. Contractor and any Subcontractor or Supplier shall not:
  1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions; or
  2. reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer.
- B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

### 3.06 *Electronic Data*

- A. Unless otherwise stated in the Supplementary Conditions, the data furnished by Owner or Engineer to Contractor, or by Contractor to Owner or Engineer, that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.
- B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party.
- C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

## **ARTICLE 4 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS**

### 4.01 *Availability of Lands*

- A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the

Contract Price or Contract Times, or both, as a result of any delay in Owner's furnishing the Site or a part thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

- B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

#### 4.02 *Subsurface and Physical Conditions*

A. *Reports and Drawings:* The Supplementary Conditions identify:

- 1. those reports known to Owner of explorations and tests of subsurface conditions at or contiguous to the Site; and
- 2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).

B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:

- 1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or
- 2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
- 3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information.

#### 4.03 *Differing Subsurface or Physical Conditions*

A. *Notice:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed either:

- 1. is of such a nature as to establish that any "technical data" on which Contractor is entitled to rely as provided in Paragraph 4.02 is materially inaccurate; or
- 2. is of such a nature as to require a change in the Contract Documents; or
- 3. differs materially from that shown or indicated in the Contract Documents; or

4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

- B. *Engineer's Review:* After receipt of written notice as required by Paragraph 4.03.A, Engineer will promptly review the pertinent condition, determine the necessity of Owner's obtaining additional exploration or tests with respect thereto, and advise Owner in writing (with a copy to Contractor) of Engineer's findings and conclusions.

C. *Possible Price and Times Adjustments:*

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
  - a. such condition must meet any one or more of the categories described in Paragraph 4.03.A; and
  - b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.07 and 11.03.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:
  - a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or
  - b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or
  - c. Contractor failed to give the written notice as required by Paragraph 4.03.A.
3. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.05. However, neither Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

#### 4.04 *Underground Facilities*

A. *Shown or Indicated:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. Owner and Engineer shall not be responsible for the accuracy or completeness of any such information or data provided by others; and
2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
  - a. reviewing and checking all such information and data;
  - b. locating all Underground Facilities shown or indicated in the Contract Documents;
  - c. coordination of the Work with the owners of such Underground Facilities, including Owner, during construction; and
  - d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. *Not Shown or Indicated:*

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer. Engineer will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
2. If Engineer concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, Owner or Contractor may make a Claim therefor as provided in Paragraph 10.05.

#### 4.05 *Reference Points*

- A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

#### 4.06 *Hazardous Environmental Condition at Site*

- A. *Reports and Drawings:* The Supplementary Conditions identify those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at the Site.
- B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:
  - 1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or
  - 2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
  - 3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.
- D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to

permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 4.06.E.

- E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered written notice to Contractor: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, either party may make a Claim therefor as provided in Paragraph 10.05.
- F. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 7.
- G. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- H. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.H shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- I. The provisions of Paragraphs 4.02, 4.03, and 4.04 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

## ARTICLE 5 – BONDS AND INSURANCE

### 5.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish performance and payment bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 13.07, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other bonds as are required by the Contract Documents.
- B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed each bond.
- C. If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 5.01.B, Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 5.01.B and 5.02.

### 5.02 *Licensed Sureties and Insurers*

- A. All bonds and insurance required by the Contract Documents to be purchased and maintained by Owner or Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

### 5.03 *Certificates of Insurance*

- A. Contractor shall deliver to Owner, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain.
- B. Owner shall deliver to Contractor, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Contractor or any other additional insured) which Owner is required to purchase and maintain.

- C. Failure of Owner to demand such certificates or other evidence of Contractor's full compliance with these insurance requirements or failure of Owner to identify a deficiency in compliance from the evidence provided shall not be construed as a waiver of Contractor's obligation to maintain such insurance.
- D. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor.
- E. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner in the Contract Documents.

#### 5.04 *Contractor's Insurance*

- A. Contractor shall purchase and maintain such insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:
  - 1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;
  - 2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;
  - 3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;
  - 4. claims for damages insured by reasonably available personal injury liability coverage which are sustained:
    - a. by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or
    - b. by any other person for any other reason;
  - 5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and
  - 6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.
- B. The policies of insurance required by this Paragraph 5.04 shall:
  - 1. with respect to insurance required by Paragraphs 5.04.A.3 through 5.04.A.6 inclusive, be written on an occurrence basis, include as additional insureds (subject to any customary exclusion regarding professional liability) Owner and Engineer, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, members, partners,



employees, agents, consultants, and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;

2. include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;
3. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 6.11 and 6.20;
4. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.03 will so provide);
5. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07; and
6. include completed operations coverage:
  - a. Such insurance shall remain in effect for two years after final payment.
  - b. Contractor shall furnish Owner and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter.

#### 5.05 *Owner's Liability Insurance*

- A. In addition to the insurance required to be provided by Contractor under Paragraph 5.04, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.

#### 5.06 *Property Insurance*

- A. Unless otherwise provided in the Supplementary Conditions, Owner shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:
  1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of

them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee;

2. be written on a Builder's Risk "all-risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage (other than that caused by flood), and such other perils or causes of loss as may be specifically required by the Supplementary Conditions.
  3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);
  4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;
  5. allow for partial utilization of the Work by Owner;
  6. include testing and startup; and
  7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other loss payee to whom a certificate of insurance has been issued.
- B. Owner shall purchase and maintain such equipment breakdown insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee.
- C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other loss payee to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 5.07.
- D. Owner shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.06 to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.

- E. If Contractor requests in writing that other special insurance be included in the property insurance policies provided under this Paragraph 5.06, Owner shall, if possible, include such insurance, and the cost thereof will be charged to Contractor by appropriate Change Order. Prior to commencement of the Work at the Site, Owner shall in writing advise Contractor whether or not such other insurance has been procured by Owner.

#### 5.07 *Waiver of Rights*

- A. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or loss payees thereunder. Owner and Contractor waive all rights against each other and their respective officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner as trustee or otherwise payable under any policy so issued.
- B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for:
1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and
  2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.
- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them.

## 5.08 *Receipt and Application of Insurance Proceeds*

- A. Any insured loss under the policies of insurance required by Paragraph 5.06 will be adjusted with Owner and made payable to Owner as fiduciary for the loss payees, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.08.B. Owner shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order.
- B. Owner as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to Owner's exercise of this power. If such objection be made, Owner as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, Owner as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, Owner as fiduciary shall give bond for the proper performance of such duties.

## 5.09 *Acceptance of Bonds and Insurance; Option to Replace*

- A. If either Owner or Contractor has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by Paragraph 2.01.B. Owner and Contractor shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

## 5.10 *Partial Utilization, Acknowledgment of Property Insurer*

- A. If Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 14.05, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to Paragraph 5.06 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

## ARTICLE 6 – CONTRACTOR’S RESPONSIBILITIES

### 6.01 *Supervision and Superintendence*

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. Contractor shall not be responsible for the negligence of Owner or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

### 6.02 *Labor; Working Hours*

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.
- B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours. Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without Owner’s written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.

### 6.03 *Services, Materials, and Equipment*

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.
- B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.
- C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

## 6.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.07 as it may be adjusted from time to time as provided below.
1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.07) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.
  2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

## 6.05 *Substitutes and "Or-Equals"*

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.
1. "*Or-Equal*" Items: If in Engineer's sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an "or-equal" item, in which case review and approval of the proposed item may, in Engineer's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:
    - a. in the exercise of reasonable judgment Engineer determines that:
      - 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
      - 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole; and
      - 3) it has a proven record of performance and availability of responsive service.
    - b. Contractor certifies that, if approved and incorporated into the Work:
      - 1) there will be no increase in cost to the Owner or increase in Contract Times; and
      - 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

## 2. *Substitute Items:*

- a. If in Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.
- b. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.
- c. The requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented by the General Requirements, and as Engineer may decide is appropriate under the circumstances.
- d. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:
  - 1) shall certify that the proposed substitute item will:
    - a) perform adequately the functions and achieve the results called for by the general design,
    - b) be similar in substance to that specified, and
    - c) be suited to the same use as that specified;
  - 2) will state:
    - a) the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time,
    - b) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and
    - c) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;
  - 3) will identify:
    - a) all variations of the proposed substitute item from that specified, and
    - b) available engineering, sales, maintenance, repair, and replacement services; and
  - 4) shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change.

- B. *Substitute Construction Methods or Procedures:* If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.
- C. *Engineer's Evaluation:* Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by a Change Order in the case of a substitute and an approved Shop Drawing for an "or equal." Engineer will advise Contractor in writing of any negative determination.
- D. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- E. *Engineer's Cost Reimbursement:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.
- F. *Contractor's Expense:* Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.

#### 6.06 *Concerning Subcontractors, Suppliers, and Others*

- A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Owner as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.
- B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or



entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Engineer to reject defective Work.

- C. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:
1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity; nor
  2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.
- D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.
- E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.
- F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer. Whenever any such agreement is with a Subcontractor or Supplier who is listed as a loss payee on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner, Contractor, Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

## 6.07 *Patent Fees and Royalties*

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its

use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.

- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.
- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

#### 6.08 *Permits*

- A. Unless otherwise provided in the Supplementary Conditions, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

#### 6.09 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work. However, it shall not be Contractor's responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.
- C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times. If Owner

and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

#### 6.10 *Taxes*

- A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

#### 6.11 *Use of Site and Other Areas*

##### A. *Limitation on Use of Site and Other Areas:*

1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.
2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.
3. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.

- B. *Removal of Debris During Performance of the Work:* During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

- C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

- D. *Loading Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

## 6.12 *Record Documents*

- A. Contractor shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to Engineer for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to Engineer for Owner.

## 6.13 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:
  - 1. all persons on the Site or who may be affected by the Work;
  - 2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
  - 3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.
- C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.
- D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.
- E. All damage, injury, or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts

any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

- F. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

#### 6.14 *Safety Representative*

- A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

#### 6.15 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

#### 6.16 *Emergencies*

- A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

#### 6.17 *Shop Drawings and Samples*

- A. Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals (as required by Paragraph 2.07). Each submittal will be identified as Engineer may require.

##### 1. *Shop Drawings:*

- a. Submit number of copies specified in the General Requirements.
- b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 6.17.D.

##### 2. *Samples:*

- a. Submit number of Samples specified in the Specifications.

- b. Clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 6.17.D.
- B. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. *Submittal Procedures:*

1. Before submitting each Shop Drawing or Sample, Contractor shall have:
  - a. reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
  - b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;
  - c. determined and verified the suitability of all materials offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
  - d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.
2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review and approval of that submittal.
3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop Drawings or Sample submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.

D. *Engineer's Review:*

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the

Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1.

E. *Resubmittal Procedures:*

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

6.18 *Continuing the Work*

- A. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraph 15.04 or as Owner and Contractor may otherwise agree in writing.

6.19 *Contractor's General Warranty and Guarantee*

- A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on representation of Contractor's warranty and guarantee.
- B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
  1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
  2. normal wear and tear under normal usage.
- C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:
  1. observations by Engineer;
  2. recommendation by Engineer or payment by Owner of any progress or final payment;

3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
4. use or occupancy of the Work or any part thereof by Owner;
5. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by Engineer;
6. any inspection, test, or approval by others; or
7. any correction of defective Work by Owner.

## 6.20 *Indemnification*

- A. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable .
- B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- C. The indemnification obligations of Contractor under Paragraph 6.20.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:
  1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
  2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.



## 6.21 *Delegation of Professional Design Services*

- A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable law.
- B. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.
- C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.
- D. Pursuant to this Paragraph 6.21, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 6.17.D.1.
- E. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

## **ARTICLE 7 – OTHER WORK AT THE SITE**

### 7.01 *Related Work at Site*

- A. Owner may perform other work related to the Project at the Site with Owner's employees, or through other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:
  - 1. written notice thereof will be given to Contractor prior to starting any such other work; and
  - 2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.05.
- B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner, and Owner, if Owner is performing other work with Owner's employees, proper and safe

access to the Site, provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and properly coordinate the Work with theirs. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected. The duties and responsibilities of Contractor under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Owner and such utility owners and other contractors.

- C. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 7, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

## 7.02 *Coordination*

- A. If Owner intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:
  - 1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;
  - 2. the specific matters to be covered by such authority and responsibility will be itemized; and
  - 3. the extent of such authority and responsibilities will be provided.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

## 7.03 *Legal Relationships*

- A. Paragraphs 7.01.A and 7.02 are not applicable for utilities not under the control of Owner.
- B. Each other direct contract of Owner under Paragraph 7.01.A shall provide that the other contractor is liable to Owner and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor's wrongful actions or inactions.
- C. Contractor shall be liable to Owner and any other contractor under direct contract to Owner for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's wrongful action or inactions.

## ARTICLE 8 – OWNER’S RESPONSIBILITIES

### 8.01 *Communications to Contractor*

- A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

### 8.02 *Replacement of Engineer*

- A. In case of termination of the employment of Engineer, Owner shall appoint an engineer to whom Contractor makes no reasonable objection, whose status under the Contract Documents shall be that of the former Engineer.

### 8.03 *Furnish Data*

- A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

### 8.04 *Pay When Due*

- A. Owner shall make payments to Contractor when they are due as provided in Paragraphs 14.02.C and 14.07.C.

### 8.05 *Lands and Easements; Reports and Tests*

- A. Owner’s duties with respect to providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. Paragraph 4.02 refers to Owner’s identifying and making available to Contractor copies of reports of explorations and tests of subsurface conditions and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

### 8.06 *Insurance*

- A. Owner’s responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 5.

### 8.07 *Change Orders*

- A. Owner is obligated to execute Change Orders as indicated in Paragraph 10.03.

### 8.08 *Inspections, Tests, and Approvals*

- A. Owner’s responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 13.03.B.

### 8.09 *Limitations on Owner’s Responsibilities*

- A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor’s means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws

and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

8.10 *Undisclosed Hazardous Environmental Condition*

A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 4.06.

8.11 *Evidence of Financial Arrangements*

A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents.

8.12 *Compliance with Safety Program*

A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed pursuant to Paragraph 6.13.D.

## **ARTICLE 9 – ENGINEER'S STATUS DURING CONSTRUCTION**

9.01 *Owner's Representative*

A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract Documents.

9.02 *Visits to Site*

A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 9.09. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

### 9.03 *Project Representative*

- A. If Owner and Engineer agree, Engineer will furnish a Resident Project Representative to assist Engineer in providing more extensive observation of the Work. The authority and responsibilities of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 9.09. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

### 9.04 *Authorized Variations in Work*

- A. Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on Owner and also on Contractor, who shall perform the Work involved promptly. If Owner or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, and the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

### 9.05 *Rejecting Defective Work*

- A. Engineer will have authority to reject Work which Engineer believes to be defective, or that Engineer believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Engineer will also have authority to require special inspection or testing of the Work as provided in Paragraph 13.04, whether or not the Work is fabricated, installed, or completed.

### 9.06 *Shop Drawings, Change Orders and Payments*

- A. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.
- B. In connection with Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21.
- C. In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.
- D. In connection with Engineer's authority as to Applications for Payment, see Article 14.

### 9.07 *Determinations for Unit Price Work*

- A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations

on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of Paragraph 10.05.

9.08 *Decisions on Requirements of Contract Documents and Acceptability of Work*

- A. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question.
- B. Engineer will, with reasonable promptness, render a written decision on the issue referred. If Owner or Contractor believes that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.
- C. Engineer's written decision on the issue referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.05.
- D. When functioning as interpreter and judge under this Paragraph 9.08, Engineer will not show partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.09 *Limitations on Engineer's Authority and Responsibilities*

- A. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.
- B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 14.07.A will only be to determine generally that their content complies with the requirements of,

and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with, the Contract Documents.

- E. The limitations upon authority and responsibility set forth in this Paragraph 9.09 shall also apply to the Resident Project Representative, if any, and assistants, if any.

#### 9.10 *Compliance with Safety Program*

- A. While at the Site, Engineer's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Engineer has been informed pursuant to Paragraph 6.13.D.

### **ARTICLE 10 – CHANGES IN THE WORK; CLAIMS**

#### 10.01 *Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).
- B. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 10.05.

#### 10.02 *Unauthorized Changes in the Work*

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in Paragraph 3.04, except in the case of an emergency as provided in Paragraph 6.16 or in the case of uncovering Work as provided in Paragraph 13.04.D.

#### 10.03 *Execution of Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders recommended by Engineer covering:
  - 1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.01.A, (ii) required because of acceptance of defective Work under Paragraph 13.08.A or Owner's correction of defective Work under Paragraph 13.09, or (iii) agreed to by the parties;
  - 2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and
  - 3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Engineer pursuant to Paragraph 10.05; provided that, in lieu of

executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the Progress Schedule as provided in Paragraph 6.18.A.

#### 10.04 *Notification to Surety*

- A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

#### 10.05 *Claims*

- A. *Engineer's Decision Required:* All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.
- B. *Notice:* Written notice stating the general nature of each Claim shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data shall be delivered to the Engineer and the other party to the Contract within 60 days after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract Times shall be prepared in accordance with the provisions of Paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to Engineer and the claimant within 30 days after receipt of the claimant's last submittal (unless Engineer allows additional time).
- C. *Engineer's Action:* Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:
  - 1. deny the Claim in whole or in part;
  - 2. approve the Claim; or
  - 3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer's sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.
- D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.



- E. Engineer's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial.
- F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.05.

## **ARTICLE 11 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK**

### **11.01 *Cost of the Work***

A. *Costs Included:* The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 11.01.B, and shall include only the following items:

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.
2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.
3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.01.

4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
5. Supplemental costs including the following:
  - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
  - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
  - c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.
  - d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
  - e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
  - f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 5.06.D), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.
  - g. The cost of utilities, fuel, and sanitary facilities at the Site.
  - h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, express and courier services, and similar petty cash items in connection with the Work.
  - i. The costs of premiums for all bonds and insurance Contractor is required by the Contract Documents to purchase and maintain.

B. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.01.A.1 or specifically covered by Paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the Contractor's fee.
  2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
  3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
  4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
  5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.01.A.
- C. *Contractor's Fee:* When all the Work is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 12.01.C.
- D. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.01.A and 11.01.B, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

## 11.02 Allowances

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.
- B. *Cash Allowances:*
1. Contractor agrees that:
    - a. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
    - b. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in

the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

C. *Contingency Allowance:*

1. Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

11.03 *Unit Price Work*

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of Paragraph 9.07.

C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

D. Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 if:

1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and
2. there is no corresponding adjustment with respect to any other item of Work; and
3. Contractor believes that Contractor is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

**ARTICLE 12 – CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES**

12.01 *Change of Contract Price*

A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

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- B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:
1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or
  2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or
  3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).
- C. *Contractor's Fee*: The Contractor's fee for overhead and profit shall be determined as follows:
1. a mutually acceptable fixed fee; or
  2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
    - a. for costs incurred under Paragraphs 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be 15 percent;
    - b. for costs incurred under Paragraph 11.01.A.3, the Contractor's fee shall be five percent;
    - c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 12.01.C.2.a and 12.01.C.2.b is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under Paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;
    - d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;
    - e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and
    - f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

## 12.02 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Claim for an adjustment in the Contract Times shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.
- B. Any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this Article 12.

## 12.03 *Delays*

- A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.02.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.
- B. If Owner, Engineer, or other contractors or utility owners performing other work for Owner as contemplated by Article 7, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- C. If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of God, acts or failures to act of utility owners not under the control of Owner, or other causes not the fault of and beyond control of Owner and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays described in this Paragraph 12.03.C.
- D. Owner, Engineer, and their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.
- E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

## **ARTICLE 13 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK**

### *13.01 Notice of Defects*

- A. Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor. Defective Work may be rejected, corrected, or accepted as provided in this Article 13.

### *13.02 Access to Work*

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

### *13.03 Tests and Inspections*

- A. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.
- B. Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:
  - 1. for inspections, tests, or approvals covered by Paragraphs 13.03.C and 13.03.D below;
  - 2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in Paragraph 13.04.C; and
  - 3. as otherwise specifically provided in the Contract Documents.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.
- D. Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.

- E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation.
- F. Uncovering Work as provided in Paragraph 13.03.E shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.

#### 13.04 *Uncovering Work*

- A. If any Work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense.
- B. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment.
- C. If it is found that the uncovered Work is defective, Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05.
- D. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

#### 13.05 *Owner May Stop the Work*

- A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

#### 13.06 *Correction or Removal of Defective Work*

- A. Promptly after receipt of written notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers,



architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).

- B. When correcting defective Work under the terms of this Paragraph 13.06 or Paragraph 13.07, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

### 13.07 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents) or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by Owner or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
1. repair such defective land or areas; or
  2. correct such defective Work; or
  3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
  4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom.
- B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor.
- C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.07, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.
- E. Contractor's obligations under this Paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

### 13.08 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner (and, prior to Engineer's recommendation of final payment, Engineer) prefers to accept it, Owner may do so. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness) and for the diminished value of the Work to the extent not otherwise paid by Contractor pursuant to this sentence. If any such acceptance occurs prior to Engineer's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner.

### 13.09 *Owner May Correct Defective Work*

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer in accordance with Paragraph 13.06.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Owner may, after seven days written notice to Contractor, correct, or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 13.09, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this Paragraph.
- C. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefor as provided in Paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 13.09.

## ARTICLE 14 – PAYMENTS TO CONTRACTOR AND COMPLETION

### 14.01 *Schedule of Values*

- A. The Schedule of Values established as provided in Paragraph 2.07.A will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed.

### 14.02 *Progress Payments*

A. *Applications for Payments:*

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.
2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

B. *Review of Applications:*

1. Engineer will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Owner or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's

review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

- a. the Work has progressed to the point indicated;
  - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, and any other qualifications stated in the recommendation); and
  - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
- a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract Documents; or
  - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.
4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
- a. to supervise, direct, or control the Work, or
  - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or
  - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or
  - d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or
  - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:

- a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;
- b. the Contract Price has been reduced by Change Orders;
- c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or
- d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

C. *Payment Becomes Due:*

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.02.D) become due, and when due will be paid by Owner to Contractor.

D. *Reduction in Payment:*

1. Owner may refuse to make payment of the full amount recommended by Engineer because:
  - a. claims have been made against Owner on account of Contractor's performance or furnishing of the Work;
  - b. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;
  - c. there are other items entitling Owner to a set-off against the amount recommended; or
  - d. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.c or Paragraph 15.02.A.
2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, when Contractor remedies the reasons for such action.
3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.02.C.1 and subject to interest as provided in the Agreement.

14.03 *Contractor's Warranty of Title*

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to Owner no later than the time of payment free and clear of all Liens.

#### 14.04 *Substantial Completion*

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a certificate of Substantial Completion.
- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the tentative certificate to Owner, notify Contractor in writing, stating the reasons therefor. If, after consideration of Owner's objections, Engineer considers the Work substantially complete, Engineer will, within said 14 days, execute and deliver to Owner and Contractor a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of delivery of the tentative certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial Completion, Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.
- E. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the tentative list.

#### 14.05 *Partial Utilization*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:

1. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 14.04.A through D for that part of the Work.
2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready for its intended use and substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 5.10 regarding property insurance.

#### 14.06 *Final Inspection*

- A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

#### 14.07 *Final Payment*

##### A. *Application for Payment:*

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, marked-up record documents (as provided in Paragraph 6.12), and other documents, Contractor may make application for final payment following the procedure for progress payments.
2. The final Application for Payment shall be accompanied (except as previously delivered) by:
  - a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.04.B.6;
  - b. consent of the surety, if any, to final payment;
  - c. a list of all Claims against Owner that Contractor believes are unsettled; and

- d. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of or Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified in Paragraph 14.07.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien.

*B. Engineer's Review of Application and Acceptance:*

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract Documents have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of payment and present the Application for Payment to Owner for payment. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable subject to the provisions of Paragraph 14.09. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

*C. Payment Becomes Due:*

1. Thirty days after the presentation to Owner of the Application for Payment and accompanying documentation, the amount recommended by Engineer, less any sum Owner is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages, will become due and will be paid by Owner to Contractor.

**14.08** *Final Completion Delayed*

- A. If, through no fault of Contractor, final completion of the Work is significantly delayed, and if Engineer so confirms, Owner shall, upon receipt of Contractor's final Application for Payment (for Work fully completed and accepted) and recommendation of Engineer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by Owner for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if bonds have been furnished as required in Paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by Contractor to Engineer with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.



## 14.09 *Waiver of Claims*

- A. The making and acceptance of final payment will constitute:
1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and
  2. a waiver of all Claims by Contractor against Owner other than those previously made in accordance with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.

## **ARTICLE 15 – SUSPENSION OF WORK AND TERMINATION**

### 15.01 *Owner May Suspend Work*

- A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to Contractor and Engineer which will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be granted an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if Contractor makes a Claim therefor as provided in Paragraph 10.05.

### 15.02 *Owner May Terminate for Cause*

- A. The occurrence of any one or more of the following events will justify termination for cause:
1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);
  2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;
  3. Contractor's repeated disregard of the authority of Engineer; or
  4. Contractor's violation in any substantial way of any provisions of the Contract Documents.
- B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:
1. exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion);

2. incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere; and
  3. complete the Work as Owner may deem expedient.
- C. If Owner proceeds as provided in Paragraph 15.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this Paragraph, Owner shall not be required to obtain the lowest price for the Work performed.
- D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.
- E. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.
- F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.02.B and 15.02.C.

### 15.03 *Owner May Terminate For Convenience*

- A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
  2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;
  3. all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other

dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and

4. reasonable expenses directly attributable to termination.

B. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

#### 15.04 *Contractor May Stop Work or Terminate*

A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (iii) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Paragraph 15.03.

B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this Paragraph 15.04 are not intended to preclude Contractor from making a Claim under Paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this Paragraph.

### **ARTICLE 16 – DISPUTE RESOLUTION**

#### 16.01 *Methods and Procedures*

A. Either Owner or Contractor may request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.05 before such decision becomes final and binding. The mediation will be governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.

B. Owner and Contractor shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.

C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:

1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions; or

2. agrees with the other party to submit the Claim to another dispute resolution process; or
3. gives written notice to the other party of the intent to submit the Claim to a court of competent jurisdiction.

## ARTICLE 17 – MISCELLANEOUS

### 17.01 *Giving Notice*

- A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:
  1. delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended; or
  2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

### 17.02 *Computation of Times*

- A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

### 17.03 *Cumulative Remedies*

- A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents. The provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

### 17.04 *Survival of Obligations*

- A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

### 17.05 *Controlling Law*

- A. This Contract is to be governed by the law of the state in which the Project is located.

### 17.06 *Headings*

- A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

**SECTION 00750**  
**SUPPLEMENTARY CONDITIONS**

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract, EJCDC C-700 (2007 Edition) and other provisions of the Contract Documents as indicated below. All provisions which are not so amended or supplemented remain in full force and effect.

The terms used in these Supplementary Conditions have the meanings stated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings stated below, which are applicable to both the singular and plural thereof.

The address system used in these Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix "SC" added thereto.

**ARTICLE 1. DEFINITIONS AND TERMINOLOGY**

SC-1.01.A.12

Add the following language at the beginning of the definition entitled "Contract Documents" in the General Conditions:

"The Invitation to Bid, Instructions to Bidders"

SC-1.01.A.44

Delete the definition of Substantial Completion in the General Conditions in its entirety and add the following in its place:

*"Substantial Completion* – The Work required by the Contract has been completed except for work having a Contract Price of less than one percent of the then adjusted total contract price, or substantially all of the Work has been completed and opened to Owner's use except for minor incomplete or unsatisfactory work items that do not materially impair the usefulness of the Work required by the Contract."

SC-1.02.E

Delete paragraph 1.02.E of the General Conditions in its entirety and insert the following in its place:

"E. The words "furnish", "furnish and install", "install", and "provide" or words with similar meaning shall be interpreted, unless otherwise specifically stated, to mean "furnish and install complete in place and ready for service."

Add the following new paragraph immediately after paragraph 1.02.F of the General Conditions:

- “G. The terms used in these Supplementary Conditions which are defined in the Standard General Conditions of the Construction Contract (EJCDC C-700, 2007 Edition) have the meanings assigned to them in the General Conditions.”

## **ARTICLE 2. PRELIMINARY MATTERS**

### **SC-2.01**

Delete paragraph 2.01.B of the General Conditions in its entirety and insert the following in its place:

- “B. Before any Work at the Site is started, Contractor shall deliver to Owner, with a copy to Engineer, certificates of insurance (and other evidence of insurance requested by Owner) which Contractor is required to purchase and maintain in accordance with the requirements of Article 5.
1. Contractor shall include and identify on the certificate of insurance, indemnification as required by Article 6.20 of the General Conditions.
  2. Contractor acknowledges that Kleinfelder, Inc. and the Springfield Water and Sewer Commission (SWSC) have no responsibility as a generator, treater, storer, or disposer of hazardous or toxic substances, including but not limited to asbestos-cement pipe found or identified in connection with the Project. Contractor agrees to defend, indemnify, and hold harmless Kleinfelder, Inc. and the Springfield Water and Sewer Commission from any claim or liability, arising out of Contractor’s performance of Work under the Agreement and made or brought against Kleinfelder, Inc. and the Springfield Water and Sewer Commission for any actual or threatened environmental pollution or contamination except to the extent that either Kleinfelder, Inc. and the Springfield Water and Sewer Commission has negligently caused or contributed to any such pollution or contamination. This indemnification includes reasonable attorney fees and expenses incurred by Kleinfelder, Inc. and the Springfield Water and Sewer Commission in defense of such claim.”

### **SC-2.03**

Delete paragraph 2.03.A of the General Conditions in its entirety and insert the following in its place:

- “A. The Contract Times will commence to run on the date specified in the written Notice to Proceed.”

## **ARTICLE 3. CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE**

SC-3.01

Add the following new paragraphs immediately after paragraph 3.01.A of the General Conditions:

- “1. Each and every provision of law and clause required by law to be inserted in the Contract shall be deemed to be inserted herein, and the Contract shall be read and enforced as though they were included herein. If through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon the application of either party, the Contract shall forthwith be physically amended to make such insertion.
2. Sections of Division 1 – General Requirements govern the execution of the work of all sections of the specifications.”

Add the following new paragraphs immediately after paragraph 3.01.C of the General Conditions:

“D. Priority/Conflict

1. Priority Among Contract Documents. In the event of conflict among the Contract Documents, the Contract Documents shall be construed according to the following priorities except as may otherwise be specifically stated:

Highest Priority:	Modifications to Contract Documents via Addenda
Second Priority:	Agreement
Third Priority:	Addenda-later date to take precedence
Fourth Priority:	Supplementary General Conditions
Fifth Priority:	General Conditions
Sixth Priority:	Drawings and Specifications
2. If there is a conflict between the Drawings and Specifications, the figured dimensions shall govern over the scaled dimensions. Detailed Drawings shall govern over the general Drawings. Larger scale Drawings shall take precedence over smaller scale Drawings. Drawings shall govern over Shop Drawings. Whenever there is a conflict concerning quality or quantity between or among notes, specifications, dimensions, details, or schedules in the Specifications or in the Drawings, or between the Specifications and the Drawings, or in all other instances not specifically noted above, the Contractor shall provide, unless otherwise directed by a Modification of the Contract, the better quality or greater quantity of Work at no increase in the Contract Sum or in the Contract Times.

- E. It is the intent of the Specification and Contract Documents to obtain an operable Project. Equipment, components, systems, etc. therein shall be made operable by the Contractor.
- F. The Contract Drawings may be supplemented from time to time with additional Drawings by the Engineer as may be required to illustrate the Work or, as the Work progresses, with additional Drawings by the Contractor, subject to the approval of the Engineer. Supplementary Drawings, when issued by the Engineer or by the Contractor, after approval by the Engineer, shall be furnished in sufficient quantity to all those who, in the opinion of the Engineer, are affected by such Drawings.”

**ARTICLE 4. AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIOINS; REFERENCE POINTS**

SC-4.01

Delete Paragraph 4.01.B of the General Conditions in its entirety.

SC-4.03

Delete paragraphs 4.03.A.1 and 4.03.A.2 in their entirety.

Add the following new paragraph immediately after paragraph 4.03.C of the General Conditions:

- “D. Adjustments resulting from actual subsurface or latent physical conditions from those indicated will be in accordance with Massachusetts General Law, Chapter 30, Section 39N and the applicable provisions of the Contract Documents.”

SC-4.04

Change “of” to “or” in paragraph 4.04.A.1 of the General Conditions.

Delete the following words from the first sentence of paragraph 4.04.B.1 of the General Conditions:

“or not shown or indicated with reasonable accuracy”

Delete the following words from the second sentence of paragraph 4.04.B.2 of the General Conditions:

“or not shown or indicated with reasonable accuracy”

Add the following new paragraph immediately after paragraph 4.04.B.2 of the General Conditions:



- “3. The Owner, Engineer, and Engineer’s Consultants shall not be liable to Contractor for any claims, costs, losses, or damages incurred or sustained by Contractor or in connection with any other project or anticipated project.”

#### SC-4.05

Add the following new paragraph following paragraph 4.05.A of the General Conditions:

- “B. Engineer may check the lines, elevations, reference marks, batter boards, etc., set by Contractor, and Contractor shall correct any errors disclosed by such check. Such a check shall not be considered as approval of Contractor’s work and shall not relieve Contractor of the responsibility for accurate and satisfactory construction and completion of the entire Work. Contractor shall furnish personnel to assist Engineer in checking lines and grades.”

#### SC-4.06

Delete the words “The Supplementary Conditions” in paragraph 4.06.A of the General Conditions and replace with “Contract Documents”.

### **ARTICLE 5. BONDS AND INSURANCE**

#### SC-5.01

Amend paragraph 5.01.B of the General Conditions by adding the following language to the end of the paragraph:

“Every bid bond, every performance bond, and every payment bond issued for any construction work in the Commonwealth of Massachusetts shall be the bond of a surety company organized pursuant to Massachusetts General Laws, Chapter 175, Section 105 or of a surety company authorized to do business in the Commonwealth of Massachusetts under the provisions of Massachusetts General Laws, Chapter 175, Section 106 and be approved by the U. S. Department of Treasury and acceptable as sureties and reinsurers on federal bonds under Title 31 of the United States Code, sections 9304 to 9308.”

#### SC-5.03

Delete paragraph 5.03.B of the General Conditions in its entirety.

#### SC-5.04

The limits of liability for the insurance required by paragraph 5.04 of the General Conditions shall provide the following coverages for not less than the following amounts or greater where required by Laws and Regulations:

5.04.A.1 and 5.04.A.2 Worker’s Compensation, etc. under paragraphs 5.04.A.1 and 5.04.A.2 of the General Conditions:

(1)	Worker's Compensation	
	Coverage B (Each Accident)	\$500,000
(2)	Worker's Compensation	
	Disease (Each Employee)	\$500,000
(3)	Employer's Liability	\$1,000,000 Each accident
		\$1,000,000 Disease per employee

5.04.A.3, 5.04.A.4, and 5.04.A.5 Contractor's Liability Insurance under paragraphs 5.04.A.3 through 5.04.A.5 of the General Conditions which shall also include completed operations and product liability coverages and eliminate the exclusion with respect to property under the care, custody, and control of Contractor:

(1)	General Aggregate	
	(Except Products—Completed Operations)	\$3,000,000
(2)	Products--Completed Operations	
	Aggregate	\$2,000,000
(3)	Personal and Advertising	
	Injury (Per Person/Organization)	\$1,000,000
(4)	Each Occurrence	
	(Bodily Injury and Property Damage)	\$1,000,000
(5)	Property Damage Liability	
	Insurance, including Collapse and Underground coverages. If blasting is to be used, also include explosion coverage.	\$5,000,000
(6)	Excess Liability:	
	General Aggregate	\$10,000,000
	Each Occurrence	\$10,000,000
(6)	Commercial Protective Liability:	
	General Aggregate	\$10,000,000
	Each Occurrence	\$5,000,000

5.04.A.6 Automobile Liability:

- (1) Bodily Injury:
  - Each Person \$1,000,000
  - Each Accident \$1,000,000
  - Property Damage:
    - Each Accident \$1,000,000

or

- (2) Combined Single Limit (Bodily Injury and Property Damage):
  - Each Accident \$5,000,000

5.04.A.7 Pollution Liability

- Combined single limit each occurrence \$5 Million
- Annual Aggregate \$10 Million

SC-5.04.B.3 The Contractual Liability coverage required by paragraph 5.04.B.3 in the General Conditions shall provide coverage for not less than the following amounts:

- (1) General Aggregate \$10,000,000
- (2) Each Occurrence (Bodily Injury and Property Damage) \$5,000,000

Builder's Risk (Fire Insurance) in an amount equal to the insurable value of the Contract.

SC-5.05

Delete paragraph 5.05. of the General Conditions in its entirety and insert the following in its place:

"5.05A. Contractor shall name the following as additional insured with full coverage as described above, SPRINGFIELD WATER AND SEWER COMMISSION, Kleinfelder, Inc., and its affiliates, successors, and/or assigns as named insured."

SC-5.06

Delete the first sentence of Paragraph 5.06.A of the General Conditions and replace with the following:

"A. Contractor shall purchase and maintain property insurance upon the Work at the Site, written on the completed value form, in an amount equal to the total bid price for the completed construction."

Delete the last sentence in paragraph 5.06.A and paragraphs 5.06.A.1 through 5.06.A.7, 5.06.B, and 5.06.C.

#### SC-5.07

Delete paragraph 5.07.B of the General Conditions in its entirety.

Delete paragraph 5.07.C of the General Conditions in its entirety.

#### SC-5.08

Delete paragraph 5.08.B of the General Conditions in its entirety.

#### SC-5.10

Delete paragraph 5.10.A of the General Conditions in its entirety.

### **ARTICLE 6. CONTRACTOR'S RESPONSIBILITIES**

#### SC-6.02

Add the following new paragraphs immediately after paragraph 6.02.B of the General Conditions:

- “C. Regular working hours shall be defined as 8 hours per day, Monday through Friday, excluding holidays, between the hours of 7:00 AM and 4:00 PM. Requests to work other than regular working hours shall be submitted to Engineer and Owner not less than 48 hours prior to any proposed weekend work or scheduled extended work weeks. Occasional unscheduled overtime on weekdays may be permitted provided two hours notice is given to Engineer.
- D. Contractor shall reimburse Owner for additional engineering and/or inspection costs incurred as a result of unscheduled overtime work in excess of the regular working hours stipulated in paragraph SC-6.02.C or otherwise allowed by the Owner. At Owner’s option, such costs may either be deducted from the Contractor’s monthly payment request or deducted from retention prior to release of final payment.”

#### SC-6.06

Delete the words “Supplementary Conditions” in the first sentence of paragraph 6.06.B of the General Conditions and replace with “Instructions to Bidders”.

Add the following new paragraph immediately after paragraph 6.06.C.2 of the General Conditions:

- “3. Contractor shall make payments to subcontractors in accordance with Massachusetts General Laws, Chapter 30, Section 39F.”

Add the following new paragraph immediately following paragraph 6.06.D of the General Conditions:

- “1. Owner or Engineer may furnish to any such Subcontractor, Supplier, or other person or organization, to the extent practicable, information about amounts paid to Contractor in accordance with Contractor's Applications for Payment on account of the particular Subcontractor's, Suppliers, other persons, or other organization's Work.”

#### SC-6.07

Delete paragraphs 6.07.A, 6.07.B, and 6.07.C in their entirety and replace with the following:

- “A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work of any invention, design, process, products, or device which is the subject of patent rights or copyrights held by others. Contractor shall indemnify and hold harmless Owner and Engineer, and anyone directly or indirectly employed by either of them from and against all claims, damages, losses and expenses, including attorney's fees, arising out of any infringement of patent rights or copyrights incident to the use in the performance of the Work or furnished by them in fulfillment of the requirements of this Contract. In the event of any claim or action by law on account of such patents or fees, it is agreed that the Owner may retain out of the monies which are, or which may become due the Contractor under this Contract, a sum of money sufficient to protect itself against loss, and to retain the same until said claims are paid or are satisfactorily adjusted.”

#### SC-6.08

Delete the words “or, if there are no Bids...to the Work” from the third and fourth sentences of paragraph 6.08.A of the General Conditions and replace with “and the Contractor shall pay all charges of utility owners for connections to the Work”.

#### SC-6.09

Delete paragraph 6.09.B of the General Conditions in its entirety and replace with the following:

- “B. If Contractor observes that the Specifications or Drawings are at variance with any Laws or Regulations, they shall give Engineer prompt written notice thereof. If Contractor performs any Work knowing it to be contrary to such Laws or Regulations, and without such notice to Engineer, they shall bear all costs arising therefrom. The Contractor shall, at all times, observe and comply with and shall cause all their agents and employees and all their Subcontractor to observe and comply with all such existing Laws or Regulations, and shall protect and indemnify the Owner and the Engineer and the municipalities in which Work is being performed, and their officers and agents against any claim, civil penalty, fine or liability arising from or based on the violation of any such Law or

Regulation, whether by themselves or their employees or any of their Subcontractors.”

#### SC-6.10

Add the following new paragraph immediately after paragraph 6.10.A of the General Conditions:

- “1. The materials and supplies to be used in the Work under this Contract are exempt from the Sales and Use Tax of the Commonwealth of Massachusetts. Contractor shall obtain the proper certificates, maintain the necessary records, and otherwise comply with all applicable requirements governing the exemption from sales tax.”

#### SC-6.13

After the word “Contractor” in the first sentence of paragraph 6.13.B of the General Conditions, insert the words “, subject to provisions of paragraph 6.09.B”.

#### SC-6.17

Add the following new paragraph immediately after paragraph 6.17.E of the General Conditions:

- “F. The accuracy of all such information submitted by the Contractor is the responsibility of the Contractor. In reviewing Shop Drawings, Samples, and similar submittals, the Engineer shall be entitled to rely upon the Contractor’s representation that such information is correct and accurate.”

#### SC-6.19

After the first sentence of paragraph 6.19.A of the General Conditions, insert the following:

“All materials or equipment delivered to the Site shall be accompanied by certificates, signed by an authorized officer of the supplier, and notarized guaranteeing that the materials or equipment conform to specification requirements. Such certificates shall be immediately turned over to the Engineer. Materials or equipment delivered to the Site without such certificates will be subject to rejection.”

#### SC-6.20

After the words “claims, costs” in the first sentence of paragraph 6.20.A of the General Conditions insert the words “, civil penalties, fines,”.

Add the following new paragraph immediately after paragraph 6.20.C.2 of the General Conditions:

- “3. Nothing in the Contract Documents shall create or give to third parties any claim or right of action against the Contractor, the Owner, or the Engineer beyond such as may legally exist irrespective of the Contract.”

SC-6.21

Add the following new paragraph immediately after Paragraph 6.21.E

“6.21.F Contractor shall comply with all applicable provisions of the Massachusetts General Laws, Chapter 30, Section 39R regarding Contractor’s records.”

## **ARTICLE 7. OTHER WORK AT THE SITE**

SC-7.02

Delete paragraph 7.02 of the General Conditions in its entirety.

SC-7.03

Delete the words “Owner and” from paragraph 7.03.B of the General Conditions.

Delete the words “Owner and” from paragraph 7.03.C of the General Conditions.

Add the following new paragraph immediately after paragraph 7.03.C of the General Conditions:

- “D. Should Contractor cause damage to the work or property of any separate contractor at the site, or should any claim arising out of Contractor's performance of the Work at the site be made by any separate contractor against Contractor, Owner, Engineer, Engineer’s Consultants, or any other person, Contractor shall promptly attempt to settle with such other contractor by agreement, or to otherwise resolve the dispute by law. Contractor shall, to the fullest extent permitted by Laws and Regulations, defend, indemnify and hold Owner, Engineer, and Engineer’s Consultants, harmless from and against all claims, damages, losses, and expenses (including, but not limited to, fees of engineers, architects, attorneys, and other professionals, and court costs) arising directly, indirectly, or consequentially out of any action, legal or equitable, brought by any separate contractor against Owner, Engineer, or Engineer’s Consultants, to the extent based on a claim arising out of the Contractor's performance of the Work. Should a separate contractor cause damage to the Work or property of Contractor or should the performance of Work by any separate contractor at the site give rise to any other claim, Contractor shall not institute any action, legal or equitable, against Owner, Engineer, or Engineer’s Consultants or permit any action against any of them to be maintained and continued in its name or for its benefit in any court which seeks to impose liability on or to recover damages from Owner, Engineer, or Engineer’s Consultants, on such damage or claim. If Contractor is delayed at any time in performing or furnishing Work by any act or neglect of a separate contractor and Owner and Contractor are unable to agree to the extent of any adjustment in Contract Times attributable thereto, Contractor may make a claim for an extension of times in accordance with Article 12.02. The Contractor hereby agrees that the Contractor shall have no claim for damages of any kind against the Owner, the Engineer, or the Engineer’s consultants on

account of any delay in the performance or furnishing of the Work and/or any delay or suspension of any portion of the Work, whether such delay is caused by the Owner, the Engineer, the Engineer's consultants or otherwise. The Contractor acknowledges that the Contractor's sole remedy for any such delay and/or suspension will be an extension of time in accordance with Article 12.02."

## **ARTICLE 8. OWNER'S RESPONSIBILITIES**

### SC-8.06

Delete paragraph 8.06 of the General Conditions in its entirety.

### SC-8.07

Delete paragraph 8.07 of the General Conditions in its entirety.

### SC-8.11

Delete paragraph 8.11 of the General Conditions in its entirety.

## **ARTICLE 9. ENGINEER'S STATUS DURING CONSTRUCTION**

### SC-9.01

Delete paragraph 9.01.A of the General Conditions in its entirety and replace with the following:

- "A. Engineer will be the Owner's representative during the construction period, and Engineer's instructions shall be carried into effect promptly and efficiently."

### SC-9.02

Delete paragraph 9.02.A of the General Conditions in its entirety.

### SC-9.03

Add the following new paragraph immediately after paragraph 9.03.A of the General Conditions:

- "1. Engineer will furnish a Resident Project Representative and assistants to assist Engineer in observing the performance of the Work. The duties and responsibilities of the Resident Project Representative will be as enumerated in a document entitled "Duties, Responsibilities, and Limitations of the Authority of Resident Project Representative" and will be made available to Contractor at the start of his work."

### SC-9.04

Add the following new paragraph immediately after paragraph 9.04.A of the General Conditions:



- “1. Engineer’s interpretations will be made in accordance with Massachusetts General Laws, Chapter 30, Section 39P.”

SC-9.09

Add the following new paragraphs immediately after paragraph 9.09.E of the General Conditions:

- “F. Except upon written instructions of the Engineer, the Resident Project Representative:
1. Shall not authorize any deviation from the Contract Documents or approve any substitute materials or equipment.
  2. Shall not exceed limitations of Engineer’s authority as set forth in the Contract Documents.
  3. Shall not undertake any of the responsibilities of Contractor, Subcontractors, or Contractor’s superintendent, or expedite the Work.
  4. Shall not advise on or issue directions relative to any aspect of the means, methods, techniques, sequences, or procedures of construction unless such is specifically called for in the Contract.
  5. Shall not advise on or issue directions as to safety precautions and programs in connection with the Work.”

**ARTICLE 10. CHANGES IN THE WORK; CLAIMS**

SC-10.01A

Add the following new paragraph immediately after paragraph 10.01.A of the General Conditions:

- “1. Upon request of the Owner or the Engineer, the Contractor shall without cost to the Owner submit to the Engineer, in such form as the Engineer may require, an accurate written estimate of the cost of any such proposed extra Work or change. The estimate shall indicate the quantity and unit cost of each item of materials, and the number of hours of work and hourly rate for each class of labor, as well as the description and amounts of all other costs chargeable under the terms of this Article. Unit labor costs for the installation of each item of materials shall be shown if required by the Engineer. The contractor shall promptly revise and resubmit such estimate if the Engineer determines that it is not in compliance with the requirements of this Article, or that it contains errors of fact or mathematical errors. If required by the Engineer, in order to establish the exact cost of new Work added or previously required Work omitted, the Contractor shall obtain and furnish to the Engineer bona fide proposals from recognized

suppliers for furnishing any material included in such Work. Such estimates shall be furnished promptly so as to occasion no delay in the Work, and shall be furnished at the Contractor's expense. The Contractor shall state in the estimate any extension of time required for the completion of the Work if the change or extra work is ordered."

## **ARTICLE 11. COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK**

### SC-11.01

After the words "in Paragraph 11.01.B" in the last sentence of paragraph 11.01.A of the General Conditions, add the words "and no claims for extra cost shall be considered based on an escalation of labor costs throughout the period of the Contract".

In the second sentence of paragraph 11.01.A.1 delete the word "superintendents".

Add the following sentence to the end of paragraph 11.01.A.2 of the General Conditions:

"No claims for extra cost shall be considered based on an escalation of material costs throughout the period of the Contract."

Delete the second sentence of paragraph 11.01.A.3 of the General Conditions in its entirety.

Delete paragraph 11.01.A.4 of the General Conditions in its entirety.

Delete paragraph 11.01.A.5.a of the General Conditions in its entirety.

Delete paragraph 11.01.A.5.f of the General Conditions in its entirety.

Delete paragraph 11.01.A.5.g of the General Conditions in its entirety.

Delete paragraph 11.01.A.5.h of the General Conditions in its entirety.

### SC-11.03

Delete the words "materially and significantly" from paragraph 11.03.D.1 and insert the words "by more than plus or minus twenty percent (20%)".

## **ARTICLE 12. CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIME**

### SC-12.03

In the second sentence of paragraph 12.03.A of the General Conditions, replace the words "include, but not be limited to," with "limited to".

Delete paragraph 12.03.B of the General Conditions in its entirety.

## **ARTICLE 13. TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK**

### SC-13.03

Delete paragraph 13.03.B of the General Conditions in its entirety and replace with the following:

- “B. Owner shall employ and pay for inspections and testing services specifically noted as such in the Contract. All others required shall be the responsibility of the Contractor.”

Delete paragraph 13.03.C of the General Conditions in its entirety and replace with the following:

- “C. If the Contract Documents, laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction require any Work to be specifically inspected, tested, or approved by some public body, Contractor shall assume full responsibility therefore, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection, testing, or approval.”

Add the following new paragraph immediately after paragraph 13.03.F of the General Conditions:

- “G. The Owner reserves the right to independently perform at its own expense, laboratory tests on random samples of material or performance tests on equipment delivered to the Site. These tests, if made, will be conducted in accordance with the appropriate referenced standards or Specification requirements. The entire shipment represented by a given sample, samples, or piece of equipment may be rejected on the basis of the failure of samples or pieces of equipment to meet specified test requirements. All rejected materials or equipment shall be removed from the Site, whether stored or installed in the Work, and the required replacement shall be made, all at no additional cost to the Owner.”

### SC-13.05

After the words “conform to the Contract Documents” in the first sentence of paragraph 13.05.A of the General Conditions, add the words “or if the Work interferes with the operation of the existing facility”.

Add the following sentence to the end of paragraph 13.05.A of the General Conditions:

“If Owner stops work pursuant to this paragraph, Contractor shall be entitled to no extension of Contract Times or increase in Contract Price.”

## SC-13.06

Add the following new paragraph immediately after paragraph 13.06.B of the General Conditions:

- “C. At any time during the progress of the Work and up to the date of final acceptance, the Engineer shall have the right to reject any Work which does not conform to the requirements of the Contract Documents, even though such Work has been previously inspected and paid for. Any omissions or failure on the part of the Engineer to disapprove or reject any Work or materials at the time of inspection shall not be construed as an acceptance of any defective Work or materials.”

## **ARTICLE 14. PAYMENTS TO CONTRACTOR AND COMPLETION**

### SC-14.01

Add the following new paragraph immediately after paragraph 14.01.A of the General Conditions:

- “B. The Contractor shall submit for the Engineer’s approval, a complete breakdown of all lump sum items in the Proposal. This breakdown, modified as directed by the Engineer, will be used as a basis for preparing estimates and establishing progress payments.

### SC-14.02

Add the following new paragraphs immediately after paragraph 14.02.A.1 of the General Conditions:

- “a. Only the following items of material and equipment will be accepted for delivery at the site or at a local bonded warehouse and included in progress estimates in advance of actual requirement, subject to all conditions stated below.
  - i. Pre-Cast Concrete Special Structures.
- b. Materials and equipment listed above will not be included in progress estimates until the requirements stated herein have been fulfilled.
- c. The Contractor must present an invoice to the Engineer for each item of material or equipment he is requesting payment for. The invoice must be broken down to show the costs for the actual materials.
- d. Sufficient monies have been allocated in the payment requisition line items to cover all of the costs listed in "a" above, plus the costs of physically installing the items of work.
- e. The materials have been submitted and approved for use in this Project.

- f. The Contractor has, at the time of delivery, given the Engineer written notice of the delivery using the form provided by the Engineer.
- g. The material is acceptably stored and protected. Storage in a bonded warehouse will require proof of bonding, and insurance coverage specifically for the item being stored.
- h. The manufacturer's short and/or long term storage requirements have been received by the Engineer, prior to payment.
- i. The Contractor has established a program to implement the manufacturer's required storage procedures. Said program to consist of at the very least a written schedule of daily, weekly, monthly, routine maintenance requirements for each piece of equipment. A copy of this schedule to be presented to the Engineer prior to each requisition submittal, signed by the Contractor, stating that the required maintenance has been performed.
- j. Signed, notarized Title Transfers, format to be furnished by the Engineer, must be furnished for each item of equipment.
- k. When the above have been complied with to the satisfaction of the Engineer, payment will be authorized for the full invoice values of the item, less normal retainage and less all costs for O&M Manuals, installation, incidental items included for payment, spare parts, start-up certification, training, testing, final acceptance testing, and installation.”

Delete paragraph 14.02.A.3 of the General Conditions in its entirety and replace with the following:

- “3. Progress payment request shall include the percentage of the total amount of the Contract which has been completed from the start-up of the Project to and including the last day of the preceding month, or other mutually agreed upon day of the month accompanied by such data and supporting evidence as Owner or Engineer may require.”

Add the following new paragraphs immediately after paragraph 14.02.A.3 of the General Conditions:

- “4. Forms to be used shall be prepared by the Contractor and submitted to the Engineer for approval.
- 5. At the option of the Owner, partial payment up to the estimated value, less retainage, may be allowed for any materials and equipment not incorporated in the Work, pursuant to the following conditions:
  - a. Major equipment items stored off site shall be stored in a bonded warehouse and properly maintained during storage.

- b. Equipment or materials stored on the Site shall be properly stored, protected, and maintained.
- c. For any partial payment the Contractor shall submit, with their monthly progress payment from each material or equipment manufacturer, bills or invoices indicating actual material cost.
- d. Contractor shall submit evidence that they have paid for materials or equipment stored and for which the Engineer has authorized partial payment and previous progress payments, prior to submission of the next monthly payment request.”

Delete the words “10 days” from the first sentence of paragraph 14.02.B.1 of the General Conditions and insert the words “30 days”.

Delete the words “as provided in the Agreement” from paragraph 14.02.D.3 of the General Conditions and insert the words “equal to the federal funds rate as established from time to time by the Federal Open Market Committee of the United States Federal Reserve”.

#### SC-14.04

Delete paragraphs 14.04.A through 14.04.D of the General Conditions in their entirety and replace with the following:

- “A. Contractor may, in writing to Owner and Engineer, certify that the entire Project is substantially complete and request that Engineer issue a certificate of Substantial Completion. Within a reasonable time thereafter, Owner, Contractor, and Engineer shall make an inspection of the Project to determine the status of completion. If Engineer and Owner do not consider the Project substantially complete, Engineer will notify Contractor in writing giving their reasons therefor. If Engineer and Owner consider the Project substantially complete, Engineer will prepare and deliver to Owner a tentative certificate of Substantial Completion and the responsibilities between Owner and Contractor for maintenance, heat, and utilities. There shall be attached to the certificate a tentative list of items to be completed or corrected before Substantial Completion, and the certificate shall fix the time within which such items shall be completed or corrected, said time to be within Contract Time.”

#### SC-14.05

Delete paragraph 14.05.A of the General Conditions in its entirety and replace with the following:

- “A. Prior to Substantial Completion of the Project, Owner may request Contractor in writing to permit them to use a specified part of the Project which they believe they may use without significant interference with construction of the other parts of the Project. If Contractor agrees, they will certify to Owner and Engineer that said part of the Project is substantially complete and request the Engineer to

issue a certificate of Substantial Completion for that part of the Project. Within a reasonable time thereafter, Owner, Contractor, and Engineer shall make an inspection of that part of the Project to determine its status of completion. If Engineer and Owner do not consider that it is substantially complete, Engineer will notify Contractor in writing giving their reasons therefor. If Engineer and Owner consider that part of the Project to be substantially complete, Engineer will execute and deliver to Owner and Contractor a certificate to that effect, fixing the date of Substantial Completion as to that part of the Project, attaching thereto a tentative list of items to be completed or corrected before Substantial Completion of the entire Project, and fixing the responsibility between Owner and Contractor for maintenance, heat, and utilities as to that part of the Project. Owner shall have the right to exclude Contractor from any part of the Project which Engineer has so certified to be substantially complete, but Owner shall allow Contractor reasonable access to complete items on the tentative list”.

## **ARTICLE 15. SUSPENSION OF WORK AND TERMINATION**

### **SC-15.01**

Delete paragraph 15.01.A of the General Conditions in its entirety and insert in place thereof the following:

- “A. Owner may order, at any time and without cause, suspension of the Work in accordance with Massachusetts General Laws, Chapter 30, Section 39O.”

Insert the following new paragraph immediately after paragraph 15.01.A of the General Conditions:

- “B. Should the Owner suspend Work due to repeated unsafe Work conducted by the Contractor, the Contractor shall not be allowed any adjustment in Contract Price or extension of Contract Times attributed to this delay.”

### **SC-15.02**

After the word “jurisdiction” in paragraph 15.02.A.2 of the General Conditions, add the words “(including those governing employee safety)”.

Delete paragraph 15.02.D of the General Conditions in its entirety.

### **SC-15.05**

Add the following new paragraphs immediately after paragraph 15.04 of the General Conditions:

#### **“15.05 Assignment of Contract**

- A. Contractor shall not assign, transfer, convey or otherwise dispose of the Contract, or of their legal right, title, or interest in or to the same or to any part

thereof, without the prior written consent of the Owner. Contractor shall not assign by power of attorney or otherwise any monies due to them and payable under this Contract without the prior written consent of the Owner. Such consent, if given, will in no way relieve the Contractor from any of the obligations of this Contract. Owner shall not be bound to abide by or observe the requirements of any such assignment.”

## **ARTICLE 16. DISPUTE RESOLUTION**

### **SC-16.01**

Delete paragraph 16.01 of the General Conditions in its entirety and insert in place thereof the following:

- “A. It is the express intention and agreement of the parties that all disputes related to this Agreement or to any rights or any relationship between the parties arising therefrom shall be solely and exclusively initiated and maintained through legal proceedings in the courts of the Commonwealth located in Hampden County, Massachusetts. The Contractor and Owner each irrevocably consents to the jurisdiction of such courts in any such actions or proceedings, and waives its right to a trial by jury.
- B. Contractor shall carry on the Work and maintain the progress schedule during the dispute resolution proceedings, unless otherwise agreed by Contractor and Owner in writing.”

## **ARTICLE 17. MISCELLANEOUS**

### **SC-17.01**

Add the following new paragraph immediately after paragraph 17.01.A of the General Conditions:

- “B. No oral statement of any person whomsoever shall in any manner or degree modify or otherwise affect the terms of this Contract. Any notice to the Contractor, from Owner and Engineer, relative to any part of this Contract shall be in writing.”

### **SC-17.06**

Add the following sentence to 17.06.A: “The headings or titles of any article, paragraph, subparagraph, section, subsection, or part of the Contract Documents shall not be deemed to limit or restrict the article, paragraph, section, or part.”

Add the following new paragraphs immediately after paragraph 17.06 of the General Conditions:

“17.07 Legal Address of Contractor



- A. Contractor's business address and his office at or near the site of the Work are both hereby designated as places to which communications shall be delivered. The depositing of any letter, notice, or other communication in a postpaid wrapper directed to the Contractor's business address in a post office box regularly maintained by the Post Office Department or the delivery at either designated address of any letter, notice, or other communication by mail or otherwise shall be deemed sufficient service thereof upon Contractor, and the date of such service shall be the date of receipt. The first-named address may be changed at any time by an instrument in writing, executed and acknowledged by Contractor and delivered to Engineer. Service of any notice, letter, or other communication upon the Contractor personally shall likewise be deemed sufficient service.

#### 17.08 Wage Rates

- A. The requirements and provisions of all applicable laws and any amendments thereto as to the employment of labor, and the schedules of minimum wage rates established in accordance with such laws shall be a part of these Contract Documents.
- B. The said schedules of wages shall continue to be the minimum rates to be paid during the life of this contract and a legible copy of said schedules shall be kept posted in a conspicuous place at the site of the Work."

#### SC-18

Add the following new paragraphs immediately after Article 17 of the General Conditions:

#### "ARTICLE 18 – LIQUIDATED DAMAGES FOR FAILURE TO COMPLETE WORK ON TIME

##### 18.01 Liquidated Damages

- A. If the Contractor shall fail to complete the Work within the Contract Times, or extension of time granted by the Owner in accordance with Article 12, then the Contractor will pay to the Owner the amount for liquidated damages as specified in the Contract for each calendar day that the Contractor shall be in default after the time stipulated in the Contract Documents.
- B. The Contractor shall not be charged with liquidated damages or any excess cost when delay in completion of the Work is due to the following and the Contractor has promptly given written notice of such delay to the Owner or Engineer.
- C. To any preference, priority, or allocation order duly issued by the Owner.
- D. To unforeseeable causes beyond the control and without the fault or negligence of the Contractor, including but not restricted to, acts of God, or of the public enemy, acts of the Owner, acts of another Contractor in the performance of a

contract with the Owner, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes; and abnormal and unforeseeable weather; and

- E. To any delays of Subcontractors occasioned by any of the causes specified in Paragraphs 18.01.C and 18.01.D of this Article.”

## **PART II – ADDITIONAL PROVISIONS**

State Government Provisions included herein have been selected from those to which specific references have been made elsewhere in the Contract Documents. Each and every other provision of law or clause required by law to be inserted in this Contract shall be deemed to be also inserted herein in accordance with paragraph SC-3.01 of the Supplementary Conditions.

- 1.1. Applicable provisions of Massachusetts General Laws and Regulations and/or the United States Code and Code of Federal Regulations govern this Contract, and any provision violation of the foregoing shall be deemed null, void and of no effect.

### **2.0. MASSACHUSETTS WAGE RATES**

- 2.1. Minimum Wage Rates as determined by the Commissioner of Department of Labor and Industries under the provision of the Massachusetts General Laws, Chapter 149, Section 26 to 27D, as amended, apply to this project. It is the responsibility of the Contractor, before the bid opening, to request, if necessary, any additional information on Minimum Wage Rates for those tradespeople who may be employed for the proposed work under this Contract.

- 2.2. The schedule of Minimum Wage Rates is included in the Supplementary Conditions Part IV – Wage Determination Schedules.

### **3.0. CHANGE ORDERS**

- 3.1. Following the Notice of Award and prior to execution of the Contract the prospective contractor shall submit to the Engineer for review documentation that will assist in developing the markup percentage to be used as Direct Labor. Prior to execution of the Contract by the Owner, the prospective contractor will work out an agreement on what percentage markup shall be used as Direct Labor Costs and this agreement shall become a part of the Contract Documents at the time the Contract is executed.

### **4.0. RECORD DRAWINGS**

- 4.1. The Owner shall be responsible for the preparation of all record drawings required by this Contract. This responsibility may be delegated to the Owner's representative. The responsibility for preparation of record drawings shall not be delegated or transferred to the Contractor. The preparation and maintenance of as-built drawings and as-built data remains the responsibility of the Contractor

and shall be maintained and provided to the Engineer as specified elsewhere in the Technical Specifications.

5.0. UTILITY UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM

5.1. All excavation within public or private ways are subject to the requirements of Massachusetts General Laws, Chapter 82, Section 40.

6.0 The Contractor is responsible for submitting for and obtaining all building construction permits for this Project. The Contractor will pay for all building construction permit fees.

7.0 Markups are limited to the not to exceed amounts defined in the Agreement.

8.0 AMERICAN IRON AND STEEL REQUIREMENTS

8.1 Section 746 of Title VII of the Consolidated Appropriations Act of 2017 (Division A – Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2017) and subsequent statutes mandating domestic preference applies an American Iron and Steel requirement to this Project. The amendments to the Clean Water Act, as part of WRRDA, apply the American Iron and Steel (AIS) requirements to all treatment works projects. Compliance with AIS is required in accordance with Public Law 113-76, the Consolidated Appropriations Act of 2014. All iron and steel products used in this Project must be produced in the United States. The term “iron and steel products” means the following products made primarily of iron or steel: lined or unlined pipes and fittings, manhole covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, reinforced precast concrete, and Construction Materials.

8.2 The following waivers apply to this Contract:

8.2.1 De Minimis.

8.2.2 Minor Components.

8.2.3 Pig iron and direct reduced iron.

8.2.4 The Build American Buy America (BABA) requirements are waived for this Project based on EPA’s Decision Memorandum titled Adjustment Period Waiver of Section 70914(a) of P.L. 117-58, Build America, Buy America Act for SRF Projects that have initiated Design Planning issued September 2, 2022.

**END OF SECTION**

**APPENDIX E  
CONSTRUCTION BID SPECIFICATIONS  
SPECIAL PROVISIONS FOR DISADVANTAGED BUSINESS ENTERPRISES  
MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
DIVISION OF MUNICIPAL SERVICES**

DISADVANTAGED BUSINESS ENTERPRISE PROGRAM BACKGROUND

In May 2008 a United States Environmental Protection Agency (EPA) rule became effective that changed the Minority Business Enterprise (MBE) and Women Business Enterprise (WBE) Program to a Disadvantaged Business Enterprise (DBE) Program.

For firms to qualify under the old MBE/WBE program they needed to be socially disadvantaged and had to be certified by the Supplier Diversity Office (SDO). Under the new DBE rule, the firms must be both **socially** and **economically** disadvantaged, **citizens of the United States**, and certified as a DBE. Women and certain minorities are presumed to be socially disadvantaged. The economic disadvantage is measured by the owner's initial and continuing personal net worth of less than \$1,320,000.

Because the Clean Water Act requires the use of MBEs and WBEs, these firms will still be utilized in the State Revolving Fund (SRF) Loan Program, but they must also be certified as DBEs.

SDO will continue to be the certifying agency for the SRF program. SDO certifies firms under the federal Department of Transportation program, which is acceptable for use in the SRF program. An additional form has been added to the DBE package to verify that DBEs are owned or controlled by United States citizens.

**BID SPECIFICATIONS**

**I.** In this contract, the percentage of business activity to be performed by disadvantaged business enterprise(s) (DBE) shall not be less than the following percentages of the total contract price or the percentage submitted by the contractor in the Schedule of Participation, whichever is greater:

Disadvantaged MBE (D/MBE) 4.80%

Disadvantaged WBE (D/WBE) 6.90%

## II. DEFINITIONS

For the purpose of these provisions, the following terms are defined as follows:

- A. Awarding Authority – Entity that awards a prime contract under a State Revolving Fund loan.
- B. Bidder - Any individual, partnership, joint venture, corporation, or firm submitting a price, directly or through an authorized representative, for the purpose of performing construction or construction related activities under a Contract.
- C. Certified DBE – A DBE certified by the United States Small Business Administration, under its 8(a) Business Development Program (13 CFR part 124, subpart A) or its Small Disadvantaged Business Program (13 CFR part 124, subpart B); The United States Department of Transportation (DOT), under its regulations for Participation by DBEs in DOT programs (49 CFR parts 23 and 26); or SDO in accordance with 40 CFR part 33; provided that the certification meets the U.S. citizenship requirement under 40 CFR §33.202 or §33.203.
- D. Compliance Unit - A subdivision of MassDEP’s Affirmative Action Office designated to ensure compliance under these provisions.
- E. Contractor - Any business that contracts or subcontracts for construction, demolition, renovation, survey, or maintenance work in the various classifications customarily used in work and that is acting in this capacity under the subject contract.
- F. Construction Related Services - Those services performed at the work site ancillary to, and/or in support of, the construction work, such as hauling, trucking, equipment operation, surveying or other technical services, etc. For the purposes hereof, supply and delivery of materials (e.g. pre-cast concrete elements) to the site by a supplier who has manufactured those goods, or substantially altered them before re-sales shall be considered as “construction related services
- G. Construction Work - The activities at the work site, or labor and use of materials in the performance of constructing, reconstructing, erecting, demolishing, altering, installing, disassembling, excavating, etc, all or part of the work required by the Contract Documents.
- H. Disadvantaged Business Enterprise (DBE) - An entity owned or controlled by a socially and economically disadvantaged individual as described by Public Law 102-389 (42 U.S.C. 4370d) or an entity owned and controlled by a socially and economically disadvantaged individual as described by Title X of the Clean Air Act Amendments of 1990 (42 U.S.C. 7601 note); a Small Business Enterprise (SBE); a Small Business in a Rural Area (SBRA); or a Labor Surplus Area Firm (LAF), a Historically Underutilized Business (HUB) Zone Small Business Concern, or a concern under a successor program.

- I. Equipment Rental Firm - A firm that owns equipment and assumes actual and contractual responsibility for renting said equipment to perform a useful function of the work of the contract consistent with normal industry practice
- J. Good Faith Efforts – The race and/or gender neutral measures described in 40 CFR 33, subpart C.
- K. HUBZone - A historically underutilized business zone, which is an area located within one or more qualified census tracts, qualified metropolitan counties, or lands within the external boundaries of an Indian reservation.
- L. HUBZone small business concern - A small business concern that appears on the List of Qualified HUBZone Small Business Concerns maintained by the Small Business Administration.
- M. Joint Venture - An agreement between SDO certified DBE and a non-DBE or non-DBE controlled enterprise.
1. A pairing of companies will be considered a DBE joint venture if the SDO certified DBE which is part of the relationship has more than 51% of the profits that are derived from that project.
  2. A joint venture between a certified DBE subcontractor and a non DBE subcontractor, in which the DBE for that proportion of the joint venture’s contract equal to the DBE participation in the joint venture.
  3. Whenever a general bid is filed by a joint venture with a certified DBE participant in the joint venture that does not exercise more than 51% control over management and profits, that joint venture shall be entitled to credit as a DBE for that portion of the joint venture’s contract equal to the DBE participation in the joint venture. Minority As deemed by SDO.
- N. Labor surplus area firm (LSAF) - A concern that together with its first-tier subcontractors will perform substantially in labor surplus areas (as identified by the Department of Labor in accordance with 20 CFR part 654). Performance is substantially in labor surplus areas if the costs incurred under the contract on account of manufacturing, production or performance of appropriate services in labor surplus areas exceed 50 percent of the contract price.
- O. Letter of Intent – Certified document signed by the principal(s) of the DBE with respect to the work to be performed under contract.
- P. Local Government Unit (LGU) – A city, town, or municipal district which applies for a loan under the Clean Water Trust Program.
- Q. Material Supplier – A vendor certified by SDO as a DBE in sales to supply industry from an established place of business or source of supply, and that vendor.

1. Manufactures goods from raw materials, or substantially utilizes them in the work, or substantially alters them before resale, entitling the general contractor to DBE credit for 100% of the purchase order.
  2. Provides and maintains a storage facility for materials utilized in the work, entitling the general contractor to DBE credit for 10% of the purchase order
- R. Minority and Women Business Enterprise (M/WBE) – Any business concern certified by the SDO as a bona-fide M/WBE. A bona-fide M/WBE is a business whose minority group/women ownership interests are real, which have at least 51% ownership and control over management and operation.
- S. Percent of Total Price – Is the percentage to be paid to the DBE, work they perform, as compared to the total bid price
- T. Recipient - An agency, person or political subdivision which has been awarded or received financial assistance by the Trust or MassDEP.
- U. Small business, small business concern or small business enterprise (SBE) - A concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding, and qualified as a small business under the criteria and size standards in 13 CFR part 121.
- V. Small business in a rural area (SBRA) - A small business operating in an area identified as a rural county with a code 6-9 in the Rural-Urban continuum Classification Code developed by the United States Department of Agriculture in 1980.
- W. SDO – The Supplier Diversity Office.
- X. Subcontractor – A company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an award of financial assistance.
- Y. Total Contract Price – The total amount of compensation to be paid for all materials, work or services rendered in the performance of the contract
- Z. Trust – The Massachusetts Clean Water Trust established by M.G.L. c.29.

### **III. REQUIREMENTS FOR CONTRACT AWARD**

DBE packages must be submitted by the two lowest bidders on the project. Following bid opening, the LGU shall notify the two lowest bidders to submit DBE packages to the LGU or the LGUs consultant, as directed. By the close of business on the third business day after notification, the two lowest bidders, including a bidder who is a MBE, WBE or DBE, shall submit the following information:

- A. A Schedule of Participation (Form EEO-DEP-190). The Schedule of Participation shall list those certified DBEs the bidder intends to use in fulfilling the contract obligations, the nature of the work to be performed by each certified DBE subcontractor and the total price they are to be paid.
  - 1. A listing of bona-fide services such as a professional, technical, consultant or managerial services, assistance in the procurement of essential personnel, facilities, equipment, materials, or supplies required for performance of the contract, and reasonable fees or commissions charged.
  - 2. A listing of haulers, truckers, or delivery services, not the contractors, including reasonable fees for delivery of said materials or supplies to be included on the project.
- B. A Letter of Intent (Form EEO-DEP-191) for each DBE the bidder intends to use on the project. The Letter of Intent shall include, among other things, a reasonable description of the work the certified DBE is proposing to perform and the prices the certified DBE proposes to charge for the work. A Letter of Intent shall be jointly signed by the certified DBE and the General Contractor who proposes to use them in the performance of the Contract.
- C. Each DBE must also sign and return the DBE Certification of United States Citizenship form to verify that the firm is owned or controlled by a United States citizen.
- D. The SDO “DBE Certification” as prepared by each certified DBE.
- E. ~~A completed Request for Waiver form and backup documentation should the goals not be achieved (See IV below).~~

### **IV. REQUIREMENTS FOR MODIFICATION OR WAIVERS.**

~~The bidder shall make every possible effort to meet the minimum requirements of certified DBE participation. If the percentage of DBE participation submitted by the bidder on its Schedule of Participation (EEO-DEP-190) does not meet the minimum requirements, the bid may be rejected by the Awarding Authority and found not to be eligible for award of the contract.~~



~~In the event that the bidder is unable to meet the minimum requirements of DBE participation, the bidder shall submit with his/her submittal required in Section III. Requirement of Contract Award a Request for Waiver form (EEO-DEP-490). The Awarding Authority shall review the waiver request to determine if the request should proceed. If approved by the Awarding Authority, the Awarding Authority shall submit the waiver request and supporting documentation, with a recommendation to MassDEP within five days of receipt of the Request for Waiver. MassDEP in conjunction with the project manager, Compliance Unit, will determine whether the waiver will be granted.~~

~~The waiver request shall include detailed information as specified below to establish that the bidder has made a good faith effort to comply with the minimum requirements of DBE participation specified in Part I. In addition, the bidder must show that such efforts were undertaken well in advance of the time set for opening of bids to allow adequate response. A waiver request shall include the following:~~

- ~~A. A detailed record of the effort made to contact and negotiate with the certified DBE, including, but not limited to:
  - ~~1. names, addresses and telephone numbers of all such companies contacted;~~
  - ~~2. copies of written notices(s) which were sent to certified DBE potential subcontractors, prior to bid opening;~~
  - ~~3. a detailed statement as to why each subcontractor contacted (i) was not willing to do the job or (ii) was not qualified to perform the work as solicited; and~~
  - ~~4. in the case(s) where a negotiated price could not be reached the bidder should detail what efforts were made to reach an agreement on a competitive price;~~
  - ~~5. copies of advertisements, dated not less than ten (10) days prior to bid opening, as appearing in general publications, trade-oriented publications, and applicable minority/ women-focused media detailing the opportunities for participation.~~~~
- ~~B. MassDEP may require the bidder to produce such additional information as it deems appropriate.~~
- ~~C. No later than fifteen (15) days after MassDEP receives all required information and documentation, it shall make a decision in writing, whether the waiver is granted and shall provide that determination to the bidder and Awarding Authority. If the waiver request is denied, the facts upon which a denial is based will be set forth in writing. If the waiver request is denied, the bid shall be rejected by the Awarding Authority, or the contract will be determined ineligible for SRF funding.~~

~~If a Request for Waiver is denied by MassDEP and the bid is rejected by the Awarding Authority, the Awarding Authority may then move to the second bidder on the project. At the Awarding Authority's discretion, it may collect a DBE package from the third bidder on the project.~~

## **V. DISADVANTAGED BUSINESS ENTERPRISES PARTICIPATION**

### **A. Reporting Requirements**

1. The Contractor's utilization of certified DBEs will be documented based upon submittal of the LGU's monthly Payment Requisitions as reported on Form-2000. The Form-2000 form will show all certified DBEs performing work on the project regardless of any billing activity for that month. For auditing and accounting purposes, the Contractor periodically may be required to submit copies of canceled checks verifying that payments have been made to the certified DBE as listed on the schedule. The Contractor may also be required to submit current schedules on utilization of all DBEs to indicate when their services will commence and be billed for.
2. During the life of the Contract, the Contractor's fulfillment of the percentage requirements in Part I shall be determined with reference to the Contract price as follows:
  - A. If the price in the Contract executed exceeds the base bid price (e.g., because an alternate was selected or because unit prices were used in awarding the Contract), the Contractor shall submit for approval by MassDEP a revised Schedule of Participation by certified DBEs satisfying the percentage requirements and such other information concerning additional DBE participation as may be requested by MassDEP.
  - B. If the Contract price increases after execution due to change orders or other adjustments, MassDEP may require the Contractor to subcontract additional work or to purchase additional goods and services from certified DBEs up to the percentages stated in Part I.

## **VI. COMPLIANCE**

- A. If the Schedule or any of the Letters of Intent are materially incomplete or not submitted in a timely manner, the LGU may rescind its vote of award; treat the bid informal as to substance and reject the bid. If the bid is incomplete in any other respect than the Schedule the LGU with the approval of MassDEP may waive the informalities upon satisfactory completion of the required information by the Contractor and the certified DBE as applicable.
- B. If the LGU finds that the percentage of certified DBE participation submitted by the contractor on its Schedule does not meet the percentage requirement in Part I, it shall rescind its vote of award and find such contractor not to be eligible for award of the contract.

- C. The Contractor shall not perform with its own organization, or subcontract to any other primary or subcontractor any work designated for the named certified DBEs on the schedule submitted by the Contractor under Part III without the approval of MassDEP.
- D. A Contractor's compliance with the percentage requirement in Part I shall continue to be determined by reference to the required percentage of the total contract price as stated in Section I even though the total of actual contract payments may be greater or less than the bid price.
- E. If the Contractor for reasons beyond its control cannot comply with Part III in accordance with the Schedule submitted under Part III, Section B, the contractor must submit to MassDEP as soon as they are aware of the deficiency, the reason for its inability to comply. Proposed revisions to the Schedule stating how the contractor intends to meet its obligations under these conditions must be submitted within ten (10) working days of notification.
- F. If the Contractor becomes aware by any means that that DBE is no longer certified, the Contractor shall immediately notify MassDEP. The Contractor shall use good faith efforts to retain a substitute certified DBE.
- G. If a certified DBE listed by the bidder in its Schedule of M/WBE contractors fails to obtain a performance or payment bond requested by the bidder, said failure shall not entitle the bidder to avoid the requirements of Part III (A). After a bidder has been awarded the contract, he shall not change the certified DBE listed in its Schedule at the time of the award or make any other such substitutions without the written approval of MassDEP.

## **VII. SANCTIONS**

- A. If the Contractor does not comply with the terms of these Special Provisions, the Awarding Authority may (1) suspend any payment for the work that should have been performed by a certified DBE pursuant to the schedule, or (2) require specific performance of the Contractor's obligation by requiring the Contractor to subcontract with a DBE for any contract or specialty item at the contract price established for that item in the proposal submitted by the Contractor.
- B. To the extent that the Contractor has not complied with the terms of these Special Provisions, the Awarding Authority may retain in connection with Estimates and Payments an amount determined by multiplying the bid price of this contract by the percentage in Section I, less the amount paid to DBE's for work performed under the contract and any payments already suspended under VII A.
- C. The Awarding Authority may suspend, terminate or cancel this contract, in whole or in part, or may call upon the Contractor's surety to perform all terms and conditions in the contract, unless the contractor is able to demonstrate his compliance with the terms

of these Special Provisions, and further deny to the Contractor, the right to participate in any future contracts awarded by the Awarding Authority for a period of up to three years.

- D. In any proceeding involving the imposition of sanctions by the Awarding Authority, no sanctions shall be imposed if the Awarding Authority finds that the contractor has taken every possible measure to comply with these Special Provisions or that some other justifiable reason exists for waiving these Special Provisions in whole or in part.
- E. The contract shall provide such information as is necessary in the judgment of the Awarding Authority to ascertain its compliance with the terms of these Special Provisions.
- F. A contractor shall have the right to request suspension of any sanctions imposed under this section upon demonstrating that he is in compliance with these Special Provisions.

DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION  
 MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
 DIVISION OF MUNICIPAL SERVICES

**SCHEDULE OF PARTICIPATION FOR SRF CONSTRUCTION**

**Project Title:** \_\_\_\_\_ **Project Location:** \_\_\_\_\_

**Disadvantaged Minority Business Enterprise Participation in the SRF Loan Work**

Name & Address of D/MBE	Nature of Participation	Dollar Value of Participation
1.		
2.		
3.		
<b>Total D/MBE Commitment:</b>		<b>\$</b>
<b>Percentage D/MBE Participation = (Total D/MBE Commitment) / (Bid Price) =</b>		<b>%</b>

**Disadvantaged Women Business Enterprise Participation in the SRF Loan Work**

Name & Address of D/WBE	Nature of Participation	Dollar Value of Participation
1.		
2.		
3.		
<b>Total D/WBE Commitment:</b>		<b>\$</b>
<b>Percentage D/WBE Participation = (Total D/WBE Commitment) / ( Bid Price) =</b>		<b>%</b>

The Bidder agrees to furnish implementation reports as required by MassDEP to indicate the D/MBEs and D/WBE(s) which it has used or intends to use. Breach of this commitment constitutes a breach of the contract.

Name of Bidder: \_\_\_\_\_

Date: \_\_\_\_\_ By: \_\_\_\_\_  
Signature

NOTE: Participation of a DBE may be counted in only their certified category; the same dollar participation cannot be used in computing the percentage of D/MBE participation and again of D/WBE participation.

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**LETTER OF INTENT FOR SRF CONSTRUCTION**

This form is to be completed by the D/MBE and D/WBE and must be submitted by the Bidder no later than close of business on the third business day after notification by the LGU. A separate form must be completed for each D/MBE and D/WBE involved in the project.

Project Title: \_\_\_\_\_ Project Location: \_\_\_\_\_

**TO:** \_\_\_\_\_  
(Name of Bidder)

**FROM:** \_\_\_\_\_  
(Please Indicate Status [ ] D/MBE or [ ] D/WBE)

° I/we intend to perform work in connection with the above project as (check one):

- An individual
- A partnership
- A corporation
- A joint venture with: \_\_\_\_\_
- Other (explain): \_\_\_\_\_

° It is understood that if you are awarded the contract, you intend to enter into an agreement to perform the activity described below for the prices indicated.

**DBE PARTICIPATION**

Description of Activity	Date of Project Commencement	\$ Amount	% Bid Price
		\$	%

° The undersigned certify that they will enter into a formal agreement upon execution of the contract for the above referenced project.

<b>BIDDER</b>		<b>DBE</b>	
(Authorized Original Signature)	Date	(Authorized Original Signature)	Date
ADDRESS:		ADDRESS:	
TELEPHONE #:		TELEPHONE #:	
FEIN:		FEIN:	
EMAIL ADDRESS:		EMAIL ADDRESS:	

**ORIGINALS:**

- ° Compliance Mgr. City/Town Project Location
- ° DEP Program Manager for DEP's AAO Director

**\* Attach a copy of current (within 2 years) DBE Certification**

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**DBE CERTIFICATION OF UNITED STATES CITIZENSHIP**

For the SRF program, under the EPA Disadvantage Business Enterprise (DBE) Rule, a DBE must be owned or controlled by a socially and economically disadvantaged person that is also a **citizen of the United States** (See 40 CFR 33.202). “Ownership” is defined at 13 CFR 124.105 and “control” is defined at 13 CFR 124.106.

DBEs are certified for the SRF program through the Supplier Diversity Office using the federal Department of Transportation (DOT) DBE rules. EPA allows the use of DBEs certified under the DOT rules as long as they are also United States citizens. To ensure compliance with the EPA rule, MassDEP must verify United States citizenship through the completion of the following form for each DBE used on the project.

SRF Project Number \_\_\_\_\_

Contract Number \_\_\_\_\_

Contract Title \_\_\_\_\_

DBE Subcontractor \_\_\_\_\_

The undersigned, on behalf of the above named DBE subcontractor, hereby certifies that the DBE firm is either owned or controlled by a person or persons that are citizens of the United States.

\_\_\_\_\_  
Printed Name and Title of DBE Signatory

\_\_\_\_\_  
DBE Signature

\_\_\_\_\_  
Date

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**DISADVANTAGED BUSINESS ENTERPRISE**  
**PROGRAM DBE SUBCONTRACTOR PARTICIPATION**  
**FORM**

The United States Environmental Protection Agency (EPA) requires that this form be provided to all subcontractors on the project. At the option of the subcontractor, this form may be filled out and submitted directly to the EPA DBE Coordinator.

NAME OF SUBCONTRACTOR	PROJECT NAME
ADDRESS	CONTRACT NO.
TELEPHONE NO.	E-MAIL ADDRESS
PRIME CONTRACTOR NAME:	

Please use the space below to report any concerns regarding the above EPA-funded project (e.g., reason for termination by prime contractor, late payment, etc.).

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CONTRACT ITEM NO.	ITEM OF WORK OR DESCRIPTION OF SERVICES RECEIVED FROM THE PRIME CONTRACTOR	AMOUNT SUBCONTRACTOR WAS PAID BY PRIME CONTRACTOR
<hr/> Subcontractor Signature		<hr/> Title/Date



REQUEST FOR WAIVER FOR SRF CONSTRUCTION

Upon exhausting all known sources and making every possible effort to meet the minimum requirements for DBE participation, the Bidder may seek relief either partially or entirely from these requirements by submitting a completed waiver package by the close of business on the third business day after notification by the LGU. Failure to comply with this process shall be cause to reject the bid thereby rendering the Bidder not eligible for award of the contract.

General Information

Project Title: \_\_\_\_\_ Project Location: \_\_\_\_\_

Bid Opening (time/date) \_\_\_\_\_

Bidder: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

Contact Person: \_\_\_\_\_ Telephone No. (\_\_\_\_) \_\_\_\_\_ Ext. \_\_\_\_\_

Minimum Requirements

The bidder must demonstrate that good faith efforts were undertaken to comply with the percentage goals as specified. The firm seeking relief must show that such efforts were taken appropriately in advance of the time set for opening bid proposals to allow adequate time for response(s) by submitting the following:

A. A detailed record of the effort made to contact and negotiate with disadvantaged minority and/or woman owned businesses, including:

1. names, addresses, telephone numbers and contact dates of all such companies contacted;

2. copies of written notice(s) which were sent to DBE potential subcontractors prior to bid opening;

3. a detailed statement as to why each subcontractor contacted (i) was not willing to do the job or (ii) was not qualified to perform the work as solicited; and

4. in the case(s) where a negotiated price could not be reached the bidder should detail what efforts were made to reach an agreement on a competitive price.

5. copies of advertisements, dated not less than ten (10) days prior to bid opening, as appearing in general publications, trade-oriented publications, and applicable minority/women focused media detailing the opportunities for participation;

- B. ~~MassDEP may require the bidder to produce such additional information as it deems appropriate.~~
  
- C. ~~No later than fifteen (15) days after submission of all required information and documentation, MassDEP shall make a determination, in writing, whether the waiver request is granted and shall provide that determination to the bidder and Awarding Authority. If the waiver request is denied, the facts upon which a denial is based will be set forth in writing.~~

CERTIFICATION

The ~~undersigned~~ herewith certifies that the above information and appropriate attachments are true and accurate to the best of my knowledge and that I have been authorized to act on behalf of the bidder in this matter.

\_\_\_\_\_  
\_\_\_\_\_  
(authorized original signature) DATE

DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION  
 MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
 DIVISION OF MUNICIPAL SERVICES

STATE REVOLVING FUND LOAN PROGRAM – SCHEDULE OF SUBCONTRACTOR PARTICIPATION

Local Governmental Unit \_\_\_\_\_

Project Name \_\_\_\_\_

SRF Identification Number \_\_\_\_\_

General Contractor \_\_\_\_\_

Contract Value \_\_\_\_\_

The United States Environmental Protection Agency (EPA) requires that all SRF borrowers develop and maintain a list of all MBE/WBE and non MBE/WBE subcontractors on the project.

This form must be completed and returned to MassDEP within 90 days of award of the contract.

Subcontractor	Point of Contact	Mailing Address	Telephone Number	E-Mail Address	MBE	WBE	DBE	Subcontract Value

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# WEEKLY STATEMENT OF COMPLIANCE

In accordance with Massachusetts General Law c. 149, §27B, a true and accurate record must be kept of all persons employed on the public works project for which the enclosed rates have been provided. A Payroll Form is available from the Department of Labor Standards (DLS) at [mass.gov/dols/pw](http://mass.gov/dols/pw) and includes all the information required to be kept by law. Every contractor or subcontractor is required to keep these records and preserve them for a period of three years from the date of completion of the contract.

On a weekly basis, every contractor and subcontractor is required to submit a certified copy of their weekly payroll records to the awarding authority; this includes the payroll forms and the Statement of Compliance form. The certified payroll records must be submitted either by regular mail or by e-mail to the awarding authority. Once collected, the awarding authority is required to preserve those records for three years from the date of completion of the project.

Each such contractor and subcontractor shall furnish weekly **and** within 15 days after completion of its portion of the work, to the awarding authority directly by first-class mail or email, a statement, executed by the contractor, subcontractor or by any authorized officer thereof who supervised the payment of wages, this form, accompanied by their payroll:

<b>WEEKLY STATEMENT OF COMPLIANCE</b>	
_____, 20____	
I, _____	_____,
(Name of signatory party)	(Title)
do hereby state:	
That I pay or supervise the payment of the persons employed by	
_____	_____ on the _____
(Contractor, subcontractor or public body)	(Building or project)
and that all mechanics and apprentices, teamsters, chauffeurs and laborers employed on said project have been paid in accordance with wages determined under the provisions of sections twenty-six and twenty-seven of chapter one hundred and forty nine of the General Laws.	
Signature	_____
Title	_____

## WEEKLY CERTIFIED PAYROLL REPORT AND WORKFORCE PARTICIPATION FORM

**CERTIFIED PAYROLL REPORT:** Pursuant to MGL c. 149, s. 27B, every contractor and subcontractor is required to submit a true and accurate copy of their certified weekly payroll records to the awarding authority by first-class mail or e-mail. In addition, each weekly payroll must be accompanied by a statement of compliance signed by the employer. Failure to comply may result in the commencement of a criminal action or the issuance of a civil citation.

**WORKFORCE PARTICIPATION GOALS:** The Commonwealth of Massachusetts has set the following goals for workforce participation for minorities and women. The participation goals for this project shall be 15.3% for minorities and 6.9% for women. The Contractor shall strive to achieve on this project the labor workforce participation goals contained herein. **The Contractor shall enter the number of hours worked in each trade by each employee, identified as woman, minority, or non-minority below.**

<b>Company Name:</b>				<b>Address:</b>				<b>Phone No.:</b>				<b>Payroll No.:</b>			
<b>Employer's Signature:</b>				<b>Title:</b>				<b>Contract No.:</b>		<b>Tax Payer ID #:</b>		<b>Work Week Ending:</b>			
<b>Awarding Authority Name:</b>				<b>Public Works Project Name:</b>				<b>Public Works Project Location:</b>				<b>Min. Wage Rate Sheet Number:</b>			

<b>General / Prime Contractor's Name:</b>				<b>Subcontractor's Name:</b>				<b>Employer Hourly Fringe Benefit Contributions</b>											
												(B+C+D+E) (A x F)							

Employee Name & Complete Address	Work Classification	Project Hours Non-Minority	Project Hours Minority	Project Hours Women	Employee is OSHA 10 certified (?)	Appr. Rate (%)	Hours Worked							Project Hours (A) All Other Hours	Hourly Base Wage (B)	Health & Welfare Insurance (C)	ERISA Pension Plan (D)	Supp. Unemp. (E)	Total Hourly Prev. Wage (F)	Project Gross Wages Total Gross Wages	Check No. (H)	
							Su.	Mo.	Tu.	We.	Th.	Fr.	Sa.									

**APPRENTICESHIP DOCUMENTATION:** Please answer the questions below.

(1) Are any apprentice employees identified above?	YES <input type="checkbox"/>	NO <input type="checkbox"/>
(2) If yes, are all apprentice employees identified above currently registered with the MA DLS Division of Apprentices Standards?	YES <input type="checkbox"/>	NO <input type="checkbox"/>
(3) If yes, is a copy of the apprentice ID card issued by the MA DLS Division of Apprentices Standards included for all apprentice employees identified above?	YES <input type="checkbox"/>	NO <input type="checkbox"/>

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MAURA HEALEY  
Governor

KIM DRISCOLL  
Lt. Governor

THE COMMONWEALTH OF MASSACHUSETTS  
EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT  
DEPARTMENT OF LABOR STANDARDS

Prevailing Wage Rates

As determined by the Director under the provisions of the  
Massachusetts General Laws, Chapter 149, Sections 26 to 27H

LAUREN JONES  
Secretary

MICHAEL FLANAGAN  
Director

**Awarding Authority:** Springfield Water and Sewer Commission  
**Contract Number:** SWSC IFB No. 25-08 **City/Town:** SPRINGFIELD  
**Description of Work:** CIPP lining of approx. 450 LF of 39-inch clay tile pipe and 2,600 LF of 36-inch clay tile pipe of the existing North Branch Sewer Interceptor pipe between Wilbraham Road and SMH 4349  
**Job Location:** 1601 State Street, Springfield, MA

Information about Prevailing Wage Schedules for Awarding Authorities and Contractors

- The wage rates will remain in effect for the duration of the project, except in the case of multi-year public construction projects. For construction projects lasting longer than one year, awarding authorities must request an updated wage schedule no later than two weeks before the anniversary of the date the contract was executed by the awarding authority and the general contractor. For multi-year CM AT RISK projects, the awarding authority must request an annual update no later than two weeks before the anniversary date, determined as the earlier of: (a) the execution date of the GMP Amendment, or (b) the execution date of the first amendment to permit procurement of construction services. The updated wage schedule must be provided to all contractors, including general and sub-contractors, working on the construction project.
- This annual update requirement is generally not applicable to 27F "rental of equipment" contracts. For such contracts, the prevailing wage rates issued by DLS shall remain in effect for the duration of the contract term. However, if the prevailing wage rate sheet issued does not contain wage rates for each year covered by the contract term, the Awarding Authority must request updated rate sheets from DLS and provide them to the contractor to ensure the correct rates are being paid throughout the duration of the contract. Additionally, if an Awarding Authority exercises an option to renew or extend the contract term, they must request updated rate sheets from DLS and provide them to the contractor.
- This wage schedule applies only to the specific project referenced at the top of this page and uniquely identified by the "Wage Request Number" on all pages of this schedule.
- An Awarding Authority must request an updated wage schedule if it has not opened bids or selected a contractor within 90 days of the date of issuance of the wage schedule. For CM AT RISK projects (bid pursuant to G.L. c.149A), the earlier of: (a) the execution date of the GMP Amendment, or (b) the bid for the first construction scope of work must be within 90-days of the wage schedule issuance date.
- The wage schedule shall be incorporated in any advertisement or call for bids for the project as required by M.G.L. c. 149, § 27. The wage schedule shall be made a part of the contract awarded for the project. The wage schedule must be posted in a conspicuous place at the work site for the life of the project in accordance with M.G.L. c. 149 § 27. The wages listed on the wage schedule must be paid to employees performing construction work on the project whether they are employed by the prime contractor, a filed sub-bidder, or a sub-contractor.
- Apprentices working on the project are required to be registered with the Massachusetts Division of Apprentice Standards (DAS). Apprentices must keep their apprentice identification card on their persons during all work hours on the project. An apprentice registered with DAS may be paid the lower apprentice wage rate at the applicable step as provided on the prevailing wage schedule. **Any apprentice not registered with DAS regardless of whether they are registered with another federal, state, local, or private agency must be paid the journeyworker's rate.**
- Every contractor or subcontractor working on the construction project must submit weekly payroll reports and a Statement of Compliance directly to the awarding authority by mail or email and keep them on file for three years. Each weekly payroll report must contain: the employee's name, address, occupational classification, hours worked, and wages paid. Do not submit weekly payroll reports to DLS. For a sample payroll reporting form go to <http://www.mass.gov/dols/pw>.
- Contractors with questions about the wage rates or classifications included on the wage schedule have an affirmative obligation to inquire with DLS at (617) 626-6953.
- Contractors must obtain the wage schedules from awarding authorities. Failure of a contractor or subcontractor to pay the prevailing wage rates listed on the wage schedule to all employees who perform construction work on the project is a violation of the law and subjects the contractor or subcontractor to civil and criminal penalties.
- Employees not receiving the prevailing wage rate set forth on the wage schedule may file a complaint with the Fair Labor Division of the office of the Attorney General at (617) 727-3465.

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Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
<b>Construction</b>						
(2 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	01/01/2025	\$39.95	\$15.57	\$20.17	\$0.00	\$75.69
	06/01/2025	\$40.95	\$15.57	\$20.17	\$0.00	\$76.69
	12/01/2025	\$40.95	\$15.57	\$21.78	\$0.00	\$78.30
	01/01/2026	\$40.95	\$16.17	\$21.78	\$0.00	\$78.90
	06/01/2026	\$41.95	\$16.17	\$21.78	\$0.00	\$79.90
	12/01/2026	\$41.95	\$16.17	\$23.52	\$0.00	\$81.64
	01/01/2027	\$41.95	\$16.77	\$23.52	\$0.00	\$82.24
(3 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	01/01/2025	\$40.02	\$15.57	\$20.17	\$0.00	\$75.76
	06/01/2025	\$41.02	\$15.57	\$20.17	\$0.00	\$76.76
	12/01/2025	\$41.02	\$15.57	\$21.78	\$0.00	\$78.37
	01/01/2026	\$41.02	\$16.17	\$21.78	\$0.00	\$78.97
	06/01/2026	\$42.02	\$16.17	\$21.78	\$0.00	\$79.97
	12/01/2026	\$42.02	\$16.17	\$23.52	\$0.00	\$81.71
	01/01/2027	\$42.02	\$16.77	\$23.52	\$0.00	\$82.31
(4 & 5 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	01/01/2025	\$40.14	\$15.57	\$20.17	\$0.00	\$75.88
	06/01/2025	\$41.14	\$15.57	\$20.17	\$0.00	\$76.88
	12/01/2025	\$41.14	\$15.57	\$21.78	\$0.00	\$78.49
	01/01/2026	\$41.14	\$16.17	\$21.78	\$0.00	\$79.09
	06/01/2026	\$42.14	\$16.17	\$21.78	\$0.00	\$80.09
	12/01/2026	\$42.14	\$16.17	\$23.52	\$0.00	\$81.83
	01/01/2027	\$42.14	\$16.77	\$23.52	\$0.00	\$82.43
ADS/SUBMERSIBLE PILOT <i>PILE DRIVER LOCAL 56 (ZONE 3)</i>	08/01/2024	\$117.16	\$10.08	\$24.29	\$0.00	\$151.53
For apprentice rates see "Apprentice- PILE DRIVER"						
AIR TRACK OPERATOR <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	12/02/2024	\$35.75	\$9.90	\$17.57	\$0.00	\$63.22
	06/02/2025	\$37.00	\$9.90	\$17.57	\$0.00	\$64.47
	12/01/2025	\$38.25	\$9.90	\$17.57	\$0.00	\$65.72
	06/01/2026	\$39.55	\$9.90	\$17.57	\$0.00	\$67.02
	12/07/2026	\$40.85	\$9.90	\$17.57	\$0.00	\$68.32
	06/07/2027	\$42.25	\$9.90	\$17.57	\$0.00	\$69.72
	12/06/2027	\$43.65	\$9.90	\$17.57	\$0.00	\$71.12
	06/05/2028	\$45.15	\$9.90	\$17.57	\$0.00	\$72.62
	12/04/2028	\$46.65	\$9.90	\$17.57	\$0.00	\$74.12
For apprentice rates see "Apprentice- LABORER"						
AIR TRACK OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY &amp; HIGHWAY)</i>	12/01/2024	\$35.75	\$9.90	\$15.56	\$0.00	\$61.21
	06/01/2025	\$37.00	\$9.90	\$15.56	\$0.00	\$62.46
	12/01/2025	\$38.24	\$9.90	\$15.56	\$0.00	\$63.70
	06/01/2026	\$39.54	\$9.90	\$15.56	\$0.00	\$65.00
	12/01/2026	\$40.83	\$9.90	\$15.56	\$0.00	\$66.29
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
ASBESTOS WORKER (PIPES & TANKS) <i>HEAT &amp; FROST INSULATORS LOCAL 6 (SPRINGFIELD)</i>	12/01/2024	\$38.52	\$14.50	\$10.55	\$0.00	\$63.57
	06/01/2025	\$39.42	\$14.50	\$10.55	\$0.00	\$64.47
	12/01/2025	\$40.32	\$14.50	\$10.55	\$0.00	\$65.37

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Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
ASPHALT RAKER <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	12/02/2024	\$35.25	\$9.90	\$17.57	\$0.00	\$62.72
	06/02/2025	\$36.50	\$9.90	\$17.57	\$0.00	\$63.97
	12/01/2025	\$37.75	\$9.90	\$17.57	\$0.00	\$65.22
	06/01/2026	\$39.05	\$9.90	\$17.57	\$0.00	\$66.52
	12/07/2026	\$40.35	\$9.90	\$17.57	\$0.00	\$67.82
	06/07/2027	\$41.75	\$9.90	\$17.57	\$0.00	\$69.22
	12/06/2027	\$43.15	\$9.90	\$17.57	\$0.00	\$70.62
	06/05/2028	\$44.65	\$9.90	\$17.57	\$0.00	\$72.12
	12/04/2028	\$46.15	\$9.90	\$17.57	\$0.00	\$73.62
For apprentice rates see "Apprentice- LABORER"						
ASPHALT RAKER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY &amp; HIGHWAY)</i>	12/01/2024	\$35.25	\$9.90	\$15.56	\$0.00	\$60.71
	06/01/2025	\$36.50	\$9.90	\$15.56	\$0.00	\$61.96
	12/01/2025	\$37.74	\$9.90	\$15.56	\$0.00	\$63.20
	06/01/2026	\$39.04	\$9.90	\$15.56	\$0.00	\$64.50
	12/01/2026	\$40.33	\$9.90	\$15.56	\$0.00	\$65.79
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
AUTOMATIC GRADER-EXCAVATOR (RECLAIMER) <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.56	\$13.78	\$15.15	\$0.00	\$68.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BACKHOE/FRONT-END LOADER OPERATOR <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.56	\$13.78	\$15.15	\$0.00	\$68.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BARCO-TYPE JUMPING TAMPER <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	12/02/2024	\$35.25	\$9.90	\$17.57	\$0.00	\$62.72
	06/02/2025	\$36.50	\$9.90	\$17.57	\$0.00	\$63.97
	12/01/2025	\$37.75	\$9.90	\$17.57	\$0.00	\$65.22
	06/01/2026	\$39.05	\$9.90	\$17.57	\$0.00	\$66.52
	12/07/2026	\$40.35	\$9.90	\$17.57	\$0.00	\$67.82
	06/07/2027	\$41.75	\$9.90	\$17.57	\$0.00	\$69.22
	12/06/2027	\$43.15	\$9.90	\$17.57	\$0.00	\$70.62
	06/05/2028	\$44.65	\$9.90	\$17.57	\$0.00	\$72.12
	12/04/2028	\$46.15	\$9.90	\$17.57	\$0.00	\$73.62
For apprentice rates see "Apprentice- LABORER"						
BATCH/CEMENT PLANT - ON SITE <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.03	\$13.78	\$15.15	\$0.00	\$67.96
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BLOCK PAVER, RAMMER / CURB SETTER <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	12/02/2024	\$35.75	\$9.90	\$17.57	\$0.00	\$63.22
	06/02/2025	\$37.00	\$9.90	\$17.57	\$0.00	\$64.47
	12/01/2025	\$38.25	\$9.90	\$17.57	\$0.00	\$65.72
	06/01/2026	\$39.55	\$9.90	\$17.57	\$0.00	\$67.02
	12/07/2026	\$40.85	\$9.90	\$17.57	\$0.00	\$68.32
	06/07/2027	\$42.25	\$9.90	\$17.57	\$0.00	\$69.72
	12/06/2027	\$43.65	\$9.90	\$17.57	\$0.00	\$71.12
	06/05/2028	\$45.15	\$9.90	\$17.57	\$0.00	\$72.62
12/04/2028	\$46.65	\$9.90	\$17.57	\$0.00	\$74.12	
For apprentice rates see "Apprentice- LABORER"						

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Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
BLOCK PAVER, RAMMER / CURB SETTER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY &amp; HIGHWAY)</i>	12/01/2024	\$35.75	\$9.90	\$15.56	\$0.00	\$61.21
	06/01/2025	\$37.00	\$9.90	\$15.56	\$0.00	\$62.46
	12/01/2025	\$38.24	\$9.90	\$15.56	\$0.00	\$63.70
	06/01/2026	\$39.54	\$9.90	\$15.56	\$0.00	\$65.00
	12/01/2026	\$40.83	\$9.90	\$15.56	\$0.00	\$66.29

For apprentice rates see "Apprentice- LABORER (Heavy and Highway)

BOILER MAKER <i>BOILERMAKERS LOCAL 29</i>	01/01/2024	\$48.12	\$7.07	\$20.60	\$0.00	\$75.79
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**Apprentice - BOILERMAKER - Local 29**

**Effective Date - 01/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	65	\$31.28	\$7.07	\$13.22	\$0.00	\$51.57
2	65	\$31.28	\$7.07	\$13.22	\$0.00	\$51.57
3	70	\$33.68	\$7.07	\$14.23	\$0.00	\$54.98
4	75	\$36.09	\$7.07	\$15.24	\$0.00	\$58.40
5	80	\$38.50	\$7.07	\$16.25	\$0.00	\$61.82
6	85	\$40.90	\$7.07	\$17.28	\$0.00	\$65.25
7	90	\$43.31	\$7.07	\$18.28	\$0.00	\$68.66
8	95	\$45.71	\$7.07	\$19.32	\$0.00	\$72.10

**Notes:**

**Apprentice to Journeyworker Ratio:1:4**

BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING) <i>BRICKLAYERS LOCAL 3 (SPRINGFIELD/PITTSFIELD)</i>	02/01/2025	\$54.21	\$11.49	\$21.46	\$0.00	\$87.16
	08/01/2025	\$56.36	\$11.49	\$21.46	\$0.00	\$89.31
	02/01/2026	\$57.71	\$11.49	\$21.46	\$0.00	\$90.66
	08/01/2026	\$59.91	\$11.49	\$21.46	\$0.00	\$92.86
	02/01/2027	\$61.31	\$11.49	\$21.46	\$0.00	\$94.26

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**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - BRICK/PLASTER/CEMENT MASON - Local 3 Springfield/Pittsfield**

**Effective Date - 02/01/2025**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$27.11	\$11.49	\$21.46	\$0.00	\$60.06
2	60	\$32.53	\$11.49	\$21.46	\$0.00	\$65.48
3	70	\$37.95	\$11.49	\$21.46	\$0.00	\$70.90
4	80	\$43.37	\$11.49	\$21.46	\$0.00	\$76.32
5	90	\$48.79	\$11.49	\$21.46	\$0.00	\$81.74

**Effective Date - 08/01/2025**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$28.18	\$11.49	\$21.46	\$0.00	\$61.13
2	60	\$33.82	\$11.49	\$21.46	\$0.00	\$66.77
3	70	\$39.45	\$11.49	\$21.46	\$0.00	\$72.40
4	80	\$45.09	\$11.49	\$21.46	\$0.00	\$78.04
5	90	\$50.72	\$11.49	\$21.46	\$0.00	\$83.67

**Notes:**

**Apprentice to Journeyworker Ratio:1:5**

<b>BULLDOZER/POWER SHOVEL/TREE SHREDDER</b> <i>/CLAM SHELL OPERATING</i>	12/01/2023	\$39.56	\$13.78	\$15.15	\$0.00	\$68.49
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*ENGINEERS LOCAL 98*

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

<b>CAISSON &amp; UNDERPINNING BOTTOM MAN</b> <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2024	\$47.35	\$9.90	\$19.05	\$0.00	\$76.30
	06/01/2025	\$48.85	\$9.90	\$19.05	\$0.00	\$77.80
	12/01/2025	\$50.35	\$9.90	\$19.05	\$0.00	\$79.30
	06/01/2026	\$51.90	\$9.90	\$19.05	\$0.00	\$80.85
	12/01/2026	\$53.40	\$9.90	\$19.05	\$0.00	\$82.35

For apprentice rates see "Apprentice- LABORER"

<b>CAISSON &amp; UNDERPINNING LABORER</b> <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2024	\$46.20	\$9.90	\$19.05	\$0.00	\$75.15
	06/01/2025	\$47.70	\$9.90	\$19.05	\$0.00	\$76.65
	12/01/2025	\$49.20	\$9.90	\$19.05	\$0.00	\$78.15
	06/01/2026	\$50.75	\$9.90	\$19.05	\$0.00	\$79.70
	12/01/2026	\$52.25	\$9.90	\$19.05	\$0.00	\$81.20

For apprentice rates see "Apprentice- LABORER"

<b>CAISSON &amp; UNDERPINNING TOP MAN</b> <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2024	\$46.53	\$9.90	\$19.05	\$0.00	\$75.48
	06/01/2025	\$48.03	\$9.90	\$19.05	\$0.00	\$76.98
	12/01/2025	\$49.53	\$9.90	\$19.05	\$0.00	\$78.48
	06/01/2026	\$51.08	\$9.90	\$19.05	\$0.00	\$80.03
	12/01/2026	\$52.58	\$9.90	\$19.05	\$0.00	\$81.53

For apprentice rates see "Apprentice- LABORER"

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Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CARBIDE CORE DRILL OPERATOR <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	12/02/2024	\$35.25	\$9.90	\$17.57	\$0.00	\$62.72
	06/02/2025	\$36.50	\$9.90	\$17.57	\$0.00	\$63.97
	12/01/2025	\$37.75	\$9.90	\$17.57	\$0.00	\$65.22
	06/01/2026	\$39.05	\$9.90	\$17.57	\$0.00	\$66.52
	12/07/2026	\$40.35	\$9.90	\$17.57	\$0.00	\$67.82
	06/07/2027	\$41.75	\$9.90	\$17.57	\$0.00	\$69.22
	12/06/2027	\$43.15	\$9.90	\$17.57	\$0.00	\$70.62
	06/05/2028	\$44.65	\$9.90	\$17.57	\$0.00	\$72.12
	12/04/2028	\$46.15	\$9.90	\$17.57	\$0.00	\$73.62

For apprentice rates see "Apprentice- LABORER"

CARPENTER <i>CARPENTERS LOCAL 336 - HAMPDEN HAMPSHIRE FRANKLIN</i>	03/01/2025	\$43.26	\$7.91	\$18.15	\$0.00	\$69.32
	09/01/2025	\$44.21	\$7.91	\$18.15	\$0.00	\$70.27
	03/01/2026	\$45.11	\$7.91	\$18.15	\$0.00	\$71.17
	09/01/2026	\$46.06	\$7.91	\$18.15	\$0.00	\$72.12
	03/01/2027	\$46.96	\$7.91	\$18.15	\$0.00	\$73.02

**Apprentice - CARPENTER - Local 336 Hampden Hampshire Franklin**

**Effective Date - 03/01/2025**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$19.47	\$7.91	\$1.40	\$0.00	\$28.78
2	45	\$19.47	\$7.91	\$1.40	\$0.00	\$28.78
3	55	\$23.79	\$7.91	\$2.76	\$0.00	\$34.46
4	55	\$23.79	\$7.91	\$2.76	\$0.00	\$34.46
5	70	\$30.28	\$7.91	\$15.39	\$0.00	\$53.58
6	70	\$30.28	\$7.91	\$15.39	\$0.00	\$53.58
7	80	\$34.61	\$7.91	\$16.77	\$0.00	\$59.29
8	80	\$34.61	\$7.91	\$16.77	\$0.00	\$59.29

**Effective Date - 09/01/2025**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$19.89	\$7.91	\$1.38	\$0.00	\$29.18
2	45	\$19.89	\$7.91	\$1.38	\$0.00	\$29.18
3	55	\$24.32	\$7.91	\$2.76	\$0.00	\$34.99
4	55	\$24.32	\$7.91	\$2.76	\$0.00	\$34.99
5	70	\$30.95	\$7.91	\$15.39	\$0.00	\$54.25
6	70	\$30.95	\$7.91	\$15.39	\$0.00	\$54.25
7	80	\$35.37	\$7.91	\$16.77	\$0.00	\$60.05
8	80	\$35.37	\$7.91	\$16.77	\$0.00	\$60.05

**Notes:**

**Apprentice to Journeyworker Ratio:1:5**

CARPENTER WOOD FRAME <i>CARPENTERS-ZONE 3 (Wood Frame)</i>	10/01/2024	\$26.65	\$7.02	\$4.80	\$0.00	\$38.47
	10/01/2025	\$27.75	\$7.02	\$4.80	\$0.00	\$39.57
	10/01/2026	\$28.85	\$7.02	\$4.80	\$0.00	\$40.67

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**Classification**

All Aspects of New Wood Frame Work

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - CARPENTER (Wood Frame) - Zone 3**

**Effective Date - 10/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$15.99	\$7.02	\$0.00	\$0.00	\$23.01
2	60	\$15.99	\$7.02	\$0.00	\$0.00	\$23.01
3	65	\$17.32	\$7.02	\$1.00	\$0.00	\$25.34
4	70	\$18.66	\$7.02	\$1.00	\$0.00	\$26.68
5	75	\$19.99	\$7.02	\$4.80	\$0.00	\$31.81
6	80	\$21.32	\$7.02	\$4.80	\$0.00	\$33.14
7	85	\$22.65	\$7.02	\$4.80	\$0.00	\$34.47
8	90	\$23.99	\$7.02	\$4.80	\$0.00	\$35.81

**Effective Date - 10/01/2025**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$16.65	\$7.02	\$0.00	\$0.00	\$23.67
2	60	\$16.65	\$7.02	\$0.00	\$0.00	\$23.67
3	65	\$18.04	\$7.02	\$1.00	\$0.00	\$26.06
4	70	\$19.43	\$7.02	\$1.00	\$0.00	\$27.45
5	75	\$20.81	\$7.02	\$4.80	\$0.00	\$32.63
6	80	\$22.20	\$7.02	\$4.80	\$0.00	\$34.02
7	85	\$23.59	\$7.02	\$4.80	\$0.00	\$35.41
8	90	\$24.98	\$7.02	\$4.80	\$0.00	\$36.80

**Notes:**

**Apprentice to Journeyworker Ratio:1:5**

CEMENT MASONRY/PLASTERING BRICKLAYERS LOCAL 3 (SPRINGFIELD/PITTSFIELD)	07/01/2024	\$44.56	\$13.20	\$19.23	\$1.69	\$78.68
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**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - CEMENT MASONRY/PLASTERING - Springfield/Pittsfield**

**Effective Date - 07/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.28	\$13.20	\$16.30	\$0.00	\$51.78
2	60	\$26.74	\$13.20	\$19.23	\$1.69	\$60.86
3	65	\$28.96	\$13.20	\$19.23	\$1.69	\$63.08
4	70	\$31.19	\$13.20	\$19.23	\$1.69	\$65.31
5	75	\$33.42	\$13.20	\$19.23	\$1.69	\$67.54
6	80	\$35.65	\$13.20	\$19.23	\$1.69	\$69.77
7	90	\$40.10	\$13.20	\$19.23	\$1.69	\$74.22

**Notes:**  
Steps 3,4 are 500 hrs. All other steps are 1,000 hrs.

**Apprentice to Journeyworker Ratio:1:3**

<b>CHAIN SAW OPERATOR</b> <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	12/02/2024	\$35.25	\$9.90	\$17.57	\$0.00	\$62.72
	06/02/2025	\$36.50	\$9.90	\$17.57	\$0.00	\$63.97
	12/01/2025	\$37.75	\$9.90	\$17.57	\$0.00	\$65.22
	06/01/2026	\$39.05	\$9.90	\$17.57	\$0.00	\$66.52
	12/07/2026	\$40.35	\$9.90	\$17.57	\$0.00	\$67.82
	06/07/2027	\$41.75	\$9.90	\$17.57	\$0.00	\$69.22
	12/06/2027	\$43.15	\$9.90	\$17.57	\$0.00	\$70.62
	06/05/2028	\$44.65	\$9.90	\$17.57	\$0.00	\$72.12
	12/04/2028	\$46.15	\$9.90	\$17.57	\$0.00	\$73.62

For apprentice rates see "Apprentice- LABORER"

<b>COMPRESSOR OPERATOR</b> <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.03	\$13.78	\$15.15	\$0.00	\$67.96
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For apprentice rates see "Apprentice- OPERATING ENGINEERS"

<b>CRANE OPERATOR</b> <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$43.06	\$13.78	\$15.15	\$0.00	\$71.99
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For apprentice rates see "Apprentice- OPERATING ENGINEERS"

<b>DELEADER (BRIDGE)</b> <i>PAINTERS LOCAL 35 - ZONE 3</i>	01/01/2025	\$58.46	\$9.95	\$23.95	\$0.00	\$92.36
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**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - PAINTER Local 35 - BRIDGES/TANKS**

**Effective Date - 01/01/2025**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$29.23	\$9.95	\$0.00	\$0.00	\$39.18
2	55	\$32.15	\$9.95	\$6.66	\$0.00	\$48.76
3	60	\$35.08	\$9.95	\$7.26	\$0.00	\$52.29
4	65	\$38.00	\$9.95	\$7.87	\$0.00	\$55.82
5	70	\$40.92	\$9.95	\$20.32	\$0.00	\$71.19
6	75	\$43.85	\$9.95	\$20.93	\$0.00	\$74.73
7	80	\$46.77	\$9.95	\$21.53	\$0.00	\$78.25
8	90	\$52.61	\$9.95	\$22.74	\$0.00	\$85.30

**Notes:**

Steps are 750 hrs.

**Apprentice to Journeyworker Ratio:1:1**

<b>DEMO: ADZEMAN</b>	12/02/2024	\$46.25	\$9.90	\$18.90	\$0.00	\$75.05
<i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	06/02/2025	\$47.75	\$9.90	\$18.90	\$0.00	\$76.55
	12/01/2025	\$49.25	\$9.90	\$18.90	\$0.00	\$78.05
	06/01/2026	\$50.80	\$9.90	\$18.90	\$0.00	\$79.60
	12/07/2026	\$52.30	\$9.90	\$18.90	\$0.00	\$81.10
	06/07/2027	\$53.90	\$9.90	\$18.90	\$0.00	\$82.70
	12/06/2027	\$55.50	\$9.90	\$18.90	\$0.00	\$84.30
	06/05/2028	\$57.18	\$9.90	\$18.90	\$0.00	\$85.98
	12/04/2028	\$58.85	\$9.90	\$18.90	\$0.00	\$87.65

For apprentice rates see "Apprentice- LABORER"

<b>DEMO: BACKHOE/LOADER/HAMMER OPERATOR</b>	12/02/2024	\$47.25	\$9.90	\$18.90	\$0.00	\$76.05
<i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	06/02/2025	\$48.75	\$9.90	\$18.90	\$0.00	\$77.55
	12/01/2025	\$50.25	\$9.90	\$18.90	\$0.00	\$79.05
	06/01/2026	\$51.80	\$9.90	\$18.90	\$0.00	\$80.60
	12/07/2026	\$53.30	\$9.90	\$18.90	\$0.00	\$82.10
	06/07/2027	\$54.90	\$9.90	\$18.90	\$0.00	\$83.70
	12/06/2027	\$56.50	\$9.90	\$18.90	\$0.00	\$85.30
	06/05/2028	\$58.18	\$9.90	\$18.90	\$0.00	\$86.98
	12/04/2028	\$59.85	\$9.90	\$18.90	\$0.00	\$88.65

For apprentice rates see "Apprentice- LABORER"

<b>DEMO: BURNERS</b>	12/02/2024	\$47.75	\$9.65	\$18.40	\$0.00	\$75.80
<i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	06/02/2025	\$49.25	\$9.65	\$18.40	\$0.00	\$77.30
	12/01/2025	\$50.75	\$9.65	\$18.40	\$0.00	\$78.80
	06/01/2026	\$52.30	\$9.65	\$18.40	\$0.00	\$80.35
	12/07/2026	\$53.80	\$9.65	\$18.40	\$0.00	\$81.85
	06/07/2027	\$55.40	\$9.65	\$18.40	\$0.00	\$83.45
	12/06/2027	\$57.00	\$9.65	\$18.40	\$0.00	\$85.05
	06/05/2028	\$58.68	\$9.65	\$18.40	\$0.00	\$86.73
	12/04/2028	\$60.35	\$9.65	\$18.40	\$0.00	\$88.40

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Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER"						
DEMO: CONCRETE CUTTER/SAWYER LABORERS - ZONE 3 (BUILDING & SITE)	12/02/2024	\$47.25	\$9.90	\$18.90	\$0.00	\$76.05
	06/02/2025	\$48.75	\$9.90	\$18.90	\$0.00	\$77.55
	12/01/2025	\$50.25	\$9.90	\$18.90	\$0.00	\$79.05
	06/01/2026	\$51.80	\$9.90	\$18.90	\$0.00	\$80.60
	12/07/2026	\$53.30	\$9.90	\$18.90	\$0.00	\$82.10
	06/07/2027	\$54.90	\$9.90	\$18.90	\$0.00	\$83.70
	12/06/2027	\$56.50	\$9.90	\$18.90	\$0.00	\$85.30
	06/05/2028	\$58.18	\$9.90	\$18.90	\$0.00	\$86.98
12/04/2028	\$59.85	\$9.90	\$18.90	\$0.00	\$88.65	
For apprentice rates see "Apprentice- LABORER"						
DEMO: JACKHAMMER OPERATOR LABORERS - ZONE 3 (BUILDING & SITE)	12/02/2024	\$47.75	\$9.65	\$18.40	\$0.00	\$75.80
	06/02/2025	\$49.25	\$9.65	\$18.40	\$0.00	\$77.30
	12/01/2025	\$50.75	\$9.65	\$18.40	\$0.00	\$78.80
	06/01/2026	\$52.30	\$9.65	\$18.40	\$0.00	\$80.35
	12/07/2026	\$53.80	\$9.65	\$18.40	\$0.00	\$81.85
	06/07/2027	\$55.40	\$9.65	\$18.40	\$0.00	\$83.45
	12/06/2027	\$57.00	\$9.65	\$18.40	\$0.00	\$85.05
	06/05/2028	\$58.68	\$9.65	\$18.40	\$0.00	\$86.73
12/04/2028	\$60.35	\$9.65	\$18.40	\$0.00	\$88.40	
For apprentice rates see "Apprentice- LABORER"						
DEMO: WRECKING LABORER LABORERS - ZONE 3 (BUILDING & SITE)	12/02/2024	\$46.25	\$9.90	\$18.90	\$0.00	\$75.05
	06/02/2025	\$47.75	\$9.90	\$18.90	\$0.00	\$76.55
	12/01/2025	\$49.25	\$9.90	\$18.90	\$0.00	\$78.05
	06/01/2026	\$50.80	\$9.90	\$18.90	\$0.00	\$79.60
	12/07/2026	\$52.30	\$9.90	\$18.90	\$0.00	\$81.10
	06/07/2027	\$53.90	\$9.90	\$18.90	\$0.00	\$82.70
	12/06/2027	\$55.50	\$9.90	\$18.90	\$0.00	\$84.30
	06/05/2028	\$57.18	\$9.90	\$18.90	\$0.00	\$85.98
12/04/2028	\$58.85	\$9.90	\$18.90	\$0.00	\$87.65	
For apprentice rates see "Apprentice- LABORER"						
DIVER PILE DRIVER LOCAL 56 (ZONE 3)	08/01/2024	\$78.11	\$10.08	\$24.29	\$0.00	\$112.48
as of 8-1-24, Apprentices with diving licenses begin at second year. % of Diver wage 70/80/90 2A \$69.83, 3A \$91.79,4A \$102.14 Total Rate						
DIVER TENDER PILE DRIVER LOCAL 56 (ZONE 3)	08/01/2024	\$49.19	\$10.08	\$24.29	\$0.00	\$83.56
as of 8-1-24, Apprentices with diving licenses begin at second year. % of Piledriver wage 70/80/90 2A \$54.20, 3A \$73.93,4A \$82.05 Total Rate						
DIVER TENDER (EFFLUENT) PILE DRIVER LOCAL 56 (ZONE 3)	08/01/2024	\$83.69	\$10.08	\$24.29	\$0.00	\$118.06
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER/SLURRY (EFFLUENT) PILE DRIVER LOCAL 56 (ZONE 3)	08/01/2024	\$117.16	\$10.08	\$24.29	\$0.00	\$151.53
For apprentice rates see "Apprentice- PILE DRIVER"						
DRAWBRIDGE OPERATOR (Construction) DRAWBRIDGE - SEIU LOCAL 888	07/01/2020	\$26.77	\$6.67	\$3.93	\$0.16	\$37.53

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Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
ELECTRICIAN (Including Core Drilling) <i>ELECTRICIANS LOCAL 7</i>	12/29/2024	\$51.06	\$13.25	\$15.06	\$0.00	\$79.37
	06/29/2025	\$52.16	\$13.50	\$15.21	\$0.00	\$80.87
	12/28/2025	\$53.26	\$13.75	\$15.36	\$0.00	\$82.37
	06/28/2026	\$54.41	\$14.00	\$15.46	\$0.00	\$83.87
	01/03/2027	\$55.56	\$14.25	\$15.56	\$0.00	\$85.37

**Apprentice - *ELECTRICIAN - Local 7***

**Effective Date - 12/29/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$20.42	\$7.35	\$0.61	\$0.00	\$28.38
2	45	\$22.98	\$7.35	\$0.69	\$0.00	\$31.02
3	50	\$25.53	\$13.25	\$7.47	\$0.00	\$46.25
4	55	\$28.08	\$13.25	\$7.54	\$0.00	\$48.87
5	65	\$33.19	\$13.25	\$9.74	\$0.00	\$56.18
6	70	\$35.74	\$13.25	\$11.19	\$0.00	\$60.18

**Effective Date - 06/29/2025**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$20.86	\$7.50	\$0.63	\$0.00	\$28.99
2	45	\$23.47	\$7.50	\$0.70	\$0.00	\$31.67
3	50	\$26.08	\$13.50	\$7.53	\$0.00	\$47.11
4	55	\$28.69	\$13.50	\$7.61	\$0.00	\$49.80
5	65	\$33.90	\$13.50	\$9.84	\$0.00	\$57.24
6	70	\$36.51	\$13.50	\$11.30	\$0.00	\$61.31

**Notes:**

Steps 1-2 are 1000 hrs; Steps 3-6 are 1500 hrs.

**Apprentice to Journeyworker Ratio:2:3\*\*\*\***

ELEVATOR CONSTRUCTOR <i>ELEVATOR CONSTRUCTORS LOCAL 41</i>	01/01/2025	\$62.83	\$16.28	\$21.36	\$0.00	\$100.47
	01/01/2026	\$63.68	\$16.38	\$21.76	\$0.00	\$101.82
	01/01/2027	\$64.53	\$16.48	\$22.16	\$0.00	\$103.17



**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - ELEVATOR CONSTRUCTOR - Local 41**

**Effective Date - 01/01/2025**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$31.42	\$16.28	\$0.00	\$0.00	\$47.70
2	55	\$34.56	\$16.28	\$21.36	\$0.00	\$72.20
3	65	\$40.84	\$16.28	\$21.36	\$0.00	\$78.48
4	70	\$43.98	\$16.28	\$21.36	\$0.00	\$81.62
5	80	\$50.26	\$16.28	\$21.36	\$0.00	\$87.90

**Effective Date - 01/01/2026**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$31.84	\$16.38	\$0.00	\$0.00	\$48.22
2	55	\$35.02	\$16.38	\$21.76	\$0.00	\$73.16
3	65	\$41.39	\$16.38	\$21.76	\$0.00	\$79.53
4	70	\$44.58	\$16.38	\$21.76	\$0.00	\$82.72
5	80	\$50.94	\$16.38	\$21.76	\$0.00	\$89.08

**Notes:**

Steps 1-2 are 6 mos.; Steps 3-5 are 1 year

**Apprentice to Journeyworker Ratio:1:1**

ELEVATOR CONSTRUCTOR HELPER <i>ELEVATOR CONSTRUCTORS LOCAL 41</i>	01/01/2025	\$43.98	\$16.28	\$21.36	\$0.00	\$81.62
	01/01/2026	\$44.58	\$16.38	\$21.76	\$0.00	\$82.72
	01/01/2027	\$45.17	\$16.48	\$22.16	\$0.00	\$83.81

For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR"

FENCE & GUARD RAIL ERECTOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY &amp; HIGHWAY)</i>	12/01/2024	\$35.25	\$9.90	\$15.56	\$0.00	\$60.71
	06/01/2025	\$36.50	\$9.90	\$15.56	\$0.00	\$61.96
	12/01/2025	\$37.74	\$9.90	\$15.56	\$0.00	\$63.20
	06/01/2026	\$39.04	\$9.90	\$15.56	\$0.00	\$64.50
	12/01/2026	\$40.33	\$9.90	\$15.56	\$0.00	\$65.79

For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"

FIELD ENG.INST/ROD-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/1999	\$18.84	\$4.80	\$4.10	\$0.00	\$27.74
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FIELD ENG.PARTY CHIEF:BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/1999	\$21.33	\$4.80	\$4.10	\$0.00	\$30.23
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FIELD ENG.SURVEY CHIEF-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/1999	\$22.33	\$4.80	\$4.10	\$0.00	\$31.23
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FIRE ALARM INSTALLER <i>ELECTRICIANS LOCAL 7</i>	12/29/2024	\$51.06	\$13.25	\$15.06	\$0.00	\$79.37
	06/29/2025	\$52.16	\$13.50	\$15.21	\$0.00	\$80.87
	12/28/2025	\$53.26	\$13.75	\$15.36	\$0.00	\$82.37
	06/28/2026	\$54.41	\$14.00	\$15.46	\$0.00	\$83.87
	01/03/2027	\$55.56	\$14.25	\$15.56	\$0.00	\$85.37

For apprentice rates see "Apprentice- ELECTRICIAN"

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Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FIRE ALARM REPAIR / MAINTENANCE / COMMISSIONING <i>ELECTRICIANS</i>	12/29/2024	\$51.06	\$13.25	\$15.06	\$0.00	\$79.37
<i>LOCAL 7</i>	06/29/2025	\$52.16	\$13.50	\$15.21	\$0.00	\$80.87
	12/28/2025	\$53.26	\$13.75	\$15.36	\$0.00	\$82.37
	06/28/2026	\$54.41	\$14.00	\$15.46	\$0.00	\$83.87
	01/03/2027	\$55.56	\$14.25	\$15.56	\$0.00	\$85.37

For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"

FIREMAN <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.03	\$13.78	\$15.15	\$0.00	\$67.96
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**Apprentice - OPERATING ENGINEERS - Local 98 Class 3**

**Effective Date - 12/01/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$23.42	\$13.78	\$15.15	\$0.00	\$52.35
2	70	\$27.32	\$13.78	\$15.15	\$0.00	\$56.25
3	80	\$31.22	\$13.78	\$15.15	\$0.00	\$60.15
4	90	\$35.13	\$13.78	\$15.15	\$0.00	\$64.06

**Notes:**

Steps 1-2 are 1000 hrs.; Steps 3-4 are 2000 hrs.

**Apprentice to Journeyworker Ratio:1:6**

FLAGGER & SIGNALER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY &amp; HIGHWAY)</i>	12/01/2024	\$27.01	\$9.90	\$15.56	\$0.00	\$52.47
	06/01/2025	\$28.09	\$9.90	\$15.56	\$0.00	\$53.55
	12/01/2025	\$28.09	\$9.90	\$15.56	\$0.00	\$53.55
	06/01/2026	\$29.21	\$9.90	\$15.56	\$0.00	\$54.67
	12/01/2026	\$29.21	\$9.90	\$15.56	\$0.00	\$54.67

For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"

FLOORCOVERER <i>FLOORCOVERERS LOCAL 2168 ZONE III</i>	03/01/2025	\$43.26	\$7.91	\$18.15	\$0.00	\$69.32
	09/01/2025	\$44.21	\$7.91	\$18.15	\$0.00	\$70.27
	03/01/2026	\$45.11	\$7.91	\$18.15	\$0.00	\$71.17
	09/01/2026	\$46.06	\$7.91	\$18.15	\$0.00	\$72.12
	03/01/2027	\$46.96	\$7.91	\$18.15	\$0.00	\$73.02

Last Modified: 04/09/2025 at 10:39AM EDT

**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - FLOORCOVERER - Local 2168 Zone III**

**Effective Date - 03/01/2025**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$19.47	\$7.91	\$1.38	\$0.00	\$28.76
2	45	\$19.47	\$7.91	\$1.38	\$0.00	\$28.76
3	55	\$23.79	\$7.91	\$2.76	\$0.00	\$34.46
4	55	\$23.79	\$7.91	\$2.76	\$0.00	\$34.46
5	70	\$30.28	\$7.91	\$15.39	\$0.00	\$53.58
6	70	\$30.28	\$7.91	\$15.39	\$0.00	\$53.58
7	80	\$34.61	\$7.91	\$16.77	\$0.00	\$59.29
8	80	\$34.61	\$7.91	\$16.77	\$0.00	\$59.29

**Effective Date - 09/01/2025**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$19.89	\$7.91	\$1.38	\$0.00	\$29.18
2	45	\$19.89	\$7.91	\$1.38	\$0.00	\$29.18
3	55	\$24.32	\$7.91	\$2.76	\$0.00	\$34.99
4	55	\$24.32	\$7.91	\$2.76	\$0.00	\$34.99
5	70	\$30.95	\$7.91	\$15.39	\$0.00	\$54.25
6	70	\$30.95	\$7.91	\$15.39	\$0.00	\$54.25
7	80	\$35.37	\$7.91	\$16.77	\$0.00	\$60.05
8	80	\$35.37	\$7.91	\$16.77	\$0.00	\$60.05

**Notes:** Steps are 750 hrs.

**Apprentice to Journeyworker Ratio:1:1**

**FORK LIFT** 12/01/2023 \$39.25 \$13.78 \$15.15 \$0.00 \$68.18  
*OPERATING ENGINEERS LOCAL 98*

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

**GENERATORS/LIGHTING PLANTS** 12/01/2023 \$35.80 \$13.78 \$15.15 \$0.00 \$64.73  
*OPERATING ENGINEERS LOCAL 98*

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

**GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS)** 06/01/2020 \$39.18 \$10.80 \$10.45 \$0.00 \$60.43  
*GLAZIERS LOCAL 1333*

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**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - GLAZIER - Local 1333**

**Effective Date - 06/01/2020**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.59	\$10.80	\$1.80	\$0.00	\$32.19
2	56	\$22.04	\$10.80	\$1.80	\$0.00	\$34.64
3	63	\$24.49	\$10.80	\$2.45	\$0.00	\$37.74
4	69	\$26.94	\$10.80	\$2.45	\$0.00	\$40.19
5	75	\$29.39	\$10.80	\$3.15	\$0.00	\$43.34
6	81	\$31.83	\$10.80	\$3.15	\$0.00	\$45.78
7	88	\$34.28	\$10.80	\$10.45	\$0.00	\$55.53
8	94	\$36.73	\$10.80	\$10.45	\$0.00	\$57.98

**Notes:**

**Apprentice to Journeyworker Ratio:1:3**

GRADER/TRENCHING MACHINE/DERRICK <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.56	\$13.78	\$15.15	\$0.00	\$68.49
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For apprentice rates see "Apprentice- OPERATING ENGINEERS"

HVAC (DUCTWORK) <i>SHEETMETAL WORKERS LOCAL 63</i>	01/01/2025	\$42.23	\$12.20	\$18.74	\$2.13	\$75.30
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For apprentice rates see "Apprentice- SHEET METAL WORKER"

HVAC (ELECTRICAL CONTROLS) <i>ELECTRICIANS LOCAL 7</i>	12/29/2024	\$51.06	\$13.25	\$15.06	\$0.00	\$79.37
	06/29/2025	\$52.16	\$13.50	\$15.21	\$0.00	\$80.87
	12/28/2025	\$53.26	\$13.75	\$15.36	\$0.00	\$82.37
	06/28/2026	\$54.41	\$14.00	\$15.46	\$0.00	\$83.87
	01/03/2027	\$55.56	\$14.25	\$15.56	\$0.00	\$85.37

For apprentice rates see "Apprentice- ELECTRICIAN"

HVAC (TESTING AND BALANCING - AIR) <i>SHEETMETAL WORKERS LOCAL 63</i>	01/01/2025	\$42.23	\$12.20	\$18.74	\$2.13	\$75.30
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For apprentice rates see "Apprentice- SHEET METAL WORKER"

HVAC (TESTING AND BALANCING -WATER) <i>PLUMBERS &amp; PIPEFITTERS LOCAL 104</i>	03/17/2024	\$49.21	\$9.55	\$17.10	\$0.00	\$75.86
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For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"

HVAC MECHANIC <i>PLUMBERS &amp; PIPEFITTERS LOCAL 104</i>	03/17/2024	\$49.21	\$9.55	\$17.10	\$0.00	\$75.86
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For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"

HYDRAULIC DRILLS (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY &amp; HIGHWAY)</i>	12/01/2024	\$35.75	\$9.90	\$15.56	\$0.00	\$61.21
	06/01/2025	\$37.00	\$9.90	\$15.56	\$0.00	\$62.46
	12/01/2025	\$38.24	\$9.90	\$15.56	\$0.00	\$63.70
	06/01/2026	\$39.54	\$9.90	\$15.56	\$0.00	\$65.00
	12/01/2026	\$40.83	\$9.90	\$15.56	\$0.00	\$66.29

For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"

INSULATOR (PIPES & TANKS) <i>HEAT &amp; FROST INSULATORS LOCAL 6 (SPRINGFIELD)</i>	09/01/2024	\$45.54	\$14.75	\$19.61	\$0.00	\$79.90
	09/01/2025	\$48.27	\$14.75	\$19.61	\$0.00	\$82.63
	09/01/2026	\$51.01	\$14.75	\$19.61	\$0.00	\$85.37

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**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - ASBESTOS INSULATOR (Pipes & Tanks) - Local 6 Springfield**

**Effective Date - 09/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.77	\$14.75	\$14.32	\$0.00	\$51.84
2	60	\$27.32	\$14.75	\$15.37	\$0.00	\$57.44
3	70	\$31.88	\$14.75	\$16.43	\$0.00	\$63.06
4	80	\$36.43	\$14.75	\$17.49	\$0.00	\$68.67

**Effective Date - 09/01/2025**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.14	\$14.75	\$14.32	\$0.00	\$53.21
2	60	\$28.96	\$14.75	\$15.37	\$0.00	\$59.08
3	70	\$33.79	\$14.75	\$16.43	\$0.00	\$64.97
4	80	\$38.62	\$14.75	\$17.49	\$0.00	\$70.86

**Notes:**  
Steps are 1 year

**Apprentice to Journeyworker Ratio:1:4**

<b>IRONWORKER/WELDER</b> <i>IRONWORKERS LOCAL 7 (SPRINGFIELD AREA)</i>	03/16/2024	\$40.66	\$8.25	\$22.70	\$0.00	\$71.61
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**Apprentice - IRONWORKER - Local 7 Springfield**

**Effective Date - 03/16/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$24.40	\$8.25	\$22.70	\$0.00	\$55.35
2	70	\$28.46	\$8.25	\$22.70	\$0.00	\$59.41
3	75	\$30.50	\$8.25	\$22.70	\$0.00	\$61.45
4	80	\$32.53	\$8.25	\$22.70	\$0.00	\$63.48
5	85	\$34.56	\$8.25	\$22.70	\$0.00	\$65.51
6	90	\$36.59	\$8.25	\$22.70	\$0.00	\$67.54

**Notes:**

**Apprentice to Journeyworker Ratio:1:4**

<b>JACKHAMMER &amp; PAVING BREAKER OPERATOR</b> <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	12/02/2024	\$35.25	\$9.90	\$17.57	\$0.00	\$62.72
	06/02/2025	\$36.50	\$9.90	\$17.57	\$0.00	\$63.97
	12/01/2025	\$37.75	\$9.90	\$17.57	\$0.00	\$65.22
	06/01/2026	\$39.05	\$9.90	\$17.57	\$0.00	\$66.52
	12/07/2026	\$40.35	\$9.90	\$17.57	\$0.00	\$67.82
	06/07/2027	\$41.75	\$9.90	\$17.57	\$0.00	\$69.22
	12/06/2027	\$43.15	\$9.90	\$17.57	\$0.00	\$70.62
	06/05/2028	\$44.65	\$9.90	\$17.57	\$0.00	\$72.12
	12/04/2028	\$46.15	\$9.90	\$17.57	\$0.00	\$73.62

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Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER"						
LABORER	12/02/2024	\$35.50	\$9.90	\$17.57	\$0.00	\$62.97
LABORERS - ZONE 3 (BUILDING & SITE)	06/02/2025	\$36.75	\$9.90	\$17.57	\$0.00	\$64.22
	12/01/2025	\$38.00	\$9.90	\$17.57	\$0.00	\$65.47
	06/01/2026	\$39.30	\$9.90	\$17.57	\$0.00	\$66.77
	12/07/2026	\$40.60	\$9.90	\$17.57	\$0.00	\$68.07
	06/07/2027	\$42.00	\$9.90	\$17.57	\$0.00	\$69.47
	12/06/2027	\$43.40	\$9.90	\$17.57	\$0.00	\$70.87
	06/05/2028	\$44.90	\$9.90	\$17.57	\$0.00	\$72.37
	12/04/2028	\$46.40	\$9.90	\$17.57	\$0.00	\$73.87

**Apprentice - LABORER - Zone 3 Building & Site**

**Effective Date - 12/02/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$21.30	\$9.90	\$17.57	\$0.00	\$48.77
2	70	\$24.85	\$9.90	\$17.57	\$0.00	\$52.32
3	80	\$28.40	\$9.90	\$17.57	\$0.00	\$55.87
4	90	\$31.95	\$9.90	\$17.57	\$0.00	\$59.42

**Effective Date - 06/02/2025**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$22.05	\$9.90	\$17.57	\$0.00	\$49.52
2	70	\$25.73	\$9.90	\$17.57	\$0.00	\$53.20
3	80	\$29.40	\$9.90	\$17.57	\$0.00	\$56.87
4	90	\$33.08	\$9.90	\$17.57	\$0.00	\$60.55

**Notes:**

**Apprentice to Journeyworker Ratio:1:5**

LABORER (HEAVY & HIGHWAY)	12/01/2024	\$35.00	\$9.90	\$15.56	\$0.00	\$60.46
LABORERS - ZONE 3 (HEAVY & HIGHWAY)	06/01/2025	\$36.25	\$9.90	\$15.56	\$0.00	\$61.71
	12/01/2025	\$37.49	\$9.90	\$15.56	\$0.00	\$62.95
	06/01/2026	\$38.79	\$9.90	\$15.56	\$0.00	\$64.25
	12/01/2026	\$40.08	\$9.90	\$15.56	\$0.00	\$65.54

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**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - LABORER (Heavy & Highway) - Zone 3**

**Effective Date - 12/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$21.00	\$9.90	\$15.56	\$0.00	\$46.46
2	70	\$24.50	\$9.90	\$15.56	\$0.00	\$49.96
3	80	\$28.00	\$9.90	\$15.56	\$0.00	\$53.46
4	90	\$31.50	\$9.90	\$15.56	\$0.00	\$56.96

**Effective Date - 06/01/2025**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$21.75	\$9.90	\$15.56	\$0.00	\$47.21
2	70	\$25.38	\$9.90	\$15.56	\$0.00	\$50.84
3	80	\$29.00	\$9.90	\$15.56	\$0.00	\$54.46
4	90	\$32.63	\$9.90	\$15.56	\$0.00	\$58.09

**Notes:**

**Apprentice to Journeyworker Ratio:1:5**

<b>LABORER: CARPENTER TENDER</b> <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	12/02/2024	\$35.50	\$9.90	\$17.57	\$0.00	\$62.97
	06/02/2025	\$36.75	\$9.90	\$17.57	\$0.00	\$64.22
	12/01/2025	\$38.00	\$9.90	\$17.57	\$0.00	\$65.47
	06/01/2026	\$39.30	\$9.90	\$17.57	\$0.00	\$66.77
	12/07/2026	\$40.60	\$9.90	\$17.57	\$0.00	\$68.07
	06/07/2027	\$42.00	\$9.90	\$17.57	\$0.00	\$69.47
	12/06/2027	\$43.40	\$9.90	\$17.57	\$0.00	\$70.87
	06/05/2028	\$44.90	\$9.90	\$17.57	\$0.00	\$72.37
	12/04/2028	\$46.40	\$9.90	\$17.57	\$0.00	\$73.87

For apprentice rates see "Apprentice- LABORER"

<b>LABORER: CEMENT FINISHER TENDER</b> <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	12/02/2024	\$35.00	\$9.90	\$17.57	\$0.00	\$62.47
	06/02/2025	\$36.25	\$9.90	\$17.57	\$0.00	\$63.72
	12/01/2025	\$37.50	\$9.90	\$17.57	\$0.00	\$64.97
	06/01/2026	\$38.80	\$9.90	\$17.57	\$0.00	\$66.27
	12/07/2026	\$40.10	\$9.90	\$17.57	\$0.00	\$67.57
	06/07/2027	\$41.50	\$9.90	\$17.57	\$0.00	\$68.97
	12/06/2027	\$42.90	\$9.90	\$17.57	\$0.00	\$70.37
	06/05/2028	\$44.40	\$9.90	\$17.57	\$0.00	\$71.87
	12/04/2028	\$45.90	\$9.90	\$17.57	\$0.00	\$73.37

For apprentice rates see "Apprentice- LABORER"

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Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	12/02/2024	\$34.92	\$9.90	\$17.70	\$0.00	\$62.52
	06/02/2025	\$36.17	\$9.90	\$17.70	\$0.00	\$63.77
	12/01/2025	\$37.42	\$9.90	\$17.70	\$0.00	\$65.02
	06/01/2026	\$38.72	\$9.90	\$17.70	\$0.00	\$66.32
	12/07/2026	\$40.02	\$9.90	\$17.70	\$0.00	\$67.62
	06/07/2027	\$41.42	\$9.90	\$17.70	\$0.00	\$69.02
	12/06/2027	\$42.82	\$9.90	\$17.70	\$0.00	\$70.42
	06/05/2028	\$44.32	\$9.90	\$17.70	\$0.00	\$71.92
12/04/2028	\$45.82	\$9.90	\$17.70	\$0.00	\$73.42	
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	12/02/2024	\$38.00	\$9.90	\$17.57	\$0.00	\$65.47
	06/02/2025	\$39.25	\$9.90	\$17.57	\$0.00	\$66.72
	12/01/2025	\$40.50	\$9.90	\$17.57	\$0.00	\$67.97
	06/01/2026	\$41.80	\$9.90	\$17.57	\$0.00	\$69.27
	12/07/2026	\$43.10	\$9.90	\$17.57	\$0.00	\$70.57
	06/07/2027	\$44.50	\$9.90	\$17.57	\$0.00	\$71.97
	12/06/2027	\$45.90	\$9.90	\$17.57	\$0.00	\$73.37
	06/05/2028	\$47.40	\$9.90	\$17.57	\$0.00	\$74.87
12/04/2028	\$48.90	\$9.90	\$17.57	\$0.00	\$76.37	
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY &amp; HIGHWAY)</i>	12/01/2024	\$35.25	\$9.90	\$15.56	\$0.00	\$60.71
	06/01/2025	\$36.50	\$9.90	\$15.56	\$0.00	\$61.96
	12/01/2025	\$37.74	\$9.90	\$15.56	\$0.00	\$63.20
	06/01/2026	\$39.04	\$9.90	\$15.56	\$0.00	\$64.50
	12/01/2026	\$40.33	\$9.90	\$15.56	\$0.00	\$65.79
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
LABORER: MULTI-TRADE TENDER <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	12/02/2024	\$35.50	\$9.90	\$17.57	\$0.00	\$62.97
	06/02/2025	\$36.75	\$9.90	\$17.57	\$0.00	\$64.22
	12/01/2025	\$38.00	\$9.90	\$17.57	\$0.00	\$65.47
	06/01/2026	\$39.30	\$9.90	\$17.57	\$0.00	\$66.77
	12/07/2026	\$40.60	\$9.90	\$17.57	\$0.00	\$68.07
	06/07/2027	\$42.00	\$9.90	\$17.57	\$0.00	\$69.47
	12/06/2027	\$43.40	\$9.90	\$17.57	\$0.00	\$70.87
	06/05/2028	\$44.90	\$9.90	\$17.57	\$0.00	\$72.37
12/04/2028	\$46.40	\$9.90	\$17.57	\$0.00	\$73.87	
For apprentice rates see "Apprentice- LABORER"						
LABORER: TREE REMOVER <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	12/02/2024	\$35.50	\$9.90	\$17.57	\$0.00	\$62.97
	06/02/2025	\$36.75	\$9.90	\$17.57	\$0.00	\$64.22
	12/01/2025	\$38.00	\$9.90	\$17.57	\$0.00	\$65.47
	06/01/2026	\$39.30	\$9.90	\$17.57	\$0.00	\$66.77
	12/07/2026	\$40.60	\$9.90	\$17.57	\$0.00	\$68.07
	06/07/2027	\$42.00	\$9.90	\$17.57	\$0.00	\$69.47
	12/06/2027	\$43.40	\$9.90	\$17.57	\$0.00	\$70.87
	06/05/2028	\$44.90	\$9.90	\$17.57	\$0.00	\$72.37
12/04/2028	\$46.40	\$9.90	\$17.57	\$0.00	\$73.87	

This classification applies to the removal of standing trees, and the trimming and removal of branches and limbs when related to public works construction or site clearance incidental to construction . For apprentice rates see "Apprentice- LABORER"

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Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LASER BEAM OPERATOR <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	12/02/2024	\$35.25	\$9.90	\$17.57	\$0.00	\$62.72
	06/02/2025	\$36.50	\$9.90	\$17.57	\$0.00	\$63.97
	12/01/2025	\$37.75	\$9.90	\$17.57	\$0.00	\$65.22
	06/01/2026	\$39.05	\$9.90	\$17.57	\$0.00	\$66.52
	12/07/2026	\$40.35	\$9.90	\$17.57	\$0.00	\$67.82
	06/07/2027	\$41.75	\$9.90	\$17.57	\$0.00	\$69.22
	12/06/2027	\$43.15	\$9.90	\$17.57	\$0.00	\$70.62
	06/05/2028	\$44.65	\$9.90	\$17.57	\$0.00	\$72.12
	12/04/2028	\$46.15	\$9.90	\$17.57	\$0.00	\$73.62

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LASER BEAM OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY &amp; HIGHWAY)</i>	12/01/2024	\$35.25	\$9.90	\$15.56	\$0.00	\$60.71
	06/01/2025	\$36.50	\$9.90	\$15.56	\$0.00	\$61.96
	12/01/2025	\$37.74	\$9.90	\$15.56	\$0.00	\$63.20
	06/01/2026	\$39.04	\$9.90	\$15.56	\$0.00	\$64.50
	12/01/2026	\$40.33	\$9.90	\$15.56	\$0.00	\$65.79

For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
MARBLE & TILE FINISHERS <i>BRICKLAYERS LOCAL 3 (SPR/PITT) - MARBLE &amp; TILE</i>	02/01/2025	\$43.84	\$11.49	\$20.78	\$0.00	\$76.11
	08/01/2025	\$44.75	\$11.49	\$20.78	\$0.00	\$77.02
	02/01/2026	\$45.83	\$11.49	\$20.78	\$0.00	\$78.10
	08/01/2026	\$47.59	\$11.49	\$20.78	\$0.00	\$79.86
	02/01/2027	\$48.71	\$11.49	\$20.78	\$0.00	\$80.98

**Apprentice - MARBLE-TILE FINISHER-Local 3 Marble/Tile (Spr/Pitt)**

**Effective Date - 02/01/2025**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.92	\$11.49	\$20.78	\$0.00	\$54.19
2	60	\$26.30	\$11.49	\$20.78	\$0.00	\$58.57
3	70	\$30.69	\$11.49	\$20.78	\$0.00	\$62.96
4	80	\$35.07	\$11.49	\$20.78	\$0.00	\$67.34
5	90	\$39.46	\$11.49	\$20.78	\$0.00	\$71.73

**Effective Date - 08/01/2025**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.38	\$11.49	\$20.78	\$0.00	\$54.65
2	60	\$26.85	\$11.49	\$20.78	\$0.00	\$59.12
3	70	\$31.33	\$11.49	\$20.78	\$0.00	\$63.60
4	80	\$35.80	\$11.49	\$20.78	\$0.00	\$68.07
5	90	\$40.28	\$11.49	\$20.78	\$0.00	\$72.55

**Notes:**

**Apprentice to Journeyworker Ratio:1:5**

MARBLE MASON/TILE LAYER(SP/PT)SeeBrick

*BRICKLAYERS LOCAL 3 (SPR/PITT) - MARBLE & TILE*

See "BRICK/STONE/ARTIFICIAL MASONRY(INCL.MASONRY WATERPROOFING)

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
MECH. SWEEPER OPERATOR (ON CONST. SITES) <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.56	\$13.78	\$15.15	\$0.00	\$68.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MECHANIC/WELDER/BOOM TRUCK <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.03	\$13.78	\$15.15	\$0.00	\$67.96
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MILLWRIGHT (Zone 3) <i>MILLWRIGHTS LOCAL 1121 - Zone 3</i>	01/06/2025	\$43.48	\$10.08	\$21.22	\$0.00	\$74.78
	01/05/2026	\$45.76	\$10.08	\$21.22	\$0.00	\$77.06

**Apprentice - MILLWRIGHT - Local 1121 Zone 3**

**Effective Date - 01/06/2025**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$23.91	\$10.08	\$5.36	\$0.00	\$39.35
2	65	\$28.26	\$10.08	\$6.34	\$0.00	\$44.68
3	75	\$32.61	\$10.08	\$18.78	\$0.00	\$61.47
4	85	\$36.96	\$10.08	\$19.76	\$0.00	\$66.80

**Effective Date - 01/05/2026**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$25.17	\$10.08	\$5.36	\$0.00	\$40.61
2	65	\$29.74	\$10.08	\$6.34	\$0.00	\$46.16
3	75	\$34.32	\$10.08	\$18.78	\$0.00	\$63.18
4	85	\$38.90	\$10.08	\$19.76	\$0.00	\$68.74

**Notes:** Step 1&2 Appr. indentured after 1/6/2020 receive no pension, but do receive annuity. (Step 1 \$5.72, Step 2 \$6.66)  
Steps are 2,000 hours

**Apprentice to Journeyworker Ratio:1:4**

MORTAR MIXER <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	12/02/2024	\$35.25	\$9.90	\$17.57	\$0.00	\$62.72
	06/02/2025	\$36.50	\$9.90	\$17.57	\$0.00	\$63.97
	12/01/2025	\$37.75	\$9.90	\$17.57	\$0.00	\$65.22
	06/01/2026	\$39.05	\$9.90	\$17.57	\$0.00	\$66.52
	12/07/2026	\$40.35	\$9.90	\$17.57	\$0.00	\$67.82
	06/07/2027	\$41.75	\$9.90	\$17.57	\$0.00	\$69.22
	12/06/2027	\$43.15	\$9.90	\$17.57	\$0.00	\$70.62
	06/05/2028	\$44.65	\$9.90	\$17.57	\$0.00	\$72.12
	12/04/2028	\$46.15	\$9.90	\$17.57	\$0.00	\$73.62

For apprentice rates see "Apprentice- LABORER"

OILER <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$35.02	\$13.78	\$15.15	\$0.00	\$63.95
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For apprentice rates see "Apprentice- OPERATING ENGINEERS"

OTHER POWER DRIVEN EQUIPMENT - CLASS VI <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$32.74	\$13.78	\$15.15	\$0.00	\$61.67
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For apprentice rates see "Apprentice- OPERATING ENGINEERS"

PAINTER (BRIDGES/TANKS) <i>PAINTERS LOCAL 35 - ZONE 3</i>	01/01/2025	\$58.46	\$9.95	\$23.95	\$0.00	\$92.36
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**Classification**

**Effective Date   Base Wage   Health   Pension   Supplemental Unemployment   Total Rate**

**Apprentice - PAINTER Local 35 - BRIDGES/TANKS**

**Effective Date - 01/01/2025**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$29.23	\$9.95	\$0.00	\$0.00	\$39.18
2	55	\$32.15	\$9.95	\$6.66	\$0.00	\$48.76
3	60	\$35.08	\$9.95	\$7.26	\$0.00	\$52.29
4	65	\$38.00	\$9.95	\$7.87	\$0.00	\$55.82
5	70	\$40.92	\$9.95	\$20.32	\$0.00	\$71.19
6	75	\$43.85	\$9.95	\$20.93	\$0.00	\$74.73
7	80	\$46.77	\$9.95	\$21.53	\$0.00	\$78.25
8	90	\$52.61	\$9.95	\$22.74	\$0.00	\$85.30

**Notes:**

Steps are 750 hrs.

**Apprentice to Journeyworker Ratio:1:1**

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PAINTER (SPRAY OR SANDBLAST, NEW) *	01/01/2025	\$41.23	\$9.65	\$19.90	\$0.00	\$70.78
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\* If 30% or more of surfaces to be painted are new construction,

NEW paint rate shall be used. *PAINTERS LOCAL 35 - ZONE 3*

**Apprentice - PAINTER Local 35 Zone 3 - Spray/Sandblast - New**

**Effective Date - 01/01/2025**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.62	\$9.95	\$0.00	\$0.00	\$30.57
2	55	\$22.68	\$9.95	\$4.43	\$0.00	\$37.06
3	60	\$24.74	\$9.95	\$4.83	\$0.00	\$39.52
4	65	\$26.80	\$9.95	\$5.23	\$0.00	\$41.98
5	70	\$28.86	\$9.95	\$17.49	\$0.00	\$56.30
6	75	\$30.92	\$9.95	\$17.89	\$0.00	\$58.76
7	80	\$32.98	\$9.95	\$18.29	\$0.00	\$61.22
8	90	\$37.11	\$9.95	\$19.10	\$0.00	\$66.16

**Notes:**

Steps are 750 hrs.

**Apprentice to Journeyworker Ratio:1:1**

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PAINTER (SPRAY OR SANDBLAST, REPAINT)	01/01/2025	\$38.55	\$9.95	\$19.90	\$0.00	\$68.40
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*PAINTERS LOCAL 35 - ZONE 3*

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**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - PAINTER Local 35 Zone 3 - Spray/Sandblast - Repaint**

**Effective Date - 01/01/2025**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.28	\$9.95	\$0.00	\$0.00	\$29.23
2	55	\$21.20	\$9.95	\$4.43	\$0.00	\$35.58
3	60	\$23.13	\$9.95	\$4.83	\$0.00	\$37.91
4	65	\$25.06	\$9.95	\$5.23	\$0.00	\$40.24
5	70	\$26.99	\$9.95	\$17.49	\$0.00	\$54.43
6	75	\$28.91	\$9.95	\$17.89	\$0.00	\$56.75
7	80	\$30.84	\$9.95	\$18.29	\$0.00	\$59.08
8	90	\$34.70	\$9.95	\$19.10	\$0.00	\$63.75

**Notes:**  
Steps are 750 hrs.

**Apprentice to Journeyworker Ratio:1:1**

PAINTER / TAPER (BRUSH, NEW) *	01/01/2025	\$39.83	\$9.95	\$19.90	\$0.00	\$69.68
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\* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used. PAINTERS LOCAL 35 - ZONE 3

**Apprentice - PAINTER - Local 35 Zone 3 - BRUSH NEW**

**Effective Date - 01/01/2025**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.92	\$9.95	\$0.00	\$0.00	\$29.87
2	55	\$21.91	\$9.95	\$4.43	\$0.00	\$36.29
3	60	\$23.90	\$9.95	\$4.83	\$0.00	\$38.68
4	65	\$25.89	\$9.95	\$5.23	\$0.00	\$41.07
5	70	\$27.88	\$9.95	\$17.49	\$0.00	\$55.32
6	75	\$29.87	\$9.95	\$17.89	\$0.00	\$57.71
7	80	\$31.86	\$9.95	\$18.29	\$0.00	\$60.10
8	90	\$35.85	\$9.95	\$19.10	\$0.00	\$64.90

**Notes:**  
Steps are 750 hrs.

**Apprentice to Journeyworker Ratio:1:1**

PAINTER / TAPER (BRUSH, REPAINT)	01/01/2025	\$37.15	\$9.95	\$19.90	\$0.00	\$67.00
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PAINTERS LOCAL 35 - ZONE 3

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**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - PAINTER Local 35 Zone 3 - BRUSH REPAINT**

**Effective Date - 01/01/2025**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$18.58	\$9.95	\$0.00	\$0.00	\$28.53
2	55	\$20.43	\$9.95	\$4.43	\$0.00	\$34.81
3	60	\$22.29	\$9.95	\$4.83	\$0.00	\$37.07
4	65	\$24.15	\$9.95	\$5.23	\$0.00	\$39.33
5	70	\$26.01	\$9.95	\$17.49	\$0.00	\$53.45
6	75	\$27.86	\$9.95	\$17.89	\$0.00	\$55.70
7	80	\$29.72	\$9.95	\$18.29	\$0.00	\$57.96
8	90	\$33.44	\$9.95	\$19.10	\$0.00	\$62.49

**Notes:**  
Steps are 750 hrs.

**Apprentice to Journeyworker Ratio:1:1**

<b>PAINTER TRAFFIC MARKINGS (HEAVY/HIGHWAY)</b>	12/01/2024	\$35.00	\$9.90	\$15.56	\$0.00	\$60.46
<i>LABORERS - ZONE 3 (HEAVY &amp; HIGHWAY)</i>	06/01/2025	\$36.25	\$9.90	\$15.56	\$0.00	\$61.71
	12/01/2025	\$37.49	\$9.90	\$15.56	\$0.00	\$62.95
	06/01/2026	\$38.79	\$9.90	\$15.56	\$0.00	\$64.25
	12/01/2026	\$40.08	\$9.90	\$15.56	\$0.00	\$65.54

For apprentice rates see "Apprentice- LABORER (Heavy and Highway)

<b>PANEL &amp; PICKUP TRUCKS DRIVER</b>	01/01/2025	\$39.78	\$15.57	\$20.17	\$0.00	\$75.52
<i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	06/01/2025	\$40.78	\$15.57	\$20.17	\$0.00	\$76.52
	12/01/2025	\$40.78	\$15.57	\$21.78	\$0.00	\$78.13
	01/01/2026	\$40.78	\$16.17	\$21.78	\$0.00	\$78.73
	06/01/2026	\$41.78	\$16.17	\$21.78	\$0.00	\$79.73
	12/01/2026	\$41.78	\$16.17	\$23.52	\$0.00	\$81.47
	01/01/2027	\$41.78	\$16.77	\$23.52	\$0.00	\$82.07

<b>PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK)</b>	08/01/2024	\$49.19	\$10.08	\$24.29	\$0.00	\$83.56
<i>PILE DRIVER LOCAL 56 (ZONE 3)</i>						

For apprentice rates see "Apprentice- PILE DRIVER"

<b>PILE DRIVER</b>	08/01/2024	\$49.19	\$10.08	\$24.29	\$0.00	\$83.56
<i>PILE DRIVER LOCAL 56 (ZONE 3)</i>						

Last Modified: 04/09/2025 at 10:39AM EDT

**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - PILE DRIVER - Local 56 Zone 3**

**Effective Date - 08/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$22.14	\$10.08	\$2.53	\$0.00	\$34.75
2	55	\$27.05	\$10.08	\$5.07	\$0.00	\$42.20
3	70	\$34.43	\$10.08	\$19.22	\$0.00	\$63.73
4	80	\$39.35	\$10.08	\$21.76	\$0.00	\$71.19

**Notes:**  
 % Indentured BEFORE 8/1/2020, 50/60/70/75/80/80/90/90  
 1\$58.97/2\$63.88/3\$68.80/4\$71.26/5&6 \$73.72/7&8 \$78.64

**Apprentice to Journeyworker Ratio:1:5**

<b>PIPELAYER</b> <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	12/02/2024	\$35.25	\$9.90	\$17.57	\$0.00	\$62.72
	06/02/2025	\$36.50	\$9.90	\$17.57	\$0.00	\$63.97
	12/01/2025	\$37.75	\$9.90	\$17.57	\$0.00	\$65.22
	06/01/2026	\$39.05	\$9.90	\$17.57	\$0.00	\$66.52
	12/07/2026	\$40.35	\$9.90	\$17.57	\$0.00	\$67.82
	06/07/2027	\$41.75	\$9.90	\$17.57	\$0.00	\$69.22
	12/06/2027	\$43.15	\$9.90	\$17.57	\$0.00	\$70.62
	06/05/2028	\$44.65	\$9.90	\$17.57	\$0.00	\$72.12
	12/04/2028	\$46.15	\$9.90	\$17.57	\$0.00	\$73.62

For apprentice rates see "Apprentice- LABORER"

<b>PIPELAYER (HEAVY &amp; HIGHWAY)</b> <i>LABORERS - ZONE 3 (HEAVY &amp; HIGHWAY)</i>	12/01/2024	\$35.25	\$9.90	\$15.56	\$0.00	\$60.71
	06/01/2025	\$36.50	\$9.90	\$15.56	\$0.00	\$61.96
	12/01/2025	\$37.74	\$9.90	\$15.56	\$0.00	\$63.20
	06/01/2026	\$39.04	\$9.90	\$15.56	\$0.00	\$64.50
	12/01/2026	\$40.33	\$9.90	\$15.56	\$0.00	\$65.79

For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"

<b>PLUMBER &amp; PIPEFITTER</b> <i>PLUMBERS &amp; PIPEFITTERS LOCAL 104</i>	03/17/2024	\$49.21	\$9.55	\$17.10	\$0.00	\$75.86
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Last Modified: 04/09/2025 at 10:39AM EDT

**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - PLUMBER/PIPEFITTER - Local 104**

**Effective Date - 03/17/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$22.14	\$9.55	\$10.10	\$0.00	\$41.79
2	50	\$24.61	\$9.55	\$10.10	\$0.00	\$44.26
3	55	\$27.07	\$9.55	\$10.10	\$0.00	\$46.72
4	60	\$29.53	\$9.55	\$10.10	\$0.00	\$49.18
5	65	\$31.99	\$9.55	\$10.10	\$0.00	\$51.64
6	70	\$34.45	\$9.55	\$10.10	\$0.00	\$54.10
7	75	\$36.91	\$9.55	\$10.10	\$0.00	\$56.56
8	80	\$39.37	\$9.55	\$10.10	\$0.00	\$59.02
9	80	\$39.37	\$9.55	\$17.10	\$0.00	\$66.02
10	80	\$39.37	\$9.55	\$17.10	\$0.00	\$66.02

**Notes: \*\*1:1,2:5,3:9,4:12**

**Apprentice to Journeyworker Ratio:\*\***

PNEUMATIC CONTROLS (TEMP.) PLUMBERS & PIPEFITTERS LOCAL 104	03/17/2024	\$49.21	\$9.55	\$17.10	\$0.00	\$75.86
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For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"

PNEUMATIC DRILL/TOOL OPERATOR (HEAVY & HIGHWAY) LABORERS - ZONE 3 (HEAVY & HIGHWAY)	12/01/2024	\$35.25	\$9.90	\$15.56	\$0.00	\$60.71
	06/01/2025	\$36.50	\$9.90	\$15.56	\$0.00	\$61.96
	12/01/2025	\$37.74	\$9.90	\$15.56	\$0.00	\$63.20
	06/01/2026	\$39.04	\$9.90	\$15.56	\$0.00	\$64.50
	12/01/2026	\$40.33	\$9.90	\$15.56	\$0.00	\$65.79

For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"

POWDERMAN & BLASTER LABORERS - ZONE 3 (BUILDING & SITE)	12/02/2024	\$36.00	\$9.90	\$17.57	\$0.00	\$63.47
	06/02/2025	\$37.25	\$9.90	\$17.57	\$0.00	\$64.72
	12/01/2025	\$38.50	\$9.90	\$17.57	\$0.00	\$65.97
	06/01/2026	\$39.80	\$9.90	\$17.57	\$0.00	\$67.27
	12/07/2026	\$41.10	\$9.90	\$17.57	\$0.00	\$68.57
	06/07/2027	\$42.50	\$9.90	\$17.57	\$0.00	\$69.97
	12/06/2027	\$43.90	\$9.90	\$17.57	\$0.00	\$71.37
	06/05/2028	\$45.40	\$9.90	\$17.57	\$0.00	\$72.87

For apprentice rates see "Apprentice- LABORER"

POWDERMAN & BLASTER (HEAVY & HIGHWAY) LABORERS - ZONE 3 (HEAVY & HIGHWAY)	12/01/2024	\$36.75	\$9.65	\$15.06	\$0.00	\$61.46
	06/01/2025	\$38.00	\$9.65	\$15.06	\$0.00	\$62.71
	12/01/2025	\$39.24	\$9.65	\$15.06	\$0.00	\$63.95
	06/01/2026	\$40.54	\$9.65	\$15.06	\$0.00	\$65.25
	12/01/2026	\$41.83	\$9.65	\$15.06	\$0.00	\$66.54

For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"

PUMP OPERATOR (CONCRETE) OPERATING ENGINEERS LOCAL 98	12/01/2023	\$39.56	\$13.78	\$15.15	\$0.00	\$68.49
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For apprentice rates see "Apprentice- OPERATING ENGINEERS"

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Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PUMP OPERATOR (DEWATERING, OTHER) <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.03	\$13.78	\$15.15	\$0.00	\$67.96
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
READY-MIX CONCRETE DRIVER <i>TEAMSTERS 404 - Construction Service (Northampton)</i>	05/01/2024	\$26.14	\$11.82	\$7.25	\$0.00	\$45.21
RIDE-ON MOTORIZED BUGGY OPERATOR <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	12/02/2024	\$35.25	\$9.90	\$17.57	\$0.00	\$62.72
	06/02/2025	\$36.50	\$9.90	\$17.57	\$0.00	\$63.97
	12/01/2025	\$37.75	\$9.90	\$17.57	\$0.00	\$65.22
	06/01/2026	\$39.05	\$9.90	\$17.57	\$0.00	\$66.52
	12/07/2026	\$40.35	\$9.90	\$17.57	\$0.00	\$67.82
	06/07/2027	\$41.75	\$9.90	\$17.57	\$0.00	\$69.22
	12/06/2027	\$43.15	\$9.90	\$17.57	\$0.00	\$70.62
	06/05/2028	\$44.65	\$9.90	\$17.57	\$0.00	\$72.12
	12/04/2028	\$46.15	\$9.90	\$17.57	\$0.00	\$73.62
For apprentice rates see "Apprentice- LABORER"						
ROLLER OPERATOR <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$38.42	\$13.78	\$15.15	\$0.00	\$67.35
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
ROOFER (Coal tar pitch) <i>ROOFERS LOCAL 248</i>	10/02/2024	\$42.38	\$10.35	\$18.00	\$0.00	\$70.73
	07/16/2025	\$43.88	\$10.35	\$18.00	\$0.00	\$72.23
	10/02/2025	\$44.88	\$10.35	\$18.00	\$0.00	\$73.23
	07/16/2026	\$46.88	\$10.35	\$18.00	\$0.00	\$75.23
For apprentice rates see "Apprentice- ROOFER"						
ROOFER (Inc.Roofer Waterproofing &Roofer Damproofg) <i>ROOFERS LOCAL 248</i>	10/02/2024	\$41.88	\$10.35	\$18.00	\$0.00	\$70.23
	07/16/2025	\$43.38	\$10.35	\$18.00	\$0.00	\$71.73
	10/02/2025	\$44.38	\$10.35	\$18.00	\$0.00	\$72.73
	07/16/2026	\$46.38	\$10.35	\$18.00	\$0.00	\$74.73

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**Apprentice - ROOFER - Local 248**

**Effective Date - 10/02/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$25.13	\$10.35	\$0.00	\$0.00	\$35.48
2	65	\$27.22	\$10.35	\$18.00	\$0.00	\$55.57
3	70	\$29.32	\$10.35	\$18.00	\$0.00	\$57.67
4	75	\$31.41	\$10.35	\$18.00	\$0.00	\$59.76
5	80	\$33.50	\$10.35	\$18.00	\$0.00	\$61.85
6	85	\$35.60	\$10.35	\$18.00	\$0.00	\$63.95
7	90	\$37.69	\$10.35	\$18.00	\$0.00	\$66.04
8	95	\$39.79	\$10.35	\$18.00	\$0.00	\$68.14

**Notes:**  
Steps are 750 hrs.Roofer(Tear Off)1:1; Same as above

**Apprentice to Journeyworker Ratio:1:3**



Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
ROOFER SLATE / TILE / PRECAST CONCRETE <i>ROOFERS LOCAL 248</i>	10/02/2024	\$42.38	\$10.35	\$18.00	\$0.00	\$70.73
	07/16/2025	\$43.88	\$10.35	\$18.00	\$0.00	\$72.23
	10/02/2025	\$44.88	\$10.35	\$18.00	\$0.00	\$73.23
	07/16/2026	\$46.88	\$10.35	\$18.00	\$0.00	\$75.23
For apprentice rates see "Apprentice- ROOFER"						
SCRAPER <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$39.03	\$13.78	\$15.15	\$0.00	\$67.96
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
SELF-POWERED ROLLERS AND COMPACTORS (TAMPERS) <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$38.42	\$13.78	\$15.15	\$0.00	\$67.35
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
SELF-PROPELLED POWER BROOM <i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2023	\$35.80	\$13.78	\$15.15	\$0.00	\$64.73
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
SHEETMETAL WORKER <i>SHEETMETAL WORKERS LOCAL 63</i>	01/01/2025	\$42.23	\$12.20	\$18.74	\$2.13	\$75.30

**Apprentice - SHEET METAL WORKER - Local 63**

**Effective Date - 01/01/2025**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$19.00	\$5.49	\$4.86	\$0.85	\$30.20
2	50	\$21.12	\$6.10	\$5.40	\$0.94	\$33.56
3	55	\$23.23	\$6.71	\$9.71	\$1.15	\$40.80
4	60	\$25.34	\$7.32	\$9.71	\$1.23	\$43.60
5	65	\$27.45	\$7.93	\$9.71	\$1.31	\$46.40
6	70	\$29.56	\$8.54	\$9.71	\$1.39	\$49.20
7	75	\$31.67	\$9.15	\$9.71	\$1.47	\$52.00
8	80	\$33.78	\$9.76	\$17.66	\$1.78	\$62.98
9	85	\$35.90	\$10.37	\$17.66	\$1.86	\$65.79
10	90	\$38.01	\$10.98	\$17.66	\$1.94	\$68.59

**Notes:**

**Apprentice to Journeyworker Ratio:1:3**

SPECIALIZED EARTH MOVING EQUIP < 35 TONS <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	01/01/2025	\$40.24	\$15.57	\$20.17	\$0.00	\$75.98
	06/01/2025	\$41.24	\$15.57	\$20.17	\$0.00	\$76.98
	12/01/2025	\$41.24	\$15.57	\$21.78	\$0.00	\$78.59
	01/01/2026	\$41.24	\$16.17	\$21.78	\$0.00	\$79.19
	06/01/2026	\$42.24	\$16.17	\$21.78	\$0.00	\$80.19
	12/01/2026	\$42.24	\$16.17	\$23.52	\$0.00	\$81.93
	01/01/2027	\$42.24	\$16.77	\$23.52	\$0.00	\$82.53

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
SPECIALIZED EARTH MOVING EQUIP > 35 TONS <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	01/01/2025	\$40.53	\$15.57	\$20.17	\$0.00	\$76.27
	06/01/2025	\$41.53	\$15.57	\$20.17	\$0.00	\$77.27
	12/01/2025	\$41.53	\$15.57	\$21.78	\$0.00	\$78.88
	01/01/2026	\$41.53	\$16.17	\$21.78	\$0.00	\$79.48
	06/01/2026	\$42.53	\$16.17	\$21.78	\$0.00	\$80.48
	12/01/2026	\$42.53	\$16.17	\$23.52	\$0.00	\$82.22
	01/01/2027	\$42.53	\$16.77	\$23.52	\$0.00	\$82.82
SPRINKLER FITTER <i>SPRINKLER FITTERS LOCAL 669</i>	04/01/2023	\$47.43	\$11.45	\$16.61	\$0.00	\$75.49

**Apprentice - *SPRINKLER FITTER - Local 669***

**Effective Date - 04/01/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$21.34	\$8.22	\$0.00	\$0.00	\$29.56
2	50	\$23.72	\$8.22	\$0.00	\$0.00	\$31.94
3	55	\$26.09	\$11.45	\$7.20	\$0.00	\$44.74
4	60	\$28.46	\$11.45	\$8.35	\$0.00	\$48.26
5	65	\$30.83	\$11.45	\$8.35	\$0.00	\$50.63
6	70	\$33.20	\$11.45	\$8.60	\$0.00	\$53.25
7	75	\$35.57	\$11.45	\$8.60	\$0.00	\$55.62
8	80	\$37.94	\$11.45	\$8.60	\$0.00	\$57.99
9	85	\$40.32	\$11.45	\$8.60	\$0.00	\$60.37
10	90	\$42.69	\$11.45	\$8.60	\$0.00	\$62.74

**Notes:**

**Apprentice to Journeyworker Ratio:1:1**

TELECOMMUNICATION TECHNICIAN <i>ELECTRICIANS LOCAL 7</i>	12/29/2024	\$51.06	\$13.25	\$15.06	\$0.00	\$79.37
	06/29/2025	\$52.16	\$13.50	\$15.21	\$0.00	\$80.87
	12/28/2025	\$53.26	\$13.75	\$15.36	\$0.00	\$82.37
	06/28/2026	\$54.41	\$14.00	\$15.46	\$0.00	\$83.87
	01/03/2027	\$55.56	\$14.25	\$15.56	\$0.00	\$85.37

Last Modified: 04/09/2025 at 10:39AM EDT

**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - TELECOMMUNICATION TECHNICIAN - Local 7**

**Effective Date - 12/29/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$20.42	\$7.35	\$0.61	\$0.00	\$28.38
2	45	\$22.98	\$7.35	\$0.69	\$0.00	\$31.02
3	50	\$25.53	\$13.25	\$7.47	\$0.00	\$46.25
4	55	\$28.08	\$13.25	\$7.54	\$0.00	\$48.87
5	65	\$33.19	\$13.25	\$9.74	\$0.00	\$56.18
6	70	\$35.74	\$13.25	\$11.19	\$0.00	\$60.18

**Effective Date - 06/29/2025**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$20.86	\$7.50	\$0.63	\$0.00	\$28.99
2	45	\$23.47	\$7.50	\$0.70	\$0.00	\$31.67
3	50	\$26.08	\$13.50	\$7.53	\$0.00	\$47.11
4	55	\$28.69	\$13.50	\$7.61	\$0.00	\$49.80
5	65	\$33.90	\$13.50	\$9.84	\$0.00	\$57.24
6	70	\$36.51	\$13.50	\$11.30	\$0.00	\$61.31

**Notes:**

Steps are 800 hours

**Apprentice to Journeyworker Ratio:1:1**

<b>TERRAZZO FINISHERS</b>	02/01/2025	\$64.74	\$11.49	\$23.59	\$0.00	\$99.82
<i>BRICKLAYERS LOCAL 3 (SPR/PITT) - MARBLE &amp; TILE</i>	08/01/2025	\$66.89	\$11.49	\$23.59	\$0.00	\$101.97
	02/10/2026	\$68.24	\$11.49	\$23.59	\$0.00	\$103.32
	08/01/2026	\$70.44	\$11.49	\$23.59	\$0.00	\$105.52
	02/01/2027	\$71.84	\$11.49	\$23.59	\$0.00	\$106.92

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**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - TERRAZZO FINISHER-Local 3 Marble/Tile (Spr/Ptt)**

**Effective Date - 02/01/2025**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$32.37	\$11.49	\$23.59	\$0.00	\$67.45
2	60	\$38.84	\$11.49	\$23.59	\$0.00	\$73.92
3	70	\$45.32	\$11.49	\$23.59	\$0.00	\$80.40
4	80	\$51.79	\$11.49	\$23.59	\$0.00	\$86.87
5	90	\$58.27	\$11.49	\$23.59	\$0.00	\$93.35

**Effective Date - 08/01/2025**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$33.45	\$11.49	\$23.59	\$0.00	\$68.53
2	60	\$40.13	\$11.49	\$23.59	\$0.00	\$75.21
3	70	\$46.82	\$11.49	\$23.59	\$0.00	\$81.90
4	80	\$53.51	\$11.49	\$23.59	\$0.00	\$88.59
5	90	\$60.20	\$11.49	\$23.59	\$0.00	\$95.28

**Notes:**

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**Apprentice to Journeyworker Ratio:1:5**

TERRAZZO MECHANIC	02/01/2025	\$65.82	\$11.49	\$23.56	\$0.00	\$100.87
BRICKLAYERS LOCAL 3 (SPR/PITT) - MARBLE & TILE	08/01/2025	\$67.97	\$11.49	\$23.56	\$0.00	\$103.02
	02/01/2026	\$69.32	\$11.49	\$23.56	\$0.00	\$104.37
	08/01/2026	\$71.52	\$11.49	\$23.56	\$0.00	\$106.57
	02/01/2027	\$72.92	\$11.49	\$23.56	\$0.00	\$107.97

Last Modified: 04/09/2025 at 10:39AM EDT

**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - TERRAZZO MECH - Local 3 Marble/Tile (Spr/Pitt)**

**Effective Date - 02/01/2025**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$32.91	\$11.49	\$23.56	\$0.00	\$67.96
2	60	\$39.49	\$11.49	\$23.56	\$0.00	\$74.54
3	70	\$46.07	\$11.49	\$23.56	\$0.00	\$81.12
4	80	\$52.66	\$11.49	\$23.56	\$0.00	\$87.71
5	90	\$59.24	\$11.49	\$23.56	\$0.00	\$94.29

**Effective Date - 08/01/2025**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$33.99	\$11.49	\$23.56	\$0.00	\$69.04
2	60	\$40.78	\$11.49	\$23.56	\$0.00	\$75.83
3	70	\$47.58	\$11.49	\$23.56	\$0.00	\$82.63
4	80	\$54.38	\$11.49	\$23.56	\$0.00	\$89.43
5	90	\$61.17	\$11.49	\$23.56	\$0.00	\$96.22

**Notes:**

**Apprentice to Journeyworker Ratio:1:5**

<b>TEST BORING DRILLER</b>	12/01/2024	\$50.20	\$9.90	\$19.05	\$0.00	\$79.15
<i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2025	\$51.70	\$9.90	\$19.05	\$0.00	\$80.65
	12/01/2025	\$53.20	\$9.90	\$19.05	\$0.00	\$82.15
	06/01/2026	\$54.75	\$9.90	\$19.05	\$0.00	\$83.70
	12/01/2026	\$56.25	\$9.90	\$19.05	\$0.00	\$85.20

For apprentice rates see "Apprentice- LABORER"

<b>TEST BORING DRILLER HELPER</b>	12/01/2024	\$46.32	\$9.90	\$19.05	\$0.00	\$75.27
<i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2025	\$47.82	\$9.90	\$19.05	\$0.00	\$76.77
	12/01/2025	\$49.32	\$9.90	\$19.05	\$0.00	\$78.27
	06/01/2026	\$50.87	\$9.90	\$19.05	\$0.00	\$79.82
	12/01/2026	\$52.37	\$9.90	\$19.05	\$0.00	\$81.32

For apprentice rates see "Apprentice- LABORER"

<b>TEST BORING LABORER</b>	12/01/2024	\$46.20	\$9.90	\$19.05	\$0.00	\$75.15
<i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2025	\$47.70	\$9.90	\$19.05	\$0.00	\$76.65
	12/01/2025	\$49.20	\$9.90	\$19.05	\$0.00	\$78.15
	06/01/2026	\$50.75	\$9.90	\$19.05	\$0.00	\$79.70
	12/01/2026	\$52.25	\$9.90	\$19.05	\$0.00	\$81.20

For apprentice rates see "Apprentice- LABORER"

<b>TRACTORS</b>	12/01/2023	\$38.42	\$13.78	\$15.15	\$0.00	\$67.35
<i>OPERATING ENGINEERS LOCAL 98</i>						

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

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Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TRAILERS FOR EARTH MOVING EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	01/01/2025	\$40.82	\$15.57	\$20.17	\$0.00	\$76.56
	06/01/2025	\$41.82	\$15.57	\$20.17	\$0.00	\$77.56
	12/01/2025	\$41.82	\$15.57	\$21.78	\$0.00	\$79.17
	01/01/2026	\$41.82	\$16.17	\$21.78	\$0.00	\$79.77
	06/01/2026	\$42.82	\$16.17	\$21.78	\$0.00	\$80.77
	12/01/2026	\$42.82	\$16.17	\$23.52	\$0.00	\$82.51
	01/01/2027	\$42.82	\$16.77	\$23.52	\$0.00	\$83.11
TUNNEL WORK - COMPRESSED AIR <i>LABORERS (COMPRESSED AIR)</i>	12/01/2024	\$58.43	\$9.90	\$19.50	\$0.00	\$87.83
	06/01/2025	\$59.93	\$9.90	\$19.50	\$0.00	\$89.33
	12/01/2025	\$61.43	\$9.90	\$19.50	\$0.00	\$90.83
	06/01/2026	\$62.98	\$9.90	\$19.50	\$0.00	\$92.38
	12/01/2026	\$64.48	\$9.90	\$19.50	\$0.00	\$93.88
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) <i>LABORERS (COMPRESSED AIR)</i>	12/01/2024	\$60.43	\$9.90	\$19.50	\$0.00	\$89.83
	06/01/2025	\$61.93	\$9.90	\$19.50	\$0.00	\$91.33
	12/01/2025	\$63.43	\$9.90	\$19.50	\$0.00	\$92.83
	06/01/2026	\$64.98	\$9.90	\$19.50	\$0.00	\$94.38
	12/01/2026	\$66.48	\$9.90	\$19.50	\$0.00	\$95.88
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR <i>LABORERS (FREE AIR TUNNEL)</i>	12/01/2024	\$50.50	\$9.90	\$19.50	\$0.00	\$79.90
	06/01/2025	\$52.00	\$9.90	\$19.50	\$0.00	\$81.40
	12/01/2025	\$53.50	\$9.90	\$19.50	\$0.00	\$82.90
	06/01/2026	\$55.05	\$9.90	\$19.50	\$0.00	\$84.45
	12/01/2026	\$56.55	\$9.90	\$19.50	\$0.00	\$85.95
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR (HAZ. WASTE) <i>LABORERS (FREE AIR TUNNEL)</i>	12/01/2024	\$52.50	\$9.90	\$19.50	\$0.00	\$81.90
	06/01/2025	\$54.00	\$9.90	\$19.50	\$0.00	\$83.40
	12/01/2025	\$55.50	\$9.90	\$19.50	\$0.00	\$84.90
	06/01/2026	\$57.05	\$9.90	\$19.50	\$0.00	\$86.45
	12/01/2026	\$58.55	\$9.90	\$19.50	\$0.00	\$87.95
For apprentice rates see "Apprentice- LABORER"						
VAC-HAUL <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	01/01/2025	\$40.24	\$15.57	\$20.17	\$0.00	\$75.98
	06/01/2025	\$41.24	\$15.57	\$20.17	\$0.00	\$76.98
	12/01/2025	\$41.24	\$15.57	\$21.78	\$0.00	\$78.59
	01/01/2026	\$41.24	\$16.17	\$21.78	\$0.00	\$79.19
	06/01/2026	\$42.24	\$16.17	\$21.78	\$0.00	\$80.19
	12/01/2026	\$42.24	\$16.17	\$23.52	\$0.00	\$81.93
	01/01/2027	\$42.24	\$16.77	\$23.52	\$0.00	\$82.53

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Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
WAGON DRILL OPERATOR <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	12/02/2024	\$35.25	\$9.90	\$17.57	\$0.00	\$62.72
	06/02/2025	\$36.50	\$9.90	\$17.57	\$0.00	\$63.97
	12/01/2025	\$37.75	\$9.90	\$17.57	\$0.00	\$65.22
	06/01/2026	\$39.05	\$9.90	\$17.57	\$0.00	\$66.52
	12/07/2026	\$40.35	\$9.90	\$17.57	\$0.00	\$67.82
	06/07/2027	\$41.75	\$9.90	\$17.57	\$0.00	\$69.22
	12/06/2027	\$43.15	\$9.90	\$17.57	\$0.00	\$70.62
	06/05/2028	\$44.65	\$9.90	\$17.57	\$0.00	\$72.12
	12/04/2028	\$46.15	\$9.90	\$17.57	\$0.00	\$73.62
For apprentice rates see "Apprentice- LABORER"						
WAGON DRILL OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY &amp; HIGHWAY)</i>	12/01/2024	\$35.25	\$9.90	\$15.56	\$0.00	\$60.71
	06/01/2025	\$36.50	\$9.90	\$15.56	\$0.00	\$61.96
	12/01/2025	\$37.74	\$9.90	\$15.56	\$0.00	\$63.20
	06/01/2026	\$39.04	\$9.90	\$15.56	\$0.00	\$64.50
	12/01/2026	\$40.33	\$9.90	\$15.56	\$0.00	\$65.79
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
WATER METER INSTALLER <i>PLUMBERS &amp; PIPEFITTERS LOCAL 104</i>	03/17/2024	\$49.21	\$9.55	\$17.10	\$0.00	\$75.86
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER"						

**Additional Apprentices Information:**

All apprentices must be registered with the Division of Apprenticeship Training (DAS) in accordance with M.G.L. c. 23, §§ 11E-11L. Minimum wage rates for apprentices employed on public works projects are listed above as a percentage of the hourly prevailing wage rate established by the Commissioner under the provisions of M.G.L. c. 149, §§ 26-27D. Apprentices ratios are established by DAS pursuant to M.G.L. c. 23, §§ 11E-11L. Ratios are expressed as the allowable number of apprentices to journeymen or fraction thereof, unless otherwise specified. The ratios listed herein have been taken from relevant private collective bargaining agreements (CBAs) and are provided for illustrative purposes only. They have not been independently verified as being accurate or continuing to be accurate. Parties having questions regarding what ratio to use should contact DAS.

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**NOTICE: - This is NOT the official version of the Massachusetts General Laws (MGL). While reasonable efforts have been made to assure the accuracy of the data provided, do not rely on this information without first checking an official edition of the MGL.**

**If you are in need of legal advice or counsel, consult an attorney.**

**MASSACHUSETTS GENERAL LAWS**

**(Updated to July 12, 2013)**

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**CHAPTER 30. GENERAL PROVISIONS RELATIVE TO STATE DEPARTMENTS, COMMISSIONS, OFFICERS AND EMPLOYEES Chapter 30: Section 38A Price adjustment clause**

Contracts for road, bridge, water, and sewer projects awarded as a result of a proposal or invitation for bids under chapter 7C, section 11C of Chapter 25A, section 39M of this chapter and sections 44A to 44H, inclusive, of chapter 149 shall include a price adjustment clause for each of the following materials: fuel, both diesel and gasoline; asphalt; concrete; and steel. A base price for each material shall be set by the awarding authority or agency and shall be included in the bid documents at the time the project is advertised. The awarding authority or agency shall also identify in the bid documents the price index to be used for each material. The price adjustment clause shall provided for a contract adjustment to be made on a monthly basis when the monthly cost change exceeds plus or minus 5 per cent.

**Chapter 30: Section 39F Construction contracts; assignment and subrogation; subcontractor defined; enforcement of claim for direct payment; deposit, reduction of disputed amounts**

Section 39F. (1) Every contract awarded pursuant to sections forty-four A to L, inclusive, of chapter one hundred and forty-nine shall contain the following subparagraphs (a) through (i) and every contract awarded pursuant to section thirty-nine M of chapter thirty shall contain the following subparagraphs (a) through (h) and in each case those subparagraphs shall be binding between the general contractor and each subcontractor.

(a) Forthwith after the general contractor receives payment on account of a periodic estimate, the general contractor shall pay to each subcontractor the amount paid for the labor performed and the materials furnished by that subcontractor, less any amount specified in any court proceedings barring such payment and also less any amount claimed due from the subcontractor by the general contractor.

(b) Not later than the sixty-fifth day after each subcontractor substantially completes his work in accordance with the plans and specifications, the entire balance due under the subcontract less amounts retained by the awarding authority as the estimated cost of completing the incomplete and unsatisfactory items of work, shall be due the subcontractor; and the awarding authority shall pay that amount to the general contractor. The general contractor shall forthwith pay to the subcontractor the full amount received from the awarding authority less any amount specified in any court proceedings barring such payment and also less any amount claimed due from the subcontractor by the general contractor.

(c) Each payment made by the awarding authority to the general contractor pursuant to subparagraphs (a) and (b) of this paragraph for the labor performed and the materials

furnished by a subcontractor shall be made to the general contractor for the account of that subcontractor; and the awarding authority shall take reasonable steps to compel the general contractor to make each such payment to each such subcontractor. If the awarding authority has received a demand for direct payment from a subcontractor for any amount which has already been included in a payment to the general contractor or which is to be included in a payment to the general contractor for payment to the subcontractor as provided in subparagraphs (a) and (b), the awarding authority shall act upon the demand as provided in this section.

(d) If, within seventy days after the subcontractor has substantially completed the subcontract work, the subcontractor has not received from the general contractor the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor, less any amount retained by the awarding authority as the estimated cost of completing the incomplete and unsatisfactory items of work, the subcontractor may demand direct payment of that balance from the awarding authority. The demand shall be by a sworn statement delivered to or sent by certified mail to the awarding authority, and a copy shall be delivered to or sent by certified mail to the general contractor at the same time. The demand shall contain a detailed breakdown of the balance due under the subcontract and also a statement of the status of completion of the subcontract work. Any demand made after substantial completion of the subcontract work shall be valid even if delivered or mailed prior to the seventieth day after the subcontractor has substantially completed the subcontract work. Within ten days after the subcontractor has delivered or so mailed the demand to the awarding authority and delivered or so mailed a copy to the general contractor, the general contractor may reply to the demand. The reply shall be by a sworn statement delivered to or sent by certified mail to the awarding authority and a copy shall be delivered to or sent by certified mail to the subcontractor at the same time. The reply shall contain a detailed breakdown of the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor and of the amount due for each claim made by the general contractor against the subcontractor.

(e) Within fifteen days after receipt of the demand by the awarding authority, but in no event prior to the seventieth day after substantial completion of the subcontract work, the awarding authority shall make direct payment to the subcontractor of the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor, less any amount (i) retained by the awarding authority as the estimated cost of completing the incomplete or unsatisfactory items of work, (ii) specified in any court proceedings barring such payment, or (iii) disputed by the general contractor in the sworn reply; provided, that the awarding authority shall not deduct from a direct payment any amount as provided in part (iii) if the reply is not sworn to, or for which the sworn reply does not contain the detailed breakdown required by subparagraph (d). The awarding authority shall make further direct payments to the subcontractor forthwith after the removal of the basis for deductions from direct payments made as provided in parts (i) and (ii) of this subparagraph.

(f) The awarding authority shall forthwith deposit the amount deducted from a direct payment as provided in part (iii) of subparagraph (e) in an interest-bearing joint account in the names of the general contractor and the subcontractor in a bank in Massachusetts selected by the awarding authority or agreed upon by the general contractor and the subcontractor and shall notify the general contractor and the subcontractor of the date of the deposit and the bank receiving the deposit. The bank shall pay the amount in the account, including accrued interest, as provided in an agreement between the general contractor and the subcontractor or as determined by decree of a court of competent jurisdiction.

(g) All direct payments and all deductions from demands for direct payments deposited in an interest-bearing account or accounts in a bank pursuant to subparagraph (f) shall be made out of amounts payable to the general contractor at the time of receipt of a demand for direct payment from a subcontractor and out of amounts which later become payable to the general contractor and in the order of receipt of such demands from subcontractors. All direct payments shall discharge the obligation of the awarding authority to the general contractor to the extent of such payment.

(h) The awarding authority shall deduct from payments to a general contractor amounts which, together with the deposits in interest-bearing accounts pursuant to subparagraph (f), are sufficient to satisfy all unpaid balances of demands for direct payment received from subcontractors. All such amounts shall be earmarked for such direct payments, and the subcontractors shall have a right in such deductions prior to any claims against such amounts by creditors of the general contractor.

(i) If the subcontractor does not receive payment as provided in subparagraph (a) or if the general contractor does not submit a periodic estimate for the value of the labor or materials performed or furnished by the subcontractor and the subcontractor does not receive payment for same when due less the deductions provided for in subparagraph (a), the subcontractor may demand direct payment by following the procedure in subparagraph (d) and the general contractor may file a sworn reply as provided in that same subparagraph. A demand made after the first day of the month following that for which the subcontractor performed or furnished the labor and materials for which the subcontractor seeks payment shall be valid even if delivered or mailed prior to the time payment was due on a periodic estimate from the general contractor. Thereafter the awarding authority shall proceed as provided in subparagraph (e), (f), (g) and (h).

(2) Any assignment by a subcontractor of the rights under this section to a surety company furnishing a bond under the provisions of section twenty-nine of chapter one hundred forty-nine shall be invalid. The assignment and subrogation rights of the surety to amounts included in a demand for direct payment which are in the possession of the awarding authority or which are on deposit pursuant to subparagraph (f) of paragraph (1) shall be subordinate to the rights of all subcontractors who are entitled to be paid under this section and who have not been paid in full.

(3) "Subcontractor" as used in this section (i) for contracts awarded as provided in sections forty-four A to forty-four H, inclusive, of chapter one hundred forty-nine shall mean a person who files a sub-bid and receives a subcontract as a result of that filed sub-bid or who is approved by the awarding authority in writing as a person performing labor or both performing labor and furnishing materials pursuant to a contract with the general contractor, (ii) for contracts awarded as provided in paragraph (a) of section thirty-nine M of chapter thirty shall mean a person approved by the awarding authority in writing as a person performing labor or both performing labor and furnishing materials pursuant to a contract with the general contractor, and (iii) for contracts with the commonwealth not awarded as provided in forty-four A to forty-four H, inclusive, of chapter one hundred forty-nine shall also mean a person contracting with the general contractor to supply materials used or employed in a public works project for a price in excess of five thousand dollars.

(4) A general contractor or a subcontractor shall enforce a claim to any portion of the amount of a demand for direct payment deposited as provided in subparagraph (f) of paragraph 1 by a petition in equity in the superior court against the other and the bank shall not be a necessary party. A subcontractor shall enforce a claim for direct payment or a right to require a deposit as provided in subparagraph (f) of paragraph 1 by a petition in equity in the superior court against the awarding authority and the general contractor shall not be a necessary party. Upon motion of any party the court shall advance for speedy trial any petition filed as provided in this paragraph. Sections fifty-nine and fifty-nine B of chapter two hundred thirty-one shall apply to such petitions. The court shall enter an interlocutory decree upon which execution shall issue for any part of a claim found due pursuant to sections fifty-nine and fifty-nine B and, upon motion of any party, shall advance for speedy trial the petition to collect the remainder of the claim. Any party aggrieved by such interlocutory decree shall have the right to appeal therefrom as from a final decree. The court shall not consolidate for trial the petition of any subcontractor with the petition of one or more subcontractors or the same general contract unless the court finds that a substantial portion of the evidence of the same events during the course of construction (other than the fact that the claims sought to be consolidated arise under the same general contract) is applicable to the petitions sought to be consolidated and that such consolidation will prevent unnecessary duplication of evidence. A decree in any such proceeding shall not include interest on the disputed amount deposited in excess of the interest earned for the period of any such deposit. No person except a subcontractor filing a demand for direct payment for which no funds due the general contractor are available for direct payment shall have a right to file a petition in court of equity against the awarding authority claiming a demand for direct payment is premature and such subcontractor must file the petition before the awarding authority has made a direct payment to the subcontractor and has made a deposit of the disputed portion as provided in part (iii) of subparagraph (e) and in subparagraph (f) of paragraph (1).

(5) In any petition to collect any claim for which a subcontractor has filed a demand for direct payment the court shall, upon motion of the general contractor, reduce by the amount of any deposit of a disputed amount by the awarding authority as provided in part

(iii) of subparagraph (e) and in subparagraph (f) of paragraph (1) any amount held under a trustee writ or pursuant to a restraining order or injunction.

## **CHAPTER 30. GENERAL PROVISIONS RELATIVE TO STATE DEPARTMENTS, COMMISSIONS, OFFICERS AND EMPLOYEES**

### **Chapter 30: Section 39I Deviations from plans and specifications**

Section 39I. Every contractor having a contract for the construction, alteration, maintenance, repair or demolition of, or addition to, any public building or public works for the commonwealth, or of any political subdivision thereof, shall perform all the work required by such contract in conformity with the plans and specifications contained therein. No wilful and substantial deviation from said plans and specifications shall be made unless authorized in writing by the awarding authority or by the engineer or architect in charge of the work who is duly authorized by the awarding authority to approve such deviations. In order to avoid delays in the prosecution of the work required by such contract such deviation from the plans or specifications may be authorized by a written order of the awarding authority or such engineer or architect so authorized to approve such deviation. Within thirty days thereafter, such written order shall be confirmed by a certificate of the awarding authority stating: (1) If such deviation involves any substitution or elimination of materials, fixtures or equipment, the reasons why such materials, fixtures or equipment were included in the first instance and the reasons for substitution or elimination, and, if the deviation is of any other nature, the reasons for such deviation, giving justification therefor; (2) that the specified deviation does not materially injure the project as a whole; (3) that either the work substituted for the work specified is of the same cost and quality, or that an equitable adjustment has been agreed upon between the contracting agency and the contractor and the amount in dollars of said adjustment; and (4) that the deviation is in the best interest of the contracting authority.

Such certificate shall be signed under the penalties of perjury and shall be a permanent part of the file record of the work contracted for.

Whoever violates any provision of this section wilfully and with intent to defraud shall be punished by a fine of not more than five thousand dollars or by imprisonment for not more than six months, or both.

**CHAPTER 30. GENERAL PROVISIONS RELATIVE TO STATE DEPARTMENTS,  
COMMISSIONS, OFFICERS AND EMPLOYEES**

**Chapter 30: Section 39J Public construction contracts; effect of decisions of  
contracting body or administrative board**

Section 39L. The commonwealth and every county, city, town, district, board, commission or other public body which, as the awarding authority, requests proposals, bids or sub-bids for any work in the construction, reconstruction, alteration, remodeling, repair or demolition of any public building or other public works (1) shall not enter into a contract for the work with, and shall not approve as a subcontractor furnishing labor and materials for a part of the work, a foreign corporation which has not filed with the awarding authority a certificate of the state secretary stating that the corporation has complied with requirements of section 15.03 of subdivision A of Part 15 of chapter 156D and the date of compliance, and further has filed all annual reports required by section 16.22 of subdivision B of Part 16 of said chapter 156D, and (2) shall report to the state secretary and to the department of corporations and taxation any foreign corporation performing work under such contract or subcontract, and any person, other than a corporation, performing work under such contract or subcontract, and residing or having a principal place of business outside the commonwealth.

**CHAPTER 30. GENERAL PROVISIONS RELATIVE TO STATE DEPARTMENTS,  
COMMISSIONS, OFFICERS AND EMPLOYEES**

**Chapter 30: Section 39L Public construction work by foreign corporations;  
restrictions and reports**

Section 39L. The commonwealth and every county, city, town, district, board, commission or other public body which, as the awarding authority, requests proposals, bids or sub-bids for any work in the construction, reconstruction, alteration, remodeling, repair or demolition of any public building or other public works (1) shall not enter into a contract for the work with, and shall not approve as a subcontractor furnishing labor and materials for a part of the work, a foreign corporation which has not filed with the awarding authority a certificate of the state secretary stating that the corporation has complied with requirements of section 15.03 of subdivision A of Part 15 of chapter 156D and the date of compliance, and further has filed all annual reports required by section 16.22 of subdivision B of Part 16 of said chapter 156D, and (2) shall report to the state secretary and to the department of corporations and taxation any foreign corporation performing work under such contract or subcontract, and any person, other than a corporation, performing work under such contract or subcontract, and residing or having a principal place of business outside the commonwealth.

**CHAPTER 30. GENERAL PROVISIONS RELATIVE TO STATE DEPARTMENTS, COMMISSIONS, OFFICERS AND EMPLOYEES**

**Chapter 30: Section 39M Contracts for construction and materials; manner of awarding**

Section 38A. Contracts for road and bridge projects awarded as a result of a proposal or invitation for bids under section 39M shall include a price adjustment clause for each of the following materials: fuel, both diesel and gasoline; asphalt; concrete; and steel. Contracts for water and sewer projects awarded as a result of a proposal or invitation for bids under said section 39M shall include a price adjustment clause for fuel, both diesel and gasoline; liquid asphalt; and portland cement contained in cast-in-place concrete. A base price for each material shall be set by the awarding authority or agency and shall be included in the bid documents at the time the project is advertised. The awarding authority or agency shall also identify in the bid documents the price index to be used for each material. The price adjustment clause shall provide for a contract adjustment to be made on a monthly basis when the monthly cost change exceeds plus or minus 5 per cent.

Section 39M. (a) Every contract for the construction, reconstruction, alteration, remodeling or repair of any public work, or for the purchase of any material, as hereinafter defined, by the commonwealth, or political subdivision thereof, or by any county, city, town, district, or housing authority, and estimated by the awarding authority to cost more than ten thousand dollars, and every contract for the construction, reconstruction, installation, demolition, maintenance or repair of any building by a public agency, as defined by subsection one of section forty-four A of chapter one hundred and forty-nine, estimated to cost more than \$25,000 but not more than \$100,000, shall be awarded to the lowest responsible and eligible bidder on the basis of competitive bids publicly opened and read by such awarding authority forthwith upon expiration of the time for the filing thereof; provided, however, that such awarding authority may reject any and all bids, if it is in the public interest to do so. Every bid for such contract shall be accompanied by a bid deposit in the form of a bid bond, or cash, or a certified check on, or a treasurer's or cashier's check issued by, a responsible bank or trust company, payable to the awarding authority. The amount of such bid deposit shall be five per cent of the value of the bid. Any person submitting a bid under this section shall, on such bid, certify as follows:

The undersigned certifies under penalties of perjury that this bid is in all respects bona fide, fair and made without collusion or fraud with any other person. As used in this paragraph the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity.

\_\_\_\_\_  
(Name of person signing bid)

\_\_\_\_\_  
(Company)



This paragraph shall not apply to the award of any contract subject to the provisions of sections forty-four A to forty-four J, inclusive, of chapter one hundred and forty-nine and every such contract shall continue to be awarded as provided therein. In cases of extreme emergency caused by enemy attack, sabotage or other such hostile actions or resulting from an imminent security threat explosion, fire, flood, earthquake, hurricane, tornado or other such catastrophe, an awarding authority may, without competitive bids and notwithstanding any general or specific law, award contracts otherwise subject to this paragraph to perform work and to purchase or rent materials and equipment, all as may be necessary for temporary repair and restoration to service of any and all public work in order to preserve the health and safety of persons or property; provided, that this exception shall not apply to any permanent reconstruction, alteration, remodeling or repair of any public work.

(b) Specifications for such contracts, and specifications for contracts awarded pursuant to the provisions of said sections forty-four A to forty-four L of said chapter one hundred and forty-nine, shall be written to provide for full competition for each item of material to be furnished under the contract; except, however, that said specifications may be otherwise written for sound reasons in the public interest stated in writing in the public records of the awarding authority or promptly given in writing by the awarding authority to anyone making a written request therefor, in either instance such writing to be prepared after reasonable investigation. Every such contract shall provide that an item equal to that named or described in the said specifications may be furnished; and an item shall be considered equal to the item so named or described if, in the opinion of the awarding authority: (1) it is at least equal in quality, durability, appearance, strength and design, (2) it will perform at least equally the function imposed by the general design for the public work being contracted for or the material being purchased, and (3) it conforms substantially, even with deviations, to the detailed requirements for the item in the said specifications. For each item of material the specifications shall provide for either a minimum of three named brands of material or a description of material which can be met by a minimum of three manufacturers or producers, and for the equal of any one of said name or described materials.

(c) The term "lowest responsible and eligible bidder" shall mean the bidder: (1) whose bid is the lowest of those bidders possessing the skill, ability and integrity necessary for the faithful performance of the work; (2) who shall certify, that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the work; (3) who shall certify that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; (4) who, where the provisions of section 8B of chapter 29 apply, shall have been determined to be qualified thereunder; and (5) who obtains within 10 days of the notification of contract award the security by bond required under section 29 of chapter

149; provided that for the purposes of this section the term "security by bond" shall mean the bond of a surety company qualified to do business under the laws of the commonwealth and satisfactory to the awarding authority; provided further, that if there is more than 1 surety company, the surety companies shall be jointly and severally liable.

(d) The provisions of this section shall not apply (1) to the extent that they prevent the approval of such specifications by any contributing federal agency, (2) to materials purchased under specifications of the state department of highways at prices established by the said department pursuant to advertisement and bidding in connection with work to be performed under the provisions of chapter eighty-one or chapter ninety, (3) to any transaction between the commonwealth and any of its political subdivisions or between the commonwealth and any public service corporation, and (4) to any contract of not more than twenty-five thousand dollars awarded by a governmental body, as defined by section two of chapter thirty B, in accordance with the provisions of section five of said chapter thirty B; and (5) to any contract solely for the purchase of material awarded by a governmental body, as defined by section 2 of chapter 30B, in accordance with section 5 of said chapter 30B.

(e) The word "material" as used in this section shall mean and include any article, assembly, system, or any component part thereof.



**CHAPTER 30. GENERAL PROVISIONS RELATIVE TO STATE DEPARTMENTS, COMMISSIONS, OFFICERS AND EMPLOYEES**

**Chapter 30: Section 39N Construction contracts; equitable adjustment in contract price for differing subsurface or latent physical conditions**

Section 39N. Every contract subject to section forty-four A of chapter one hundred and forty-nine or subject to section thirty-nine M of chapter thirty shall contain the following paragraph in its entirety and an awarding authority may adopt reasonable rules or regulations in conformity with that paragraph concerning the filing, investigation and settlement of such claims:

If, during the progress of the work, the contractor or the awarding authority discovers that the actual subsurface or latent physical conditions encountered at the site differ substantially or materially from those shown on the plans or indicated in the contract documents either the contractor or the contracting authority may request an equitable adjustment in the contract price of the contract applying to work affected by the differing site conditions. A request for such an adjustment shall be in writing and shall be delivered by the party making such claim to the other party as soon as possible after such conditions are discovered. Upon receipt of such a claim from a contractor, or upon its own initiative, the contracting authority shall make an investigation of such physical conditions, and, if they differ substantially or materially from those shown on the plans or indicated in the contract documents or from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the plans and contract documents and are of such a nature as to cause an increase or decrease in the cost of performance of the work or a change in the construction methods required for the performance of the work which results in an increase or decrease in the cost of the work, the contracting authority shall make an equitable adjustment in the contract price and the contract shall be modified in writing accordingly.

**CHAPTER 30. GENERAL PROVISIONS RELATIVE TO STATE DEPARTMENTS, COMMISSIONS, OFFICERS AND EMPLOYEES**

**Chapter 30: Section 39O Contracts for construction and materials; suspension, delay or interruption due to order of awarding authority; adjustment in contract price; written claim**

Section 39O. Every contract subject to the provisions of section thirty-nine M of this chapter or subject to section forty-four A of chapter one hundred forty-nine shall contain the following provisions (a) and (b) in their entirety and, in the event a suspension, delay, interruption or failure to act of the awarding authority increases the cost of performance to any subcontractor, that subcontractor shall have the same rights against the general contractor for payment for an increase in the cost of his performance as provisions (a) and (b) give the general contractor against the awarding authority, but nothing in provisions (a) and (b) shall in any way change, modify or alter any other rights which the general contractor or the subcontractor may have against each other.

(a) The awarding authority may order the general contractor in writing to suspend, delay, or interrupt all or any part of the work for such period of time as it may determine to be appropriate for the convenience of the awarding authority; provided however, that if there is a suspension, delay or interruption for fifteen days or more or due to a failure of the awarding authority to act within the time specified in this contract, the awarding authority shall make an adjustment in the contract price for any increase in the cost of performance of this contract but shall not include any profit to the general contractor on such increase; and provided further, that the awarding authority shall not make any adjustment in the contract price under this provision for any suspension, delay, interruption or failure to act to the extent that such is due to any cause for which this contract provides for an equitable adjustment of the contract price under any other contract provisions.

(b) The general contractor must submit the amount of a claim under provision (a) to the awarding authority in writing as soon as practicable after the end of the suspension, delay, interruption or failure to act and, in any event, not later than the date of final payment under this contract and, except for costs due to a suspension order, the awarding authority shall not approve any costs in the claim incurred more than twenty days before the general contractor notified the awarding authority in writing of the act or failure to act involved in the claim.

**CHAPTER 30. GENERAL PROVISIONS RELATIVE TO STATE DEPARTMENTS,  
COMMISSIONS, OFFICERS AND EMPLOYEES**

**Chapter 30: Section 39P Contracts for construction and materials; awarding  
authority's decisions on interpretation of specifications, etc.; time limit; notice**

Section 39P. Every contract subject to section thirty-nine M of this chapter or section forty-four A of chapter one hundred forty-nine which requires the awarding authority, any official, its architect or engineer to make a decision on interpretation of the specifications, approval of equipment, material or any other approval, or progress of the work, shall require that the decision be made promptly and, in any event, no later than thirty days after the written submission for decision; but if such decision requires extended investigation and study, the awarding authority, the official, architect or engineer shall, within thirty days after the receipt of the submission, give the party making the submission written notice of the reasons why the decision cannot be made within the thirty day period and the date by which the decision will be made.

**CHAPTER 30. GENERAL PROVISIONS RELATIVE TO STATE DEPARTMENTS,  
COMMISSIONS, OFFICERS AND EMPLOYEES**

**Chapter 30: Section 39R Definitions; contract provisions; management and  
financial statements; enforcement**

Section 39R. (a) The words defined herein shall have the meaning stated below whenever they appear in this section:

(1) "Contractor" means any person, corporation, partnership, joint venture, sole proprietorship, or other entity awarded a contract pursuant to sections thirty-eight A 1/2 to thirty-eight O, inclusive, of chapter seven and any contract awarded or executed pursuant to section eleven C of chapter twenty-five A, section thirty-nine M of chapter thirty, or sections forty-four A to forty-four H, inclusive, of chapter one hundred and forty-nine, which is for an amount or estimated amount greater than one hundred thousand dollars.

(2) "Contract" means any contract awarded or executed pursuant to sections thirty-eight A 1/2 to thirty-eight O, inclusive, of chapter seven and any contract awarded or executed pursuant to section eleven C of chapter twenty-five A, section thirty-nine M of chapter thirty, or sections forty-four A through forty-four H, inclusive, of chapter one hundred and forty-nine, which is for amount or estimated amount greater than one hundred thousand dollars.

(3) "Records" means books of original entry, accounts, checks, bank statements and all other banking documents, correspondence, memoranda, invoices, computer printouts, tapes, discs, papers and other documents or transcribed information of any type, whether expressed in ordinary or machine language.

(4) "Independent Certified Public Accountant" means a person duly registered in good standing and entitled to practice as a certified public accountant under the laws of the place of his residence or principal office and who is in fact independent. In determining whether an accountant is independent with respect to a particular person, appropriate consideration should be given to all relationships between the accountant and that person or any affiliate thereof. Determination of an accountant's independence shall not be confined to the relationships existing in connection with the filing of reports with the awarding authority.

(5) "Audit", when used in regard to financial statements, means an examination of records by an independent certified public accountant in accordance with generally accepted accounting principles and auditing standards for the purpose of expressing a *certified* opinion thereon, or, in the alternative, a qualified opinion or a declination to express an opinion for stated reasons.

(6) "Accountant's Report", when used in regard to financial statements, means a document in which an independent certified public accountant indicates the scope of the audit which he has made and sets forth his opinion regarding the financial statements taken as a whole with a listing of noted exceptions and qualifications, or an assertion to the effect that an overall opinion cannot be expressed. When an overall opinion cannot be expressed the reason therefor shall be stated. An accountant's report shall include as a part thereof a signed statement by the responsible corporate officer attesting that management has fully disclosed all material facts to the independent certified public accountant, and that the audited financial statement is a true and complete statement of the financial condition of the contractor.

(7) "Management", when used herein, means the chief executive officers, partners, principals or other person or persons primarily responsible for the financial and operational policies and practices of the contractor.

(8) Accounting terms, unless otherwise defined herein, shall have a meaning in accordance with generally accepted accounting principles and auditing standards.

(b) Subsection (a)(2) hereof notwithstanding, every agreement or contract awarded or executed pursuant to sections thirty-eight A 1/2 to thirty-eight O, inclusive, of chapter seven, or eleven C of chapter twenty-five A, and pursuant to section thirty-nine M of chapter thirty or to section forty-four A through H, inclusive, of chapter one hundred and forty-nine, shall provide that:

(1) The contractor shall make, and keep for at least six years after final payment, books, records, and accounts which in reasonable detail accurately and fairly reflect the transactions and dispositions of the contractor, and

(2) until the expiration of six years after final payment, the office of inspector general, and the commissioner of capital asset management and maintenance shall have the right to examine any books, documents, papers or records of the contractor or of his subcontractors that directly pertain to, and involve transactions relating to, the contractor or his subcontractors, and

(3) if the agreement is a contract as defined herein, the contractor shall describe any change in the method of maintaining records or recording transactions which materially affect any statements filed with the awarding authority, including in his description the date of the change and reasons therefor, and shall accompany said description with a letter from the contractor's independent certified public accountant approving or otherwise commenting on the changes, and

(4) if the agreement is a contract as defined herein, the contractor has filed a statement of management on internal accounting controls as set forth in paragraph (c) below prior to the execution of the contract, and



(5) if the agreement is a contract as defined herein, the contractor has filed prior to the execution of the contracts and will continue to file annually, an audited financial statement for the most recent completed fiscal year as set forth in paragraph (d) below.

(c) Every contractor awarded a contract shall file with the awarding authority a statement of management as to whether the system of internal accounting controls of the contractor and its subsidiaries reasonably assures that:

(1) transactions are executed in accordance with management's general and specific authorization;

(2) transactions are recorded as necessary

i. to permit preparation of financial statements in conformity with generally accepted accounting principles, and

ii. to maintain accountability for assets;

(3) access to assets is permitted only in accordance with management's general or specific authorization; and

(4) the recorded accountability for assets is compared with the existing assets at reasonable intervals and appropriate action was taken with respect to any difference.

Every contractor awarded a contract shall also file with the awarding authority a statement prepared and signed by an independent certified public accountant, stating that he has examined the statement of management on internal accounting controls, and expressing an opinion as to

(1) whether the representations of management in response to this paragraph and paragraph (b) above are consistent with the result of management's evaluation of the system of internal accounting controls; and

(2) whether such representations of management are, in addition, reasonable with respect to transactions and assets in amounts which would be material when measured in relation to the applicant's financial statements.

(d) Every contractor awarded a contract by the commonwealth or by any political subdivision thereof shall annually file with the commissioner of capital asset management and maintenance during the term of the contract a financial statement prepared by an independent certified public accountant on the basis of an audit by such accountant. The final statement filed shall include the date of final payment. All statements shall be accompanied by an accountant's report. Such statements shall be made available to the awarding authority upon request.

(e) The office of inspector general, the commissioner of capital asset management and maintenance and any other awarding authority shall enforce the provisions of this section. The commissioner of capital asset management and maintenance may after providing an opportunity for the inspector general and other interested parties to comment, promulgate pursuant to the provisions of chapter thirty A such rules, regulations and guidelines as are necessary to effectuate the purposes of this section. Such rules, regulations and guidelines may be applicable to all awarding authorities. A contractor's failure to satisfy any of the requirements of this section may be grounds for debarment pursuant to section forty-four C of chapter one hundred and forty-nine.

(f) Records and statements required to be made, kept or filed under the provisions of this section shall not be public records as defined in section seven of chapter four and shall not be open to public inspection; provided, however, that such records and statements shall be made available pursuant to the provisions of clause (2) of paragraph (b).

**CHAPTER 82. THE LAYING OUT, ALTERATION, RELOCATION AND DISCONTINUANCE OF PUBLIC WAYS, AND SPECIFIC REPAIRS THEREON**

**EXCAVATIONS; NOTICES; PENALTIES**

**Chapter 82: Section 40 Definitions**

Section 40. The following words, as used in this section and sections 40A to 40E, inclusive, shall have the following meanings:—

“Company”, natural gas pipeline company, petroleum or petroleum products pipeline company, public utility company, cable television company, and municipal utility company or department that supply gas, electricity, telephone, communication or cable television services or private water companies within the city or town where such excavation is to be made.

“Description of excavation location”, such description shall include the name of the city or town, street, way, or route number where appropriate, the name of the streets at the nearest intersection to the excavation, the number of the buildings closest to the excavation or any other description, including landmarks, utility pole numbers or other information which will accurately define the location of the excavation.

“Emergency”, a condition in which the safety of the public is in imminent danger, such as a threat to life or health or where immediate correction is required to maintain or restore essential public utility service.

“Excavation”, an operation for the purpose of movement or removal of earth, rock or the materials in the ground including, but not limited to, digging, blasting, augering, backfilling, test boring, drilling, pile driving, grading, plowing in, hammering, pulling in, jacking in, trenching, tunneling and demolition of structures, excluding excavation by tools manipulated only by human power for gardening purposes and use of blasting for quarrying purposes.

“Excavator”, any entity including, but not limited to, a person, partnership, joint venture, trust, corporation, association, public utility, company or state or local government body which performs excavation operations.

“Premark”, to delineate the general scope of the excavation or boring on the paved surface of the ground using white paint, or stakes or other suitable white markings on nonpaved surfaces. No premarking shall be acceptable if such marks can reasonably interfere with traffic or pedestrian control or are misleading to the general public. Premarking shall not be required of any continuous excavation that is over 500 feet in length.

“Safety zone”, a zone designated on the surface by the use of standard color-coded markings which contains the width of the facilities plus not more than 18 inches on each side.

“Standard color-coded markings”, red - electric power lines, cables, conduit or light cables; yellow - gas, oil, street petroleum, or other gaseous materials; orange - communications cables or conduit, alarm or signal lines; blue - water, irrigation and slurry lines; green - sewer and drain lines; white - premark of proposed excavation.

“System”, the underground plant damage prevention system as defined in section 76D of chapter 164.

### **Chapter 82: Section 40A Excavations; notice**

Section 40A. No excavator installing a new facility or an addition to an existing facility or the relay or repair of an existing facility shall, except in an emergency, make an excavation, in any public or private way, any company right-of-way or easement or any public or privately owned land or way, unless at least 72 hours, exclusive of Saturdays, Sundays and legal holidays but not more than 30 days before the proposed excavation is to be made, such excavator has premarked not more than 500 feet of the proposed excavation and given an initial notice to the system. Such initial notice shall set forth a description of the excavation location in the manner as herein defined. In addition, such initial notice shall indicate whether any such excavation will involve blasting and, if so, the date and the location at which such blasting is to occur.

The notice requirements shall be waived in an emergency as defined herein; provided, however, that before such excavation begins or during a life-threatening emergency, notification shall be given to the system and the initial point of boring or excavation shall be premarked. The excavator shall ensure that the underground facilities of the utilities in the area of such excavation shall not be damaged or jeopardized.

In no event shall any excavation by blasting take place unless notice thereof, either in the initial notice or a subsequent notice accurately specifying the date and location of such blasting shall have been given and received at least 72 hours in advance, except in the case of an unanticipated obstruction requiring blasting when such notice shall be not less than four hours prior to such blasting. If any such notice cannot be given as aforesaid because of an emergency requiring blasting, it shall be given as soon as may be practicable but before any explosives are discharged.

### **Chapter 82: Section 40B Designation of location of underground facilities**

Section 40B. Within 72 hours, exclusive of Saturdays, Sundays and legal holidays, from the time the initial notice is received by the system or at such time as the company and the excavator agree, such company shall respond to the initial notice or subsequent notice by designating the location of the underground facilities within 15 feet in any direction of

the premarking so that the existing facilities are to be found within a safety zone. Such safety zone shall be so designated by the use of standard color-coded markings. The providing of such designation by the company shall constitute prima facie evidence of an exercise of reasonable precaution by the company as required by this section; provided, however, that in the event that the excavator has given notice as aforesaid at a location at which because of the length of excavation the company cannot reasonably designate the entire location of its facilities within such 72 hour period, then such excavator shall identify for the company that portion of the excavation which is to be first made and the company shall designate the location of its facilities in such portion within 72 hours and shall designate the location of its facilities in the remaining portion of the location within a reasonable time thereafter. When an emergency notification has been given to the system, the company shall make every attempt to designate its facilities as promptly as possible.

**Chapter 82: Section 40C Excavator's responsibility to maintain designation markings; damage caused by excavator**

Section 40C. After a company has designated the location of its facilities at the location in accordance with section 40B, the excavator shall be responsible for maintaining the designation markings at such locations, unless such excavator requests remarking at the location due to the obliteration, destruction or other removal of such markings. The company shall then remark such location within 24 hours following receipt of such request.

When excavating in close proximity to the underground facilities of any company when such facilities are to be exposed, non-mechanical means shall be employed, as necessary, to avoid damage in locating such facility and any further excavation shall be performed employing reasonable precautions to avoid damage to any underground facilities including, but not limited to, any substantial weakening of structural or lateral support of such facilities, penetration or destruction of any pipe, main, wire or conduit or the protective coating thereof, or damage to any pipe, main, wire or conduit.

If any damage to such pipe, main, wire or conduit or its protective coating occurs, the company shall be notified immediately by the excavator responsible for causing such damage.

The making of an excavation without providing the notice required by section 40A with respect to any proposed excavation which results in any damage to a pipe, main, wire or conduit, or its protective coating, shall be prima facie evidence in any legal or administrative proceeding that such damage was caused by the negligence of such person.

**Chapter 82: Section 40D Local laws requiring excavation permits; public ways**

Section 40D. Nothing in this section shall affect or impair local ordinances or by-laws requiring a permit to be obtained before excavation in a public way or on private property; but notwithstanding any general or special law, ordinance or by-law to the contrary, to the extent that any permit issued under the provisions of the state building code or state fire code requires excavation by an excavator on a public way or on private property, the permit shall not be valid unless the excavator notifies the system as required pursuant to sections 40 and 40A, before the commencement of the excavation, and has complied with the permitting requirements of chapter 82A.

**Chapter 82: Section 40D Section 40E Violations of Secs. 40A to 40E; punishment**

Section 40E. Any person or company found by the department of telecommunications and energy, after a hearing, to have violated any provision of sections 40A to 40E, inclusive, shall be fined \$1,000 for the first offense and not less than \$5,000 nor more than \$10,000 for any subsequent offense within 12 consecutive months as set forth by the rules of said department; provided, however, that nothing herein shall be construed to require forfeiture of any penal sum by a state or local government body for violation of section 40A or 40C; and provided, further, that nothing herein shall be construed to require the forfeiture of any penal sum by a residential property owner for the failure to premark for an excavation on such person's residential property.

## **Davis Bacon Act Requirements**

All construction projects are subject to the Davis Bacon wage rate requirements and must include the appropriate sections of the following document in its entirety in the contract documents.

**The vast majority of SRF projects will be bid by Governmental Entities (i.e., Cities, Towns, Authorities, Water Districts, Wastewater Districts). These projects must include the following language in construction contracts:**

**I.3. Contract and Subcontract Provisions**

**I.4. Contract Provisions for Contracts in Excess of \$100,000 (if applicable)**

**I.5. Compliance Verification**

**This language may be found on pages DB-3-DB-11.**

**In certain cases, SRF projects may be bid by non-Governmental Entities (i.e., private water companies, private PWSs, etc.). These projects must include the following language in construction contracts:**

**II.3. Contract and Subcontract Provisions**

**II.4. Contract Provisions for Contracts in Excess of \$100,000 (if applicable)**

**II.5. Compliance Verification**

**This language may be found on pages DB-11-DB-21**

### **Preamble**

With respect to the Clean Water and Safe Drinking Water State revolving Funds, EPA provides capitalization grants to each State which in turn provides subgrants or loans to eligible entities within the State. Typically, the subrecipients are municipal or other local governmental entities that manage the funds. For these types of recipients, the provisions set forth under Roman Numeral I, below, shall apply. Although EPA and the State remain responsible for ensuring subrecipients' compliance with the wage rate requirements set forth herein, those subrecipients shall have the primary responsibility to maintain payroll records as described in Section 3(ii)(A), below and for compliance as described in Section I-5.

Occasionally, the subrecipient may be a private for profit or not for profit entity. For these types of recipients, the provisions set forth in Roman Numeral II, below, shall apply. Although EPA and the State remain responsible for ensuring subrecipients' compliance with the wage rate requirements set forth herein, those subrecipients shall have the primary responsibility to maintain payroll records as described in Section II-3(ii)(A), below and for compliance as described in Section II-5.

### **I. Requirements For Subrecipients That Are Governmental Entities:**

The following terms and conditions specify how recipients will assist EPA in meeting its Davis-Bacon (DB) responsibilities when DB applies to EPA awards of financial assistance with respect to State recipients and subrecipients that are governmental entities. If a subrecipient has

questions regarding when DB applies, obtaining the correct DB wage determinations, DB provisions, or compliance monitoring, it may contact the State recipient. If a State recipient needs guidance, the recipient may contact Valerie Marshall at EPA Region 1 (617-918-1674) for guidance. The recipient or subrecipient may also obtain additional guidance from DOL's web site at <https://www.dol.gov/whd/govcontracts/dbra.htm>

## **1. Applicability of the Davis- Bacon (DB) prevailing wage requirements.**

DB prevailing wage requirements apply to the construction, alteration, and repair of treatment works carried out in whole or in part with assistance made available by a State water pollution control revolving fund and to any construction project carried out in whole or in part by assistance made available by a drinking water treatment revolving loan fund. If a subrecipient encounters a unique situation at a site that presents uncertainties regarding DB applicability, the subrecipient must discuss the situation with the recipient State before authorizing work on that site.

## **2. Obtaining Wage Determinations.**

(a) Subrecipients shall obtain the wage determination for the locality in which a covered activity subject to DB will take place prior to issuing requests for bids, proposals, quotes or other methods for soliciting contracts (solicitation) for activities subject to DB. These wage determinations shall be incorporated into solicitations and any subsequent contracts. Prime contracts must contain a provision requiring that subcontractors follow the wage determination incorporated into the prime contract.

(i) While the solicitation remains open, the subrecipient shall monitor <https://sam.gov/> weekly to ensure that the wage determination contained in the solicitation remains current. The subrecipients shall amend the solicitation if DOL issues a modification more than 10 days prior to the closing date (i.e. bid opening) for the solicitation. If DOL modifies or supersedes the applicable wage determination less than 10 days prior to the closing date, the subrecipients may request a finding from the State recipient that there is not a reasonable time to notify interested contractors of the modification of the wage determination. The State recipient will provide a report of its findings to the subrecipient.

(ii) If the subrecipient does not award the contract within 90 days of the closure of the solicitation, any modifications or supersedes DOL makes to the wage determination contained in the solicitation shall be effective unless the State recipient, at the request of the subrecipient, obtains an extension of the 90 day period from DOL pursuant to 29 CFR 1.6(c)(3)(iv). The subrecipient shall monitor <https://sam.gov/> on a weekly basis if it does not award the contract within 90 days of closure of the solicitation to ensure that wage determinations contained in the solicitation remain current.

(b) If the subrecipient carries out activity subject to DB by issuing a task order, work assignment or similar instrument to an existing contractor (ordering instrument) rather than by publishing a solicitation, the subrecipient shall insert the appropriate DOL wage determination from <https://sam.gov/> into the ordering instrument.



(c) Subrecipients shall review all subcontracts subject to DB entered into by prime contractors to verify that the prime contractor has required its subcontractors to include the applicable wage determinations.

(d) As provided in 29 CFR 1.6(f), DOL may issue a revised wage determination applicable to a subrecipient's contract after the award of a contract or the issuance of an ordering instrument if DOL determines that the subrecipient has failed to incorporate a wage determination or has used a wage determination that clearly does not apply to the contract or ordering instrument. If this occurs, the subrecipient shall either terminate the contract or ordering instrument and issue a revised solicitation or ordering instrument or incorporate DOL's wage determination retroactive to the beginning of the contract or ordering instrument by change order. The subrecipient's contractor must be compensated for any increases in wages resulting from the use of DOL's revised wage determination.

### **3. Contract and Subcontract provisions.**

(a) The Recipient shall insure that the subrecipient(s) shall insert in full in any contract in excess of \$2,000 which is entered into for the actual construction, alteration and/or repair, including painting and decorating, of a treatment work under the CWSRF or a construction project under the DWSRF financed in whole or in part from Federal funds or in accordance with guarantees of a Federal agency or financed from funds obtained by pledge of any contract of a Federal agency to make a loan, grant or annual contribution (except where a different meaning is expressly indicated), and which is subject to the labor standards provisions of any of the acts listed in § 5.1 or the FY 2012 Appropriations Act, the following clauses:

#### **(1) Minimum wages.**

(i) All laborers and mechanics employed or working upon the site of the work will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (a)(1)(iv) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in §5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein:

Provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph (a)(1)(ii) of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers. Subrecipients may obtain wage determinations from the U.S. Department of Labor's web site, <https://sam.gov/>.

(ii)(A) The subrecipient(s), on behalf of EPA, shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The State award official shall approve a request for an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

- (1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and
- (2) The classification is utilized in the area by the construction industry; and
- (3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(B) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the subrecipient(s) agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), documentation of the action taken and the request, including the local wage determination shall be sent by the subrecipient (s) to the State award official. The State award official will transmit the request, to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210 and to the EPA DB Regional Coordinator concurrently. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification request within 30 days of receipt and so advise the State award official or will notify the State award official within the 30-day period that additional time is necessary.

(C) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the subrecipient(s) do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the award official shall refer the request and the local wage determination, including the views of all interested parties and the recommendation of the State award official, to the Administrator for determination. The request shall be sent to the EPA DB Regional Coordinator concurrently. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt of the request and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (a)(1)(ii)(B) or (C) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

(2) Withholding. The subrecipient(s), shall upon written request of the EPA Award Official or an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the (Agency) may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

(3) Payrolls and basic records.

(i) Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(ii)(A) The contractor shall submit weekly, for each week in which any contract work is performed, a copy of all payrolls to the subrecipient, that is, the entity that receives the sub-grant or loan from the State capitalization grant recipient. Such documentation shall be available on request of the State recipient or EPA. As to each payroll copy received, the subrecipient shall provide written confirmation in a form satisfactory to the State indicating whether or not the project is in compliance with the requirements of 29 CFR 5.5(a)(1) based on the most recent payroll copies for the specified week. The payrolls shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on the weekly payrolls. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <https://www.dol.gov/whd/forms/wh347.pdf> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the subrecipient(s) for transmission to the State or EPA if requested by EPA, the State, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the subrecipient(s).

(B) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

- (1) That the payroll for the payroll period contains the information required to be provided under § 5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under § 5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;
- (2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;
- (3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph (a)(3)(ii)(B) of this section.

(D) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

(iii) The contractor or subcontractor shall make the records required under paragraph (a)(3)(i) of this section available for inspection, copying, or transcription by authorized representatives of the State, EPA or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the Federal agency or State may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

(4) Apprentices and trainees--

(i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

- (5) Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.
- (6) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR 5.5(a)(1) through (10) and such other clauses as the EPA determines may be appropriate, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.
- (7) Contract termination; debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.
- (8) Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.
- (9) Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29

CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and Subrecipient(s), State, EPA, the U.S. Department of Labor, or the employees or their representatives.

(10) Certification of eligibility.

(i) By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

**4. Contract Provision for Contracts in Excess of \$100,000.**

(a) Contract Work Hours and Safety Standards Act. The subrecipient shall insert the following clauses set forth in paragraphs (a)(1), (2), (3), and (4) of this section in full in any contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by Item 3, above or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

(1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (a)(1) of this section the contractor and any subcontractor responsible therefore shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (a)(1) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (a)(1) of this section.

(3) Withholding for unpaid wages and liquidated damages. The subrecipient, upon written request of the EPA Award Official or an authorized representative of the Department of Labor, shall withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other

Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b)(2) of this section.

(4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (a)(1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (a)(1) through (4) of this section.

(b) In addition to the clauses contained in Item 3, above, in any contract subject only to the Contract Work Hours and Safety Standards Act and not to any of the other statutes cited in 29 CFR 5.1, the Subrecipient shall insert a clause requiring that the contractor or subcontractor shall maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the contract for all laborers and mechanics, including guards and watchmen, working on the contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. Further, the Subrecipient shall insert in any such contract a clause providing that the records to be maintained under this paragraph shall be made available by the contractor or subcontractor for inspection, copying, or transcription by authorized representatives of the (write the name of agency) and the Department of Labor, and the contractor or subcontractor will permit such representatives to interview employees during working hours on the job.

## 5. Compliance Verification

(a) The subrecipient shall periodically interview a sufficient number of employees entitled to DB prevailing wages (covered employees) to verify that contractors or subcontractors are paying the appropriate wage rates. As provided in 29 CFR 5.6(a)(6), all interviews must be conducted in confidence. The subrecipient must use Standard Form 1445 (SF 1445) or equivalent documentation to memorialize the interviews. Copies of the SF 1445 are available from EPA on request.

(b) The subrecipient shall establish and follow an interview schedule based on its assessment of the risks of noncompliance with DB posed by contractors or subcontractors and the duration of the contract or subcontract. At a minimum, the subrecipient should conduct interviews with a representative group of covered employees within two weeks of each contractor or subcontractor's submission of its initial weekly payroll data and two weeks prior to the estimated completion date for the contract or subcontract. Subrecipients must conduct more frequent interviews if the initial interviews or other information indicates that there is a risk that the contractor or subcontractor is not complying with DB. Subrecipients shall immediately conduct necessary interviews in response to an alleged violation of the prevailing wage requirements. All interviews shall be conducted in confidence.

(c) The subrecipient shall periodically conduct spot checks of a representative sample of weekly payroll data to verify that contractors or subcontractors are paying the appropriate wage rates. The subrecipient shall establish and follow a spot check schedule based on its



assessment of the risks of noncompliance with DB posed by contractors or subcontractors and the duration of the contract or subcontract. At a minimum, if practicable, the subrecipient should spot check payroll data within two weeks of each contractor or subcontractor's submission of its initial payroll data and two weeks prior to the completion date the contract or subcontract. Subrecipients must conduct more frequent spot checks if the initial spot check or other information indicates that there is a risk that the contractor or subcontractor is not complying with DB. In addition, during the examinations the subrecipient shall verify evidence of fringe benefit plans and payments thereunder by contractors and subcontractors who claim credit for fringe benefit contributions.

(d) The subrecipient shall periodically review contractors and subcontractors use of apprentices and trainees to verify registration and certification with respect to apprenticeship and training programs approved by either the U.S Department of Labor or a state, as appropriate, and that contractors and subcontractors are not using disproportionate numbers of, laborers, trainees and apprentices. These reviews shall be conducted in accordance with the schedules for spot checks and interviews described in Item 5(b) and (c) above.

(e) Subrecipients must immediately report potential violations of the DB prevailing wage requirements to the EPA DB contact listed above and to the appropriate DOL Wage and Hour District Office listed at [https://www.dol.gov/whd/whd\\_district\\_offices.pdf](https://www.dol.gov/whd/whd_district_offices.pdf).

## II. Requirements For Subrecipients That Are Not Governmental Entities

The following terms and conditions specify how recipients will assist EPA in meeting its DB responsibilities when DB applies to EPA awards of financial assistance with respect to subrecipients that are not governmental entities. If a subrecipient has questions regarding when DB applies, obtaining the correct DB wage determinations, DB provisions, or compliance monitoring, it may contact the State recipient for guidance. If a State recipient needs guidance, the recipient may contact Valerie Marshall at EPA Region 1 (617-918-1674) for guidance. The recipient or subrecipient may also obtain additional guidance from DOL's web site at <https://www.dol.gov/whd/govcontracts/dbra.htm>

**Under these terms and conditions, the subrecipient must submit its proposed DB wage determinations to the State recipient for approval prior to including the wage determination in any solicitation, contract task orders, work assignments, or similar instruments to existing contractors.**

### 1. Applicability of the Davis- Bacon (DB) prevailing wage requirements.

DB prevailing wage requirements apply to the construction, alteration, and repair of treatment works carried out in whole or in part with assistance made available by a State water pollution control revolving fund and to any construction project carried out in whole or in part by assistance made available by a drinking water treatment revolving loan fund. If a subrecipient encounters a unique situation at a site that presents uncertainties regarding DB applicability, the subrecipient must discuss the situation with the recipient State before authorizing work on that site.

### 2. Obtaining Wage Determinations.

(a) Subrecipients must obtain proposed wage determinations for specific localities at <https://sam.gov/>. After the Subrecipient obtains its proposed wage determination, it must submit the wage determination to (insert contact information for State recipient DB point of contact for wage determination) for approval prior to inserting the wage determination into a solicitation, contract or issuing task orders, work assignments or similar instruments to existing contractors (ordering instruments unless subsequently directed otherwise by the State recipient Award Official).

(b) Subrecipients shall obtain the wage determination for the locality in which a covered activity subject to DB will take place prior to issuing requests for bids, proposals, quotes or other methods for soliciting contracts (solicitation) for activities subject to DB. These wage determinations shall be incorporated into solicitations and any subsequent contracts. Prime contracts must contain a provision requiring that subcontractors follow the wage determination incorporated into the prime contract.

(i) While the solicitation remains open, the subrecipient shall monitor <https://sam.gov/> on a weekly basis to ensure that the wage determination contained in the solicitation remains current. The subrecipients shall amend the solicitation if DOL issues a modification more than 10 days prior to the closing date (i.e. bid opening) for the solicitation. If DOL modifies or supersedes the applicable wage determination less than 10 days prior to the closing date, the subrecipients may request a finding from the State recipient that there is not a reasonable time to notify interested contractors of the modification of the wage determination. The State recipient will provide a report of its findings to the subrecipient.

(ii) If the subrecipient does not award the contract within 90 days of the closure of the solicitation, any modifications or supersedes DOL makes to the wage determination contained in the solicitation shall be effective unless the State recipient, at the request of the subrecipient, obtains an extension of the 90 day period from DOL pursuant to 29 CFR 1.6(c)(3)(iv). The subrecipient shall monitor <https://sam.gov/> on a weekly basis if it does not award the contract within 90 days of closure of the solicitation to ensure that wage determinations contained in the solicitation remain current.

(c) If the subrecipient carries out activity subject to DB by issuing a task order, work assignment or similar instrument to an existing contractor (ordering instrument) rather than by publishing a solicitation, the subrecipient shall insert the appropriate DOL wage determination from <https://sam.gov/> into the ordering instrument.

(d) Subrecipients shall review all subcontracts subject to DB entered into by prime contractors to verify that the prime contractor has required its subcontractors to include the applicable wage determinations.

(e) As provided in 29 CFR 1.6(f), DOL may issue a revised wage determination applicable to a subrecipient's contract after the award of a contract or the issuance of an ordering instrument if DOL determines that the subrecipient has failed to incorporate a wage determination or has used a wage determination that clearly does not apply to the contract or ordering instrument. If this occurs, the subrecipient shall either terminate the contract or ordering instrument and issue a revised solicitation or ordering instrument or incorporate DOL's wage determination retroactive to the beginning of the contract or ordering instrument by change order. The subrecipient's contractor must be compensated for any increases in wages resulting from the use of DOL's revised wage determination.

### 3. Contract and Subcontract provisions.

(a) The Recipient shall insure that the subrecipient(s) shall insert in full in any contract in excess of \$2,000 which is entered into for the actual construction, alteration and/or repair, including painting and decorating, of a treatment work under the CWSRF or a construction project under the DWSRF financed in whole or in part from Federal funds or in accordance with guarantees of a Federal agency or financed from funds obtained by pledge of any contract of a Federal agency to make a loan, grant or annual contribution (except where a different meaning is expressly indicated), and which is subject to the labor standards provisions of any of the acts listed in § 5.1 or the FY 2011 Full-Year Continuing Appropriation, the following clauses:

(1) Minimum wages.

(i) All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3) ), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (a)(1)(iv) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in §5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph (a)(1)(ii) of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers. Subrecipients may obtain wage determinations from the U.S. Department of Labor's web site, <https://sam.gov/>.

(ii)(A) The subrecipient(s), on behalf of EPA, shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The State award official shall approve a request for an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(2) The classification is utilized in the area by the construction industry; and

(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(B) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the subrecipient(s) agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), documentation of the action taken and the request, including the local wage determination shall be sent by the subrecipient(s) to the State award official. The State award official will transmit the report, to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210 and to the EPA DB Regional Coordinator concurrently. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification request within 30 days of receipt and so advise the State award official or will notify the State award official within the 30-day period that additional time is necessary.

(C) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the and the subrecipient(s) do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the award official shall refer the request, and the local wage determination, including the views of all interested parties and the recommendation of the State award official, to the Administrator for determination. The request shall be sent to the EPA Regional Coordinator concurrently. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt of the request and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (a)(1)(ii)(B) or (C) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

(2) Withholding. The subrecipient(s) shall upon written request of the EPA Award Official or an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the (Agency) may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

(3) Payrolls and basic records.

(i) Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(ii)(A) The contractor shall submit weekly, for each week in which any contract work is performed, a copy of all payrolls to the subrecipient, that is, the entity that receives the sub-grant or loan from the State capitalization grant recipient. Such documentation shall be available on request of the State recipient or EPA. As to each payroll copy received, the subrecipient shall provide written confirmation in a form satisfactory to the State indicating whether or not the project is in compliance with the requirements of 29 CFR 5.5(a)(1) based on the most recent payroll copies for the specified week. The payrolls shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on the weekly payrolls. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is

available for this purpose from the Wage and Hour Division Web site at <https://www.dol.gov/whd/forms/wh347.pdf> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the subrecipient(s) for transmission to the State or EPA if requested by EPA, the State, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the subrecipient(s).

(B) Each payroll submitted shall be accompanied by a “Statement of Compliance,” signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

- (1) That the payroll for the payroll period contains the information required to be provided under § 5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under § 5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;
- (2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;
- (3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the “Statement of Compliance” required by paragraph (a)(3)(ii)(B) of this section.

(D) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

(iii) The contractor or subcontractor shall make the records required under paragraph (a)(3)(i) of this section available for inspection, copying, or transcription by authorized representatives of the State, EPA or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the Federal agency or State may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

(4) Apprentices and trainees--

(i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of

fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

(5) Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

(6) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR 5.5(a)(1) through (10) and such other clauses as the EPA determines may be appropriate, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

(7) Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

(8) Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

(9) Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and Subrecipient(s), State, EPA, the U.S. Department of Labor, or the employees or their representatives.

(10) Certification of eligibility.

(i) By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).



(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

#### **4. Contract Provision for Contracts in Excess of \$100,000.**

(a) Contract Work Hours and Safety Standards Act. The subrecipient shall insert the following clauses set forth in paragraphs (a)(1), (2), (3), and (4) of this section in full in any contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by Item 3, above or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

- (1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.
- (2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (b)(1) of this section the contractor and any subcontractor responsible therefore shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (b)(1) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (b)(1) of this section.
- (3) Withholding for unpaid wages and liquidated damages. The subrecipient shall upon the request of the EPA Award Official or an authorized representative of the Department of Labor, withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b)(2) of this section.
- (4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (b)(1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (b)(1) through (4) of this section.

(c) In addition to the clauses contained in Item 3, above, in any contract subject only to the Contract Work Hours and Safety Standards Act and not to any of the other statutes cited in 29 CFR 5.1, the Subrecipient shall insert a clause requiring that the contractor or subcontractor shall maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the contract for all laborers and mechanics, including guards and watchmen, working on the contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. Further, the Subrecipient shall insert in any such contract a clause providing that the records to be maintained under this paragraph shall be made available by the contractor or subcontractor for inspection, copying, or transcription by authorized representatives of the (write the name of agency) and the Department of Labor, and the contractor or subcontractor will permit such representatives to interview employees during working hours on the job.

## 5. Compliance Verification

(a). The subrecipient shall periodically interview a sufficient number of employees entitled to DB prevailing wages (covered employees) to verify that contractors or subcontractors are paying the appropriate wage rates. As provided in 29 CFR 5.6(a)(6), all interviews must be conducted in confidence. The subrecipient must use Standard Form 1445 (SF 1445) or equivalent documentation to memorialize the interviews. Copies of the SF 1445 are available from EPA on request.

(b) The subrecipient shall establish and follow an interview schedule based on its assessment of the risks of noncompliance with DB posed by contractors or subcontractors and the duration of the contract or subcontract. At a minimum, the subrecipient should conduct interviews with a representative group of covered employees within two weeks of each contractor or subcontractor's submission of its initial weekly payroll data and two weeks prior to the estimated completion date for the contract or subcontract. Subrecipients must conduct more frequent interviews if the initial interviews or other information indicates that there is a risk that the contractor or subcontractor is not complying with DB. Subrecipients shall immediately conduct necessary interviews in response to an alleged violation of the prevailing wage requirements. All interviews shall be conducted in confidence.

(c). The subrecipient shall periodically conduct spot checks of a representative sample of weekly payroll data to verify that contractors or subcontractors are paying the appropriate wage rates. The subrecipient shall establish and follow a spot check schedule based on its assessment of the risks of noncompliance with DB posed by contractors or subcontractors and the duration of the contract or subcontract. At a minimum, if practicable the subrecipient should spot check payroll data within two weeks of each contractor or subcontractor's submission of its initial payroll data and two weeks prior to the completion date the contract or subcontract. Subrecipients must conduct more frequent spot checks if the initial spot check or other information indicates that there is a risk that the contractor or subcontractor is not complying with DB . In addition, during the examinations the subrecipient shall verify evidence of fringe benefit plans and payments thereunder by contractors and subcontractors who claim credit for fringe benefit contributions.

(d). The subrecipient shall periodically review contractors and subcontractors use of apprentices and trainees to verify registration and certification with respect to apprenticeship and training programs approved by either the U.S Department of Labor or a state, as appropriate, and that contractors and subcontractors are not using disproportionate numbers of, laborers, trainees and apprentices. These reviews shall be conducted in accordance with the schedules for spot checks and interviews described in Item 5(b) and (c) above.

(e) Subrecipients must immediately report potential violations of the DB prevailing wage requirements to the EPA DB contact listed above and to the appropriate DOL Wage and Hour District Office listed at [https://www.dol.gov/whd/whd\\_district\\_offices.pdf](https://www.dol.gov/whd/whd_district_offices.pdf).

"General Decision Number: MA20250019 01/03/2025

Superseded General Decision Number: MA20240019

State: Massachusetts

Construction Type: Highway

County: Hampden County in Massachusetts.

HIGHWAY CONSTRUCTION PROJECTS

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(1).

<p>If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:</p>	<ul style="list-style-type: none"> <li>. Executive Order 14026 generally applies to the contract.</li> <li>. The contractor must pay all covered workers at least \$17.75 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2025.</li> </ul>
<p>If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:</p>	<ul style="list-style-type: none"> <li>. Executive Order 13658 generally applies to the contract.</li> <li>. The contractor must pay all covered workers at least \$13.30 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2025.</li> </ul>

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at <http://www.dol.gov/whd/govcontracts>.

Modification Number	Publication Date
0	01/03/2025

ENGI0004-019 12/01/2024

Last Modified: 04/09/2025 at 10:39AM EDT

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
Group 1.....	\$ 57.03	33.20
Group 2.....	\$ 56.40	33.20

FOOTNOTE FOR POWER EQUIPMENT OPERATORS:

A. PAID HOLIDAYS: New Year's Day, Washington's Birthday, Labor Day, Memorial Day, Independence Day, Patriot's Day, Columbus Day, Veteran's Day, Thanksgiving Day, Christmas Day

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

Group 1: Broom/Sweeper; Crane; Gradall; Post Driver (Guardrail/Fences)  
Group 2: Bulldozer; Grader/Blade

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ENGI0098-010 06/01/2024

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
Group 1.....	\$ 41.23	30.58+A
Group 2.....	\$ 40.92	30.58+A
Group 4.....	\$ 37.47	30.58+A

Footnote:

A. Paid Holidays: New year's Day, Washington's Birthday, Memorial Day, Independence Day, Labor Day, Columbus Day, Veterans Day, Thanksgiving Day and Christmas Day

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

Group 1: Backhoe/Excavator/Trackhoe; Bobcat/Skid Steer/Skid Loader; Loader  
Group 2: Milling Machine; Paver (Asphalt, Aggregate, and Concrete)  
Group 4: Roller

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IRON0007-027 03/16/2024

	Rates	Fringes
IRONWORKER (ORNAMENTAL AND STRUCTURAL).....	\$ 39.51	32.98

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LABO0596-006 12/01/2021

	Rates	Fringes
LABORER (Traffic Control: Flagger).....	\$ 24.50	23.96

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LABO0999-002 12/01/2021

	Rates	Fringes
LABORER (Common or General).....	\$ 32.50	23.96

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PAIN0035-023 07/01/2024

	Rates	Fringes
PAINTER (Steel).....	\$ 56.76	36.00

Last Modified: 04/09/2025 at 10:39AM EDT

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SUMA2014-009 01/11/2017

	Rates	Fringes
CARPENTER, Includes Form Work....	\$ 33.03	20.02
CEMENT MASON/CONCRETE FINISHER...	\$ 52.13	20.89
ELECTRICIAN.....	\$ 47.13	13.41
IRONWORKER, REINFORCING.....	\$ 46.21	21.27
LABORER: Asphalt, Includes Raker, Shoveler, Spreader and Distributor.....	\$ 33.10	18.09
LABORER: Concrete Saw (Hand Held/Walk Behind).....	\$ 44.43	14.18
LABORER: Landscape.....	\$ 44.11	18.85
OPERATOR: Forklift.....	\$ 51.63	0.00
OPERATOR: Mechanic.....	\$ 48.14	17.02
OPERATOR: Piledriver.....	\$ 43.87	18.04
PAINTER: Spray (Linestriping)....	\$ 38.30	17.43
TRAFFIC CONTROL: Laborer-Cones/ Barricades/Barrels - Setter/Mover/Sweeper.....	\$ 43.73	15.06
TRUCK DRIVER: Concrete Truck....	\$ 33.69	15.79
TRUCK DRIVER: Dump Truck.....	\$ 43.81	5.39
TRUCK DRIVER: Flatbed Truck.....	\$ 48.53	0.00

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WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at <https://www.dol.gov/agencies/whd/government-contracts>.

Last Modified: 04/09/2025 at 10:39AM EDT

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (iii)).

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The body of each wage determination lists the classifications and wage rates that have been found to be prevailing for the type(s) of construction and geographic area covered by the wage determination. The classifications are listed in alphabetical order under rate identifiers indicating whether the particular rate is a union rate (current union negotiated rate), a survey rate, a weighted union average rate, a state adopted rate, or a supplemental classification rate.

#### Union Rate Identifiers

A four-letter identifier beginning with characters other than ""SU"", ""UAVG"", ?SA?, or ?SC? denotes that a union rate was prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2024. PLUM is an identifier of the union whose collectively bargained rate prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2024 in the example, is the effective date of the most current negotiated rate.

Union prevailing wage rates are updated to reflect all changes over time that are reported to WHD in the rates in the collective bargaining agreement (CBA) governing the classification.

#### Union Average Rate Identifiers

The UAVG identifier indicates that no single rate prevailed for those classifications, but that 100% of the data reported for the classifications reflected union rates. EXAMPLE: UAVG-OH-0010 01/01/2024. UAVG indicates that the rate is a weighted union average rate. OH indicates the State of Ohio. The next number, 0010 in the example, is an internal number used in producing the wage determination. The date, 01/01/2024 in the example, indicates the date the wage determination was updated to reflect the most current union average rate.

A UAVG rate will be updated once a year, usually in January, to reflect a weighted average of the current rates in the collective bargaining agreements on which the rate is based.

#### Survey Rate Identifiers

The ""SU"" identifier indicates that either a single non-union rate prevailed (as defined in 29 CFR 1.2) for this classification in the survey or that the rate was derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As a weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SUFL2022-007 6/27/2024. SU indicates the rate is a single non-union prevailing rate or a weighted average of survey data for that

classification. FL indicates the State of Florida. 2022 is the year of the survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 6/27/2024 in the example, indicates the survey completion date for the classifications and rates under that identifier.

?SU? wage rates typically remain in effect until a new survey is conducted. However, the Wage and Hour Division (WHD) has the discretion to update such rates under 29 CFR 1.6(c)(1).

#### State Adopted Rate Identifiers

The ""SA"" identifier indicates that the classifications and prevailing wage rates set by a state (or local) government were adopted under 29 C.F.R 1.3(g)-(h). Example: SAME2023-007 01/03/2024. SA reflects that the rates are state adopted. ME refers to the State of Maine. 2023 is the year during which the state completed the survey on which the listed classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 01/03/2024 in the example, reflects the date on which the classifications and rates under the ?SA? identifier took effect under state law in the state from which the rates were adopted.

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#### WAGE DETERMINATION APPEALS PROCESS

1) Has there been an initial decision in the matter? This can be:

- a) a survey underlying a wage determination
- b) an existing published wage determination
- c) an initial WHD letter setting forth a position on a wage determination matter
- d) an initial conformance (additional classification and rate) determination

On survey related matters, initial contact, including requests for summaries of surveys, should be directed to the WHD Branch of Wage Surveys. Requests can be submitted via email to [davisbaconinfo@dol.gov](mailto:davisbaconinfo@dol.gov) or by mail to:

Branch of Wage Surveys  
Wage and Hour Division  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

Regarding any other wage determination matter such as conformance decisions, requests for initial decisions should be directed to the WHD Branch of Construction Wage Determinations. Requests can be submitted via email to [BCWD-Office@dol.gov](mailto:BCWD-Office@dol.gov) or by mail to:

Branch of Construction Wage Determinations  
Wage and Hour Division  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

2) If an initial decision has been issued, then any interested party (those affected by the action) that disagrees with the



decision can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Requests for review and reconsideration can be submitted via email to dba.reconsideration@dol.gov or by mail to:

Wage and Hour Administrator  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210.

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END OF GENERAL DECISION"

Last Modified: 04/09/2025 at 10:39AM EDT

## AMERICAN IRON AND STEEL REQUIREMENTS



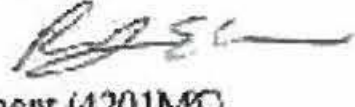
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

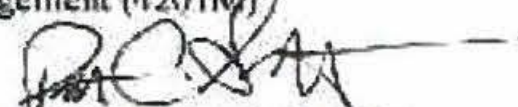
MAR 20 2014

OFFICE OF WATER

### MEMORANDUM

**SUBJECT:** Implementation of American Iron and Steel provisions of P.L. 113-76, Consolidated Appropriations Act, 2014

**FROM:** ✓ Andrew D. Sawyers, Director   
Office of Wastewater Management (4201M)

Peter C. Grevatt, Director   
Office of Ground Water and Drinking Water (4601M)

**TO:** Water Management Division Directors  
Regions I - X

P.L. 113-76, Consolidated Appropriations Act, 2014 (Act), includes an "American Iron and Steel (AIS)" requirement in section 436 that requires Clean Water State Revolving Loan Fund (CWSRF) and Drinking Water State Revolving Loan Fund (DWSRF) assistance recipients to use iron and steel products that are produced in the United States for projects for the construction, alteration, maintenance, or repair of a public water system or treatment works if the project is funded through an assistance agreement executed beginning January 17, 2014 (enactment of the Act) through the end of Federal Fiscal Year 2014.

Section 436 also sets forth certain circumstances under which EPA may waive the AIS requirement. Furthermore, the Act specifically exempts projects where engineering plans and specifications were approved by a State agency prior to January 17, 2014.

The approach described below explains how EPA will implement the AIS requirement. The first section is in the form of questions and answers that address the types of projects that must comply with the AIS requirement, the types of products covered by the AIS requirement, and compliance. The second section is a step-by-step process for requesting waivers and the circumstances under which waivers may be granted.

## Implementation

The Act states:

Sec. 436 (a)(1) None of the funds made available by a State water pollution control revolving fund as authorized by title VI of the Federal Water Pollution Control Act (33 U.S.C. 1381 et seq.) or made available by a drinking water treatment revolving loan fund as authorized by section 1452 of the Safe Drinking Water Act (42 U.S.C. 300j-12) shall be used for a project for the construction, alteration, maintenance, or repair of a public water system or treatment works unless all of the iron and steel products used in the project are produced in the United States.

(2) In this section, the term “iron and steel products” means the following products made primarily of iron or steel: lined or unlined pipes and fittings, manhole covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, reinforced precast concrete, and construction materials.

(b) Subsection (a) shall not apply in any case or category of cases in which the Administrator of the Environmental Protection Agency (in this section referred to as the “Administrator”) finds that—

(1) applying subsection (a) would be inconsistent with the public interest;

(2) iron and steel products are not produced in the United States in sufficient and reasonably available quantities and of a satisfactory quality; or

(3) inclusion of iron and steel products produced in the United States will increase the cost of the overall project by more than 25 percent.

(c) If the Administrator receives a request for a waiver under this section, the Administrator shall make available to the public on an informal basis a copy of the request and information available to the Administrator concerning the request, and shall allow for informal public input on the request for at least 15 days prior to making a finding based on the request. The Administrator shall make the request and accompanying information available by electronic means, including on the official public Internet Web site of the Environmental Protection Agency.

(d) This section shall be applied in a manner consistent with United States obligations under international agreements.

(e) The Administrator may retain up to 0.25 percent of the funds appropriated in this Act for the Clean and Drinking Water State Revolving Funds for carrying out the provisions described in subsection (a)(1) for management and oversight of the requirements of this section.

(f) This section does not apply with respect to a project if a State agency approves the engineering plans and specifications for the project, in that agency's capacity to approve such plans and specifications prior to a project requesting bids, prior to the date of the enactment of this Act.

The following questions and answers provide guidance for implementing and complying with the AIS requirements:

### **Project Coverage**

**1) What classes of projects are covered by the AIS requirement?**

All treatment works projects funded by a CWSRF assistance agreement, and all public water system projects funded by a DWSRF assistance agreement, from the date of enactment through the end of Federal Fiscal Year 2014, are covered. The AIS requirements apply to the entirety of the project, no matter when construction begins or ends. Additionally, the AIS requirements apply to all parts of the project, no matter the source of funding.

**2) Does the AIS requirement apply to nonpoint source projects or national estuary projects?**

No. Congress did not include an AIS requirement for nonpoint source and national estuary projects unless the project can also be classified as a 'treatment works' as defined by section 212 of the Clean Water Act.

**3) Are any projects for the construction, alteration, maintenance, or repair of a public water system or treatment works excluded from the AIS requirement?**

Any project, whether a treatment works project or a public water system project, for which engineering plans and specifications were approved by the responsible state agency prior to January 17, 2014, is excluded from the AIS requirements.

**4) What if the project does not have approved engineering plans and specifications but has signed an assistance agreement with a CWSRF or DWSRF program prior to January 17, 2014?**

The AIS requirements do not apply to any project for which an assistance agreement was signed prior to January 17, 2014.

**5) What if the project does not have approved engineering plans and specifications, but bids were advertised prior to January 17, 2014 and an assistance agreement was signed after January 17, 2014?**



If the project does not require approved engineering plans and specifications, the bid advertisement date will count in lieu of the approval date for purposes of the exemption in section 436(f).

**6) What if the assistance agreement that was signed prior to January 17, 2014, only funded a part of the overall project, where the remainder of the project will be funded later with another SRF loan?**

If the original assistance agreement funded any construction of the project, the date of the original assistance agreement counts for purposes of the exemption. If the original assistance agreement was only for planning and design, the date of that assistance agreement will count for purposes of the exemption only if there is a written commitment or expectation on the part of the assistance recipient to fund the remainder of the project with SRF funds.

**7) What if the assistance agreement that was signed prior to January 17, 2014, funded the first phase of a multi-phase project, where the remaining phases will be funded by SRF assistance in the future?**

In such a case, the phases of the project will be considered a single project if all construction necessary to complete the building or work, regardless of the number of contracts or assistance agreements involved, are closely related in purpose, time and place. However, there are many situations in which major construction activities are clearly undertaken in phases that are distinct in purpose, time, or place. In the case of distinct phases, projects with engineering plans and specifications approval or assistance agreements signed prior to January 17, 2014 would be excluded from AIS requirements while those approved/signed on January 17, 2014, or later would be covered by the AIS requirements.

**8) What if a project has split funding from a non-SRF source?**

Many States intend to fund projects with “split” funding, from the SRF program and from State or other programs. Based on the Act language in section 436, which requires that American iron and steel products be used in any project for the construction, alteration, maintenance, or repair of a public water system or treatment works receiving SRF funding between and including January 17, 2014 and September 30, 2014, any project that is funded in whole or in part with such funds must comply with the AIS requirement. A “project” consists of all construction necessary to complete the building or work regardless of the number of contracts or assistance agreements involved so long as all contracts and assistance agreements awarded are closely related in purpose, time and place. This precludes the intentional splitting of SRF projects into separate and smaller contracts or assistance agreements to avoid AIS coverage on some portion of a larger project, particularly where the activities are integrally and proximately related to the whole. However, there are many situations in which major construction activities are clearly undertaken in separate phases that are distinct in purpose, time, or place, in which case, separate contracts or assistance agreement for SRF and State or other funding would carry separate requirements.

## 9) What about refinancing?

If a project began construction, financed from a non-SRF source, prior to January 17, 2014, but is refinanced through an SRF assistance agreement executed on or after January 17, 2014 and prior to October 1, 2014, AIS requirements will apply to all construction that occurs on or after January 17, 2014, through completion of construction, unless, as is likely, engineering plans and specifications were approved by a responsible state agency prior to January 17, 2014. There is no retroactive application of the AIS requirements where a refinancing occurs for a project that has completed construction prior to January 17, 2014.

## 10) Do the AIS requirements apply to any other EPA programs, besides the SRF program, such as the Tribal Set-aside grants or grants to the Territories and DC?

No, the AIS requirement only applies to funds made available by a State water pollution control revolving fund as authorized by title VI of the Federal Water Pollution Control Act (33 U.S.C. 1381 et seq.) or made available by a drinking water treatment revolving loan fund as authorized by section 1452 of the Safe Drinking Water Act (42 U.S.C. 300j-12)

## Covered Iron and Steel Products

### 11) What is an iron or steel product?

For purposes of the CWSRF and DWSRF projects that must comply with the AIS requirement, an iron or steel product is one of the following made primarily of iron or steel that is permanently incorporated into the public water system or treatment works:

- Lined or unlined pipes or fittings;
- Manhole Covers;
- Municipal Castings (defined in more detail below);
- Hydrants;
- Tanks;
- Flanges;
- Pipe clamps and restraints;
- Valves;
- Structural steel (defined in more detail below);
- Reinforced precast concrete; and
- Construction materials (defined in more detail below).

### 12) What does the term 'primarily iron or steel' mean?

'Primarily iron or steel' places constraints on the list of products above. For one of the listed products to be considered subject to the AIS requirements, it must be made of

greater than 50% iron or steel, measured by cost. The cost should be based on the material costs.

**13) Can you provide an example of how to perform a cost determination?**

For example, the iron portion of a fire hydrant would likely be the bonnet, body and shoe, and the cost then would include the pouring and casting to create those components. The other material costs would include non-iron and steel internal workings of the fire hydrant (i.e., stem, coupling, valve, seals, etc). However, the assembly of the internal workings into the hydrant body would not be included in this cost calculation. If one of the listed products is not made primarily of iron or steel, United States (US) provenance is not required. An exception to this definition is reinforced precast concrete, which is addressed in a later question.

**14) If a product is composed of more than 50% iron or steel, but is not listed in the above list of items, must the item be produced in the US? Alternatively, must the iron or steel in such a product be produced in the US?**

The answer to both question is no. Only items on the above list must be produced in the US. Additionally, the iron or steel in a non-listed item can be sourced from outside the US.

**15) What is the definition of steel?**

Steel means an alloy that includes at least 50 percent iron, between .02 and 2 percent carbon, and may include other elements. Metallic elements such as chromium, nickel, molybdenum, manganese, and silicon may be added during the melting of steel for the purpose of enhancing properties such as corrosion resistance, hardness, or strength. The definition of steel covers carbon steel, alloy steel, stainless steel, tool steel and other specialty steels.

**16) What does 'produced in the United States' mean?**

Production in the United States of the iron or steel products used in the project requires that all manufacturing processes, including application of coatings, must take place in the United States, with the exception of metallurgical processes involving refinement of steel additives. All manufacturing processes includes processes such as melting, refining, forming, rolling, drawing, finishing, fabricating and coating. Further, if a domestic iron and steel product is taken out of the US for any part of the manufacturing process, it becomes foreign source material. However, raw materials such as iron ore, limestone and iron and steel scrap are not covered by the AIS requirement, and the material(s), if any, being applied as a coating are similarly not covered. Non-iron or steel components of an iron and steel product may come from non-US sources. For example, for products such as valves and hydrants, the individual non-iron and steel components do not have to be of domestic origin.

**17) Are the raw materials used in the production of iron or steel required to come from US sources?**

No. Raw materials, such as iron ore, limestone, scrap iron, and scrap steel, can come from non-US sources.

**18) If an above listed item is primarily made of iron or steel, but is only at the construction site temporarily, must such an item be produced in the US?**

No. Only the above listed products made primarily of iron or steel, permanently incorporated into the project must be produced in the US. For example trench boxes, scaffolding or equipment, which are removed from the project site upon completion of the project, are not required to be made of U.S. Iron or Steel.

**19) What is the definition of ‘municipal castings’?**

Municipal castings are cast iron or steel infrastructure products that are melted and cast. They typically provide access, protection, or housing for components incorporated into utility owned drinking water, storm water, wastewater, and surface infrastructure. They are typically made of grey or ductile iron, or steel. Examples of municipal castings are:

- Access Hatches;
- Ballast Screen;
- Benches (Iron or Steel);
- Bollards;
- Cast Bases;
- Cast Iron Hinged Hatches, Square and Rectangular;
- Cast Iron Riser Rings;
- Catch Basin Inlet;
- Cleanout/Monument Boxes;
- Construction Covers and Frames;
- Curb and Corner Guards;
- Curb Openings;
- Detectable Warning Plates;
- Downspout Shoes (Boot, Inlet);
- Drainage Grates, Frames and Curb Inlets;
- Inlets;
- Junction Boxes;
- Lampposts;
- Manhole Covers, Rings and Frames, Risers;
- Meter Boxes;
- Service Boxes;
- Steel Hinged Hatches, Square and Rectangular;
- Steel Riser Rings;
- Trash receptacles;
- Tree Grates;



Tree Guards;  
Trench Grates; and  
Valve Boxes, Covers and Risers.

## **20) What is 'structural steel'?**

Structural steel is rolled flanged shapes, having at least one dimension of their cross-section three inches or greater, which are used in the construction of bridges, buildings, ships, railroad rolling stock, and for numerous other constructional purposes. Such shapes are designated as wide-flange shapes, standard I-beams, channels, angles, tees and zees. Other shapes include H-piles, sheet piling, tie plates, cross ties, and those for other special purposes.

## **21) What is a 'construction material' for purposes of the AIS requirement?**

Construction materials are those articles, materials, or supplies made primarily of iron and steel, that are permanently incorporated into the project, not including mechanical and/or electrical components, equipment and systems. Some of these products may overlap with what is also considered "structural steel". This includes, but is not limited to, the following products: wire rod, bar, angles, concrete reinforcing bar, wire, wire cloth, wire rope and cables, tubing, framing, joists, trusses, fasteners (i.e., nuts and bolts), welding rods, decking, grating, railings, stairs, access ramps, fire escapes, ladders, wall panels, dome structures, roofing, ductwork, surface drains, cable hanging systems, manhole steps, fencing and fence tubing, guardrails, doors, and stationary screens.

## **22) What is not considered a 'construction material' for purposes of the AIS requirement?**

Mechanical and electrical components, equipment and systems are not considered construction materials. Mechanical equipment is typically that which has motorized parts and/or is powered by a motor. Electrical equipment is typically any machine powered by electricity and includes components that are part of the electrical distribution system.

The following examples (including their appurtenances necessary for their intended use and operation) are NOT considered construction materials: pumps, motors, gear reducers, drives (including variable frequency drives (VFDs)), electric/pneumatic/manual accessories used to operate valves (such as electric valve actuators), mixers, gates, motorized screens (such as traveling screens), blowers/aeration equipment, compressors, meters, sensors, controls and switches, supervisory control and data acquisition (SCADA), membrane bioreactor systems, membrane filtration systems, filters, clarifiers and clarifier mechanisms, rakes, grinders, disinfection systems, presses (including belt presses), conveyors, cranes, HVAC (excluding ductwork), water heaters, heat exchangers, generators, cabinetry and housings (such as electrical boxes/enclosures), lighting fixtures, electrical conduit, emergency life systems, metal office furniture, shelving, laboratory equipment, analytical instrumentation, and dewatering equipment.

**23) If the iron or steel is produced in the US, may other steps in the manufacturing process take place outside of the US, such as assembly?**

No. Production in the US of the iron or steel used in a listed product requires that all manufacturing processes must take place in the United States, except metallurgical processes involving refinement of steel additives.

**24) What processes must occur in the US to be compliant with the AIS requirement for reinforced precast concrete?**

While reinforced precast concrete may not be at least 50% iron or steel, in this particular case, the reinforcing bar and wire must be produced in the US and meet the same standards as for any other iron or steel product. Additionally, the casting of the concrete product must take place in the US. The cement and other raw materials used in concrete production are not required to be of domestic origin.

If the reinforced concrete is cast at the construction site, the reinforcing bar and wire are considered to be a construction material and must be produced in the US.

**Compliance**

**25) How should an assistance recipient document compliance with the AIS requirement?**

In order to ensure compliance with the AIS requirement, specific AIS contract language must be included in each contract, starting with the assistance agreement, all the way down to the purchase agreements. Sample language for assistance agreements and contracts can be found in Appendix 3 and 4.

EPA recommends the use of a step certification process, similar to one used by the Federal Highway Administration. The step certification process is a method to ensure that producers adhere to the AIS requirement and assistance recipients can verify that products comply with the AIS requirement. The process also establishes accountability and better enables States to take enforcement actions against violators.

Step certification creates a paper trail which documents the location of the manufacturing process involved with the production of steel and iron materials. A step certification is a process under which each handler (supplier, fabricator, manufacturer, processor, etc) of the iron and steel products certifies that their step in the process was domestically performed. Each time a step in the manufacturing process takes place, the manufacturer delivers its work along with a certification of its origin. A certification can be quite simple. Typically, it includes the name of the manufacturer, the location of the manufacturing facility where the product or process took place (not its headquarters), a description of the product or item being delivered, and a signature by a manufacturer's responsible party. Attached, as Appendix 5, are sample certifications. These certifications should be collected and maintained by assistance recipients.

Alternatively, the final manufacturer that delivers the iron or steel product to the worksite, vendor, or contractor, may provide a certification asserting that all manufacturing processes occurred in the US. While this type of certification may be acceptable, it may not provide the same degree of assurance. Additional documentation may be needed if the certification is lacking important information. Step certification is the best practice.

**26) How should a State ensure assistance recipients are complying with the AIS requirement?**

In order to ensure compliance with the AIS requirement, States SRF programs must include specific AIS contract language in the assistance agreement. Sample language for assistance agreements can be found in Appendix 3.

States should also, as a best practice, conduct site visits of projects during construction and review documentation demonstrating proof of compliance which the assistance recipient has gathered.

**27) What happens if a State or EPA finds a non-compliant iron and/or steel product permanently incorporated in the project?**

If a potentially non-compliant product is identified, the State should notify the assistance recipient of the apparent unauthorized use of the non-domestic component, including a proposed corrective action, and should be given the opportunity to reply. If unauthorized use is confirmed, the State can take one or more of the following actions: request a waiver where appropriate; require the removal of the non-domestic item; or withhold payment for all or part of the project. Only EPA can issue waivers to authorize the use of a non-domestic item. EPA may use remedies available to it under the Clean Water Act, the Safe Drinking Water Act, and 40 CFR part 31 grant regulations, in the event of a violation of a grant term and condition.

It is recommended that the State work collaboratively with EPA to determine the appropriate corrective action, especially in cases where the State is the one who identifies the item in noncompliance or there is a disagreement with the assistance recipient.

If fraud, waste, abuse, or any violation of the law is suspected, the Office of Inspector General (OIG) should be contacted immediately. The OIG can be reached at 1-888-546-8740 or [OIG\\_Hotline@epa.gov](mailto:OIG_Hotline@epa.gov). More information can be found at this website: <http://oig.hhs.gov/fraud/report-fraud/>

**28) How do international trade agreements affect the implementation of the AIS requirements?**

The AIS provision applies in a manner consistent with United States obligations under international agreements. Typically, these obligations only apply to direct procurement by the entities that are signatories to such agreements. In general, SRF

assistance recipients are not signatories to such agreements, so these agreements have no impact on this AIS provision. In the few instances where such an agreement applies to a municipality, that municipality is under the obligation to determine its applicability and requirements and document the actions taken to comply for the State.

### **Waiver Process**

The statute permits EPA to issue waivers for a case or category of cases where EPA finds (1) that applying these requirements would be inconsistent with the public interest; (2) iron and steel products are not produced in the US in sufficient and reasonably available quantities and of a satisfactory quality; or (3) inclusion of iron and steel products produced in the US will increase the cost of the overall project by more than 25 percent.

In order to implement the AIS requirements, EPA has developed an approach to allow for effective and efficient implementation of the waiver process to allow projects to proceed in a timely manner. The framework described below will allow States, on behalf of the assistance recipients, to apply for waivers of the AIS requirement directly to EPA Headquarters. Only waiver requests received from states will be considered. Pursuant to the Act, EPA has the responsibility to make findings as to the issuance of waivers to the AIS requirements.

### **Definitions**

The following terms are critical to the interpretation and implementation of the AIS requirements and apply to the process described in this memorandum:

Reasonably Available Quantity: The quantity of iron or steel products is available or will be available at the time needed and place needed, and in the proper form or specification as specified in the project plans and design.

Satisfactory Quality: The quality of iron or steel products, as specified in the project plans and designs.

Assistance Recipient: A borrower or grantee that receives funding from a State CWSRF or DWSRF program.

### **Step-By-Step Waiver Process**

#### **Application by Assistance Recipient**

Each local entity that receives SRF water infrastructure financial assistance is required by section 436 of the Act to use American made iron and steel products in the construction of its project. However, the recipient may request a waiver. Until a waiver is granted by EPA, the AIS requirement stands, except as noted above with respect to municipalities covered by international agreements.



The waiver process begins with the SRF assistance recipient. In order to fulfill the AIS requirement, the assistance recipient must in good faith design the project (where applicable) and solicit bids for construction with American made iron and steel products. It is essential that the assistance recipient include the AIS terms in any request for proposals or solicitations for bids, and in all contracts (see Appendix 3 for sample construction contract language). The assistance recipient may receive a waiver at any point before, during, or after the bid process, if one or more of three conditions is met:

1. Applying the American Iron and Steel requirements of the Act would be inconsistent with the public interest;
2. Iron and steel products are not produced in the United States in sufficient and reasonably available quantities and of a satisfactory quality; or
3. Inclusion of iron and steel products produced in the United States will increase the cost of the overall project by more than 25 percent.

Proper and sufficient documentation must be provided by the assistance recipient. A checklist detailing the types of information required for a waiver to be processed is attached as Appendix 1.

Additionally, it is strongly encouraged that assistance recipients hold pre-bid conferences with potential bidders. A pre-bid conference can help to identify iron and steel products needed to complete the project as described in the plans and specifications that may not be available from domestic sources. It may also identify the need to seek a waiver prior to bid, and can help inform the recipient on compliance options.

In order to apply for a project waiver, the assistance recipient should email the request in the form of a Word document (.doc) to the State SRF program. It is strongly recommended that the State designate a single person for all AIS communications. The State SRF designee will review the application for the waiver and determine whether the necessary information has been included. Once the waiver application is complete, the State designee will forward the application to either of two email addresses. For CWSRF waiver requests, please send the application to: [cwsrfwaiver@epa.gov](mailto:cwsrfwaiver@epa.gov). For DWSRF waiver requests, please send the application to: [dwsrfwaiver@epa.gov](mailto:dwsrfwaiver@epa.gov).

### Evaluation by EPA

After receiving an application for waiver of the AIS requirements, EPA Headquarters will publish the request on its website for 15 days and receive informal comment. EPA Headquarters will then use the checklist in Appendix 2 to determine whether the application properly and adequately documents and justifies the statutory basis cited for the waiver – that it is quantitatively and qualitatively sufficient – and to determine whether or not to grant the waiver.

In the event that EPA finds that adequate documentation and justification has been submitted, the Administrator may grant a waiver to the assistance recipient. EPA will notify the State designee that a waiver request has been approved or denied as soon as such a decision has been made. Granting such a waiver is a three-step process:

1. Posting – After receiving an application for a waiver, EPA is required to publish the application and all material submitted with the application on EPA’s website for 15 days. During that period, the public will have the opportunity to review the request and provide informal comment to EPA. The website can be found at: [http://water.epa.gov/grants\\_funding/aisrequirement.cfm](http://water.epa.gov/grants_funding/aisrequirement.cfm)
2. Evaluation – After receiving an application for waiver of the AIS requirements, EPA Headquarters will use the checklist in Appendix 2 to determine whether the application properly and adequately documents and justifies the statutory basis cited for the waiver – that it is quantitatively and qualitatively sufficient – and to determine whether or not to grant the waiver.
3. Signature of waiver approval by the Administrator or another agency official with delegated authority – As soon as the waiver is signed and dated, EPA will notify the State SRF program, and post the signed waiver on our website. The assistance recipient should keep a copy of the signed waiver in its project files.

### Public Interest Waivers

EPA has the authority to issue public interest waivers. Evaluation of a public interest waiver request may be more complicated than that of other waiver requests so they may take more time than other waiver requests for a decision to be made. An example of a public interest waiver that might be issued could be for a community that has standardized on a particular type or manufacturer of a valve because of its performance to meet their specifications. Switching to an alternative valve may require staff to be trained on the new equipment and additional spare parts would need to be purchased and stocked, existing valves may need to be unnecessarily replaced, and portions of the system may need to be redesigned. Therefore, requiring the community to install an alternative valve would be inconsistent with public interest.

EPA also has the authority to issue a public interest waiver that covers categories of products that might apply to all projects.

EPA reserves the right to issue national waivers that may apply to particular classes of assistance recipients, particular classes of projects, or particular categories of iron or steel products. EPA may develop national or (US geographic) regional categorical waivers through the identification of similar circumstances in the detailed justifications presented to EPA in a waiver request or requests. EPA may issue a national waiver based on policy decisions regarding the public’s interest or a determination that a particular item is not produced domestically in reasonably available quantities or of a sufficient quality. In such cases, EPA may determine it is necessary to issue a national waiver.

If you have any questions concerning the contents of this memorandum, you may contact us, or have your staff contact Jordan Dorfman, Attorney-Advisor, State Revolving Fund Branch, Municipal Support Division, at [dorfman.jordan@epa.gov](mailto:dorfman.jordan@epa.gov) or (202) 564-0614 or Kiri Anderer, Environmental Engineer, Infrastructure Branch, Drinking Water Protection Division, at [anderer.kirsten@epa.gov](mailto:anderer.kirsten@epa.gov) or (202) 564-3134.

#### Attachments

**Attachment 1: Information Checklist for Waiver Request**

The purpose of this checklist is to help ensure that all appropriate and necessary information is submitted to EPA. EPA recommends that States review this checklist carefully and provide all appropriate information to EPA. This checklist is for informational purposes only and does not need to be included as part of a waiver application.

Items	✓	Notes
<p><b>General</b></p> <ul style="list-style-type: none"> <li>• Waiver request includes the following information:                             <ul style="list-style-type: none"> <li>— Description of the foreign and domestic construction materials</li> <li>— Unit of measure</li> <li>— Quantity</li> <li>— Price</li> <li>— Time of delivery or availability</li> <li>— Location of the construction project</li> <li>— Name and address of the proposed supplier</li> <li>— A detailed justification for the use of foreign construction materials</li> </ul> </li> <li>• Waiver request was submitted according to the instructions in the memorandum</li> <li>• Assistance recipient made a good faith effort to solicit bids for domestic iron and steel products, as demonstrated by language in requests for proposals, contracts, and communications with the prime contractor</li> </ul>	✓	
<p><b>Cost Waiver Requests</b></p> <ul style="list-style-type: none"> <li>• Waiver request includes the following information:                             <ul style="list-style-type: none"> <li>— Comparison of overall cost of project with domestic iron and steel products to overall cost of project with foreign iron and steel products</li> <li>— Relevant excerpts from the bid documents used by the contractors to complete the comparison</li> <li>— Supporting documentation indicating that the contractor made a reasonable survey of the market, such as a description of the process for identifying suppliers and a list of contacted suppliers</li> </ul> </li> </ul>		
<p><b>Availability Waiver Requests</b></p> <ul style="list-style-type: none"> <li>• Waiver request includes the following supporting documentation necessary to demonstrate the availability, quantity, and/or quality of the materials for which the waiver is requested:                             <ul style="list-style-type: none"> <li>— Supplier information or pricing information from a reasonable number of domestic suppliers indicating availability/delivery date for construction materials</li> <li>— Documentation of the assistance recipient's efforts to find available domestic sources, such as a description of the process for identifying suppliers and a list of contacted suppliers.</li> <li>— Project schedule</li> <li>— Relevant excerpts from project plans, specifications, and permits indicating the required quantity and quality of construction materials</li> </ul> </li> <li>• Waiver request includes a statement from the prime contractor and/or supplier confirming the non-availability of the domestic construction materials for which the waiver is sought</li> <li>• Has the State received other waiver requests for the materials described in this waiver request, for comparable projects?</li> </ul>		



**Attachment 2: HQ Review Checklist for Waiver Request**

Instructions: To be completed by EPA. Review all waiver requests using the questions in the checklist, and mark the appropriate box as Yes, No or N/A. Marks that fall inside the shaded boxes may be grounds for denying the waiver. If none of your review markings fall into a shaded box, the waiver is eligible for approval if it indicates that one or more of the following conditions applies to the domestic product for which the waiver is sought:

1. The iron and/or steel products are not produced in the United States in sufficient and reasonably available quantities and of a satisfactory quality.
2. The inclusion of iron and/or steel products produced in the United States will increase the cost of the overall project by more than 25 percent.

Review Items	Yes	No	N/A	Comments
<p>Cost Waiver Requests</p> <ul style="list-style-type: none"> <li>• Does the waiver request include the following information?                             <ul style="list-style-type: none"> <li>— Comparison of overall cost of project with domestic iron and steel products to overall cost of project with foreign iron and steel products</li> <li>— Relevant excerpts from the bid documents used by the contractors to complete the comparison</li> <li>— A sufficient number of bid documents or pricing information from domestic sources to constitute a reasonable survey of the market</li> </ul> </li> <li>• Does the Total Domestic Project exceed the Total Foreign Project Cost by more than 25%?</li> </ul>				
<p>Availability Waiver Requests</p> <ul style="list-style-type: none"> <li>• Does the waiver request include supporting documentation sufficient to show the availability, quantity, and/or quality of the iron and/or steel product for which the waiver is requested?                             <ul style="list-style-type: none"> <li>— Supplier information or other documentation indicating availability/delivery date for materials</li> <li>— Project schedule</li> <li>— Relevant excerpts from project plans, specifications, and permits indicating the required quantity and quality of materials</li> </ul> </li> <li>• Does supporting documentation provide sufficient evidence that the contractors made a reasonable effort to locate domestic suppliers of materials, such as a description of the process for identifying suppliers and a list of contacted suppliers?</li> <li>• Based on the materials delivery/availability date indicated in the supporting documentation, will the materials be unavailable when they are needed according to the project schedule? (By item, list schedule date and domestic delivery quote date or other relevant information)</li> <li>• Is EPA aware of any other evidence indicating the non-availability of the materials for which the waiver is requested?</li> </ul>				
<p>Examples include:</p> <ul style="list-style-type: none"> <li>— Multiple waiver requests for the materials described in this waiver request, for comparable projects in the same State</li> <li>— Multiple waiver requests for the materials described in this waiver request, for comparable projects in other States</li> <li>— Correspondence with construction trade associations indicating the non-availability of the materials</li> </ul>				
<ul style="list-style-type: none"> <li>• Are the available domestic materials indicated in the bid documents of inadequate quality compared those required by the project plans, specifications, and/or permits?</li> </ul>				

### Attachment 3: Example Loan Agreement Language

ALL ASSISTANCE AGREEMENT MUST HAVE A CLAUSE REQUIRING COMPLIANCE WITH THE AIS REQUIREMENT. THIS IS AN EXAMPLE OF WHAT COULD BE INCLUDED IN SRF ASSISTANCE AGREEMENTS. EPA MAKES NO CLAIMS REGARDING THE LEGALITY OF THIS CLAUSE WITH RESPECT TO STATE LAW:

Comply with all federal requirements applicable to the Loan (including those imposed by the 2014 Appropriations Act and related SRF Policy Guidelines) which the Participant understands includes, among other, requirements that all of the iron and steel products used in the Project are to be produced in the United States (“American Iron and Steel Requirement”) unless (i) the Participant has requested and obtained a waiver from the Agency pertaining to the Project or (ii) the Finance Authority has otherwise advised the Participant in writing that the American Iron and Steel Requirement is not applicable to the Project.

Comply with all record keeping and reporting requirements under the Clean Water Act/Safe Drinking Water Act, including any reports required by a Federal agency or the Finance Authority such as performance indicators of program deliverables, information on costs and project progress. The Participant understands that (i) each contract and subcontract related to the Project is subject to audit by appropriate federal and state entities and (ii) failure to comply with the Clean Water Act/Safe Drinking Water Act and this Agreement may be a default hereunder that results in a repayment of the Loan in advance of the maturity of the Bonds and/or other remedial actions.

#### Attachment 4: Sample Construction Contract Language

ALL CONTRACTS MUST HAVE A CLAUSE REQUIRING COMPLIANCE WITH THE AIS REQUIREMENT. THIS IS AN EXAMPLE OF WHAT COULD BE INCLUDED IN ALL CONTRACTS IN PROJECTS THAT USE SRF FUNDS. EPA MAKES NO CLAIMS REGARDING THE LEGALITY OF THIS CLAUSE WITH RESPECT TO STATE OR LOCAL LAW:

The Contractor acknowledges to and for the benefit of the City of \_\_\_\_\_ (“Purchaser”) and the \_\_\_\_\_ (the “State”) that it understands the goods and services under this Agreement are being funded with monies made available by the Clean Water State Revolving Fund and/or Drinking Water State Revolving Fund that have statutory requirements commonly known as “American Iron and Steel;” that requires all of the iron and steel products used in the project to be produced in the United States (“American Iron and Steel Requirement”) including iron and steel products provided by the Contractor pursuant to this Agreement. The Contractor hereby represents and warrants to and for the benefit of the Purchaser and the State that (a) the Contractor has reviewed and understands the American Iron and Steel Requirement, (b) all of the iron and steel products used in the project will be and/or have been produced in the United States in a manner that complies with the American Iron and Steel Requirement, unless a waiver of the requirement is approved, and (c) the Contractor will provide any further verified information, certification or assurance of compliance with this paragraph, or information necessary to support a waiver of the American Iron and Steel Requirement, as may be requested by the Purchaser or the State. Notwithstanding any other provision of this Agreement, any failure to comply with this paragraph by the Contractor shall permit the Purchaser or State to recover as damages against the Contractor any loss, expense, or cost (including without limitation attorney’s fees) incurred by the Purchaser or State resulting from any such failure (including without limitation any impairment or loss of funding, whether in whole or in part, from the State or any damages owed to the State by the Purchaser). While the Contractor has no direct contractual privity with the State, as a lender to the Purchaser for the funding of its project, the Purchaser and the Contractor agree that the State is a third-party beneficiary and neither this paragraph (nor any other provision of this Agreement necessary to give this paragraph force or effect) shall be amended or waived without the prior written consent of the State.

## Attachment 5: Sample Certification 1

The following information is provided as a sample letter of step certification for AIS compliance. Documentation must be provided on company letterhead.

Date

Company Name

Company Address

City, State Zip

Subject: American Iron and Steel Step Certification for Project (XXXXXXXXXX)

I, (company representative), certify that the (melting, bending, coating, galvanizing, cutting, etc.) process for (manufacturing or fabricating) the following products and/or materials shipped or provided for the subject project is in full compliance with the American Iron and Steel requirement as mandated in EPA's State Revolving Fund Programs.

Item, Products and/or Materials:

1. Xxxx
2. Xxxx
3. Xxxx

Such process took place at the following location:

If any of the above compliance statements change while providing material to this project we will immediately notify the prime contractor and the engineer.

Signed by company representative

## Attachment 5: Sample Certification 2

The following information is provided as a sample letter of certification for AIS compliance. Documentation must be provided on company letterhead.

Date

Company Name

Company Address

City, State Zip

Subject: American Iron and Steel Certification for Project (XXXXXXXXXX)

I, (company representative), certify that the following products and/or materials shipped/provided to the subject project are in full compliance with the American Iron and Steel requirement as mandated in EPA's State Revolving Fund Programs.

Item, Products and/or Materials:

1. Xxxx
2. Xxxx
3. Xxxx

Such process took place at the following location:

If any of the above compliance statements change while providing material to this project we will immediately notify the prime contractor and the engineer.

Signed by company representative

# APPENDIX: WIFIA SPECIFICATION PACKAGE AND BID CONTRACT LANGUAGE

*Last Updated: November 2022*

This is a reference document that provides all necessary contract language for WIFIA funded projects. Please note that some of the contract language in this package is required and must be included verbatim and some is suggested. For *Suggested Contract Language*, you may use your own language so long as it still ensures that provisions are included to guarantee compliance with the federal requirements.

EPA MAKES NO CLAIMS REGARDING THE LEGALITY OF THE FEDERAL LANGUAGE PROVISIONS WITH RESPECT TO STATE OR LOCAL LAW.

## ECONOMIC AND MISCELLANEOUS AUTHORITIES

### DEBARMENT AND SUSPENSION AND PROHIBITIONS RELATING TO VIOLATIONS OF CWA AND CAA WITH RESPECT TO FEDERAL CONTRACTS, GRANTS, OR LOANS

*Suggested Contract Language:*

**Debarment and Suspension.** Contractor certifies that it will not knowingly enter into a contract with anyone who is ineligible under the 2 CFR part 180 and part 1532 (per Executive Order 12549, 51 FR 6370, February 21, 1986) or who is prohibited under Section 306 of the Clean Air Act or Section 508 of the Clean Water Act to participate in the [Project]. Suspension and debarment information can be accessed at <http://www.sam.gov>. Contractor represents and warrants that it has or will include a term or conditions requiring compliance with this provision in all of its subcontracts under this Agreement.

### NEW RESTRICTIONS ON LOBBYING

*Suggested Contract Language:*

**Federal Lobbying Restrictions (31 U.S.C 1352).** Recipients of federal financial assistance may not pay any person for influencing or attempting to influence any officer or employee of a federal agency, a member of Congress, an officer or employee of Congress, or an employee of a member of Congress with respect to the award, continuation, renewal, amendment, or modification of a federal grant, loan, or contract. These requirements are implemented for USEPA in 40 CFR Part 34, which also describes types of activities, such as legislative liaison activities and professional and technical services, which are not subject to this prohibition. Upon award of this contract, Contractor shall complete and submit to the City the certification and disclosure forms in Appendix A and Appendix B to 40 CFR Part 34. Contractor shall also require all subcontractors and suppliers of any tier awarded a subcontract over \$100,000 to similarly complete and submit the certification and disclosure forms pursuant to the process set forth in 40 CFR 34.110.

# CIVIL RIGHTS, NONDISCRIMINATION, AND EQUAL EMPLOYMENT OPPORTUNITY AUTHORITIES

## AGE DISCRIMINATION ACT, SECTION 504 OF THE REHABILITATION ACT, TITLE VI OF THE CIVIL RIGHTS ACT OF 1964, AND SECTION 13 OF THE CLEAN WATER ACT

*Suggested Contract Language:*

**CIVIL RIGHTS OBLIGATIONS.** Contractor shall comply with the following federal non-discrimination requirements:

- a. Title VI of the Civil Rights Act of 1964, which prohibits discrimination based on race, color, and national origin, including limited English proficiency (LEP). (42 U.S.C 2000D, *et. seq*)
- b. Section 504 of the Rehabilitation Act of 1973, which prohibits discrimination against persons with disabilities. (29 U.S.C. 794, supplemented by EO 11914, 41 FR 17871, April 29, 1976 and EO 11250, 30 FR 13003, October 13, 1965)
- c. The Age Discrimination Act of 1975, which prohibits age discrimination. (42 U.S.C 6101 *et. seq*)
- d. Section 13 of the Federal Water Pollution Control Act Amendments of 1972, which prohibits discrimination on the basis of sex.
- e. 40 CFR Part 7, as it relates to the foregoing.

## EQUAL EMPLOYMENT OPPORTUNITY

**Required Contract Language.** *Note the requirements include three separate sections to include in contracts: EEO, Standard Federal Equal Employment Opportunity Construction Contract Specifications, and Segregated Facilities. This language must be included verbatim:*

**Equal Employment Opportunity (EEO).** The Contractor shall comply with Executive Order 11246, entitled 'Equal Employment Opportunity,' as amended by Executive Order 11375, and as supplemented in Department of Labor regulations (41 CFR Part 60). (EO 11246, 30 FR 12319, September 28, 1965)

Contractor's compliance with Executive order 11246 shall be based on implementation of the Equal Opportunity Clause, and specific affirmative active obligations required by the Standard Federal Equal Employment Opportunity Construction Contract Specifications, as set forth in 41 CFR Part 60-4.

During the performance of this contract, the contractor agrees as follows:

- 1) The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following: employment, upgrading,

demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the contracting officer setting forth the provisions of this nondiscrimination clause.

- 2) The contractor will, in all solicitations or advancements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.
- 3) The contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information.
- 4) The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the agency contracting officer, advising the labor union or workers' representative of the contractor's commitments under Section 202 of Executive Order No. 11246 of September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- 5) The contractor will comply with all provisions of Executive Order No. 11246 of Sept. 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
- 6) The contractor will furnish all information and reports required by Executive Order No. 11246 of September 24, 1965, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the contracting agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
- 7) In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of such rules, regulations, or orders, this contract may be cancelled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts in accordance with procedures authorized in Executive Order No. 11246 of Sept. 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order No. 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
- 8) The contractor will include the provisions of paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order No. 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as may be directed by the Secretary of Labor as a means of enforcing such provisions including sanctions for noncompliance: Provided, however, that in the event the contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor



as a result of such direction, the contractor may request the United States to enter into such litigation to protect the interests of the United States. [Sec. 202 amended by EO 11375 of Oct. 13, 1967, 32 FR 14303, 3 CFR, 1966–1970 Comp., p. 684, EO 12086 of Oct. 5, 1978, 43 FR 46501, 3 CFR, 1978 Comp., p. 230, EO 13665 of April 8, 2014, 79 FR 20749, EO 13672 of July 21, 2014, 79 FR 42971]

**Standard Federal Equal Employment Opportunity Construction Contract Specifications. (41 CFR 60-4.3)**

- 1) As used in these specifications:
  - a) “Covered area” means the geographical area described in the solicitation from which this contract resulted;
  - b) “Director” means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority;
  - c) “Employer identification number” means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941.
  - d) “Minority” includes:
    - i) Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);
    - ii) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);
    - iii) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and
    - iv) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).
- 2) Whenever the Contractor, or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.
- 3) If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other Contractors or Subcontractors toward a goal in an approved Plan does not excuse any covered Contractor's or Subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.
- 4) The Contractor shall implement the specific affirmative action standards provided in paragraphs 7 a through p of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and

female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. Covered Construction contractors performing construction work in geographical areas where they do not have a Federal or federally assisted construction contract shall apply the minority and female goals established for the geographical area where the work is being performed. Goals are published periodically in the Federal Register in notice form, and such notices may be obtained from any Office of Federal Contract Compliance Programs office or from Federal procurement contracting officers. The Contractor is expected to make substantially uniform progress in meeting its goals in each craft during the period specified.

- 5) Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.
- 6) In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.
- 7) The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:
  - a) Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.
  - b) Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.
  - c) Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefor, along with whatever additional actions the Contractor may have taken.
  - d) Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the

union referral process has impeded the Contractor's efforts to meet its obligations.

- e) Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under 7b above.
- f) Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.
- g) Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination or other employment decisions including specific review of these items with onsite supervisory personnel such as Superintendents, General Foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.
- h) Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other Contractors and Subcontractors with whom the Contractor does or anticipates doing business.
- i) Direct its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.
- j) Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a Contractor's work force.
- k) Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR part 60-3.
- l) Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.
- m) Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations

under these specifications are being carried out.

- n) Ensure that all facilities and company activities are non-segregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.
  - o) Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.
  - p) Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligations.
- 8) Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (7a through p). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7a through p of these Specifications provided that the contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.
- 9) A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized).
- 10) The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, sexual orientation, gender identity, or national origin.
- 11) The Contractor shall not enter into any Subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.
- 12) The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.
- 13) The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the

implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.

- 14) The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.
- 15) Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

**Segregated Facilities.** (41 CFR 60-1.8) The contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, sexual orientation, gender identity, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensuring that its employees are not assigned to perform their services at any location, under the contractor's control, where the facilities are segregated. This obligation extends to all contracts containing the equal opportunity clause regardless of the amount of the contract. The term "facilities," as used in this section, means waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, wash rooms, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees; Provided, That separate or single-user restrooms and necessary dressing or sleeping areas shall be provided to assure privacy between the sexes.

**Required** EEO language in bid solicitations only (or equivalent). Goals for minority participation must be filled in for the locality of work.

**Notice of Requirement for Affirmative Action to Ensure Equal Employment Opportunity (Executive Order 11246) located at 41 CFR § 60-4.2:**

1. The Offeror's or Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Specifications" set forth herein.
2. The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

Timetables	Goals for minority participation for each trade	Goals for female participation in each trade
	Insert goals for each year <sup>2</sup>	6.9% <sup>3</sup>

These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally assisted) performed in the covered area. If the contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the contractor also is subject to the goals for both its federally involved and non-federally involved construction.

The Contractor's compliance with the Executive Order and the regulations in 41 CFR part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3(a), and its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executive Order and the regulations in 41 CFR part 60-4. Compliance with the goals will be measured against the total work hours performed.

3. The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within 10 working days of award of any construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address and telephone number of the subcontractor; employer identification number of the subcontractor; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the subcontract is to be performed.
4. As used in this Notice, and in the contract resulting from this solicitation, the "covered area" is (insert description of the geographical areas where the contract is to be performed giving the state, county and city, if any).

<sup>2</sup> Goals can be found at: <https://www.dol.gov/agencies/ofccp/construction>

<sup>3</sup> Nationwide goal for all covered areas

## PARTICIPATION BY DISADVANTAGED BUSINESS ENTERPRISES IN PROCUREMENT UNDER EPA FINANCIAL ASSISTANCE AGREEMENTS

*Note: The WIFIA program only requires use of the EPA DBE program's six good faith efforts during contract procurement. States may require additional DBE reporting.*

*Suggested Contract Language:*

**Disadvantaged Business Enterprises (DBE).** The contractor must ensure that the DBE's six good faith efforts are used during the procurement of subcontractors for the [Project]. The six good faith efforts are found at: <https://www.epa.gov/grants/disadvantaged-business-enterprise-program-requirements#sixgoodfaithefforts>.

## AMERICAN IRON AND STEEL (AIS) REQUIREMENT

### *Suggested Contract Language:*

The Contractor acknowledges to and for the benefit of **[Insert WIFIA Borrower Name]** (“Purchaser”) and the United States Environmental Protection Agency (“EPA”) that it understands the goods and services under this Agreement are being funded with monies made available by the Water Infrastructure Finance and Innovation Act program of the EPA that has statutory requirements commonly known as “American Iron and Steel” that requires all of the iron and steel products used in the project to be produced in the United States (“American Iron and Steel Requirement”) including iron and steel products provided by the Contractor pursuant to this Agreement. The Contractor hereby represents, warrants and covenants to and for the benefit of the Purchaser and the EPA that (a) the Contractor has reviewed and understands the American Iron and Steel Requirement, (b) all of the iron and steel products used in the project will be and/or have been produced in the United States in a manner that complies with the American Iron and Steel Requirement, unless a waiver of the requirement is approved, and (c) the Contractor will provide any further verified information, certification or assurance of compliance with this paragraph, or information necessary to support a waiver of the American Iron and Steel Requirement, as may be requested by the Purchaser or the EPA. Notwithstanding any other provision of this Agreement, any failure to comply with this paragraph by the Contractor shall permit the Purchaser or the EPA to recover as damages against the Contractor any loss, expense, or cost (including without limitation attorney’s fees) incurred by the Purchaser or the EPA resulting from any such failure (including without limitation any impairment or loss of funding, whether in whole or in part, from the EPA or any damages owed to the EPA by the Purchaser). While the Contractor has no direct contractual privity with the EPA, as a lender to the Purchaser for the funding of its project, the Purchaser and the Contractor agree that the EPA is a third-party beneficiary and neither this paragraph (nor any other provision of this Agreement necessary to give this paragraph force or effect) shall be amended or waived without the prior written consent of the EPA.



## LABOR LAWS AND STANDARDS

*Note that the language below addresses Davis Bacon and Related Acts and incorporates the WIFIA borrower as an authorized representative, in accordance with the WIFIA loan agreement, to ensure compliance with this federal requirement.*

### **Required Contract Language.**

#### **Compliance with Davis-Bacon and Related Acts.**

(a) In any contract in excess of \$2,000 which is entered into for the actual construction, alteration and/or repair, including painting and decorating, of a public building or public work, or building or work financed in whole or in part from Federal funds or in accordance with guarantees of a Federal agency or financed from funds obtained by pledge of any contract of a Federal agency to make a loan, grant or annual contribution (except where a different meaning is expressly indicated), and which is subject to the labor standards provisions of any of the acts listed in 29 C.F.R. § 5.1, the following clauses (or any modifications thereof to meet the particular needs of the agency, provided that such modifications are first approved by the Department of Labor):

(1) Minimum wages.

(i) All laborers and mechanics employed or working upon the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act ( 29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (a)(1)(iv) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in § 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph (a)(1)(ii) of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its

subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

(ii)

(A) The WIFIA assistance recipient, [name of WIFIA borrower], on behalf of the U.S. Environmental Protection Agency (EPA), shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The WIFIA assistance recipient shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(2) The classification is utilized in the area by the construction industry; and

(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(B) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the WIFIA assistance recipient agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent to the Administrator of the Wage and Hour Division (WHD Administrator), U.S. Department of Labor, Washington, DC 20210. The WHD Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the WIFIA assistance recipient or will notify the WIFIA assistance recipient within the 30-day period that additional time is necessary.

(C) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the WIFIA assistance recipient do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the WIFIA assistance recipient shall refer the questions, including the views of all interested parties and the recommendation of the WIFIA assistance recipient, to the WHD Administrator for determination. The WHD Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the WIFIA assistance recipient or will notify the WIFIA assistance recipient within the 30-day period that additional time is necessary.

(D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (a)(1)(ii) (B) or (C) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the contractor does not make payments to a trustee or other third person, the contractor

may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

(2) Withholding. [name of WIFIA borrower], shall upon written request of the WIFIA Director or an authorized representative of the Department of Labor withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), all or part of the wages required by the contract, the WIFIA Director may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

(3) Payrolls and basic records.

(i) Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work (or under the United States Housing Act of 1937, or under the Housing Act of 1949, in the construction or development of the project). Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(ii) {no text here}

- (A) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to [name of WIFIA borrower] . The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <https://www.dol.gov/agencies/whd/forms/wh347> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to [name of WIFIA borrower], for transmission to the EPA, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to [name of WIFIA borrower].
- (B) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:
- (1) That the payroll for the payroll period contains the information required to be provided under § 5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under § 5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;
  - (2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;
  - (3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.
- (C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph (a)(3)(ii)(B) of this section.
- (D) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.
- (iii) The contractor or subcontractor shall make the records required under paragraph (a)(3)(i) of this section available for inspection, copying, or transcription by authorized representatives of [name of the borrower, EPA, or the Department of Labor, and shall permit such

representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the EPA may, after written notice to the [name of WIFIA borrower], take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

(4) Apprentices and trainees –

- (i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the WHD Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.
- (ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to

and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the WHD Administrator determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

- (5) Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.
- (6) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR 5.5(a)(1) through (10) and such other clauses as the EPA may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.
- (7) Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.
- (8) Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.
- (9) Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and [name of WIFIA borrower], EPA, the U.S.

Department of Labor, or the employees or their representatives. (10) Certification of eligibility.

- (i) By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
- (ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
- (iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

(b) Contract Work Hours and Safety Standards Act. The following clauses set forth in paragraphs (b)(1), (2), (3), and (4) of this section shall be inserted in full in any contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by § 5.5(a) or § 4.6 of part 4 of this title. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

- (1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.
- (2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (b)(1) of this section the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (b)(1) of this section, in the sum of \$25 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (b)(1) of this section.
- (3) Withholding for unpaid wages and liquidated damages. The [name of WIFIA borrower] shall upon its own action or upon written request of an authorized representative of the Department of Labor, or the EPA, withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b)(2) of this section.
- (4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (b)(1) through (4) of this section and also a clause requiring the subcontractors



to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (b)(1) through (4) of this section.

(c) In addition to the clauses contained in paragraph (b), in any contract subject only to the Contract Work Hours and Safety Standards Act and not to any of the other statutes cited in § 5.1, the contractor or subcontractor shall maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the contract for all laborers and mechanics, including guards and watchmen, working on the contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. Further, the EPA shall cause or require the [name of WIFIA borrower] to insert in any such contract a clause providing that the records to be maintained under this paragraph shall be made available by the contractor or subcontractor for inspection, copying, or transcription by authorized representatives of the [name of WIFIA borrower], EPA and the Department of Labor, and the contractor or subcontractor will permit such representatives to interview employees during working hours on the job.



# LATEST UPDATES ON FEDERAL REQUIREMENTS

## BUILD AMERICA, BUY AMERICA ACT

***Other language may be included on contracts for clarity on this federal requirement if an applicable waiver applies. For example, if the WIFIA program has determined program waiver coverage, indicate in contract documents, “This Project is covered under the WIFIA Program Waiver (June 22, 2022), which waives BABA requirements.”***

*Suggested Contract Language:*

### **Build America, Buy America (Effective May 14, 2022)**

The Contractor acknowledges to and for the benefit of (“Purchaser”) and the United States Environmental Protection Agency (“EPA”) that it understands the goods and services under this Agreement are being funded with federal monies made available by the Water Infrastructure Finance and Innovation Act program of EPA that have statutory requirements commonly known as “Build America, Buy America;” that requires all of the iron and steel, manufactured products, and construction materials used in the project to be produced in the United States (“Build America, Buy America Requirements”) including iron and steel, manufactured products, and construction materials provided by the Contractor pursuant to this Agreement. The Contractor hereby represents and warrants to and for the benefit of the Purchaser and Funding Authority (a) the Contractor has reviewed and understands the Build America, Buy America Requirements, (b) all of the iron and steel, manufactured products, and construction materials used in the project will be and/or have been produced in the United States in a manner that complies with the Build America, Buy America Requirements, unless a waiver of the requirements is approved, and (c) the Contractor will provide any further verified information, certification or assurance of compliance with this paragraph, or information necessary to support a waiver of the Build America, Buy America Requirements, as may be requested by the Purchaser or the Funding Authority. Notwithstanding any other provision of this Agreement, any failure to comply with this paragraph by the Contractor shall permit the Purchaser or Funding Authority to recover as damages against the Contractor any loss, expense, or cost (including without limitation attorney’s fees) incurred by the Purchaser or Funding Authority resulting from any such failure (including without limitation any impairment or loss of funding, whether in whole or in part, from the Funding Authority or any damages owed to the Funding Authority by the Owner). If the Contractor has no direct contractual privity with the Funding Authority, as a lender or awardee to the Purchaser for the funding of its project, the Purchaser and the Contractor agree that the Funding Authority is a third-party beneficiary and neither this paragraph (nor any other provision of this Agreement necessary to give this paragraph force or effect) shall be amended or waived without the prior written consent of the Funding Authority.

## PROHIBITION ON CERTAIN TELECOMMUNICATIONS AND VIDEO SURVEILLANCE SERVICES OR EQUIPMENT

*Suggested Contract Language:*

**Prohibition on Certain Telecommunications and Video Surveillance Services or Equipment** (Effective August 13, 2020). The John S. McCain National Defense Authorization Act for Fiscal Year 2019 (P.L. 115-232), at Section 889, prohibits EPA financial assistance recipients, including WIFIA borrowers, from expending loan funds to procure or obtain; extend or renew a contract to procure or obtain; or enter into a contract (or extend or renew a contract) to procure or obtain equipment, services, or systems that use covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system. As described in the Act, “covered telecommunications equipment or services” means:

- a) Telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities).
- b) For the purpose of public safety, security of government facilities, physical security surveillance of critical infrastructure, and other national security purposes, video surveillance and telecommunications equipment produced by Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities).
- c) Telecommunications or video surveillance services provided by such entities or using such equipment.
- d) Telecommunications or video surveillance equipment or services produced or provided by an entity that the Secretary of Defense, in consultation with the Director of the National Intelligence or the Director of the Federal Bureau of Investigation, reasonably believes to be an entity owned or controlled by, or otherwise connected to, the government of a covered foreign country.

The Act does not prohibit:

- a) Procuring with an entity to provide a service that connects to the facilities of a third-party, such as backhaul, roaming, or interconnection arrangements.
- b) Telecommunications equipment that cannot route or redirect user data traffic or permit visibility into any user data or packets that such equipment transmits or otherwise handles.

DOCUMENT 00811  
SPECIAL PROVISIONS  
MONTHLY PRICE ADJUSTMENT FOR HOT MIX ASPHALT (HMA) MIXTURES  
ENGLISH AND METRIC UNITS  
Revised: 07/08/2016

This provision applies to all projects using greater than 100 tons (91 megagrams) of hot mix asphalt (HMA) mixtures containing liquid asphalt cement as stipulated in the Notice to Contractors section of the bid documents.

Price Adjustments will be based on the variance in price, for the liquid asphalt component only, between the Base Price and the Period Price. They shall not include transportation or other charges. Price Adjustments will occur on a monthly basis.

**Base Price**

The Base Price of liquid asphalt on a project as listed in the Notice to Contractors section of the bid documents is a fixed price determined by the Department at the time of the bid using the same method as the determination of the Period Price detailed below. The Base Price shall be used in all bids.

**Period Price**

The Period Price is the price of liquid asphalt for each monthly period as determined by the Department using the average selling price per standard ton of PG64-28 paving grade (primary binder classification) asphalt, FOB manufacturer's terminal, as listed under the "East Coast Market - New England, Boston, Massachusetts area" section of the Poten & Partners, Inc. "Asphalt Weekly Monitor". This average selling price is listed in the issue having a publication date of the second Friday of the month and will be posted as the Period Price for that month. The Department will post this Period Price on its website at <http://www.mhd.state.ma.us/> within two (2) business days following its receipt of the relevant issue of the "Asphalt Weekly Monitor". Poten and Partners has granted the Department the right to publish this specific asphalt price information sourced from the Asphalt Weekly Monitor. This method of period price determination was formerly called the New Asphalt Period Price Method. Separate website postings using both the New Asphalt Period Price Method and the Old Asphalt Period Price Method were discontinued after June 2013.

**Price Adjustment Determination, Calculation and Payment**

The Contract Price of the HMA mixture will be paid under the respective item in the Contract. Price Adjustments, as herein provided, either upwards or downwards, will be made after the work has been performed using the monthly period price for the month during which the work was performed.

Price Adjustments will be paid only if the variance from the Base Price is 5% or more for a monthly period. The complete adjustment will be paid in all cases with no deduction of the 5% from either upward or downward adjustments.

The Price Adjustment applies only to the actual virgin liquid asphalt content in the mixture placed on the job in accordance with the Standard Specifications for Highways and Bridges, Division III, Section M3.11.03.

Price Adjustments will be separate payment items. The pay item numbers are 999.401 for a positive price adjustment (a payment) and 999.402 for a negative price adjustment (a deduction). Price Adjustments will be calculated using the following equation:

$$\text{Price Adjustment} = \text{Tons of HMA Placed} \times \text{Liquid Asphalt Content \%} \times \text{RAP Factor} \times (\text{Period Price} - \text{Base Price})$$

No Price Adjustment will be allowed beyond the Completion Date of this Contract, unless there is a Department-approved extension of time.

\*\*\*\*\* END OF DOCUMENT \*\*\*\*\*

DOCUMENT 00812

SPECIAL PROVISIONS  
MONTHLY PRICE ADJUSTMENT FOR DIESEL FUEL AND GASOLINE –  
ENGLISH UNITS

Revised: 01/26/2009

This monthly fuel price adjustment is inserted in this contract because the national and worldwide energy situation has made the future cost of fuel unpredictable. This adjustment will provide for either additional compensation to the Contractor or repayment to the Commonwealth, depending on an increase or decrease in the average price of diesel fuel or gasoline.

This adjustment will be based on fuel usage factors for various items of work developed by the Highway Research Board in Circular 158, dated July 1974. These factors will be multiplied by the quantities of work done in each item during each monthly period and further multiplied by the variance in price from the Base Price to the Period Price.

The Base Price of Diesel Fuel and Gasoline will be the price as indicated in the Department's web site ([www.mhd.state.ma.us](http://www.mhd.state.ma.us)) for the month in which the contract was bid, which includes State Tax.

The Period Price will be the average of prices charged to the State, including State Tax for the bulk purchases made during each month.

This adjustment will be effected only if the variance from the Base Price is 5% or more for a monthly period. The complete adjustment will be paid in all cases with no deduction of the 5% from either upward or downward adjustments.

No adjustment will be paid for work done beyond the extended completion date of any contract.

Any adjustment (increase or decrease) to estimated quantities made to each item at the time of final payment will have the fuel price adjustment figured at the average period price for the entire term of the project for the difference of quantity.

The fuel price adjustment will apply only to the following items of work at the fuel factors shown:

ITEMS COVERED	FUEL FACTORS	
	Diesel	Gasoline
Excavation: and Borrow Work: Items 120, 120.1, 121, 123, 124, 125, 127, 129.3, 140, 140.1, 141, 142, 143, 144., 150, 150.1, 151 and 151.1 (Both Factors used)	0.29 Gallons / CY.	0.15 Gallons / CY
Surfacing Work: All Items containing Hot Mix Asphalt	2.90 Gallons / Ton	Does Not Apply

\*\*\*\*\* END OF DOCUMENT \*\*\*\*\*

DOCUMENT 00814

SPECIAL PROVISIONS  
PRICE ADJUSTMENT FOR PORTLAND CEMENT CONCRETE MIXES

January 12, 2009

This provision applies to all projects using greater than 100 Cubic Yards (76 Cubic Meters) of Portland cement concrete containing Portland cement as stipulated in the Notice to Contractors section of the Bid Documents. This Price Adjustment will occur on a monthly basis.

The Price Adjustment will be based on the variance in price for the Portland cement component only from the Base Price to the Period Price. It shall not include transportation or other charges.

The Base Price of Portland cement on a project is a fixed price determined at the time of bid by the Department by using the same method as for the determination of the Period Price (see below) and found in the Notice to Contractors.

The Period Price of Portland cement will be determined by using the latest published price, in dollars per ton (U.S.), for Portland cement (Type I) quoted for Boston, U.S.A. in the **Construction Economics** section of *ENR Engineering News-Record* magazine or at the ENR website <http://www.enr.com> under **Construction Economics**. The Period Price will be posted on the MassHighway website the Wednesday immediately following the publishing of the monthly price in ENR, which is normally the first week of the month.

The Contract Price of the Portland cement concrete mix will be paid under the respective item in the Contract. The price adjustment, as herein provided, upwards or downwards, will be made after the work has been performed, using the monthly period price for the month during which the work was performed.

The price adjustment applies only to the actual Portland cement content in the mix placed on the job in accordance with the Standard Specifications for Highways and Bridges, Division III, Section M4.02.01. No adjustments will be made for any cement replacement materials such as fly ash or ground granulated blast furnace slag.

The Price Adjustment will be a separate payment item. It will be determined by multiplying the number of cubic yards of Portland cement concrete placed during each monthly period times the Portland cement content percentage times the variance in price between the Base Price and Period Price of Portland cement.

This Price Adjustment will be paid only if the variance from the Base Price is 5% or more for a monthly period. The complete adjustment will be paid in all cases with no deduction of the 5% from either upward or downward adjustments.

No Price Adjustment will be allowed beyond the Completion Date of this Contract, unless there is a Department-approved extension of time.

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END OF DOCUMENT

## SECTION 01010

### SUMMARY OF WORK

#### PART 1 - GENERAL

##### 1.1 SUMMARY

- A. Section summarizes the Work to be done under this contract which includes, but is not limited to:
1. CIPP lining of approximately 450 linear feet of 39-inch clay tile pipe and 2,600 linear feet of 36-inch clay tile pipe of the existing North Branch Sewer Interceptor pipe between Wilbraham Road and SMH 4349.
  2. Selective demolition of approximate eight (6) manhole corbels as required for pipeline access to carry out CIPP lining operations.
  3. Rehabilitation of approximately thirteen (13) manholes with cementitious lining
  4. Temporary sewer system bypass
  5. Construction of a permanent gravel access road between Riverton Road and the existing maintenance area within St. Michael's Cemetery.
  6. Site restoration.
  7. Installation of (1) 8-foot diameter precast concrete sewer manhole on St. Michael's Cemetery at the intersection of the North Branch and East Branch Interceptors.
  8. Replacement of approximately 70 linear feet of 24-inch, 36-inch and 39-inch existing clay tile sewer at the intersection of the North Branch and East Branch Interceptors, with approximately 70 linear feet of 24-inch and 36-inch PVC pipe (see Drawings for details). Disposal of clay tile pipe removed.
- B. A general description of the Work to be performed under this contract shall include, but will not be limited to the following construction operations:
1. Maintenance of sanitary flow through bypass operations during pipeline rehabilitation.
  2. Excavating, trench support, furnishing and installing, backfilling, grading and compacting for construction of new interconnection

between the North Branch Interceptor and the East Branch Interceptor;

3. Demolition and disposal of existing subsurface structures and pipes and fittings;
  4. Removal, replacement, restoration and construction of all indicated surface work;
  5. Removal, storage, and reuse of geotechnically and analytically suitable excavated material on site as backfill and disposal of excess material from excavation not required for fill or backfill as specified, and to the satisfaction of the Owner;
  6. Coordinate with public and private utilities for the identification, protection, and relocation of their facilities as may be required;
  7. Provide vehicular and pedestrian traffic control;
  8. Coordinate with the City of Springfield for work on City-owned property that is not within the Commission's jurisdiction;
  9. Pave trench with temporary bituminous;
  10. Restore disturbed grass/turf on public and/or private (if applicable) property;
- C. The work shall conform to such additional drawings, specifications and addenda to these Specifications and Drawings as may be published or exhibited prior to the opening of Bid Proposals or as may be furnished by the Engineer from time to time during the construction.
- D. Work and materials which are necessary in the construction of the Project but which are not specifically referred to in the Specification, or shown on the Drawings, but implied by the Contract shall be furnished by the Contractor and included in the Contractor's Unit and Lump Sum Prices Bid. The work and materials shall be such as will correspond with the general character of the work as may be determined by the Engineer, whose decisions as to the necessity for and character of such work and materials shall be final and conclusive. It is the intent of these specifications to produce a complete, finished job whether shown in every detail or not.

## 1.2 RELATED SECTIONS

- A. Section 01060 – PERMITS AND REGULATORY REQUIREMENTS
- B. Section 01300 – SUBMITTALS

- C. Section 01301 – SCHEDULE OF VALUES
- D. Section 01313 – CONSTRUCTION AND SCHEDULE CONSTRAINTS
- E. Section 01560 – TEMPORARY ENVIRONMENTAL CONTROLS

### 1.3 DEFINITIONS

- A. The term “Owner” shall refer to the Springfield Water and Sewer Commission (SWSC).
- B. The term “as indicated” shall mean as shown or depicted on the Drawings.
- C. The term “as specified” shall mean as stated or required by these Specifications.
- D. The term “temporary” shall be used only when referencing items of work that are not permanent.
- E. The terms “installation”, “install”, or “provide” shall mean “furnish and install”.

### 1.4 PROJECT/SITE CONDITIONS

- A. Use of Premises and Offsite Work
  - 1. Contractor is advised that work will take place within St. Michael’s Cemetery, located at 1601 State Street, Springfield, MA 01109.
  - 2. Limits of work are as indicated. Contractor shall acquire any additional land required for temporary storage of materials and equipment. Any land and access thereto not furnished by the Owner that the Contractor deems necessary for the Contract work, for temporary construction facilities, access, and egress or for storage of materials shall be provided by the Contractor at no additional cost to the Owner.
  - 3. No entrance upon private property for any purpose without prior written permission from the property owner shall be allowed. Contractor shall not enter upon public property, other than public streets, without giving prior notice to the entity charged with maintaining the property.
  - 4. Contractor’s use of the project site shall be limited to its construction operations, including on-site storage of materials, on-site fabrication facilities and field offices.



5. Contractor shall determine the location(s) of the staging area(s) to be used for this project and shall obtain approval of the location(s) from the City of Springfield, Springfield Water and Sewer Commission and the Springfield Dioceses prior to any mobilization activities.
  - a. Contractor is to minimize disturbance to cemetery grounds as shown on the Contract Drawings.
6. The Contractor shall maintain access to street parking and driveway parking and access to all properties and businesses outside the work zone during off work hours.

**B. Public Convenience**

1. Contractor shall at all times conduct its Work to maintain the flow of pedestrian and vehicular traffic and prevent inconvenience to the general public and businesses in the vicinity of the Work, and to ensure protection of persons and property. Fire hydrants on and adjacent to the work shall be kept accessible to firefighting equipment at all times. Temporary provisions shall be made to ensure the unimpeded use of sidewalks. Gutters, storm water systems, drainage ditches and culverts shall not be obstructed.
2. Unrestricted access to all businesses and homes must be maintained at all times during construction.
3. During contract time the contractor will own the defined project area and will be responsible for all aspects of road maintenance including road plowing, road sanding, pothole repair, traffic signal maintenance, etc. Any and all accidents that occur within the defined project area will be referred to the contractor.

**C. Securing Pipeline Access**

1. When Work is not in progress, Contractor shall provide temporary barricades to secure all open access points to prevent entry by animals and unauthorized personnel.
2. Contractor shall not cut pipelines or otherwise remove pipeline components that would allow unauthorized entry into the pipeline until it is ready to begin work in the affected section.
3. Cutting and removing pipeline sections and components shall not be done until barricade materials are on site.

**D. Field Measurements**

1. All dimensions indicated, and all dimensions required for the Work shall be verified by measurement of existing conditions.
2. Any discrepancies between the Contract Documents and existing conditions shall be referred to the Owner and Engineer before any Work affected thereby has been started.

E. Work Schedule

1. The hours of work shall be Monday through Friday, 7:00 A.M. to 4:00 P.M. excluding Springfield Water and Sewer and City of Springfield holidays listed in Appendix F, unless otherwise approved in writing by Owner, Engineer, and Springfield Dioceses.
2. Work schedule on cemetery grounds must be submitted two (2) week in advance and approved by cemetery personnel.
3. The City of Springfield has a winter moratorium in place for construction activity within public rights-of-way. No work will be permitted between December 1 and April 1 unless otherwise approved in writing by Owner, Engineer, and Springfield DPW.
4. Contractor shall not work beyond the specified working hours, without prior written permission from the Owner, except for the following:
  - a. As required by regulatory permits.
  - b. Construction de-watering and bypass pumping may be operated and maintained continuously for as long as they are required.

1.5 SCHEDULING, MILESTONES, AND CONSTRAINTS

A. General

1. Contractor shall submit proposed Construction Schedule in accordance with Sections 01300, 01301, 01311, and 01313 no later than 45 days after Notice to Proceed or on the date of the preconstruction conference, whichever is first.
2. Refer to Section 01313 for constraints.

1.6 COORDINATION

- A. Coordinate with public and private utilities for the identification, protection, and relocation of their facilities.

## 1.7 UNDERGROUND UTILITIES

- A. The underground utilities shown on the plans have been located primarily from information furnished by others and are considered approximate both as to size and location. There are additional utilities to be encountered that are not shown on the plans, and it shall be the Contractor's responsibility to locate all existing utilities and to protect same from damage or harm. All utilities interfered with or damaged shall be properly restored, at the expense of the Contractor, to the satisfaction of its owner. Charges to the Owner as a result of unapproved service interruptions will not be allowed.

## 1.8 SURFACE RESTORATION

- A. Any damage to the pavement, curbing, or sidewalks outside of the limits of excavation and excavation support as defined in the Contract Documents shall be the responsibility of the Contractor and all costs associated with the repair of the excavation, sub-base, pavement, curbing, and sidewalks shall be fully borne by the Contractor. Repairs shall be immediately made by the Contractor as per the Contract Documents and as directed by the Engineer.

## 1.9 DRAWINGS

- A. The location, general characteristics, and principal details of the work are as indicated.
- B. Additional drawings showing details in accordance with which the work is to be done may be furnished from time to time by the Engineer, if found necessary, and shall then become a part of the Drawings.
- C. Appendix E contains the Springfield Water and Sewer Commission's Water and Sewer Standard details. These standard details supplement the Contract Drawings. In the case of conflicts between the details presented in the Contract Drawings and the details presented in Appendix E, the Contract Drawings take precedence.

## PART 2 - PRODUCTS

Not Used

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Archaeological Artifacts
  - 1. All articles of historical or scientific value, including coins, fossils, and articles of antiquity, which may be uncovered or otherwise brought to the Contractor's attention during the course of the Work

shall remain the property of the owner on whose property the articles were found. Such findings shall immediately be reported to the Owner who will contact the appropriate agencies for applicable procedures. Refer to Section 01560.

END OF SECTION 01010

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SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Payment for the items specified in the Bid Schedule shall include compensation for furnishing all labor, tools, equipment, materials, supplies, and manufactured articles, and for all operations, and incidentals appurtenant to the items of work described or implied, to complete the various items of the Work, all in accordance with the requirements of the Contract Documents, Drawings, Specifications, Addenda, and other modifications issued and approved by the Owner and Engineer, and all other Work items necessary to manufacture, furnish, install and test a complete working project.
- B. Payment for the items specified in the Bid Schedule shall include all costs for permits and compliance with the regulations of public agencies having jurisdiction including Safety and Health Requirements of the Occupational Safety and Health Administration of the U.S. Department of Labor (OSHA).
- C. Measurement for the items specified in the Bid Schedule shall be as measured and determined by the Owner and/or Engineer. The Owner and Engineer reserve the right to verify any measurement information provided by the Contractor.
- D. The following items are considered “Incidental” to the completion of the Work included in this Contract. These incidental work items shall be included in the Bid Schedule prices and are not included for separate payment. The incidental work items include, but are not limited to:
  - 1. Demolition, removal and disposal of existing bituminous pavement
  - 2. Abandonment, removal and disposal of existing, abandoned or relocated utilities
  - 3. Dust, Odor and Vapor Control
  - 4. Rodent Control
  - 5. Construction photographs and videos

6. Preparing for and attending Owner meetings, neighborhood meetings, and all other Construction coordination meetings
7. Submitting work plans, shop drawings and materials samples
8. Concrete encasement of impacted utilities
9. Street sweeping and removing snow from streets and sidewalks where work is ongoing
10. Transporting trash and recyclables out of the work area where municipal pickup is hindered by the Work
11. Providing certificates of design where required
12. Submitting monthly CPM schedules and narratives
13. Submitting weekly and bi-weekly construction schedule projections and updates
14. Fulfilling all reporting requirements
15. Preparation and submission of monthly and final as-built drawing information
16. Clean-up and restoration of all surface features not included for payment elsewhere.
17. Obtain and implement all permits as well pay for those permit fees not specifically listed for direct payment by the Springfield Water and Sewer Commission in Section 01060 – PERMITS AND REGULATORY REQUIREMENTS.
18. Tree protection
19. Demolition and Removal of Pipe
20. Pipe Caps for Pipe Abandonment
21. Controlled Density Fill (CDF) for pipe abandonment unless otherwise specified
22. Remove and reset all signs, meters, fences or any other site feature or furnishing not specifically listed for separate payment elsewhere.

23. Dewatering including, but not limited to the installation of well points, deep wells, or local excavation sumps.

- E. No separate payment shall be made for any item that is not specifically specified in the Bid Schedule, and all costs therefore shall be included in the prices named in the Bid Schedule for the various appurtenant items of work.
- F. The Contractor and Subcontractors shall not take advantage of any apparent error or omission on the Drawings or in the Specifications. The Contractor and Subcontractors shall make corrections and interpretations as may be deemed necessary for fulfillment of the intent of the Contract Documents at no additional cost to the Owner.
- G. Anywhere in these Contract Documents, the term furnish shall mean the manufacture; supply; delivery to the Project site including the actual unloading and unpacking; assembly; erection; placing; installation; anchoring; applying; working to dimension; finishing; curing; protecting; cleaning; testing; start-up; and similar operations unless stated otherwise.
- H. The Owner reserves the right to use other unit prices for additional work where they may exist.

## 1.2 LUMP SUM ITEMS

- A. Payment for the lump sum shall be full compensation for all labor, materials and equipment required to furnish, install, construct, startup and test the work covered under that lump sum item, whether listed in the related Compensation subsection for each item or not. All supervision; overhead items including but not limited to bonds, insurance, and labor burden; and profit are also included.
- B. Payment will fully compensate the Contractor for any other work which is not specified or shown, but which is necessary to complete the Work.

## 1.3 UNIT PRICE ITEMS

- A. Unit prices shall be full compensation for all labor, materials and equipment required to furnish, install, construct, startup and test the work covered under that unit price item, whether listed in the related Compensation subsection for each item or not. All supervision; overhead items including but not limited to bonds, insurance, and labor burden; and profit are also included.
- B. Payment will fully compensate the Contractor for any other work which is not specified or shown, but which is necessary to complete the Work.



Requests for changes to the unit prices for the quantities indicated will not be considered unless the actual final quantity is less than 85% or more than 115% of the quantity of the bid. Requests for changes to the unit prices bid must be fully documented and justified by the party (Contractor or Owner) making the request to be considered in accordance with the provisions of General Conditions.

#### 1.4 ALLOWANCE ITEMS

- A. Allowances shall be full compensation for all labor, materials and equipment required to furnish, install, construct, startup and test the work covered under that unit price item, whether listed in the related Compensation subsection for each item or not. All supervision; overhead items including but not limited to bonds, insurance, and labor burden; and profit are also included.

Payment will fully compensate the Contractor for any other work which is not specified or shown, but which is necessary to complete the Work.

#### 1.5 BASE BID ITEM DESCRIPTIONS

- A. Item 00100.1 – Price Adjustments for Fuel, Liquid Asphalt, and Portland Cement (Allowance)
1. Measurement for Payment for Price Adjustments for Diesel Fuel, Gasoline, Liquid Asphalt, and Portland Cement for Cast In Place Concrete will be based on the actual quantity included in a monthly Application for Payment, as supported by paid invoices, and will be made after the work has been performed, using the applicable Period Price per MassDOT website. Price adjustments will only be paid when the variance between the Base Price and the Period Price for the month during which the cost is incurred exceeds plus five percent (5%).
  2. The allowance for this item will be reimbursed to the General Contractor to furnish all payments for Diesel Fuel, Gasoline, Liquid Asphalt, and Portland Cement for Cast In Place Concrete when the variance between the Base Price and the Period Price for the month during which the cost is incurred exceeds plus five percent (5%), as calculated by the Engineer.
- B. Item 01025.1 – Misc. Infrastructure Improvements (Allowance)
1. Measurement for Payment for Misc. Infrastructure Improvements for unforeseen utility work will be based on price as approved by the Owner and Engineer and submitted by the General Contractor

on a monthly basis. Payment will be made upon receipt of the appropriate backup and as approved by the Owner and Engineer.

2. The allowance for this item will be reimbursed to the General Contractor to furnish all labor, professional services, subcontractors, equipment, materials and incidentals calculated based on the extra work provisions of the General Conditions.
3. Under the allowance for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required to support, repair or improve existing utilities in place and maintain operation during construction of parallel and crossing utilities. This work includes, but is not limited to temporary support of sewer, combined sewer, water and drain pipe, electric and telecommunication duct banks, street railway ducts, handholes, gas pipe, and other pipe and structures as required. This work may include furnishing, installing and/or performing the following: design of utility support system by a Registered Massachusetts Professional Engineer; submission of utility support system to the Engineer for review; furnish and install utility support system, including additional support as identified by the Engineer during the submittal review; coordination and temporary support of publicly and privately owned utilities and structures impacted by the Work; removal of utility support system following completion of the work or left in place as necessary; maintenance and improvement of the utility support system; protection of the utility; monitoring of the utility; repair of the utility where damaged during installation and removal of the utility support or during the progression of the Contract work; and additional excavation, backfill, fill, and compaction required to facilitate the support and outside the normal trench limits. This item includes the support of existing pipes, duct banks and handholes which the proposed work will cross or run parallel to. Support of utility submittals shall be provided to the Engineer for review in advance of the work. Existing utilities which are damaged or broken as a result of inadequate support shall be repaired or replaced at the Contractor's expense.
4. The following item(s) are not included for allowance under this item and are included for payment elsewhere: utility support systems required to facilitate the Contractor's means and methods; support of existing large utilities; excavation, backfill and restoration of trenches, and utility monitoring for utility crossings are included for payment elsewhere.

C. Item 01200.1 – Survey: Construction Baseline Layout and As-Builts

1. Measurement for payment for this item shall be based on a percent of the Lump Sum based on the Schedule of Values for the construction baseline layout and as-builts complete and accepted as shown on the Contract Drawings or as directed by the Owner or Engineer and as measured by the Engineer.
2. Payment for Survey: Construction Baseline Layout and As-Builts will be based on the bid for this item in the proposal. Under the Lump Sum Price bid for this item, Contractor shall furnish all labor, professional services, technician, equipment, and incidentals for the Contractor, through a Massachusetts Registered Professional Land Surveyor to establish survey control; survey, mark out and maintain construction layout and baseline layout required in this Contract; and to survey and furnish electronic deliverables of test pit information; and to survey and furnish electronic deliverables of as-built conditions.
3. This item is not for use in establishing line and grade. This shall be incidental to the overall cost of the Contract and shall not be paid separately here or elsewhere. The Contractor is required to use a Professional Land Surveyor (PLS) registered in the State of Massachusetts. Any services not performed by said PLS will not be paid for. Contractor or other support outside of the PLS will not be paid for herein and is considered incidental to the overall cost of the Contract, not paid separately here or elsewhere.

D. Item 01390.1 – Pre-Construction Survey

1. Measurement for payment for this item shall be based on a percent of the Lump Sum based on the Schedule of Values for the Preconstruction Survey complete and accepted as shown on the Contract Drawings or as directed by the Owner or Engineer and as measured by the Engineer.
2. Payment for the Pre-Construction Survey shall be based on the lump sum price bid for this item in the proposal. Under the Lump Sum Price bid for this item, the Contractor shall furnish all labor, materials, instrumentation, tools, equipment, and incidentals required to complete a video inspection, covering all limits of work within the project areas, as detailed in the Construction Documents and as directed by the Owner or Engineer. The work includes but is not limited to furnishing, installing and performing the following: advance notice and coordination with property owner(s); video inspection and documentation of existing conditions; delivering electronic versions and report of inspection;

re-inspection; and all other appurtenances and incidental work not specifically included for payment elsewhere.

3. The following item(s) are not included for payment under this item and are included for payment elsewhere: CCTV inspection of pipelines.

E. Item 01505.1 – Mobilization

1. Measurement for payment for Mobilization shall be based on substantial commencement of work and payable when the Contractor is operational on the site. The Lump Sum price bid for mobilization shall not exceed 5 percent of the Total Amount of the Base Bid.
2. Payment for Mobilization shall be based on the Lump Sum Price bid for this item in the proposal. Under the Lump Sum Price bid for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required for mobilization on-site and preparation to begin construction, as well as demobilization from the site and cleanup as specified in the Contract Documents and as directed by the Owner or Engineer. This work includes, but is not limited to, furnishing, installing and/or performing the following: all costs of initiating the Contract; securing and constructing a staging area for materials Contractor's office trailers fully equipped and supplied; all utilities, and broadband for the duration of the Contract; pre-construction traffic management signage; project sign; distributing contact numbers for Contractor's staff to Owner and Engineer; submission of initial shop drawings, CPM Schedule, and Initial Work Plans; obtaining all necessary permits; temporary power, lighting and water for construction purposes; implementing security features; OSHA safety programs and signage; temporary sanitary facilities; transporting all necessary trucks and construction equipment to the site necessary to begin construction; the presence of the Contractor's Superintendent; and all other appurtenances and incidental work necessary to start and complete Construction.
3. The following item(s) are not included for payment under this item and are included for payment elsewhere: constructing and maintaining a Soil/Fill Staging Area;, and other work needs of the Owner and Engineer; and the cost of material.

F. Item 01568.1 – Sedimentation and Erosion Control

1. Measurement for payment for this item shall be based on a percent of the Lump Sum bid calculated by dividing the elapsed time to date by the contractual construction time limit as approved by the Owner or Engineer.
2. Payment for Sedimentation and Erosion Control will be based on the Lump Sum price bid for this item in the proposal. Under the Lump Sum bid for this item, the Contractor shall furnish all labor, material, tools, equipment, and incidentals required to furnish, install maintain, relocate, and remove all sedimentation and erosion control measures as detailed in the Contract Documents and as directed by the Owner or Engineer. The work includes, but is not limited to, furnishing, installing, and performing the following: all Work Plans and submittals; line all existing and new catch basins with sediment filter devices and remove prior to inclement weather; composting sock used for protection of porous paving media beds; temporary vegetation for erosion control; removal and disposal of all silt and sediment collected from sedimentation and erosion control measures; and all appurtenances and incidental work not specifically included for payment elsewhere. The work under this item also includes the coordination with the appropriate state and local agencies with jurisdiction over the areas being protected.

G. Item 01570.1 – Traffic Management

1. Measurement for payment for Traffic Management will be based on a percent of the Lump Sum bid calculated by dividing the elapsed time to date by the contractual construction time limit as approved by the Engineer.
2. Payment for Traffic Management shall be based on the lump sum price bid for this item in the proposal. Under the lump sum price for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required to provide, maintain, relocate, and remove Traffic Management in areas directly or indirectly influenced by construction within the limits of work or outside the limits of work; along truck routes inside or outside the limits of work; as delineated in the approved Traffic Management Plan, by the MUTCD, ADA, and MADOT standards; and as further required by the Owner, Engineer, and City of Springfield. The work includes but is not limited to; obtaining permits; coordination with the City Department of Utilities, Police Department and Fire Department;; coordination with private property owners within the limits of work; preparing, submitting, reviewing, implementing, and revising traffic management and control plans; work zone

layouts, installing, and maintaining traffic management devices based on approved traffic management and control plans including precast concrete and/or triplex barriers with fencing and plywood panels, reflectorized drums, lane delineators, portable barricades, temporary crosswalks, and cones; temporary pavement markings; removal of temporary and existing pavement markings; restoring and maintaining existing pavement markings disturbed within work zone limits (prior to installation of final pavement marking); furnishing, installing, shimming, pinning, maintaining, and removing steel road plates; furnishing, installing, and removing cold patch pavement as necessary or as directed by the Engineer; ordering and coordinating police details; furnishing and installing temporary construction fencing; maintaining roadways and sidewalks inside or outside the limits of work; establishing and dismantling detours; covering existing traffic signs; obtaining, posting and maintaining “No Parking” signs; meeting with police details daily; coordinating police detail locations; and all incidental work, whether listed here or not, required to provide maintenance and protection of traffic and pedestrians.

H. Item 01570.4 – Uniform Police and Traffic Control (Allowance)

1. Measurement for payment for Uniform Police and Traffic Control shall be an allowance to be included and carried in the Schedule of Values.
2. Payment for Uniform Police and Traffic Control shall cover the cost charged to the Contractor by the Springfield Police Department for providing Uniformed Police Officers for traffic control in project areas the Contractor deems necessary. Excluded from this payment are any costs associated with traffic control, including flaggers, where the Engineer or Police Department do not specifically require the use of Uniformed Police Officers. Payment for this item shall be on the basis of invoices presented by the Police Department to the Contractor for the work. No mark-up will be added by the Contractor to the invoice.

I. Item 02051.1 – Demolition, Modification and Abandonment

1. Measurement for payment for this item shall be based on a percent of the Lump Sum bid based on the Schedule of Values for the complete select Demolition, Modification and Abandonment work completed, tested, and accepted as shown on the Contract Drawings or as directed by the Owner or Engineer and as measured by the Engineer. Modifications installed by the Contractor not successfully tested and accepted shall be paid for at

a maximum of 95 percent of the unit prices bid under this item. The remaining 5 percent shall be paid upon receipt of successful test results by the Engineer. All reduction in payment due to unsuccessful testing shall be made prior to normal retainage.

2. Payment for Demolition, Modification and Abandonment activities shall be based on the Lump Sum price bid for this item in the proposal. Under the lump sum price for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required to complete the demolition, modifications and abandonment activities as detailed in the Contract Documents and as directed by the Owner or Engineer. The work includes, but is not limited to, furnishing, installing, and performing the following: pavement sawcutting; excavation of bituminous concrete; excavation; transporting material to/from soil staging area; temporary excavation support (if timber or steel sheeting is used, payment shall include the temporary excavation support left in place and cut off below grade as per the Contract Specifications); removing and discharging or recharging of groundwater and/or other water from the excavation; grading and compacting the bottom of excavation (i.e. sub-grade); filter fabric as required; bedding, including backfilling; compaction; compaction testing; road subbase including grading and compaction; concrete fill; grout (and waterstop, if applicable); removal and disposal of debris and material, and all other appurtenances and incidental work not specifically included for payment elsewhere.

J. Item 02051.2 - Demolition and Reconstruction of Brick Sewer Manhole Chimney

1. Payment for selective demolition and reconstruction of Sewer Manholes shall be based on the Unit Price bid in the proposal. Measurement for payment for selective demolition and reconstruction of Sewer Manholes shall be based on vertical feet of manhole reconstructed and accepted by the Engineer.
2. Under the Unit Price bid for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required for the complete procurement and installation of selective demolition and reconstruction of Sewer Manholes as indicated on the Drawings and Specifications, and/or as directed by the Owner or Engineer. This work shall include furnishing, installing, and/or performing the following: all property owner notification and coordination; mobilization and demobilization of the selective demolition and reconstruction operation and equipment; pre-construction inspection, light cleaning, surface preparation not

covered in other cost items, selective demolition of the existing brick sewer manhole chimney, reconstruction of the brick sewer manhole chimney, end of shift equipment clean up procedures, and repairs or replacement of any portion of the brick sewer manhole chimney deemed unacceptable by the Owner/Engineer, repair of pipe defects not included for separate or incidental payment elsewhere; obtaining permits for and securing an approved water source; labor, materials, tools, equipment and incidentals required for the installation.

K. Item 02110.1 – Clearing and Grubbing

1. Under the unit price for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required for the clearing and grubbing of the area as specified, or as directed by the Owner or Engineer. The work includes, but is not limited to; cutting of branches and limbs; pruning and trimming of trees; removal of trees; retaining the services of a Massachusetts certified arborist; removal and disposal of all cut trees, trimmed limbs and branches; removal of tree stumps; site cleanup; protection of adjacent structures and utility lines; and all other work not included for payment elsewhere.
2. Measurement for payment shall be on the basis of square yardage by area of clearing and grubbing completed as approved by the Engineer.

L. Item 02210.1 - Roadway Grading and Construction

1. Measurement for payment for roadway grading and construction items shall be based on a percent of the Lump Sum bid based on the Schedule of Values for all roadway grading and construction as shown on the Contract Drawings or as directed by the Owner or Engineer and as measured by the Engineer.
2. Payment for roadway grading and construction items shall be based on the Lump Sum price bid for this item in the proposal. Under the lump sum price for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required to furnish, grade and construct the roadway as detailed in the Contract Documents and as directed by the Owner or Engineer. The work includes, but is not limited to, unclassified excavation; ordinary borrow; dense graded crushed stone pavement for access road; fine grading and compacting; access gate installation; permanent erosion control; seeding; and all other appurtenances



and incidental work not specifically included for payment elsewhere.

M. Item 02252.1 - 8-Foot Diameter Precast Manhole

1. Measurement for payment for precast manhole items shall be based on a percent of the Lump Sum bid based on the Schedule of Values for all precast manholes installed, tested, and accepted, as shown on the Contract Drawings or as directed by the Owner or Engineer and as measured by the Engineer. Structures installed but not successfully tested and accepted shall be paid for at a maximum of 95 percent of the unit prices bid under this item. The remaining 5 percent shall be paid upon receipt of successful test results by the Engineer. All reduction in payment due to unsuccessful testing shall be made prior to normal retainage.
2. Payment for Precast Manholes shall be based on the Lump Sum price bid for this item in the proposal. Under the lump sum price for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required to furnish and install the Precast Manholes as detailed in the Contract Documents and as directed by the Owner or Engineer. The work includes, but is not limited to, site access (from Mass Mutual), furnishing, installing, and performing the following: pavement sawcutting; excavation of bituminous concrete; excavation; transporting material to/from soil staging area; temporary excavation support (if timber or steel sheeting is used, payment shall include the temporary excavation support left in place and cut off below grade as per the Contract Specifications); removing and discharging or recharging of groundwater and/or other water from the excavation; grading and compacting the bottom of excavation (i.e. sub-grade); filter fabric as required; bedding, including test pits (as required to locate existing wye); compaction; compaction testing; precast base, riser sections, and top slab; connections to proposed pipe; flexible pipes sleeves/seals, or grouting of annular space at pipe penetrations; filling of lifting holes; dampproofing all sides, top and bottom of the structure; manhole frame and cover; masonry chimney or concrete setting ring required to raise casting to grade; field collars; bypass flow handling not included elsewhere and as required to complete the Work; factory concrete sample testing; vacuum testing and/or leakage testing; backfilling; borrow compaction; grading and compaction; concrete fill; masonry invert, channel, and bench; grout (and waterstop, if applicable); manhole steps;; and all other appurtenances and incidental work not specifically included for payment elsewhere.

N. Item 02252.7 – Manhole Frame and Covers

1. Measurement for payment Manhole Frame and Covers shall be based on the actual number of manhole frame and covers furnished, tested, and accepted, complete as shown on the Contract Drawings or as directed by the Owner or Engineer and as measured by the Engineer.
2. Payment for Manhole Frame and Covers Items shall be based on the unit prices bid for this item in the proposal. Under the unit price, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required to furnish and install manhole frame and covers as shown in the Contract Documents and as directed by the Owner or Engineer. The work includes, but is not limited to, furnishing, installing, and constructing the frame and cover component, and disposing of existing manhole frames and covers.

O. Item 02498.1 – Easement Restoration

1. Payment for Easement Restoration shall be based on the Lump Sum Price bid for this item in the proposal. Measurement for payment for easement restoration shall be based on a percentage of the lump sum value bid completed based on the Contractor's Schedule of Values as approved by the Engineer.
2. Under the lump sum price bid, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required for restoration of the disturbed project areas impacted by construction. The work includes, but is not limited to: landscaping restoration including loam and seed or hydroseeding; removal and replacement of chain link fence as needed and approved by the Engineer; replacement of existing trees and planting of new trees as directed by the Engineer; and all other appurtenant materials and work not included for payment elsewhere.
3. The following item(s) are not included for payment under this item and are included for payment elsewhere: limits of roadway restoration, approximately STA 20+00 to STA 35+49.

P. Item 02500.1 – Bituminous Concrete Trench Pavement

1. Measurement for Payment for Bituminous Concrete Trench Pavement shall be based on square yardage of hot mix asphalt placed complete, within the payment limits shown on the Contract

Drawings or as directed by the Engineer and as measured by the Engineer. Square yardage of pavement placed will be verified through calculation based on the actual trench widths and lengths or the pavement widths and lengths defined in the Contract, whichever is less. Calculated square yardage will be compared to the actual square yardage placed as submitted on pavement square yardage slips. Placement of pavement to outside the limits defined in the Contract Documents shall be at no additional cost to the Owner.

2. Payment for Bituminous Concrete Trench Pavement shall be based on the unit price bid for this item in the proposal. Under the unit price for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required to install Bituminous Concrete Trench Pavement to depth and width indicated within the payment limits, complete, as shown on the Contract Drawings or at the direction of the Engineer. The work includes, but is not limited to the following; raising and resetting existing castings; installation and compaction of hot mix asphalt pavement; power sweeping; furnish and place tack coat on all edges; removal and disposal of the placed asphalt prior to final paving; maintaining the pavement for the duration prior to final paving; any and all incidental work not included for payment elsewhere including restoration of temporary and permanent pavement markings. Payment for bituminous concrete roadways, sidewalks, driveways and parking areas shall all be included herein.
3. Items not included for payment herein include, but are not limited to; compaction testing; cold patch; temporary paving other than hot mix; hand placement and compaction of hot mix asphalt around structures, aprons, and as directed (included in Bituminous Concrete Hand Work item); temporary paving for traffic and pedestrian control (included in the Traffic Management Lump Sum Item); and pavement installed to replaced asphalt damaged by the Contractor.

Q. Item 02623.1 – 02623.2 – 36” and 24” Polyvinyl Chloride Pipe

1. Payment for Polyvinyl Chloride Pipe shall be based on the Unit Price bid in the proposal for each pipe size. Measurement for payment shall be based on the actual linear feet of all classes and at all depths, complete as shown on the Contract Drawings or as directed by the Owner or Engineer and as measured by the Engineer.

2. Under the unit price bid for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required to furnish and install PVC pipe as indicated in the Contract Documents and as directed by the Owner or Engineer. The work includes, but is not limited to, furnishing, installing, and performing the following: pavement sawcutting; excavation of bituminous concrete; excavation; protecting existing pipe to remain; transporting material to/from soil staging area; temporary excavation support (if timber or steel sheeting is used, payment shall include temporary support of excavation left in place and cut off below grade as per the Contract Specifications); removing and discharging or recharging ground water and/or other water from the excavation; bypass flow handling not included elsewhere and as required to complete the Work; grading and compaction of the bottom of excavation (subgrade); filter fabric as required; crushed stone bedding including compaction; compaction testing; polyvinyl chloride pipe, fittings, couplings and appurtenances; factory testing; CCTV inspection; backfilling; compaction; road subbase including grading and compaction; accounting for potential work suspensions due to increased wet weather flow through system; and all other appurtenances and incidental work not specifically included for payment elsewhere.
3. The following item(s) are not included for payment under this and are included for payment elsewhere: Controlled Density Fill used for backfill; temporary and final paving; classifying and disposing of soil not used; disposal of bituminous concrete; demolition of existing infrastructure, disposal of construction debris demolished within this item; CIP concrete field collars. Removal and disposal of existing sewer and drain pipe smaller than 15-in diameter is considered incidental to the overall price of the contract.

R. Item 02760.1 – Pipeline Heavy Cleaning of Interceptor Pipelines

1. Measurement and Payment for Heavy Cleaning of Pipelines shall be based on the actual linear feet of pipe cleaned and inspected as measured by the Engineer.
2. Under the Unit Price bid for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required for Heavy Cleaning complete as indicated on the Drawings and Specifications, or as directed by the Owner or Engineer. This work shall include furnishing, installing, and/or performing the following: required submittals and work plans; securing a temporary dump site; work scheduling based Section 01313 – CONSTRUCTION AND SCHEDULE CONSTRAINTS; storm

and sewer flow handling including sand bagging, temporary plugs and bulkheads, dewatering and flow bypassing; making arrangements for a water source; loosening, cleaning, and extracting deposits; transporting material to/from dump site; end-of-day surface cleaning around access manhole; repair of any damage caused by the Contractor; post-cleaning CCTV inspection; and incidental work not indicated for payment elsewhere.

S. Item 02761.1 – Bypass Flow Handling

1. Payment for temporary sewer bypass shall be based on the Lump Sum price bid for this item in the proposal. Under the Lump Sum for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required to establish, maintain, and remove flow bypass systems complete as required to handle existing flows while completing the required elements of the Work in the North Branch Interceptor. The work includes, but is not limited to, furnishing, installing, and performing the following: design of the bypass pumping system; pumps; suction hoses; discharge pipes or hoses; pump controls; freeze protection if anticipating cold weather; generators, or electrical supply; fuel; temporary plug(s) and restraint/anchoring, fittings, couplings and appurtenances; backup equipment (one backup pump and one backup generator) equipment; pavement sawcutting, excavation of bituminous concrete; excavation for temporary burial of bypass pipes, and hoses, or discharge location manhole access; protecting existing structures to remain; transporting material to/from soil staging area; temporary excavation support; preparation of subgrade; assembling bypass pumping system; backfill around buried pipes or hoses; removal and replacement of guardrail as necessary to facilitate structural improvements and/or to facilitate buried hose; temporary ramps over bypass piping/hose; testing of pumping system prior to bypassing operations; weather monitoring; periodic bypass suspension and preparing the receiving structures and pipelines to handle flow (i.e. temporarily removing equipment); emergency service during non-work hours; manning pumps or other bypasses as may be required; protection of discharge locations; temporary plating of suction and discharge manholes when pumping operation is suspended; protection of bypass measures; removal of all bypass pumping system equipment at the end of the pumping operation; backfill around discharge manhole and empty bypassing pipe trench; compaction; subbase including grading and compaction; site restoration after pumping system is removed (unless covered elsewhere); and all appurtenances and incidental work not specifically included for payment elsewhere.

2. The following items of work are not included herein and are included for separate or incidental payment elsewhere: modifications to existing manholes to be used as inversion locations; pipeline cleaning; handling, loading, testing, transportation and disposal of the material removed during cleaning operations; and pre- and post-installation inspection by closed circuit television including providing inspection photos and logs.

T. Item 02767.1 – 02767.2 –36” and 39” Cured-in-Place Pipelining

3. Payment for Cured-In-Place Pipeliner shall be based on the Unit Price bid in the proposal for each pipe size. Measurement for payment shall be based on the actual linear feet of complete and functional cured-in-place pipeliner as shown on the Contract Drawings or as directed by the Owner or Engineer. Measurement shall be taken along the centerline of the pipe from the inside face of structures to inside face of structures.

Cured-In-Place Pipeliner installed but not successfully tested and accepted shall be paid for at a maximum of 95 percent of the unit prices bid under each item. The remaining 5 percent shall be paid upon receipt of successful test results by the Engineer. All reductions in payment due to unsuccessful testing shall be made prior to normal retainage.

4. Under the Unit Price bid for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required for the complete procurement and installation of Cured-in-Place Pipeliner in existing pipes complete as indicated on the Drawings and Specifications, and/or as directed by the Owner or Engineer. This work shall include furnishing, installing, and/or performing the following: all property owner notification and coordination; mobilization and demobilization of the pipe lining operation and equipment; installation, maintenance, and removal of insertion and receiving pits, including layout, excavation; construction dewatering; support of excavation, excavation, backfill and grading; burrow fill; repair of defects not included for separate or incidental payment elsewhere; obtaining permits for and securing an approved water source; labor, materials, tools, equipment and incidentals required for the installation, maintenance and removal of temporary water facilities necessary to facilitate CIPP inversion and lining operations; leak sealing host pipe; testing as described in the Contract Specifications; sealing around manhole/structure connections; cutting liner out of manholes; Pre-lining for 39-inch

pipe only; CIPP Lining; curing; collection, sampling and disposal of curing water; mobilization and demobilization; design of the final liner; removal and disposal of all liner debris and modifications; addressing liner defects including but not limited to delamination, fins, wrinkles, and uncured sections; and all incidental work not included for separate payment elsewhere.

U. Item 02770.1 – Sewer Manhole Rehabilitation

1. Payment for Rehabilitation of Sewer Manholes shall be based on the Unit Price bid in the proposal. Measurement for payment for Rehabilitation of Sewer Manholes shall be based on vertical feet of cementitious liner installed and accepted by the Engineer. Rehabilitation of Sewer Manholes installed but not successfully tested and accepted shall be paid for at a maximum of 95 percent of the unit prices bid under each item. The remaining 5 percent shall be paid upon receipt of successful test results by the Engineer. All reductions in payment due to unsuccessful testing shall be made prior to normal retainage.
2. Under the Unit Price bid for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required for the complete procurement and installation of Sewer Manhole Rehabilitation as indicated on the Drawings and Specifications, and/or as directed by the Owner or Engineer. This work shall include furnishing, installing, and/or performing the following: all property owner notification and coordination; mobilization and demobilization of the manhole lining operation and equipment; pre-construction inspection, light cleaning, surface preparation not covered in other cost items, application of the liner on the entirety of the interior of the structure, including the base/invert, mixing and application of the liner including in hot or cold weather, curing of liner in accordance with specified requirements prior to exposure to moisture, end of shift equipment clean up procedures, and repairs or replacement of any portion of installed liner deemed unacceptable by the Owner/Engineer, repair of pipe defects not included for separate or incidental payment elsewhere; compression strength and leakage testing; obtaining permits for and securing an approved water source; labor, materials, tools, equipment and incidentals required for the installation.

V. Item 03300.1 – Cast-In-Place Concrete Field Collar

1. Measurement for payment for CIP Concrete Field Collar Items shall be based on the actual number of individual, respective sized, collars installed tested and accepted, complete as shown on the

Contract Drawings or as directed by the Owner or Engineer and as measured by the Engineer.

2. Payment for CIP Concrete Field Collar Items shall be based on the unit prices bid for these items in the proposal. Under the unit price bid for these items, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required to furnish and install concrete collars as detailed in the Contract Documents and as directed by the Owner or Engineer. The work includes, but is not limited to furnishing, installing, removing, and performing the following: grading and compacting the bottom of excavation (i.e. sub-grade); filter fabric as required; bedding, including compaction; rebar; formwork; waterstops and seals; Class A and B concrete; admixtures; jointing; concrete testing; dampproofing; and all incidental work not specifically included for payment elsewhere.
3. The following item(s) are not included for payment under this item and are included for payment elsewhere: compaction testing; trenching and backfill activities (included in the adjoining); pipe collars less than 15-inch in diameter are considered incidental to the overall price of the Contract; sawcutting and other pipe demolition and/or removal.

END OF SECTION 01025



## SECTION 01040

### PROJECT COORDINATION AND MEETINGS

#### PART 1 – GENERAL

##### 1.1 SUMMARY

- A. This Section includes general coordination requirements including preconstruction conference, site mobilization conference, and progress meetings.

##### 1.2 SPRINGFIELD DIOCESES COORDINATION

- A. Contractor shall meet with representatives of St Michael Cemetery to describe the work and submit a detailed project schedule for review. Representatives of the Commission and/or their designees shall be present at the meeting.
- B. Contractor shall coordinate all work within the St. Michael Cemetery property with the St. Michael Cemetery maintenance staff at least one (1) week prior to work activities.
- C. Maintenance office phone number: (413) 531-6941

##### 1.3 CONTRACTOR COORDINATION

- A. Coordinate scheduling, submittals, and the Work to assure efficient and orderly sequence of installation of interdependent construction elements.
- B. Coordinate completion of the Work and clean up for Substantial Completion and for portions of Work designated for Owner's partial utilization.
- C. Coordinate access to site for correction of nonconforming Work to minimize disruption of Owner's activities where Owner is in partial utilization.

##### 1.4 PRECONSTRUCTION CONFERENCE

- A. The Owner will schedule a preconstruction conference.
- B. Attendance Required: Owner's representatives, Architect/Engineer, Contractor, Contractor's Project Manager and Superintendent and major Subcontractors.

- C. The Owner or Engineer or their representative will make arrangements for meetings, and record minutes.
- D. The Owner or Engineer or their representative will prepare the agenda and preside at meetings.
- E. Contractor shall provide required information and be prepared to discuss each agenda item.
- F. Sample Agenda:
  - 1. Designation of personnel representing the parties in Contract and the Architect/Engineer.
  - 2. Description of the Project background, purpose, basis of design and major elements of the Work.
  - 3. Community Relations requirements.
  - 4. Soil and Waste Management requirements.
  - 5. Major Geotechnical requirements such as temporary support of excavation; backfill and compaction; geotechnical instrumentation and monitoring, and dewatering.
  - 6. Bypass Pumping requirements.
  - 7. Requirements and procedures for the submission of change orders and pay requisitions.
  - 8. Requirements, procedures and processing of shop drawings and other submittals; Schedules and schedule updates; substitutions; and Requests for Information.
  - 9. Scheduling of the Work and coordination with other contractors.
  - 10. Review of Subcontractors.
  - 11. Continuation of City services (trash and rubbish removal, recycling, street sweeping, and snow removal).
  - 12. Meeting requirements (Progress, Work Shops, etc.).
  - 13. Utility coordination.
  - 14. Traffic and pedestrian management requirements.
  - 15. Compliance with safety rules and regulations.

16. Other.

1.5 PROGRESS MEETINGS

- A. Project meetings shall be held at a location designated by the Owner and Engineers. Meetings shall be held at weekly intervals, or more frequent intervals if directed by the Owner or Engineer.
- B. Attendance Required: Job superintendent, Contractor's Project Manager, major Subcontractors and suppliers, Owner representatives, and Architect/Engineer as appropriate to agenda topics for each meeting.
- C. The Owner or Engineer or their representative will make arrangements for meetings, and record minutes.
- D. The Owner or Engineer or their representative will prepare the agenda and preside at meetings.
- E. Contractor shall provide required information and be prepared to discuss each agenda item.
- F. Sample Agenda:
  - 1. Review minutes of previous meetings.
  - 2. Traffic and Pedestrian Management.
  - 3. Community Relations.
  - 4. Review of work progress. Review of work completed, work on going and work scheduled within the coming month.
  - 5. Field observations, problems, and decisions.
  - 6. Identification of problems which impede planned Work progress.
  - 7. Review of submittals schedule and status of submittals.
  - 8. Review of RFI and RFP status.
  - 9. Proposed Change Orders (PCO), claims, credits, Work Change Directive, and change order status.
  - 10. Review of off-site fabrication and delivery schedules.
  - 11. Maintenance of progress schedule.
  - 12. Corrective measures to regain projected schedules.

13. Maintenance of quality and work standards.
14. Effect of proposed changes on progress schedule and coordination.
15. Other item relating to Work.

**PART 2 – PRODUCTS**

Not Used

**PART 3 – EXECUTION**

Not Used

**END OF SECTION 01040**

## SECTION 01045

### CUTTING AND PATCHING

#### PART 1 – GENERAL

##### 1.1 SUMMARY

- A. This Section specifies administrative and procedural requirements for cutting and patching.
- B. Refer to other Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.
  - 1. Requirements of this Section do not apply to mechanical installations.

##### 1.2 SUBMITTALS

- A. Submit proposed procedures for cutting and patching at a minimum of four (4) weeks in advance of the time cutting and patching will be performed. The submittal shall contain, but not be limited to the following information:
  - 1. Describe the extent of cutting and patching required and how it is to be performed; indicate why it cannot be avoided.
  - 2. Describe anticipated results in terms of changes to existing or proposed construction; include changes to structural elements and operating components.
  - 3. List firms or entities that will perform Work.
  - 4. Indicate dates when cutting and patching is to be performed.
  - 5. List utilities, service, or performance that will be disturbed or affected and indicate how long service will be disrupted.
  - 6. Where cutting and patching involves addition of reinforcement to structural elements, submit details stamped by a Massachusetts Professional Engineer to show how reinforcement is integrated with the original structure.
- B. Review by the Engineer prior to proceeding with cutting and patching does not waive the Engineer's right to later require complete removal and replacement of a part of the Work found to be unsatisfactory.

### 1.3 QUALITY ASSURANCE

- A. Requirements for Structural and Utility Work: Do not cut and patch structural elements in a manner that would reduce their load-carrying capacity or load-deflection ratio.
  - 1. Submit the cutting and patching proposal, including a structural analysis and design of additional reinforcement, stamped and signed by a Massachusetts Professional Engineer, before cutting and patching.
  
- B. Operational and Safety Limitations: Do not cut and patch operating elements or safety related components in a manner that would result in reducing their capacity to perform as intended, or result in increased maintenance, or decreased operational life or safety.
  - 1. Submit the cutting and patching proposal before cutting and patching the following operating elements or safety related systems:
    - a. Shoring, bracing, and sheeting.
    - b. Primary operational systems and equipment.
    - c. Control systems.
    - d. Electrical wiring systems.
  
- C. Visual Requirements: Do not cut and patch construction exposed on the exterior, in a manner that would, in the Engineer's opinion, reduce aesthetic qualities, or result in visual evidence of cutting and patching. Remove and replace Work cut and patched in a visually unsatisfactory manner as determined by the Engineer.
  - 1. If possible, retain the original installer or fabricator to cut and patch.
  - 2. If it is not possible to engage the original installer or fabricator, engage another recognized experienced and specialized firm acceptable to the Engineer.

## PART 2 – PRODUCTS

### 2.1 MATERIALS

- A. Use materials whose installed performance will equal or surpass that of existing materials.
  
- B. Where cutting and patching occurs on exposed exterior structures or work, use materials that are identical to existing materials. If identical materials

are not available or cannot be used where exposed surfaces are involved, use materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect.

## PART 3 – EXECUTION

### 3.1 INSPECTION

- A. Before cutting existing surfaces, examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed. Take corrective action before proceeding if unsafe or unsatisfactory conditions are encountered.
  - 1. Before proceeding, meet at the site with parties involved in cutting and patching, including but not limited to mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

### 3.2 PREPARATION

- A. Temporary Support: Provide temporary support of Work to be cut.
- B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.
- C. Take all precautions to avoid cutting existing pipe, conduit or duct banks that are scheduled to be removed or relocated until provisions have been made to bypass them.

### 3.3 CUTTING

- A. General: Employ skilled workmen to perform cutting and patching. Complete cutting and patching without delay.
- B. Cut existing construction to provide for installation of other components or performance of other construction activities and the subsequent fitting and patching required to restore surfaces to their original condition.
- C. Cutting: Cut existing construction using methods least likely to damage elements to be retained or adjoining construction. Where possible, review the proposed procedures with the original installer or manufacturer or with an installer or manufacturer with similar experience. Comply with the installer's and / or manufacturer's recommendations.
- D. In general, where cutting is required use hand or small power tools designed

for sawing or grinding, not hammering and chopping. Cut holes and slots neatly to size required with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.

- E. Cut through concrete and masonry using a cutting machine such as carborundum saw or diamond core drill.
  - F. By-pass utility services such as pipe or conduit, before cutting, where services are shown or required to be removed, relocated or abandoned. Cap, valve or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting.
- 3.4 PATCHING

- A. Inspect and test patched areas to demonstrate integrity of the installation.

3.5 CLEANING

- A. Thoroughly clean areas where cutting and patching is performed or used as access. Remove completely mortar, oils, reinforcing, concrete, masonry and items of similar nature. Thoroughly clean piping, conduit and similar features before finishing is applied. Restore damaged pipe to its original condition.

END OF SECTION 01045



## SECTION 01060

### PERMITS AND REGULATORY REQUIREMENTS

#### PART 1 - GENERAL

##### 1.1 REGULATORY AGENCIES

- A. Contractor shall comply with all laws, rules, regulations, and ordinances promulgated by any authority having jurisdiction over the Work.
- B. The Contractor shall be fully responsible for obtaining and complying with all required permit(s). The Contractor shall ensure that all necessary permits from the Massachusetts Department of Public Safety, Springfield Fire Department, Springfield Police Department, Springfield Department of Public Works, Springfield Water and Sewer Commission, Massachusetts Department of Environmental Protection, and all other regulatory agencies and/or inspectional authorities having jurisdiction are obtained and maintained and that all conditions are complied with.

##### 1.2 PERMITS OBTAINED BY THE CONTRACTOR

- A. The Contractor shall be responsible for obtaining; paying for; and complying with, as part of its base Bid, all permits; licenses; certifications; and approvals required for the work of this contract, not specifically listed in Paragraph 1.2 (and its sub-paragraphs) of this Section. The Contractor's responsibility includes but is not limited to, all permits required for his equipment, work force, staging area, and particular operations such as transportation and storage of fuel, chemicals or other materials and air emission. The Contractor shall submit copies all acquired permits to Engineer via the submittal process. The Contractor shall submit copies of all private property access agreements such as agreements for staging areas.
- B. The Contractor shall be responsible for scheduling and coordinating inspections and receipt of local, state, or federal permits/approvals/certifications for all Work as part of this Contract.
- C. A Springfield Water and Sewer Commission Industrial Pretreatment Program Temporary Discharge Permit (TDP) is required for certain discharges to the sanitary or combined sewer system. Potential work activities that could require this permit include the discharge of dewatering not able to be infiltrated into the ground, and the discharge of flushing water from testing and disinfection operations of the newly installed water main to the collection system. The Contractor shall coordinate with the Springfield Water and Sewer Commission on permit applicability and

application requirements prior to initiating any unpermitted discharges to the collection system.

- D. Contractor shall note that a Construction General Permit has NOT been filed with the DEP and EPA and as such, dewatering may not be discharged to a system that will in turn discharge directly to a surface water body (storm drains and some combined sewers). If the Contractor can not infiltrate and supplement dewatering to the sanitary sewer (and some combined sewers) or in place of discharging to the sanitary sewer (and some combined sewers), the Contractor may apply for a NPDES General Construction Dewatering Discharge Permit, at no additional cost to the Owner. The Contractor shall be responsible for the preparation of the permit and Stormwater Pollution Prevention Plan (SWPPP) and payment of all fees for obtaining the permit.
- E. The following is a list of permits which may be required for the work depending on the Contractor's means and methods. The Contractor shall pay all fees associated with obtaining the required permits.
  - 1. Street Opening / Excavation Permit (DPW)
  - 2. Traffic Management Plans including Detours (DPW)
  - 3. Department of Public Safety, Springfield Fire Department, and Springfield Police Department permits and approvals
  - 4. Springfield Water and Sewer Commission Industrial Discharge Permit
  - 5. NPDES Construction General Permit

## PART 2 - PRODUCTS

Not Used

## PART 3 - EXECUTION

Not Used

END OF SECTION 01060

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SECTION 01070

ABBREVIATIONS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Wherever in these Specifications references are made to the standards, Specifications, or other published data of the various international, national, regional, or local organizations, such organizations may be referred to by their acronym or abbreviation only. As a guide to the user of these Specifications, the following acronyms or abbreviations which may appear in these Specifications shall have the meanings indicated herein.

1.2 ABBREVIATIONS

AA	Aluminum Association
AAMA	Architectural Aluminum Manufacturer's Association
AAR	Association of American Railroads
AASHTO	American Association of State Highway and Transportation
Officials	
ACI	American Concrete Institute
ADA	American Disabilities Act
AFBMA	Anti-Friction Bearing Manufacturer's Association, Inc.
AGA	American Gas Association
AGMA	American Gear Manufacturers Association
AI	The Asphalt Institute
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
AMCA	Air Moving and Conditioning Association
ANSI	American National Standards Institute, Inc.
APA	American Plywood Association or American Parquet Association, Inc.
API	American Petroleum Institute
APWA	American Public Works Association
ARI	Air-Conditioning and Refrigeration Institute
ASCE	American Society of Civil Engineers
ASLE	American Society of Lubricating Engineers
ASME	American Society of Mechanical Engineers
ASQC	American Society for Quality Control
ASSE	American Society of Sanitary Engineers
ASTM	American Society for Testing and Materials
AWS	American Welding Society

AWWA	American Water Works Association
BBC	Basic Building Code, Building Officials and Code Administrators International
BHMA	Builders Hardware Manufacturer's Association
CABO	Council of American Building Officials
CDA	Copper Development Association
CGA	Compressed Gas Association
CLFMI	Chain Link Fence Manufacturer's Institute
CMA	Concrete Masonry Association
CRSI	Concrete Reinforcing Steel Institute
DCDMA	Diamond Core Drill Manufacturer's Association
DCR	Department of Conservation and Recreation
DHI	Door and Hardware Institute
DIPRA	Ductile Iron Pipe Research Association
EIA	Electronic Industries Association
ETL	Electrical Test Laboratories
EPA	Environmental Protection Agency
FCC	Federal Communications Commission
FCI	Fluid Controls Institute
FM	Factory Mutual System
FPL	Forest Products Laboratory
HI	Hydronics Institute
HPMA	Hardwood Plywood Manufacturers Association
IAPMO	International Association of Plumbing and Mechanical Officials
ICBO	International Conference of Building Officials
IEEE	Institute of Electrical and Electronics Engineers
IES	Illuminating Engineering Society
IP	Institute of Petroleum (London)
IPC	Institute of Printed Circuits
IPCEA	Insulated Power Cable Engineers Association
ISDSI	Insulated Steel Door Systems Institute
ISA	Instrument Society of America
ISEA	Industrial Safety Equipment Association
ISO	International Organization for Standardization
ITE	Institute of Traffic Engineers
MADEP	Massachusetts Department of Environmental Protection
MBMA	Metal Building Manufacturer's Association
MIL	Military Standards (DoD)
MBTA	Massachusetts Bay Transit Association
MHD	Massachusetts Highway Department
MPTA	Mechanical Power Transmission Association
MSS	Manufacturers Standardization Society
MUTCD	Manual of Uniform Traffic Control Devices
MWRA	Massachusetts Water Resource Authority
MTI	Marine Testing Institute
NAAMM	National Association of Architectural Metal Manufacturer's

NACE	National Association of Corrosion Engineers
NAGDM	National Association of Garage Door Manufacturers
NB	National Board of Boiler and Pressure Vessel Inspectors (alternate NBBPVI)
NBS	National Bureau of Standards (Now NIST)
NCCLS	National Committee for Clinical Laboratory Standards
NEC	National Electrical Code
NEMA	National Electrical Manufacturer's Association
NETA	International Electrical Testing Association
NFPA	National Fire Protection Association or National Fluid Power Association or National Forest Products Association
NISO	National Information Standards Organization
NLGI	National Lubricating Grease Institute
NMA	National Microfilm Association
NPDES	National Pollution Discharge Elimination
NRCA	National Roofing Contractors Association
NSF	National Sanitation Foundation
NWMA	National Woodwork Manufacturers Association
NWWDA	National Wood Window and Door Association
OSHA	Occupational Safety and Health Administration
PCA	Portland Cement Association
PPI	Plastics Pipe Institute
RCRA	Resource Conservation and Recovery Act
RIS	Redwood Inspection Service
RMA	Rubber Manufacturers Association
RVIA	Recreational Vehicle Industry Association
RWMA	Resistance Welder Manufacturer's Association
SAE	Society of Automotive Engineers
SAMA	Scientific Apparatus Makers Association
SDI	Steel Door Institute
SMA	Screen Manufacturers Association
SMACCNA	Sheet Metal and Air Conditioning Contractors National Association
SPI	Society of the Plastics Industry, Inc.
SPIB	Southern Pine Inspection Bureau
SPR	Simplified Practice Recommendation
SSA	Swedish Standards Association
SSBC	Southern Standard Building Code, Southern Building Code Congress
SSPC	Society for Protective Coating
SSPWC	Standard Specifications for Public Works Construction
TAPPI	Technical Association of the Pulp and Paper Industry
TFI	The Fertilizer Institute
TIA	Telecommunications Industries Association
TPI	Truss Plate Institute
UBC	Uniform Building Code
UL	Underwriters Laboratories, Inc.

WCLIB	West Coast Lumber Inspection Bureau
WCRSI	Western Concrete Reinforcing Steel Institute
WEF	Water Environment Federation
WIC	Woodwork Institute of California
WRI	Wire Reinforcement Institute, Inc.
WWPA	Western Wood Products Association

## PART 2 - PRODUCTS

Not Used

## PART 3 - EXECUTION

Not Used

END OF SECTION 01070

## SECTION 01090

### REFERENCE STANDARDS

#### PART 1 – GENERAL

##### 1.1 SUMMARY

- A. Titles of Sections and Paragraphs: Captions accompanying specification sections and paragraphs are for convenience of reference only, and do not form a part of the Specifications.
- B. Applicable Publications: Whenever in these Specifications references are made to published specifications, codes, standards, or other requirements, it shall be understood that wherever no date is specified, only the latest specifications, standards, or requirements of the respective issuing agencies which have been published as of the date that the Work is advertised for bids, shall apply; except to the extent that said standards or requirements may be in conflict with applicable laws, ordinances, or governing codes. No requirements set forth herein or shown on the Drawings shall be waived because of any provision of, or omission from, said standards or requirements.
- C. Specialists, Assignments: In certain instances, specification text requires (or implies) that specific work is to be assigned to specialists or expert entities, who must be engaged for the performance of that work. Such assignments shall be recognized as special requirements over which the Contractor has no choice or option. These requirements shall not be interpreted so as to conflict with the enforcement of regulations governing the Work; also they are not intended to interfere with local union jurisdiction settlements and similar conventions. Such assignments are intended to establish which party or entity involved in a specific unit of work is recognized as "expert" for the indicated construction processes or operations. Nevertheless, the final responsibility for fulfillment of the entire set of Contract requirements remains with the Contractor.

##### 1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- A. Without limiting the generality of other requirements of the Specifications, all work specified herein shall conform to or exceed the requirements of applicable codes and the applicable requirements of the following documents.
- B. In case of conflict between codes, reference standards, drawings and the other Contract Documents, the most stringent requirements shall govern. All conflicts shall be brought to the attention of the Engineer for clarification and directions prior to ordering or providing any materials or



furnishing labor. The Contractor shall bid for the most stringent requirements.

- C. The Contractor shall construct the Work specified herein in accordance with the requirements of the Contract Documents and the referenced portions of those referenced codes, standards, and specifications listed herein.
- D. Applicable Standard Specifications: References in the Contract Documents to "Standard Specifications" or SSPWC shall mean the Standard Specifications for Public Works Construction, 1991 Edition unless otherwise stated in the specification section.
- E. References herein to "OSHA Regulations for Construction" shall mean Title 29, Part 1926, Construction Safety and Health Regulations, Code of Federal Regulations (OSHA), including all changes and amendments thereto.
- F. References herein to "OSHA Standards" shall mean, Title 29, Part 1910, Occupational Safety and Health Standards, Code of Federal Regulations (OSHA), including all changes and amendments thereto.
- G. References herein to "MUTCD Standards" shall mean, the latest edition of the Manual for Uniform Traffic Control Devices (MUTCD) published by the US DOT, including all changes and amendments thereto.
- H. References herein to "MHD Standards" shall mean, the Massachusetts Highway Department Standard Specifications for Highways and Bridges, latest edition, including all changes and amendments thereto.
- I. References herein to "ADA Standards" shall mean, the American Disabilities Act of 1990 including all changes and amendments thereto.
- J. ASTM: American Society for Testing Materials
- K. AASHTO: American Association of State Highway and Transportation Officials
- L. ACI: American Concrete Institute ASTM: American Society of Testing Materials
- M. Final Rule for the Accessibility Guidelines for Recreational Facilities and Outdoor Developed Areas by the Recreational Access Advisory Committee, US Architectural and Transportation Barriers Compliance Board, most recent edition,

1.3 REGULATIONS RELATED TO HAZARDOUS MATERIALS

- A. The Contractor is responsible for ensuring that all work included in the Contract Documents, regardless if shown or not, shall comply with all EPA, OSHA, RCRA, NFPA, and any other Federal, State, and Local Regulations governing the storage and conveyance of hazardous materials, including petroleum products.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION 01090

## SECTION 01100

### OIL AND HAZARDOUS MATERIALS SPILL CONTROL

#### PART 1 - GENERAL

##### 1.1 SUMMARY

A. Section Includes:

1. Procedures for preventing and abating the release of oil and hazardous materials resulting from the Contractor's operations.

##### 1.2 REFERENCES

- A. The Contractor shall comply with all federal, state and local ordinances with regard to hazardous materials storage, spill response and containment of releases.

##### 1.3 HAZARDOUS SPILL PREVENTION AND RESPONSE PLAN

- A. Prepare a spill prevention and response plan in accordance with local, state and federal requirements to cover all vehicle fueling, vehicle maintenance and storage of oils and hazardous materials. The minimum requirements for spill response and prevention equipment that the Contractor shall keep available on site are as follows:

1. Plastic Wading Pools - Three (3) plastic wading pools (inflatable or rigid) shall be available at the construction site.
2. Absorbent - Fifteen (15) 50-pound bags of industrial absorbent shall be available at the construction site. Spread absorbent on puddles of hazardous materials or use as damming material to contain spills.
3. Plastic Sheeting - A minimum 10-foot wide by 100-foot long roll of polyethylene plastic sheeting shall be available at the construction site. Use polyethylene plastic sheeting as a protective barrier between the ground and hazardous materials.
4. Shovels - Five (5) shovels shall be stored at the construction site exclusively to build dikes or clean up contaminated soils and absorbent.
5. Storage Drums - One 55-gallon steel or polyethylene open top drum or a vessel of equal capacity and construction shall be available at the construction site for disposal of contaminated materials.
6. Communication Device - A two-way radio or other communication

device shall be available at the construction site to call for emergency aid.

- B. During refueling and lubrication, the following spill prevention measures will be employed. A plastic barrier shall be placed beneath the nozzle where the refueling hose connects to the equipment as part of spill prevention measures. Two arrangements may be used:
  - 1. Place an air-filled or rigid plastic wading pool under the filling area. The wading pool shall be approximately three feet in diameter with six-inch sides or longer.
  - 2. Dig a depression in the ground under the filling area. Depression will be three feet in diameter and a minimum of six inches deep at its center. The sides of the depression will slope towards the center. A single piece of polyethylene plastic shall then be placed over the depression such that the plastic completely covers the center of the depression. Center of the depression is approximately under the fuel fill inlet.
- C. During refueling and lubrication, spill response equipment shall be within 50 feet of the filling operation.
- D. All parked (for greater than 24 hours) mobile construction equipment and any stationary construction equipment containing hazardous substances shall be placed over polyethylene plastic sheeting positioned such that releases will be contained within the sheeting.
- E. In the event of a release of oil or hazardous material to the environment caused by actions of the Contractor, the Contractor will immediately contain and clean up the hazardous material and contaminated soil and/or water. The following cleanup procedures will be followed:
  - 1. Immediately notify the Owner, the Construction Manager, and local and state officials, as required by applicable regulations, of the spill or release.
  - 2. If a release occurs and is contained in the plastic barrier, absorb the liquid with industrial absorbent and dispose of plastic barrier and absorbent in accordance with federal, state, and local regulations. Do not re-use a contaminated barrier. A release completely contained, and which is not released to the surrounding environment does not require notification to MassDEP. The Contractor shall be responsible for determining local Fire Department notification requirements.

## 1.4 SECURITY MEASURES

- A. The Contractor shall comply with the following Security measures as follows:
1. Lock all existing gates and doors at entrances to site to prohibit access to area during non-working hours.
  2. All equipment shall have locking fuel tank caps. These caps shall be locked at all times. Fuel tank drain cocks or valves shall have handles or wheel operators removed.
  3. Disable all construction equipment and vehicles left in the construction area during non-working hours.
  4. The Contractor shall provide daily inspection of the project site during non-working days to ensure that site is secure and to check for vandalism.

### PART 2 - PRODUCTS

Not Used

### PART 3 - EXECUTION

Not Used

END OF SECTION 01100

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## SECTION 01108

### HEALTH AND SAFETY PROCEDURES

#### PART 1 - GENERAL

##### 1.1 SUMMARY

- A. Prepare a Health and Safety Plan (HASP) that meets all applicable state and federal health and safety regulations, including, but not limited to, those listed below. The Contractor shall be solely responsible for developing a HASP suitable for the Contractor's use and all work done by their subcontractors. The Owner, Engineer and/or their representative is not responsible for establishing or enforcing the health and safety requirements of the Contractor, and that nothing herein shall relieve the Contractor from its exclusive responsibility for the health and safety of its employees, and/or its representatives, and/or subcontractors.
- B. The Contractor shall be responsible for being aware of all potential hazards at the site and reviewing existing information which provides evidence of contamination within the limit of the work.
- C. The Contractor shall also be required to defend, indemnify, and hold the Springfield Water and Sewer Commission and Kleinfelder harmless against any and all claims, liabilities, fines, or penalties arising out of actual or alleged failure of the Contractor and/or its agents, employees, or subcontractors to comply with any health or safety regulation, rule, ordinance, legislation, and/or health and safety plan.
- D. All work required in the Specifications regarding development and implementation of a HASP shall be in accordance with State hazardous waste site regulations (310 CMR 40.0018) and OSHA requirements (29 CFR 1910 and 1926). The HASP shall be submitted to the Engineer prior to site mobilization. Work shall not proceed at the site until the Engineer and the Springfield Water and Sewer Commission have received a copy of the Contractor's Health and Safety Plan meeting all the requirements specified herein.
- E. The Contractor shall be responsible for the construction, maintenance, and dismantling of the decontamination areas specified within the HASP. This includes providing all labor, materials, and equipment to prepare, maintain in working order, and remove the decontamination area, including collection and disposal of decontamination water and solids, and subsequent dismantling and disposal of materials.
- F. The Contractor is responsible for establishing, implementing and maintaining of ambient air and dust monitoring programs and all other

environmental monitoring programs. All such programs shall be operated by the Contractor whenever there are soils handling construction activities occurring at the site.

- G. The Contractor shall be responsible for providing all materials, equipment, and labor associated with applying dust control suppressants, including equipment that shall be required during all soil handling activities, in the event that fugitive dust or excessive odors are encountered.

## 1.2 DUST CONTROL

- A. During excavation of soil and fill material, dust shall be controlled to limit potential spread of contaminants and potential exposure of contaminants to workers and the public. The dust control measures implemented at the site and staging area shall be performed in accordance with this Section.
- B. During the progress of the work, the Contractor will conduct his operations and maintain the area of his activities, including sweeping and sprinkling of water if acceptable to the Engineer, so as to minimize the generation and dispersion of dust.

## 1.3 AIR MONITORING

- A. Air monitoring shall involve direct reading instruments capable of providing real-time indications of air contaminants to protect on-site personnel and the local population. The Contractor's Site Health and Safety Officer and Superintendent shall be responsible for assuring that monitoring is conducted in an approved manner, that air monitoring/sampling are conducted at a frequency sufficient to ensure accurate assessments of site conditions, and that work practices, engineering controls, and/or personal protective equipment are proper for the conditions.
- B. Air monitoring shall be performed during all soil handling operations. At a minimum, detectors for organic contaminants shall be utilized to monitor on-site and off-site breathing zones and possible sources of potentially hazardous material (e.g., excavations, re-grading, etc.). All personnel shall be made aware of the potential hazards and be informed of air monitoring information. Particular attention to air quality shall be made in the work area and staging area during earthwork activities to ensure that contaminants do not escape to the atmosphere and affect off-site population, on-site control, working conditions, and personnel protection measures.
- C. The Contractor shall keep accurate documentation of all air monitoring, which shall be made available to the Owner and Engineer for review at all times.



## PART 2 - PRODUCTS

### 2.1 HEALTH AND SAFETY PLAN AND CERTIFICATIONS

- A. The Contractor shall, prior to the start of work on the site, submit an electronic copy of its site-specific Health and Safety Plan to the Engineer. Submit with the site-specific Health and Safety Plan, a certification that states the following:
1. The Contractor hereby certifies that the Contractor and any workers engaged in work on the project meet the requirements of 29 CFR 1910.120 and the provisions of the American National Standards Institute, Standard Z88.2, for training, medical surveillance, and respirator protection unless the operation does not involve employee exposure or the reasonable possibility for employee exposure to safety or health hazards. These requirements include, but are not limited to, the following items:
    - a. The Contractor's employees have been examined by a licensed physician within the last 12 months and have been determined to be physically able to perform the work and use the respirator and other protective or safety equipment required for this assignment.
    - b. The employees have received health and safety training for working in environments with known and unknown hazards within the past twelve months.
    - c. The Contractor has established and is maintaining a respiratory protection program that complies with the provision of 29 CFR 1910.134.
    - d. The Contractor maintains appropriate surveillance of the work area conditions and degree of employee exposure or stress.
  2. The Contractor shall further certify that only respirators approved or accepted by NIOSH/MSHA shall be provided and used by the Contractor's employees; that each of the Contractor's employees has been properly fitted to the respirators provided by the Contractor, including a test of the face-to-face piece seal; that the Contractor has provided its employees with written procedures covering the use of respirators in dangerous atmospheres; and that the Contractor has established a program for inspection, maintenance, and care of the respirators.

The certification shall be signed and dated by the Contractor.

3. Work shall not proceed at the project site until the Engineer has received all certification(s) and the Contractor's Health and Safety Plan. Any delays incurred by the Contractor relating to the Health and Safety Plan shall be the responsibility of the Contractor, and constitute no additional costs or claims to the Owner.

### PART 3 - EXECUTION

#### 3.1 HEALTH AND SAFETY PLAN CONTENTS, MAINTENANCE, AND IMPLEMENTATION

A. The Contractor's Plan shall address the specific work activities to be conducted by the Contractor. The HASP shall include, but not be limited to, the following:

1. All anticipated hazards based on site conditions, construction activities and the levels of contamination and information presented in previous studies.
2. Provisions for continually updating the Plan in accordance with any new applicable state and federal regulations or any additional information regarding conditions at the site.
3. The following information, shall be included in the HASP in accordance with the minimum standards set forth in 29 CFR 1910.120, 29 CFR 1910.1000, and 29 CFR 1926, and 310 CMR 40.0018:
  - a. Contractor's Standard Operating Procedures, including Personnel Training and Field Orientation; Personal Hygiene Requirements and Guidelines; Field Monitoring of Site Contaminants; Respiratory Protection Training and Requirements; Levels of Protection and Selection of Equipment Procedures; Zone Delineation of the Project Site; Site Security and Entry Control Procedures; Contingency and Emergency Procedures; and Listing of Emergency Contacts.
  - b. Identification of Contractor's Site Safety Officer.
  - c. Identification of Contractor's Designated Field Personnel.
  - d. Identification of Hazard and Risks Associated with the Contractor's work.
  - e. Type of Medical Surveillance Program.

- f. List of all hazardous materials that the Contractor shall have on site; the location of the latest Material Safety Data Sheets (MSDS) for each material listed; and the plan for notifying all on-site personnel, including, but not limited to, the Engineer and/or their representatives, of the presence of hazardous materials on site. If there are no hazardous materials to be brought on site, the Contractor shall provide a written statement to the Engineer and/or their representative, prior to initiating work activities, certifying that the Contractor shall not transport, store, or use hazardous materials on site.
  
- B. The Contractor shall keep a copy of the HASP on site during all operations and shall conduct daily health and safety meetings. Failure to keep a copy of the HASP on site, or any other breach of the Contractor's Plan, shall be cause for stopping work at the cost of the Contractor. Delays caused by the Contractor's failure to comply with the health and safety regulations, or any health and safety plan, shall not entitle the Contractor to recover any additional costs or time lost. The Contractor shall not be allowed to resume activities until corrective measures are implemented.
  
- C. Medical surveillance records, OSHA 40-hour training forms, accident forms, and all other documentation requirements of the Contractor's safety and health program for personnel working on the site shall be up-to-date and kept on file at the site. The Contractor shall provide documentation of employee status upon request of the Engineer.
  
- D. The Contractor shall make available Level C personal protective equipment and clothing, not including respirators, to the Engineer and/or their representative for use during site inspections by the Engineer and/or their representative, up to a maximum of three (3) complete sets per day. These shall be supplied and maintained at no cost to the Owner and shall be returned to the Contractor upon completion of the work (except for expendable disposal protective clothing). The Contractor shall provide a repository for collection of disposed health and safety materials. Collection and disposal of contaminated expendable supplies shall be the Contractor's responsibility.
  
- E. The level of dermal and respiratory protection shall be determined based upon continuous air monitoring to be performed by the Contractor. The Engineer may conduct duplicate air monitoring for quality control purposes. As air monitoring indicates the levels of contaminants in the air, the personal protective equipment shall be determined based upon established standards and the standards set forth in the Contractor's Health and Safety Plan. Regardless, modified Level D protection for all on-site personnel is the minimum project requirement.

- F. The Contractor shall be aware of site-specific requirements, such as site security during non-working hours, limited work space, and minimizing the effects of soil excavation, in preparing its health and safety program.

### 3.2 ROUTINE SAFETY MEETINGS

- A. The Contractor shall keep a copy of the HASP on site during all operations, and shall conduct routine health and safety meetings to ensure that all work is being performed in accordance with OSHA regulations, the Contractor's HASP, and prior to initiating a new task, following an incident or following any changes to the HASP necessitated by site conditions. Failure to conduct routine safety meetings may be cause for stopping work at the cost of the Contractor.

END OF SECTION 01108

## SECTION 01110

### ENVIRONMENTAL PROTECTION PROCEDURES

#### PART 1 - GENERAL

##### 1.1 SCOPE OF WORK

- A. The work covered by this section consists of furnishing all labor materials and equipment and performing all work required for the prevention of environmental degradation in conformance with applicable laws and regulations, during and as the result of construction operations under this Contract. For the purpose of this Specification, environmental degradation is defined as the presence of chemical, physical, or biological elements or agents which may adversely affect human health, welfare, or the environment, including animal and plant species present on a permanent or transient basis within and proximate to the work area; or degrade the utility of the environment for aesthetic and/or recreational purposes.
- B. The control of environmental degradation requires consideration of air, water, and land, and involves management of noise and solid waste, as well as other pollutants.
- C. Schedule and conduct all work in a manner that will minimize the erosion of soils. Provide erosion control measures such as straw wattles, sedimentation or filtration systems, or other special surface treatments as are required to prevent silting and muddying of surface waters and wetlands. All erosion control measures shall be in place in an area prior to any construction activity in that area.
- D. Ensure that construction is achieved with a minimum of disturbance to the existing ecological balance within a water resource, between a water resource and its upland surroundings, and within the upland area encompassed by the work. It is the Contractor's responsibility to determine the specific construction techniques to meet these guidelines.
- E. All phases of sedimentation and erosion control shall comply with and be subject to the approval of the Massachusetts Department of Environmental Protection (MassDEP) and local Conservation Commissions.
- F. Schedule and conduct all work in a manner that will minimize the level of noise escaping the site, especially at night and on weekends.

##### 1.2 APPLICABLE REGULATIONS

- A. Comply with all applicable federal, state, and local laws and regulations, including but not limited to:

1. Federal Clean Water Act;
2. National Pollution Discharge Elimination System (NPDES);
3. Massachusetts Oil & Hazardous Material Release Prevention & Response Act;
4. Massachusetts Contingency Plan;
5. Massachusetts Hazardous Waste Management Act;
6. Federal Toxic Substances Control Act; and
7. Federal Resource Conservation and Recovery Act.

### 1.3 NOTIFICATIONS

- A. Owner will notify the Contractor in writing of any non-compliance with the foregoing provisions or of any environmentally objectionable acts and corrective action to be taken. Federal, state and/or local agencies responsible for verification of certain aspects of the environmental protection requirements shall notify the Contractor in writing, through the Owner or directly, of any non-compliance with state or local requirements. Contractor shall, after receipt of such notice immediately take corrective action. Such notice, when delivered to the Contractor or his authorized representative at the site of the work, shall be deemed sufficient for the purpose. If the Contractor fails or refuses to comply promptly, the Owner may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to any such stop orders shall be made the subject of a claim for extension of time or for excess costs or damages by the Contractor unless it is later determined that the Contractor was in compliance.

### 1.4 HAZARDOUS SPILL PREVENTION AND RESPONSE PLAN

- A. Prepare a spill prevention and response plan in accordance with local, state and federal requirements to cover all vehicle fueling, vehicle maintenance and storage of oils and hazardous materials. Contractor shall submit their spill prevention and response plan to the Engineer for review and authorization to proceed prior to implementation. The minimum requirements for spill response and prevention equipment that the Contractor shall keep available on site are as follows:
  1. Plastic Wading Pools - Three (3) plastic wading pools (inflatable or rigid) shall be available at the construction site.

2. Absorbent - Fifteen (15) 50-pound bags of industrial absorbent shall be available at the construction site. Spread absorbent on puddles of hazardous materials or use as damming material to contain spills.
  3. Plastic Sheeting - A minimum 10-foot wide by 100-foot long roll of polyethylene plastic sheeting shall be available at the construction site. Use polyethylene plastic sheeting as a protective barrier between the ground and hazardous materials.
  4. Shovels - Five (5) shovels shall be stored at the construction site exclusively to build dikes or clean up contaminated soils and absorbent.
  5. Storage Drums - One 55-gallon steel or polyethylene open top drum or a vessel of equal capacity and construction shall be available at the construction site for disposal of contaminated materials.
  6. Communication Device - A two-way radio or other communication device shall be available at the construction site to call for emergency aid.
- B. During refueling and lubrication, the following spill prevention measures will be employed. A plastic barrier shall be placed beneath the nozzle where the refueling hose connects to the equipment as part of spill prevention measures. Two arrangements may be used:
1. Place an air-filled or rigid plastic wading pool under the filling area. The wading pool shall be approximately three feet in diameter with six-inch sides or longer.
  2. Dig a depression in the ground under the filling area. Depression will be three feet in diameter and a minimum of six inches deep at its center. The sides of the depression will slope towards the center. A single piece of polyethylene plastic shall then be placed over the depression such that the plastic completely covers the center of the depression. Center of the depression is approximately under the fuel fill inlet.
- C. During refueling and lubrication, spill response equipment shall be within 50 feet of the filling operation.
- D. All parked (for greater than 24 hours) mobile construction equipment and any stationary construction equipment containing hazardous substances

shall be placed over polyethylene plastic sheeting positioned such that releases will be contained within the sheeting.

- E. In the event of a release of oil or hazardous material to the environment caused by actions of the Contractor, the Contractor will immediately contain and clean up the hazardous material and contaminated soil and/or water. The following cleanup procedures will be followed:
  - 1. Immediately notify the Owner, the Construction Manager, and local and state officials, as required by applicable regulations, of the spill or release.
  - 2. If a release occurs and is contained in the plastic barrier, absorb the liquid with industrial absorbent and dispose of plastic barrier and absorbent in accordance with federal, state, and local regulations. Do not re-use a contaminated barrier. A release completely contained, and which is not released to the surrounding environment does not require notification to MassDEP. The Contractor shall be responsible for determining local Fire Department notification requirements.

## 1.5 IMPLEMENTATION

- A. Prior to commencement of the work, meet with the Owner to develop mutual understandings relative to compliance with this provision and administration of the environmental protection program.

## PART 2 - PRODUCTS

Not Used

## PART 3 - EXECUTION

### 3.1 GENERAL EROSION CONTROL

- A. Provide positive means of erosion control such as shallow ditches around construction to carry off surface water. Erosion control measures such as siltation basins, straw wattles, hay check dams, mulching, jute netting, and other equivalent techniques shall be used as appropriate and in conformance with related permits or performance standards. Offsite surface water shall be diverted around the site to a downstream channel ahead of siltation barriers. Flow of surface water into excavated areas shall be prevented. Ditches around construction area shall also be used as practicable to carry away water resulting from dewatering of excavated areas. At the completion of the work, such ditches shall be backfilled, and the ground surface restored to original condition.



### 3.2 PROTECTION OF STREAMS, WETLANDS, AND SURFACE WATER:

- A. Prevent damage to any water body, storm drain or sewer from degradation caused by debris, sediment, or other material, or from the manipulation of equipment and/or materials in or near such water bodies or water resource infrastructure. Water that has been used for washing or processing, or that contains oils or sediments that will reduce the quality of the water in the stream, shall not be directly returned to any water body. Such water shall be diverted through a settling basin or filter before being directed into the water body. Water containing oils shall be directed through an oil/water separator prior to discharge and in conformance with applicable permits.
- B. Contractor shall not discharge water from dewatering operations directly into any permanent or intermittent stream, channel, wetlands, surface water, or any storm sewer. Water from dewatering operations shall be treated by filtration, settling basins, or other approved method identified in permits or contractor submittals to reduce the amount of sediment contained in the water to allowable levels.
- C. All preventative measures shall be taken to avoid spillage of petroleum products and other pollutants. In the event of any spillage, prompt remedial action shall be taken in accordance with a contingency action drawing or plan approved by the Massachusetts Department of Environmental Protection. Contractor shall submit two copies of approved contingency drawings or plans to the Engineer.
- D. Water being flushed from structures or pipelines after disinfection, with a chlorine residue of 2 mg/l or greater, shall be treated with a dechlorination solution, in a method approved by the Engineer, prior to discharge.

### 3.3 SEDIMENTATION AND EROSION CONTROL

- A. The Contractor shall plan and execute all operations, particularly those associated with excavation and backfilling, in such a manner as to minimize the amount of excavated and exposed fill or other foreign material that is washed or otherwise carried into waterways. The water quality of waterways shall not be degraded due to construction operations. For the purposes of this Specification Section, the term waterways shall include all conveyance systems taking drainage and runoff to an eventual waterway.
- B. The Contractor's plan for siltation control shall be submitted to the Engineer for review and authorization to proceed prior to implementation.
- C. The Contractor shall line all catch basins with filter fabric or silt sacks for erosion and sedimentation control as directed. Filter fabric used to line

catch basins must be removed prior to any inclement weather and reinstalled at the direction of the Engineer.

- D. Hay bales shall consist of hay from acceptable grasses and legumes, free from weeds, reeds, twigs, chaff, debris, other objectionable material or excessive amounts of seeds and grain. It shall be free from rot or mold and the moisture content shall not exceed 15 percent by weight at the time of weighing.
- E. Baled hay shall be placed to form temporary water stops, dams, diversions, dikes, berms and for other uses connected with water pollution control; bales shall be properly disposed of by the Contractor upon completion.
- F. The hay shall be securely baled with biodegradable twine of adequate size to allow for possible rusting while in use and to permit re-handling when the bale is in a saturated condition.
- G. Individual bales shall be of a longitudinal shape not exceeding 100 pounds when weighed in dry condition.
- H. Contractor shall prevent the occurrence of sedimentation or siltation of waterways and private properties. In the event the sedimentation or siltation prevention measures used by the Contractor prove to be inadequate as determined by the Owner and Engineer, the Contractor shall be required to adjust his operations to the extent necessary to prevent any such sedimentation or siltation from occurring.
- I. The Contractor shall keep waterways clear of mud, silt, debris and other objectionable materials resulting from his construction operations.
- J. Existing natural drainage patterns and vegetative cover shall be preserved to the maximum possible extent.
- K. The Contractor shall use temporary vegetation, mulching, and paving to protect areas exposed during construction. Contractor shall minimize the amount of bare earth exposed at any one-time during construction, and he shall also minimize the length of time bare earth is exposed.
- L. On sloping terrain, hay bales may be used to trap sediment until vegetation has become established. The details of their placement shall be as approved by the Owner and in conformance with relevant permit conditions.
- M. Water that is being pumped from the trenches or excavations shall not be pumped directly into water courses or pipe conveyance systems. At a

minimum, sedimentation control measures shall include portable sedimentation tanks, pumps, and piping, or other means acceptable to the Owner and Engineer to meet the required water quality parameters. No discharge of water shall be allowed without appropriate state, federal or local permits in place, as applicable.

- N. Spoil resulting from the trench excavation shall be leveled or removed to permit free entry of water from adjacent land surfaces without excessive erosion or harmful ponding.

#### 3.4 PROTECTION OF UPLAND RESOURCES:

- A. Upland resources within the project boundaries shall be restored to a condition, after completion of construction, that will appear to be natural and not detract from the appearance of the project or as designated in project Drawings. Confine all construction activities to areas indicated on the Drawings.
- B. Outside of areas requiring earthwork for the construction of the new facilities, the Contractor shall not deface, injure, or destroy trees or shrubs, nor remove or cut them without prior approval. No ropes, cables, or guys shall be fastened to or attached to any existing nearby trees for anchorage unless specifically authorized by the Owner. Where such special emergency use is permitted, first wrap the trunk with a sufficient thickness of burlap or rags over which softwood cleats shall be tied before any rope, cable, or wire is placed. The Contractor shall in any event be responsible for any damage resulting from such use.
- C. Where trees may possibly be defaced, bruised, injured, or otherwise damaged by the Contractor's equipment, dumping or other operations, protect such trees by placing boards, planks, or poles around them. Monuments and markers shall be protected similarly before beginning operations near them.
- D. Any trees or other landscape feature scarred or damaged by the Contractor's equipment or operations shall be restored as nearly as possible to its original condition. Owner will decide what method of restoration shall be used and whether damaged trees shall be treated and healed or removed and disposed of. All scars made on trees by equipment, construction operations, or by the removal of limbs larger than 1-in. in diameter shall be coated as soon as possible with an approved tree wound dressing. All trimming or pruning shall be performed in an approved manner by experienced workmen with saws or pruning shears. Tree trimming with axes will not be permitted.

- E. The locations of the Contractor's storage and staging shall require written approval of the Owner and shall not be within wetlands or floodplains. The preservation of the landscape shall be an imperative consideration in the selection of all sites. Drawings showing storage facilities shall be submitted for approval of the Owner.
- F. All debris and excess material shall be disposed of outside wetland, riverfront, or floodplain resource areas in an environmentally sound manner and in conformance with relevant Federal, state and local permits or regulation.

3.5 PROTECTION OF AIR QUALITY:

- A. Burning: The use of burning at the project site for the disposal of refuse and debris will not be permitted.
- B. Dust Control: The Contractor will be required to maintain all excavations, embankments, stockpiles, access roads, plant sites, waste areas, borrow areas, and all other work areas within or without the project boundaries free from dust which could cause the standards for air pollution to be exceeded, or which would cause a hazard or nuisance to others.
- C. An approved method of stabilization consisting of sprinkling or other similar methods will be permitted to control dust.
- D. Sprinkling, to be approved, must be repeated at such intervals as to keep all parts of the disturbed area at least damp at all times, and the Contractor must have sufficient competent equipment on the job to accomplish this if sprinkling is used. Dust control shall be performed as the work proceeds and whenever a dust nuisance or hazard occurs, as determined by the Engineer.

3.6 MAINTENANCE OF POLLUTION CONTROL FACILITIES DURING CONSTRUCTION

- A. During the life of this Contract, maintain all facilities constructed for pollution control and environmental protection as long as the operations creating the particular pollutant or possible detrimental environmental impact are being carried out, or until the material concerned has become stabilized to the extent that pollution is no longer being created, and environmental impact is no longer threatened.

3.7 NOISE CONTROL

- A. The Contractor shall make every effort to minimize noises caused by his operations. Equipment shall be equipped with silencers or mufflers

designed to operate with the least possible noise in compliance with State and Federal (OSHA) regulations.

END OF SECTION 01110

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SECTION 01200

GENERAL REQUIREMENTS FOR UTILITY WORK

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This Section specifies general requirements for construction, protection, support, maintenance, and restoration for underground and overhead utilities affected by construction of the Project. The Work includes new construction, reconstruction, relocation, and abandonment.
- B. The utility works and services that may be affected include, but are not limited to:
  - 1. Storm drain, sanitary sewer, and combined sewer
  - 2. Water distribution
  - 3. Gas distribution
  - 4. Electric power and street lighting
  - 5. Telephone
  - 6. Traffic signals
  - 7. Fiber optic communications
  - 8. Cable Television
  - 9. Signal communication
  - 10. City fire signal lines
- C. This Section shall be used in conjunction with the specific underground utility work sections that apply to the Contract.

1.2 WORK BY UTILITY COMPANIES

- A. Certain parts of the utility work shall be performed, where shown or specified or otherwise required, by the utility company.
- B. For all utilities, with the exception of sanitary sewers, combined sewers and water services, disconnecting and connecting of service shall be performed by the respective utility companies. Disconnecting and

connecting of sanitary sewers, combined sewers and water services shall be the Contractor's responsibility as required in the Contract Documents.

- C. Contact the utility companies in advance of construction to allow sufficient time for the utility companies to accomplish the work they are required to perform. Provide the utility company at least 30 days advance notice of scheduled date for commencement of work by the utility company.
- D. Work performed by utility companies as part of the Work of this Contract, in order to facilitate the Work of this Contract, and other work performed by utility company solely for the Contractor's convenience, shall be at no additional cost to the Owner.

### 1.3 DEFINITIONS

- A. Abandoned means that use has been discontinued by the utility company.
- B. To be abandoned means that use will be discontinued as part of the Work of this Contract.
- C. Maintenance means providing continuous and satisfactory service during construction.
- D. Maintain complete-in-place means to protect, support, and otherwise maintain the existing condition and function of a facility during construction.
- E. Restoration means replacement of a facility or portions of a facility that have been removed or made inoperative by the Contractor in the performance of the Work.
- F. Utility Company means the company, agency, owner, or operator of the facility concerned.
- G. Temporary Facility means a facility provided, in lieu of an existing or new facility, to ensure continuity of service, such as temporary piping to ensure continuity of service for water, sewer, and drain pipes within the limits of excavation. When a temporary facility is not shown on the Contract Drawings, but is provided for the convenience of the Contractor, it shall be constructed at no additional cost to the Owner.

### 1.4 SUBMITTALS

- A. Shop Drawings: Submit the following in accordance with Section 01300 - SUBMITTALS



1. Submit working drawings and, if applicable, shop drawings showing the details, procedures, and scheduling for performance of each utility work. Show actual verified field locations of existing utility facilities that are affected by the Work of this Contract; interferences which these facilities present to the new work; location of settlement markers; method proposed to proceed with the construction; and, if applicable, method of testing and procedure for restoration.
2. Submit to the Engineer specifications and drawings describing the method to be used to temporarily support existing subsurface, surface and overhead utilities during construction. Include working drawings that indicate proposed materials and details.
3. Submit to the Engineer for review a detailed excavation procedure for subsurface utilities. At a minimum, the procedure shall include:
  - a. Equipment to be used for anticipated subsurface utility investigation and excavation.
  - b. Personnel to be used and designated utility coordinator.
  - c. Duration and schedule of investigation and excavation.
  - d. Techniques proposed to isolate and protect existing utilities.
  - e. Method for the Contractor to provide utility information derived from subsurface investigation to field personnel doing excavation.
  - f. A disciplinary plan that delineates all steps to be taken as a result of a utility disruption, including possible removal of Contractor's individuals from the site.
4. Submit an emergency action plan outlining procedures to be followed by the Contractor in case of unplanned utility interruptions or unplanned damage to utilities in service. Obtain concurrence from each affected utility company.
  - a. List Contractor's personnel assigned responsible charge for emergency action on site for each shift, and those on call.
  - b. List phone notification numbers for each utility company, fire, and police departments, and other relevant agencies.
  - c. Include copies of utility plans showing the valve or switch locations to isolate each line.

- B. Transmit to the Engineer the as-built utility location survey data as specified in Article 3.10 of this Section.

#### 1.5 APPROVAL BY UTILITY COMPANIES

- A. All personnel performing work on utility facilities shall be fully qualified and able to meet the standards of the affected utility company. If the Contractor does not have the required utility experience, Contractor shall retain a specialist firm acceptable to the affected utility company to perform the Work.
- B. Prior acceptance of temporary support methods for each affected utility facility shall be obtained by the Contractor from each utility company concerned.
- C. Prior permission for disrupting a utility shall be obtained by the Contractor from each utility company concerned.
- D. Prior approval for disrupting fire signal lines, high pressure fire water mains and hydrants, and fire service lines shall be obtained from the Springfield Fire Department.

#### 1.6 NOTIFICATION

- A. In addition to the initial 30-day utility company notification, the Contractor shall notify the appropriate utility companies and the Engineer at least seven days prior to starting any work involving or adjacent to surface, subsurface, or overhead utility facilities.
- B. Gas Company Requirements:
  - 1. If cut-off or connection is expected, notify the Gas Company Engineering Department four weeks prior to cut-off or connection to gas main.
  - 2. Immediately notify the Gas Company Engineering Department if surface or subsurface settlement or movement in excess of the design amount is observed, regardless of the proximity to an existing gas facility.

#### 1.7 STANDARD SPECIFICATIONS OF UTILITY OWNERS

- A. Specifications and construction methods from each utility owner apply to individual utility specification sections.

- B. It is the Contractor's responsibility to ensure that, unless otherwise specified, the standards for materials and construction methods required by the utility owner are met.

## 1.8 WORK BY GAS COMPANY

- A. Contractor shall be aware of the requirements of 220 CMR 113.00 regarding the OPERATION, MAINTENANCE, REPLACEMENT AND ABANDONMENT OF CAST-IRON PIPELINES, specifically as it relates to the replacement of existing cast-iron gas mains exposed during construction or within the Angle of Influence of the excavation. The Contractor shall coordinate the scheduling of all replacements with Eversource and shall make all efforts to accommodate the gas main replacement. Eversource shall perform the work associated with the replacement.

## PART 2 - MATERIALS

### 2.1 GENERAL

- A. Materials for temporary and permanent work shall be of the type, grade, and class specified by reference to utility company standards.

## PART 3 - EXECUTION

### 3.1 GENERAL CONSTRUCTION REQUIREMENTS

- A. Unless otherwise noted, conform to the construction standards, specifications, and standard practices of the affected utility companies. Coordinate with each utility company the work to be done by the Contractor and the work to be done by utility company. Ensure continuity of all existing utility services to all users, except when the utility company determines that temporary interruption is acceptable.
- B. Unless otherwise indicated, maintain all utility facilities complete in place. Provide temporary support of utilities during construction only by methods acceptable to the utility company concerned.
- C. Provide and maintain all temporary facilities required to provide interim utility service when a utility facility is to be relocated and when a utility facility to be replaced is abandoned prior to replacement.
- D. Where an existing utility facility is encountered that is not indicated or that is determined to be a different utility facility than that indicated, promptly notify the Engineer. The Contractor is responsible for determining the owner of the facility and the disposition of the facility.

- E. All water, sanitary, combined sewer, and storm services or catch basin connections must be maintained throughout the project through the use of temporary pumps and piping. Unless otherwise noted, no service interruptions will be permitted.
- F. The Contractor shall dewater existing utility manholes and structures prior to beginning construction. Any dewatered material shall be properly treated and disposed.

### 3.2 UNSAFE AND UNSUITABLE UTILITY STRUCTURES

- A. If, upon exposure, the condition of a facility to be maintained complete-in-place is found to be unsafe, by the utility company, for support or for maintenance of service, the Contractor shall replace or reconstruct or coordinate the replacement or reconstruction of the facility with the utility Owner and shall promptly notify the Engineer of additional costs anticipated prior to beginning the work.

### 3.3 ABANDONED FACILITIES

- A. Demolish and remove abandoned utility facilities located within areas of the Work of this Contract. Abandoned facilities that do not interfere with the Work of this Contract may remain.
- B. Do not undertake demolition or removal until written permission for such Work has been obtained from the utility company.
- C. When abandoned facilities are to be left in place, plug or cap the ends of conduits and pipes, and fill with control density fill (CDF) unless otherwise indicated. Remove abandoned utility manholes, junction boxes, and similar structures to a minimum depth of four feet below finish grade, and puncture or break the bottom slabs of manholes and similar structure to allow drainage. Backfill and compact excavations resulting from removal of utility facilities as required to restore original grade.

### 3.4 SETTLEMENT OR MOVEMENT

- A. In case of settlement or other movement that causes or could cause damage, take immediate remedial measures to correct the conditions and repair the damage.

### 3.5 ACCESS

- A. At all times permit free and clear access to the affected facilities by personnel of the utility companies.

- B. Throughout the construction period, maintain access to all utility vaults and structures.
- 3.6 SERVICE CONNECTIONS
- A. Work required for maintaining, supporting, relocating, restoring, and constructing all service connections is included as part of the Work of this Contract, even though some existing service connections, for which record information is not available, may not be shown on the Contract Drawings.
- 3.7 REPAIR AND RESTORATION
- A. Repair all damage to utilities caused by Work of this Contract. Clean all utility structures of dirt caused by Work of this Contract. Immediately notify the Engineer and the utility company of damage to utilities.
- 3.8 EXCAVATION AND BACKFILL
- A. Perform excavation and backfill in connection with utility work in accordance with Section 02210 – EXCAVATION, BACKFILL, COMPACTION, DEWATERING AND GRADING.
  - B. Perform excavation support in connection with utility work in accordance with Section 02160 – TEMPORARY SUPPORT OF EXCAVATION.
  - C. Perform groundwater control in connection with utility work in accordance with Section 02140 – DEWATERING AND DRAINAGE.
  - D. Perform erosion and sedimentation control in connection with utility work in accordance with Section 01500 – TEMPORARY FACILITIES AND CONTROLS.
- 3.9 CLEANING UP
- A. In accordance with Section 01630 – RESTORATION OF GROUNDS AND CLEANING UP, the Contractor shall, upon completion of the Work, remove all temporary construction facilities, equipment, debris, and unused materials, and put the project area and adjacent affected areas in a neat and clean condition.
- 3.10 AS-BUILT UTILITY LOCATION SURVEY
- A. For each new or relocated utility installed, including those installed or relocated by others in the Project Area, perform an as-built location survey by coordinates prior to backfilling the excavation.
  - B. The survey data shall be obtained by Global Positioning Survey (GPS) and certified by a Professional Land Surveyor registered in Massachusetts.

- C. A complete digital base plan shall be provided in AutoCAD DWG format Release 2000i or later on a Compact Disk (CD), properly referenced to the coordinate system established in the contract. The following standards shall be applicable:
1. Text as indicated below:  
All text shall be drawn using a STYLE of "L100-XX" (where XX refers to the plotted scale) and a font file of "SIMPLEX" as defined in the AutoCAD survey template provided by Kleinfelder (formerly S E A Consultants Inc.). The style shall be defined as a "fixed height" style, and have a height of 0.10 times the drawing plotted scale. (i.e. 4.0 for 40 scale plan, 2.0 for 20 scale etc.)
  
  2. Precision and Accuracy as indicated below:  
Horizontal survey:  
*Precision:* Horizontal control and surveyed points shall maintain a minimum precision of 1:10,000.  
*Accuracy:* No more than 10% of the survey points shall be in error by more than 1/100 inch or 0.25 mm when viewed at the requested scale.  
  
Vertical survey:  
*Precision:* Vertical Control shall have a maximum error of closure no greater than .075 feet or .02 meters.  
*Accuracy:* No more than 10% of elevations when interpolated from a Surface shall be in error of more than 1/2 a contour interval.
  
  3. Surface Data  
The data format shall conform to Autodesk Land Development Desktop Project files. If the Contractor uses a different software product to create a surface, then the surface must be represented as a TIN (Triangulated Irregular Network) of 3D lines on a separate, distinct layer within the AutoCAD drawing file. 3D faces or 2 dimensional lines are NOT acceptable.

END OF SECTION 01200

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## SECTION 01300

### SUBMITTALS

#### PART 1 - GENERAL

##### 1.1 SUMMARY

- A. This Section includes general requirements for Project submittals by the Contractor.

##### 1.2 RELATED WORK

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and all Division Sections apply to the work of the Section.

##### 1.3 PROGRESS REPORTS, RECORDS AND DATA

- A. The Contractor shall submit to the Owner such schedules of quantities and costs, progress schedules, payrolls, reports, estimates, records, and other data as outlined in Section 01311 – SCHEDULING AND REPORTING and as the Owner may request concerning work performed or to be performed under this Contract.

##### 1.4 OPERATION MANUALS

- A. Unless the specified operations manuals for equipment are submitted along with shop drawings at the time of submission no action will be taken on reviewing the shop drawings. The manuals shall include, at a minimum, operating instructions, and recommended maintenance schedules for all the equipment to be furnished.

##### 1.5 SHOP DRAWINGS, SAMPLES, PROJECT DATA

- A. The Contractor shall submit for review by the Engineer an electronic copy of all shop drawings, setting schedules and such other drawings as may be necessary for the prosecution of the work in the shop and in the field as required by the Drawings, Specifications, or the Engineer's instructions. Deviations from the Drawings and Specifications shall be called to the attention of the Engineer at the time of the first submission of shop drawings and other drawings for consideration. The Engineer's review of any drawings shall not release the Contractor from responsibility for such deviations. Shop drawings shall be submitted with such promptness as to cause no delay in his work or the work of any other Contractor.
- B. When submitted for the Engineers' review, all shop drawings shall bear the Contractor's certification that he has reviewed, checked, and approved



the shop drawings, that they are in harmony with the requirements of the Project and with the provisions of the Contract Documents, and that he has verified all field measurements and construction criteria, materials, catalog numbers and similar data. The Contractor shall also certify that the work represented by the shop drawings is recommended by the Contractor and the Contractor's Guaranty will fully apply.

- C. All samples called for in the Specifications or required by the Engineer shall be furnished by the Contractor and shall be submitted to the Engineer for his review. Samples shall be furnished so as not to delay fabrication, and to allow the Engineer reasonable time for the consideration of the samples submitted.
- D. Checking of submittals is only for general conformance with the design concept of the project and general compliance with the information given in the contract documents. Any action shown is subject to the requirements of the plans and specifications. Contractor is responsible for: dimensions which shall be confirmed and correlated at the job site; fabrication processes and techniques of construction; coordination of his work with that of all other trades; and the satisfactory performance of his work.
- E. The Contractor may only proceed with fabrication and construction of items with returned submittals marked "No Exception Taken", "Make Corrections as Noted" or "Noted : No Action Required". Resubmit submittals if marked "Rejected", "Revise and Resubmit" or "Submit Specified Item."
- F. The Contractor shall furnish such samples of material as may be required for examination and test. All samples of materials for tests shall be taken according to ASTM Specifications or as provided in the Contract Documents.
- G. All samples shall be submitted by the Contractor with a cover letter indicating that such samples are recommended by the Contractor for the service intended and that the Contractor's Guaranty will fully apply.
- H. All materials, equipment and workmanship shall be in accordance with samples guaranteed by the Contractor and reviewed by the Engineer.

#### 1.6 SUPPLIER REFERENCES

- A. On request, the manufacturer and/or vendor of the following shall furnish references, which shall list a minimum of three (3) Municipalities/Utilities that were supplied this product in the last two (2) years:
  - 1. Water: pipe; fittings; couplings; appurtenances; tubing; valves; gate boxes; hydrants; meters; vaults and covers; tapping sleeves

and saddles; joint restraint; backflow preventers; coating; and bypass systems.

2. Sewer: pipe; fittings; appurtenances; manholes and covers; masonry; grout; gaskets; boots; and coatings

B. The listing is to include:

1. Name of Municipality/Utility,
2. Total amount of product bid on and amount delivered,
3. Date the bid was accepted and date the product was delivered,
4. Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product.

#### 1.7 CONTRACTOR'S ORDER OF CONSTRUCTION

- A. The Contractor shall submit schedules and reporting information in accordance with the requirements of Section 01311 – SCHEDULING AND REPORTING.

#### 1.8 CONTRACTOR'S COST BREAKDOWN

- A. The Contractor shall submit a schedule of values in accordance with the requirements of Section 01301 – SCHEDULE OF VALUES.

CERTIFICATE OF DESIGN

The undersigned hereby certifies that he/she is a Professional Engineer registered in the state of \_\_\_\_\_ and that he/she has been employed by (Name of Contractor) \_\_\_\_\_ to design \_\_\_\_\_ in accordance with Specifications Section \_\_\_\_\_ for the (Name Project) \_\_\_\_\_.

The undersigned further certifies that he/she has performed similar designs previously and has performed the design of the \_\_\_\_\_; and regulations and professional practice standards; that his/her signature and Professional Engineer (P.E.) Stamp have been affixed to all calculations and drawings used in, and resulting from, the design; and that the use of that stamp signifies the responsibility of the undersigned for that design.

The undersigned hereby certifies that he/she has Professional Liability Insurance and a Certificate of Insurance is attached.

The undersigned hereby agrees to make all original design drawings and calculations available to the Springfield Water and Sewer Commission (Owner) or Owner's representative with seven days following written request therefore by the Owner.

\_\_\_\_\_  
P.E. Name

\_\_\_\_\_  
Contractor's Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

\_\_\_\_\_  
Address

\_\_\_\_\_  
Address

Last Modified: 04/09/2025 at 10:39AM EDT

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION 01300

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## SECTION 01301

### SCHEDULE OF VALUES

#### PART 1 - GENERAL

##### 1.1 SUMMARY

- A. This Section defines the process whereby the Schedule of Values shall be developed and incorporated into the cost loading function of the CPM Schedule as specified in Section 01311 – SCHEDULING AND REPORTING.
- B. Monthly progress payment amounts shall be determined from the monthly progress updates of the CPM Schedule activities.
- C. The Schedule of Values shall be developed independently but simultaneous with the development of the CPM Schedule activities and logic as follows:

##### 1.2 RELATED WORK

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and all Division Sections apply to the work of this Section.

##### 1.3 SUBMITTALS

- A. Schedule of Values: Submit the Preliminary and Detailed Schedule of Values in accordance with Section 01300 - SUBMITTALS

##### 1.4 PRELIMINARY SCHEDULE OF VALUES

- A. The Contractor shall submit a preliminary Schedule of Values for the major components of the work at the Preconstruction Conference. The listing shall include, at a minimum, the proposed value for the following major work components:
  - 1. Support of Existing Utility Cables, Conduits, and Duct Banks.
  - 2. Support of Existing Large Utilities.
  - 3. Mobilization and Demobilization.
  - 4. Sedimentation and Erosion Control.
  - 5. The Total Value of Traffic Management.
  - 6. CIPP lining of 36-inch and 39-inch clay tile pipe

7. Temporary sewer bypass
8. Construction of permanent gravel access road
9. Easement Restoration
10. The Total Value of All Other Work Not Specifically Included in the Above Items.

B. After the Pre-construction Conference, the Contractor and Engineer shall meet and jointly review the preliminary Schedule of Values and make any adjustments in value allocations if, in the opinion of the Engineer, these are necessary to establish fair and reasonable allocation of values for the major work components. Front end loading will not be permitted. The Engineer may require reallocation of major work components from items in the above listing if in the opinion of the Engineer such reallocation is necessary. This review and any necessary revisions shall be completed within 14 calendar days from the date of Notice to Proceed.

## 1.5 DETAILED SCHEDULE OF VALUES

A. The Contractor shall prepare and submit a detailed Schedule of Values to the Engineer within 28 calendar days from the date of Notice to Proceed. The detailed Schedule of Values shall be based on the accepted preliminary Schedule of Values for major work components. Because the ultimate requirement is to develop a detailed Schedule of Values sufficient to determine appropriate monthly progress payment amounts through cost loading of the CPM Schedule activities, sufficient detailed breakdown shall be provided to meet this requirement. The Engineer shall be the sole judge of acceptable numbers, details and description of values established. If, in the opinion of the Engineer, a greater number of Schedule of Values items than proposed by the Contractor is necessary, the Contractor shall add the additional items so identified by the Engineer.

B. All lump sum, allowance and unit price items included for payment in the Contract shall be included in the schedule of values. In addition to the items submitted in the preliminary Schedule of Values and reviewed by the Engineer, the following items shall be submitted: Greater detail shall be provided for the following items and as further directed by the Engineer.

1. Rodent Control – breakdown shall include: initial baiting; maintenance visits; and service calls.
2. Temporary Utility Support and Coordination – breakdown shall include: maintaining various utilities to the properties; support of overhead utilities; and support of underground utilities.

3. Traffic Management Plan – breakdown shall include: maintaining construction signage and channelizing devices; maintaining pedestrian access to properties.
  4. Miscellaneous Site Restoration – breakdown shall include: furnishing and planting trees; loam and seed.
  5. All other work not specifically included in the above items shall be broken down as necessary for establishment of pay and Schedule activity items.
- C. The Contractor and Engineer shall meet and jointly review the detailed Schedule of Values within 35 calendar days from the date of Notice to Proceed. The value allocations and extent of detail shall be reviewed to determine any necessary adjustments to the values and to determine if sufficient detail has been proposed to provide cost loading of the CPM Schedule activities. Any adjustments deemed necessary to the value allocation or level of detail shall be made by the Contractor and a revised detailed Schedule of Values shall be submitted within 38 days from the date of Notice to Proceed.
- D. Following acceptance of the detailed Schedule of Values, the Contractor shall incorporate the values into the cost loading portion of the CPM Schedule. The CPM activities and logic shall have been developed concurrent with development of the detailed Schedule of Values; however, it shall be necessary to adjust the detailed Schedule of Values to correlate to individual Schedule activities. It is anticipated that instances will occur, due to the independent but simultaneous development of the Schedule of Values and the CPM Schedule activities, where interfacing these two documents will require changes to each document. Schedule activities may need to be added to accommodate the detail of the Schedule of Values. Schedule of Value items may need to be added to accommodate the detail of the CPM Schedule activities. Where such instances arise, the Contractor shall propose changes to the Schedule of Values and to the CPM Schedule activities to satisfy the CPM Schedule cost loading requirements.

## 1.6 CROSS REFERENCE LISTING

- A. To assist in the correlation of the Schedule of Values and the CPM Schedule, the Contractor shall provide a Cross Reference Listing which shall be furnished in two parts. The first part shall list each Scheduled Activity with the breakdown of the respective valued items making up the total cost of the activity. The second part shall list the valued item with the respective Scheduled Activity or Activities that make up the total cost indicated. In the case where a number of schedule items make up the total



cost for a valued item (shown in the Schedule of Values) the total cost for each scheduled item should be indicated.

- B. These listings shall be updated and submitted in conjunction with the CPM monthly submittals as stated in Section 01311 – SCHEDULING AND REPORTING.
- C. Approved change orders reflected in the CPM Schedule shall be incorporated into the Schedule of Values as a single unit identified by the change order number.

#### 1.7 CHANGES TO SCHEDULE OF VALUES

- A. Changes to the CPM Schedule which add activities not included in the original schedule but included in the original work (schedule omissions) shall have values assigned as approved by the Engineer. Other activity values shall be reduced to provide equal value adjustment increases for added activities as approved by the Engineer.
- B. In the event that the Contractor and Engineer agree to make adjustments to the original Schedule of Values because of inequities discovered in the original accepted detailed Schedule of Values, increases and equal decreases to values for activities may be made.

#### 1.8 LIQUIDATED DAMAGES

- A. The Schedule of Values information is an integral part of the scheduling and reporting under Section 01311 – SCHEDULING AND REPORTING and the progress payment information. As such, it is critical information to evaluating the project's progress and the proper planning of the Owner's and Engineer's work effort as well as their financial obligations associated with this Project. Accordingly, if any submittal required by this Section is found to be incomplete or is submitted later than required, the Owner will suffer financial loss and, accordingly, liquidated damages will be assessed against the Contractor in accordance with the Agreement.

### PART 2 - PRODUCTS

Not Used

### PART 3 - EXECUTION

Not Used

END OF SECTION 01301

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## SECTION 01311

### SCHEDULING AND REPORTING

#### PART 1 – GENERAL

##### 1.1 SUMMARY

- A. This Section includes scheduling and reporting requirements of the Contractor.
- B. The scheduling of the Work under the Contract shall be performed by the Contractor in accordance with the requirements of this Section. The development of the schedule, the cost loading of the schedule, monthly payment requisitions and project status reporting requirements of the Contract shall employ computerized Critical Path Method (CPM) scheduling. The CPM Schedule shall be cost loaded based on the schedule of values as approved by the Owner in accordance with the requirements of Section 01301 – SCHEDULE OF VALUES. The CPM schedule and all reports should be prepared with Primavera P3, Version 2.0B software. Where submittals are required hereunder, the Contractor shall submit four copies of each submittal item.

##### 1.2 RELATED WORK

- A. Drawings and general provision of the Contract, including General and Supplemental Conditions and Division 1 Sections apply to the work of the Section.

##### 1.3 SUBMITTALS

- A. General: Submit the following in accordance with Section 01300 – SUBMITTALS:
  - 1. Initial Schedules in accordance with Paragraph 1.5 of this Section.
  - 2. CPM Schedules in accordance with Paragraph 1.6 of this Section in the format specified in Paragraph 1.9 of this Section.

##### 1.4 QUALITY ASSURANCE

- A. The Contractor shall submit a statement of computerized CPM capability at the First Progress Meeting verifying that either the Contractor has in-house capability qualified to use CPM techniques and the Primavera P3 Version 2.0B software or that the Contractor will employ a CPM consultant so qualified. In either event the statement shall identify the individual who will perform the CPM scheduling. Capability shall be verified by description of construction projects on which the individual has successfully

applied computerized CPM and shall include at least two projects of similar nature, scope and value not less than one-half the Total Bid Price of this project. The statement shall also provide the contact persons for the referenced projects with current telephone and address information.

## 1.5 INITIAL SCHEDULE

- A. The Contractor shall submit two short-term schedule documents at the First Progress Meeting which shall serve as the Contractor's Plan of Operation for the initial 60-day period of the Contract Time and to identify the manner in which the Contractor intends to complete all work within the Contract Time. The Contractor shall submit: (1) a 60-day Plan of Operation bar chart, and (2) a project overview bar chart type plan for all work as indicated below.
1. 60-Day Plan of Operation: During the initial 60 days of the Contract Time, the Contractor shall conduct Contract operations in accordance with the 60-day bar chart Plan of Operation. The bar chart so prepared and submitted shall show the accomplishment of the Contractor's early activities (mobilization, permits, submittals necessary for early material and equipment procurement, submittals necessary for long lead equipment procurement, CPM submittals, initial site work and other submittals and activities required in the first 60 days).
  2. Project Overview Bar Chart: The overview bar chart shall indicate the major components of the project work and the sequence relations between major components and subdivisions of major components. The overview bar chart shall indicate the relationships and time frames in which the various components of the Work will be made substantially complete and placed into service. Each major component and subdivision component shall be accurately plotted on time scale sheets not to exceed 36-inch by 60-inch in size. Not more than three sheets shall be employed to represent this overview information.
- B. The Owner and the Contractor shall meet to review and discuss the 60-day plan of operations and project overview bar chart within one week after they have been submitted to the Owner. The Contractor shall make corrections to the schedules necessary to comply with the Contract requirements and shall adjust the schedules to incorporate any missing information requested by the Owner.

## 1.6 CPM SCHEDULE

- A. Original CPM Schedule Submittal: Within 30 calendar days after the commencement date stated in the Notice to Proceed, the Contractor shall

submit for review by the Owner a hard copy of the CPM Network Schedule. This submittal shall have already been reviewed and approved by the Contractor's Project Manager, Project Superintendent, and the Project Estimator prior to submission. The CPM Schedule shall be a time-scaled network diagram of the "i-j" activity-on-arrow or precedence type. The Network Diagram shall describe the activities to be accomplished and their logical relationships and show the Critical Path.

- B. As stated in Paragraph 1.8.F herein, all float indicated in the schedule shall belong to the project. The Computerized Schedule Report tabulations shall include the following:
1. Report of activities sorted by Activity Number.
  2. Report of activities sorted by Early Start date.
  3. Report of activities sorted by Total Float.
  4. Report of activities sorted by Responsibility Code. Responsibility Codes shall be established for the Contractor, Owner, Engineer, subcontractors, suppliers, etc. These codes shall be identified in the Network Diagram.
  5. A successor-predecessor report which shall identify the successor and predecessor activities for each activity and ties between schedule activities.
- C. Original CPM Schedule Review Meeting: The Contractor shall, within 40 calendar days from the commencement date stated in the Notice to Proceed, meet with the Owner and Engineer to review the original CPM schedule submittal. The Contractor shall have the Project Manager, Project Superintendent, and the Project Scheduler in attendance. The Owner's review will be limited to the submittal's conformance to the Contract requirements. However, the review may also include:
1. Clarifications of the design intent, process, and startup requirements.
  2. Directions to include activities and information missing from the submittal.
  3. Requests to the Contractor to clarify the schedule.
- D. Revisions to the Original CPM Schedule: Within 50 calendar days after the commencement date stated in the Notice to Proceed, the Contractor shall have revised the original CPM schedule submittal to address all review comments from the original CPM schedule review meeting and resubmit the network diagrams and reports for the Owner's review. The Owner, within 14 calendar days from the date that the Contractor submitted his

revised schedule will either (1) accept the schedule and cost loaded activities as submitted, or (2) advise the Contractor in writing to review any part or parts of the schedule which either do not meet the Contract requirements or are unsatisfactory for the Owner to monitor the project's progress and status or evaluate monthly payment requests by the Contractor. The Owner may accept the schedule with conditions that the first monthly CPM schedule update be revised to correct deficiencies identified. When the schedule is accepted, it shall be considered as the "Original CPM Construction Schedule" until an updated schedule has been submitted. The Owner reserves the right to require that the Contractor adjust, add to, or clarify any portion of the schedule which may later be discovered to be insufficient for the monitoring of the Work or approval of partial payment requests. No additional compensation will be provided for such adjustments, additions or clarifications.

- E. Acceptance: The acceptance of the Contractor's schedule by the Owner will be based solely upon the schedule's compliance with the Contract requirements. By way of the Contractor assigning activity duration and proposing the sequence of the Work, the Contractor agrees to utilize sufficient and necessary management and other resources to perform the work in accordance with the schedule. Upon submittal of a schedule update, the updated schedule shall be considered the "current" project schedule.
- F. Submission of the Contractor's progress schedule to the Owner shall not relieve the Contractor of total responsibility for scheduling, sequencing, and pursuing the Work to comply with the requirements of the Contract Documents, including adverse effects such as delays resulting from ill-timed work.
- G. Monthly Updates and Periodic CPM Schedule Submittals: Following the acceptance of the Contractor's Original Construction Schedule, the Contractor shall monitor the progress of the Work and adjust the schedule each month to reflect actual progress and any changes in planned future activities. Each schedule update submitted must be complete including all information requested in the original schedule submittal and that shown in Paragraph 1.8. Each update shall continue to show all work activities including those already completed. These completed activities shall accurately reflect the "as built" information by indicating when the work was actually started and completed.
- H. Neither the submission nor the updating of the Contractor's original schedule submittal nor the submission, updating, change or revision of any other report, curve, schedule or narrative submitted to the Owner by the Contractor under this Contract, nor the Owner's review or acceptance of any such report, curve, schedule or narrative shall have the effect of amending or modifying, in any way, the Contract completion date or milestone dates or of modifying or limiting, in any way, the Contractor's

obligations under this Contract. Only a signed, fully executed change order can modify these contractual obligations.

- I. Weekly schedule updates shall be submitted by the Contractor and will be reviewed with the Contractor during the weekly construction progress meetings. The goal of these meetings is to enable the Contractor and the Owner to initiate appropriate remedial action to minimize any known or foreseen delay in completion of the Work and to determine the amount of Work completed since the last month's schedule update. The status of the Work will be determined by the percent complete of each activity shown in the Network Diagram. These meetings are considered a critical component of the overall monthly schedule update submittal and the Contractor shall have appropriate personnel attend. As a minimum, these meetings shall be attended by the Contractor's Project Manager and General Superintendent.
- J. The Contractor shall submit the revised CPM Network Diagram, the revised successor/predecessor report, the Project Status Reports as defined by Paragraph 1.8 of this Section with the Contractor's Application for Payment. Applications for Payment which are submitted without the proper CPM Updates shall be held until the Contractor has satisfied the Contract requirement. Within five (5) working days of receipt of the above noted revised submittals, the Owner will either accept or reject the monthly schedule update submittal. If accepted, the percent complete shown in the monthly update will be the basis for the Application for Payment to be submitted by the Contractor. If rejected, the update shall be corrected and resubmitted by the Contractor before the Application for Payment for the update period can be processed.
- K. Schedule Revisions: The Contractor shall highlight or otherwise identify all changes to the Network Diagram Schedule Logic or activity durations made from the previous schedule. The Contractor shall modify any portions of the CPM schedule which become infeasible because of activities behind schedule or for any other valid reason.

## 1.7 CHANGE ORDERS

- A. Upon written approval of a change order, or upon written receipt by the Contractor of authorization to proceed with additional work, the change shall be reflected in the next submittal of the CPM schedule by the Contractor. The Contractor shall utilize a sub-network in the schedule depicting the changed work and its effect on other activities. This sub-network shall be tied to the main network with the appropriate logic so that a true analysis of the Critical Path can be made.

## 1.8 CPM STANDARDS

- A. Definitions: CPM, as required by this Section, shall be interpreted to be generally as outlined in the Association of General Contractors (AGC) publication, "The Use of CPM in Construction." except that either "i-j" arrow diagrams or precedence diagramming format may be utilized. In the case of conflicts between this specification and the AGC Document, this specification shall govern.
- B. Construction Schedules: Construction schedules shall include a graphic network diagram and computerized construction schedule reports as described in Paragraph 1.8.
- C. Networks: The CPM network shall be in a form of a time scaled "i-j" activity-on-arrow or precedence type diagram and may be divided into a number of separate sheets with suitable match lines relating the interface points among the sheets. Individual sheets shall not exceed 36-inch by 60-inch.
- D. All construction activities and procurement shall be indicated in a time-scaled format and a calendar time line shall be shown along the entire sheet length. Each activity arrow or node shall be plotted so that the beginning and completion dates of each activity are accurately represented along the calendar time line. All activities shall be shown using the symbols that clearly distinguish between critical path activities, non-critical activities and free float for each non-critical activity. All activity items shall be identified by their respective Activity Number, Responsibility Code, Work Duration, and their Dollar Value. All non-critical path activities shall show their total float time in scale form by utilizing a dotted line or some other graphical means.
- E. Duration Estimates: The duration estimate indicated for each activity shall be computed in working days and shall represent the single best estimate considering the scope of the activity work and resources planned for the activity. Except for certain non-labor activities, such as curing of concrete or delivery of materials, activity duration shall not exceed 10 working days nor be less than one working day unless otherwise accepted by the Owner.
- F. Float Time: Float time shall be as follows:
  - 1. Definition: Unless otherwise provided herein, float as referenced in these documents, is total float. Total float is the period of time measured by the number of working days each non-critical path activity may be delayed before it and its succeeding activities become part of the critical path. If a non-critical path activity is delayed beyond its float period, that activity then becomes part of the critical path and controls the end date of the project. Thus, the



delay of the non-critical path activity beyond its float period will cause delay to the project itself.

2. Float is not for the exclusive benefit of the Contractor, but is an expiring resource available to the Owner, or the Contractor, to accommodate changes in the Work, however originated, or to mitigate the effect of events which may delay performance or completion of all or part of the Work within the Late Dates, the Contractor's anticipated completion, or Contract Time. Contract time extensions for the Contract performance will be granted only to the extent that delays or disruptions to affected work paths exceed total float along those paths of the current Working Schedule (updated schedule) in effect at the time of delay or disruption. Delays and disruptions which cause the end date of the Work to exceed current contract completion date must be beyond control and without fault or negligence of the Contractor or any Subcontractor at any tier. In the event that the delays or disruptions impact an already negative float path, the Contractor will not receive a time extension unless and until the activity with the highest negative float is driven even further negative. Delays or disruptions are not considered a basis for time extension to this contract unless and until such delays or disruptions are resolved as set forth in the General Conditions.
3. Pursuant to the float sharing requirements of this Section, the use of float suppression techniques such as preferential or logic sequencing (crew movement, equipment use, etc.), special lag/lead restraints, and extended activity times or duration, imposed dates, scheduling of work not required for a Contract Time as required work, and others, are expressly prohibited. Use of float time disclosed or implied by use of alternate float suppression techniques shall be shared to the benefit of both the Owner and the Contractor. Justify use of preferential sequencing, special lag/lead relationships and other network techniques that may be construed as float suppression techniques as being necessary for efficient utilization of resources in execution of the Contract. Use of any network techniques solely for the purpose of suppressing float will be cause for rejection of schedule submittal. The Contractor shall adjust or remove any float suppression techniques as a prerequisite to a request for an increase in Contract Price or Contract Time.

## 1.9 SCHEDULE REPORTS (FORMAT)

- A. Schedule Reports: Schedule Reports shall be prepared based on the Construction Schedule, and shall include the following minimum data for each activity:

1. Activity Numbers and Responsibility Codes.
  2. Work Order No.
  3. CIP No.
  4. Estimated Activity Duration.
  5. Activity Description.
  6. Activity's Percent Completion.
  7. Early Start Date (Calendar Dated).
  8. Early Finish Date (Calendar Dated).
  9. Late Start Date (Calendar Dated).
  10. Late Finish Date (Calendar Dated).
  11. Status (Whether Critical).
  12. Total Float for Each Activity.
  13. Free Float for Each Activity.
  14. Cost Value for Each Activity.
- B. Project Information: Each Schedule Report shall be prefaced with the following summary data:
1. Project Name.
  2. Owner.
  3. Contractor.
  4. Type of Tabulation.
  5. Project Duration.
  6. Contract Completion Date (revised to reflect time extensions).
  7. The Commencement Date Stated in the Notice to Proceed.
  8. The Data Date and Plot Date of the Network Diagram.
  9. If an update, cite the new schedule completion date.

## 1.10 PROJECT STATUS REPORTING

- A. In addition to the submittal requirements for the CPM scheduling identified in this Section, the Contractor shall provide monthly project status reports (Overview Bar Chart and a written narrative report) to be submitted in conjunction with the revised CPM Schedules as specified in Paragraph 1.6. Status reporting shall be in the form specified below.
- B. The Contractor shall prepare and submit monthly an Overview Bar Chart schedule of the major project components. The overview bar chart schedule shall be a summary of the current CPM schedule (original and as updated and adjusted throughout the entire construction period). It shall be limited to not more than four sheets which shall not exceed 8-1/2-inch by 11-inch. The major project components shall be represented as time bars which shall be subdivided into various types of work.
- C. Each major component and subdivision shall be accurately time scale plotted consistent with the project overview bar chart specified above. It shall represent the same status indicated by early start and finish activity information contained in the latest update of the CPM schedule. In addition, a percent completion shall be indicated for each major component and subdivision. The initial submittal of the overview bar chart schedule shall be made at the time that the revised original CPM schedule is submitted to the Owner. The Contractor shall amend the overview schedule to include any additional detail required by the Owner. The Contractor shall include any additional information requested by the Owner at any time during the construction of the Work.
- D. The Contractor shall prepare monthly written narrative reports of the status of the project for submission to the Owner. Written status reports shall include:
  - 1. The status of major project components (Percent Complete, amount of time ahead or behind schedule) and an explanation of how the project will be brought back on schedule if delays have occurred.
  - 2. The progress made on critical activities indicated on the CPM schedule.
  - 3. Explanations for any lack of work on critical path activities planned to be performed during the last month.
  - 4. Explanations for any schedule changes, including changes to the logic or to activity duration.
  - 5. A list of the critical activities scheduled to be performed in the next two-month period.

6. The status of major material and equipment procurement.
  7. The value of materials and equipment properly stored at the site, but not yet incorporated into the work-in-place.
  8. Any delays encountered during the reporting period.
  9. An assessment of inclement weather delays and impacts to the progress of the Work.
  10. A statement as to the adequacy of remaining contract time to complete Work.
- E. The Contractor may include any other information pertinent to the status of the project. The Contractor shall include additional status information requested by the Owner.

#### 1.11 INCLEMENT WEATHER PROVISIONS OF THE SCHEDULE

- A. The Contractor's construction schedule shall include lost days on the CPM schedule's critical path due to inclement weather during an active period of Work. The Contractor's schedule shall also include lost days due to an inclement weather-related shutdown at the direction of the Owner, see Section 01313 – CONSTRUCTION AND SCHEDULE CONSTRAINTS.

#### PART 2 – PRODUCTS

Not Used

#### PART 3 – EXECUTION

Not Used

END OF SECTION 01311

## SECTION 01313

### CONSTRUCTION AND SCHEDULE CONSTRAINTS

#### PART 1 - GENERAL

##### 1.1 SUMMARY

- A. This Section provides limitations that the Contractor must take into account when submitting the Project Bid Estimate; developing Preliminary and Updated Construction Schedules/Sequencing; executing the work; and obtaining and complying with applicable permits. The guidelines and constraints listed in this Section do not substitute for the Contractor's coordination and planning for completion of the Work within the Contract Times. The Contractor shall be prepared to accommodate these requirements at no additional cost to the Owner:
1. This project provides improvements to the North Branch Sewer Interceptor located between Riverton Road and Wilbraham Road along the southern border of St. Michael's Cemetery. This interceptor is critical infrastructure to the SWSC collection system. Construction is proposed to be sequenced in a way that preserves the integrity of the existing clay tile pipeline, limits disruption to the cemetery grounds, and limits duration for required flow bypass.
- B. Construction activities on St. Michael's property may begin following Memorial Day, Monday, May 26, 2025.
- C. Work shall be scheduled, sequenced, and performed in a manner which minimizes disruption to the public and to the operation of the existing facilities along the pipeline alignment.
- D. Overall sequence of work will be as follows:
1. Construction of gravel access road.
  2. CIPP lining of all pipe segments within project scope. This includes all necessary flow bypass setup, SMH selective demolition for pipeline access, and clearing and grading necessary for truck access.
  3. Reconstruction of all manhole risers and cones selectively demolished for pipeline access, including installation of new manhole frames and covers.

4. Installation of (1) 8-foot diameter precast concrete sewer manhole at approximately STA 4+80 at the intersection of the North Branch and East Branch Interceptors.
  5. Replacement of approximately 70 linear feet of 24-inch, 36-inch and 39-inch existing clay tile sewer at the intersection of the North Branch and East Branch Interceptors, with approximately 70 linear feet of 24-inch and 36-inch PVC pipe (see Drawings for details). Disposal of clay tile pipe removed. This includes making all pipe connections to manholes with cast-in-place concrete field collars as shown on Drawings.
  6. Cementitious lining of all existing manholes in project scope.
- E. The construction and schedule guidelines and constraints in this Section do not include every item affecting the completion of Work, but are intended to call attention to critical elements necessary to minimize disruption of flow conveyance. It shall be understood and agreed by the Contractor that the critical elements described are not all inclusive and that additional items of Work and/or restrictions, not included herein, may be required to minimize disruption and ensure compliance.
- F. Deviation from, or modification of, these guidelines and constraints are permitted if: techniques and methods known to the Contractor will result in reducing disruption to the infrastructure, lowering costs to the Owner, and reducing schedule impacts; and if the deviation is approved in advance by the Engineer or Owner. Requested deviations and/or modifications shall be submitted, in detail and in writing, to the Owner and Engineer, in advance of the Work. The Owner and Engineer will be allowed a minimum of two weeks to review and respond to the written request. Resubmittals and requests for supplemental or additional information may be required and will be necessary outside of the two-week review window referenced above. The Contractor is responsible for planning the work appropriately.
- G. Making critical connections to, and rehabilitating existing infrastructure, or other operations that interfere with the operation of the existing transmission and distribution system that convey live flow shall be thoroughly planned in advance, and the required equipment, material, and labor shall be on hand at the time of undertaking. Work shall be completed as quickly as possible, and with as little delay as possible. Working 24 hours a day and/or seven days a week may be necessary to complete critical items of the Work in a timely manner to minimize impacts to the transmission and distribution system performance. Even if not specifically called out in the Construction Documents, the Contractor shall be prepared to accommodate these requirements at no additional cost to the Owner.

1. Only for work items requiring an extended and continuous period of time without the presence of flow in a pipe segment, the Contractor shall submit a baseline schedule that includes working extended hours (24 hours/day and/or all 7 days/week). The schedule shall be submitted in writing, for approval, 48 hours in advance of the start of proposed work item.
  2. The cost of any temporary facility; and/or nighttime, weekend, holiday, and/or overtime payments required shall be at no additional cost to the Owner.
- H. The limits of work for the North Branch Sewer Interceptor Rehabilitation as shown on the Contract Drawings and as summarized in Section 01010 – SUMMARY OF WORK, restricts the Contractor from disturbing cemetery grounds except where specified. It is critical that the grounds not be disturbed near grave sites.

## 1.2 RELATED WORK

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Sections apply to the work of this Section.
- B. Section 02761 – BYPASS FLOW HANDLING

## 1.3 GENERAL SEQUENCING REQUIREMENTS

- A. Construction activities shall be scheduled and sequenced to ensure continuous operation of the existing collection system. The Contractor shall be responsible for developing the construction sequencing and implement such that it will not adversely impact flow conveyance nor degrade collection system performance from existing conditions. The following general guidelines shall be complied with:
  1. Safe working conditions for personnel shall be maintained during installation, rehabilitation, modification, and demolition Work. Safe working conditions include, but are not limited to, providing proper temporary support of excavation, and maintaining permitted confined space entry into the pipe and manholes.
  2. With the exception of approved activities requiring extended hours (24 hours/day and/or all 7 days/week) or unless otherwise directed by the Owner and/or Engineer, at the end of the Work Day/Work Period, at the onset of an unexpected precipitation event, or at the direction of the Owner, the Contractor must provide a means of

continuous flow conveyance through the work zone at a capacity consistent with the preexisting conditions.

- B. Requirements in Section 01570 – MAINTENANCE AND PROTECTION OF TRAFFIC shall be complied with when developing Construction Sequence Plans and Critical Path Method Schedules.
  - 1. Contractor shall maintain access to all private property sites throughout construction activities.
- C. The Contractor shall coordinate with St. Michael’s Cemetery and Mass Mutual as required such that the proposed work sequence can be completed in the time frame submitted by the Contractor.
- D. Access to Work on private property must be via existing easements, or via temporary easements established between the Owner and the property owner.
- E. Contractor and utility companies shall adhere to the City’s construction moratorium schedule.

**PART 2 – PRODUCTS**

Not Used

**PART 3 – EXECUTION**

Not Used

END OF SECTION 01313



## SECTION 01380

### CONSTRUCTION PHOTOGRAPHS

#### PART 1 - GENERAL

##### 1.1 SUMMARY

- A. This Section describes the requirements of the Project Photographs in which shall be captured by a professional photographer. However, it is not intending to specify the means of which informal photographs are to be taken capturing immediate site conditions, or the frequency of such documentation.

##### 1.2 RELATED WORK

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Sections apply to the work of this Section.

##### 1.3 SUBMITTALS

- A. General: Submit the following in accordance with Section 01300 – SUBMITTALS.
  - 1. During ongoing construction, sufficient digital photographs (no less than 5 photographs per workday) shall be taken at each site during the progress of the work. These photographs will document existing conditions and final completion of the work. Each file shall be identified with project name, job number, and location of photograph and dated.
  - 2. Digital photographs shall be dated and submitted on CD to the Engineer on a monthly basis.

##### 1.4 QUALITY ASSURANCE

- A. The Contractor shall arrange for a professional photographer to take photographs during construction.

#### PART 2 - PRODUCTS

Not Used

#### PART 3 - EXECUTION

Not Used

END OF SECTION 01380

## SECTION 01390

### PRE-CONSTRUCTION SURVEY

#### PART 1 – GENERAL

##### 1.1 SUMMARY

- A. This Section specifies the performance of Pre-Construction Surveys of the conditions of existing landscape and structures above grade to be conducted by an independent Consultant employed by the Contractor.
- B. Pre-Construction Surveys shall be completed for areas within the entire limits of disturbance on St. Michael's Property as shown in the Access Agreement Figures included in Appendix J.
- C. Digital video shall be taken as required indicating the existing conditions. The independent Pre-Construction Survey Consultant shall make available, at the request of the Engineer, one video file of each of the areas surveyed. Digital video shall be made available to the Engineer for review, at his request. Photographs taken with a digital camera are acceptable

##### 1.2 RELATED WORK

- A. Drawings and general provisions of the contract, including General and Supplementary Conditions and Division 1 Sections, apply to the work of this Section.

##### 1.3 SUBMITTALS

- A. Shop Drawings: Submit the following in accordance with Section 01300 - SUBMITTALS.
  - 1. The qualifications of the independent Pre-Construction Survey Consultant and their Massachusetts Registered Professional Engineer supervising the Pre-Construction Survey as specified in Paragraph 1.4 of this Section.
  - 2. The Draft Pre-Construction Report: submit to the Engineer prior to the start of construction and include the following, as a minimum:
    - a. Location and description of on-site property and improvements;
    - b. Results of visual inspection;
    - c. Sketches as required;

- d. Results of interviews;
  - e. Points where deterioration has occurred shall be noted on digital video to show deterioration or other deficiencies. The absence of deficiencies shall also be recorded. The Engineer shall review the draft reports and may indicate additional information that is required. This information shall be included in the final report.
3. The Final Report: shall include the results of the Pre-construction Survey for the pipeline alignment and areas identified on the Drawings.
- a. Four (4) copies of the final report shall be made: one of which shall be the original, one for the Engineer, one copy for Springfield Water and Sewer Commission, and one copy shall be retained by the independent Pre-Construction Survey Consultant and one for the Contractor.

#### 1.4 QUALITY ASSURANCE

- A. The Registered Professional Engineer shall have at least five (5) years experience and three (3) projects in performing pre-construction surveys of heavy civil construction projects similar to this project, including work in urban areas, and a record of performance in completing condition surveys of similar types of works.

### PART 2 – PRODUCTS

Not Used

### PART 3 – EXECUTION

#### 3.1 GENERAL

- A. The independent Consultant under the supervision of their Massachusetts Registered Professional Civil/Structural Engineer shall make a detailed examination of the existing pipeline alignment, the areas within the limits of work, and the work identified on the Drawings and record their conditions no earlier than four (4) weeks before construction begins in the area.
- B. Notify the Engineer, both orally and in writing, 48 hours prior to surveying

the project area.

- C. The Pre-construction Surveys shall be performed and submitted before construction work begins, but no sooner than four (4) weeks before construction in the area.

END OF SECTION 01390

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## SECTION 01400

### QUALITY ASSURANCE

#### PART 1 - GENERAL

##### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Division 1 Specification Sections, apply to this Section.

##### 1.2 SUMMARY

- A. This section covers Quality Assurance requirements for this contract.
- B. The Contractor is responsible for controlling the quality of work, including work of its subcontractors and suppliers and for assuring the quality specified in the Technical Specifications is achieved.

##### 1.3 TESTING LABORATORY SERVICES

- A. All tests which require the services of a laboratory to determine compliance with the Contract Documents shall be performed by an independent commercial testing laboratory engaged by the Contractor and acceptable to the Engineer. The laboratory shall be staffed with experienced technicians, properly equipped, and fully qualified to perform the tests in accordance with the specified standards.
- B. Preliminary Testing Services: Unless otherwise specified, the Contractor shall be responsible for all testing laboratory services in connection with concrete materials and mix designs, the design of asphalt mixtures, gradation tests for structural and embankment fills, backfill materials, and all other tests and engineering data required for the Engineer's review of materials and equipment proposed to be used in the Work. The Contractor shall obtain the Engineer's acceptance of the testing laboratory before having services performed, and shall pay all costs for services.
- C. Quality Control Testing Services: Perform all quality control tests in the field or in the laboratory on concrete, asphalt mixtures, moisture-density (Proctor) and gradation tests on structural and embankment fills, and backfill materials, in-place field density tests on structural and embankment fills, and other materials and equipment, during and after their incorporation in the Work. Field sampling and testing shall be performed in the general manner indicated in the specifications, with minimum interference with construction operations. The Engineer shall

determine the exact time and location of field sampling and testing, and may require such additional sampling and testing as necessary to determine that materials and equipment conform with data previously furnished by Contractor and with the Contract Documents.

- D. Arrangements for delivery of samples and test specimens to the testing laboratory will be made by the Contractor. The laboratory tests shall be performed within a reasonable time consistent with the specified standards. Furnish a written report of each test to the Engineer.
- E. Contractor shall furnish all sample materials and cooperate in the sampling and field testing activities, interrupting the Work when necessary. When sampling or testing activities are performed in the field, the Contractor shall furnish personnel and facilities to assist in the activities.
- F. The Contractor shall not retain any testing laboratory against which the Owner or the Engineer have reasonable objection, and if at any time during the construction process the services become unacceptable to the Owner, or the Engineer, either the Owner or the Engineer may direct in writing that such services be terminated. The request must be supported with evidence of improper testing or unreasonable delay. If the Engineer determines that sufficient cause exists, the Contractor shall terminate the services and engage a different testing laboratory.
- G. Transmittal of Test Reports: Written reports of testing and engineering data furnished by the Contractor for the Engineer's review of materials and equipment proposed to be used in the Work shall be submitted as specified for Shop Drawings.
- H. The testing laboratory shall furnish four copies of a written report of each test performed by laboratory personnel in the field or laboratory to the Contractor. Distribution shall be two copies of each test report to the Engineer's Representative, one copy to the Owner, and one copy for the Contractor within three days after each test is completed.

#### 1.4 QUALITY ASSURANCE

- A. Copies of applicable referenced standards are not included in the Contract Documents. Where copies of standards are needed by the Contractor for superintendence and quality control of the work, the Contractor shall obtain a copy or copies directly from the publication source and maintain at the jobsite, available to the Contractor's personnel, subcontractors, and Engineer.
- B. Quality of Materials: Unless otherwise specified, all materials and equipment furnished for permanent installation in the Work shall conform



to applicable standards and specifications and shall be new, unused, and free from defects and imperfections, when installed or otherwise incorporated in the Work. Material and equipment shall not be used by the Contractor for any purpose other than that intended or specified unless such use is authorized by the Engineer.

- C. Where so specified, products or workmanship shall also conform to the additional performance requirements included within the Contract Documents to establish a higher or more stringent standard or quality than that required by the referenced standard.

## 1.5 OFFSITE INSPECTION

- A. When the specifications require inspection of materials or equipment during the production, manufacturing, or fabricating process, or before shipment, such services shall be performed by an independent testing laboratory, or inspection organization acceptable to Engineer in conjunction with or by the Engineer.
- B. The Contractor shall give appropriate written notice to the Engineer not less than 30 days before offsite inspection services are required, and shall provide for the producer, manufacturer, or fabricator to furnish safe access and proper facilities and to cooperate with inspecting personnel in the performance of their duties.
- C. The inspection organization shall submit a written report to the Contractor who shall provide copies to the Engineer.

## 1.6 MATERIALS AND EQUIPMENT

- A. The Contractor shall maintain control over procurement sources to ensure that materials and equipment conform to specified requirements in the Contract Documents.
- B. The Contractor shall comply with manufacturer's printed instructions regarding all facets of materials and/or equipment movement, storage, installation, testing, startup, and operation. Should circumstances occur where the contract documents are more stringent than the manufacturer's printed instructions, the Contractor shall comply with the specifications. In cases where the manufacturer's printed instructions are more stringent than the contract documents, the Contractor shall advise the Engineer of the disparity and conform to the manufacturer's printed instructions. In either case, the Contractor is to apply the more stringent specification or recommendation, unless approved otherwise by the Engineer.

## 1.7 SHOP AND FIELD TESTING

- A. The Contractor is also responsible for providing the shop and field testing specified in the technical specification sections.
- B. The Contractor and its Subcontractor shall perform inspections, tests, and other services as required by the Contract Documents.
- C. Contractor shall provide twenty-one days notice to the Engineer so that the Engineer may witness Contractor and/or Subcontractors off site and on-site tests. The Engineer's witnessing of tests does not relieve the Contractor and/or Subcontractors of their obligation to comply with the requirements of the Contract Documents.

## 1.8 MANUFACTURER'S FIELD SERVICES

- A. When specified in the technical specification sections, the Contractor shall arrange for and provide technical representation from manufacturer's of respective equipment, items or components. The manufacturer's representative shall be a factory trained service engineer/technician with the type and length of experience specified in the technical specifications.
- B. Services Furnished Under This Contract: An experienced, competent, and authorized factory trained service engineer/technician representative of the manufacturer of each item of equipment for which field services are indicated in the specifications shall visit the site of the Work and inspect, operate, test, check, adjust if necessary, and approve the equipment installation. In each case, the manufacturer's service representative shall be present when the equipment is placed in operation. The manufacturer's service representative shall revisit the jobsite as often as necessary until all problems are corrected and the equipment installation and operation are satisfactory to the Engineer.

## 1.9 CERTIFICATION FORMS AND CERTIFICATES

- A. The Contractor shall be responsible for submitting the certification forms and certificates in conformance with the requirements specified in Section 01300 - SUBMITTALS.

## PART 2 - PRODUCTS

Not Used

## PART 3 – EXECUTION

### 3.1 QUALITY CONTROL

- A. Quality control is the responsibility of the Contractor, and the Contractor shall maintain control over construction and installation processes to assure compliance with specified requirements.
- B. Certifications for personnel, procedures, and equipment associated with special processes shall be maintained in the Contractor's field office, available for inspection by the Engineer. Copies will be made available to the Engineer upon request.
- C. Means and methods of construction and installation processes are the responsibility of the Contractor, and at no time is it the intent of the Engineer or Owner to supersede or void that responsibility.

END OF SECTION 01400

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## SECTION 01500

### TEMPORARY FACILITIES AND CONTROLS

#### PART 1 – GENERAL

##### 1.1 SUMMARY

- A. This Section includes temporary facilities and the necessary controls for the project including private land, pipe locations, hauling, handling and storage of materials, open excavations, test pits, protection and relocation of existing structures and utilities, coordination with existing utilities, water for construction purposes, protection of construction and equipment, care and protection of property, installation of equipment, sleeves and openings, grease, oil and fuel, cleaning and replacement of glass, architectural coatings, pipe marking, rejected materials and defective work, temporary utilities, access to the work, dust control, pollution control, sedimentation and erosion control, and engineer's field office.

##### 1.2 RELATED WORK

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Sections apply to the work of the Section.

##### 1.3 SUBMITTALS

- A. General: Submit the following in accordance with Section 01300 - SUBMITTALS
  - 1. Work Plan: include proposed hours of operation; sequencing of work; number of shifts; number of work crews; and anticipated conflicts with existing utilities and facilities throughout the project. The work plan shall also include:
    - a. Dates for temporary facility service interruption and required utility relocation.
    - b. Detailed schedule of all cooperation requirements with owners/operators of existing utilities and facilities.

#### PART 2 – PRODUCTS

Not Used

## PART 3 – EXECUTION

### 3.1 PRIVATE LAND

- A. The Contractor shall not enter or occupy private land outside of easements, except by permission of the land owner.

### 3.2 PIPE LOCATIONS

- A. Pipelines shall be located substantially as indicated on the Drawings, but the Engineer reserves the right to make such modifications in locations as may be found desirable to avoid interference with existing structures or for other reasons. Where fittings are noted on the Drawings, such notation is for the Contractor's convenience and does not relieve him for laying and jointing different or additional items where required.

### 3.3 HAULING, HANDLING AND STORAGE OF MATERIALS

- A. The Contractor shall, at his own expense, handle and haul all materials furnished by him and shall remove any of his surplus materials at the completion of the work. The Contractor shall provide suitable and adequate storage for equipment and materials furnished by him and shall be responsible for any loss or damage to any equipment or materials by theft, breakage, or otherwise. The Contractor shall be responsible for all damages to the work under construction during its progress and until final completion and acceptance even though partial payments have been made under the Contract.

### 3.4 OPEN EXCAVATIONS

- A. All open excavations shall be adequately safeguarded by providing temporary barricades, steel plates, caution signs, concrete barriers, protective 7' tall fencing, lights and other means to prevent accidents to persons, and damage to property. The Contractor shall, at his own expense, provide suitable and safe means for completely covering all open excavations and for accommodating pedestrian and/or vehicular travel when work is not in progress. Bridges provided for access to private property during construction shall be removed when no longer required. The length of open trench will be controlled by the particular surrounding conditions but shall always be confined to the limits prescribed by the Engineer. If the excavation becomes a hazard, or if it excessively restricts traffic at any point, then special construction procedures shall be taken, such as limiting the length of open trench.

### 3.5 TEST PITS

- A. Test pits for the purpose of locating underground pipeline or structures in

advance of the construction shall be excavated and backfilled by the Contractor at the direction of the Engineer and/or as shown on the Drawings. Test pits shall be backfilled immediately after their purpose has been satisfied and the surface restored and maintained in a manner satisfactory to the Engineer.

### 3.6 PROTECTION AND RELOCATION OF EXISTING STRUCTURES AND UTILITIES

- A. The Contractor shall assume full responsibility for the protection of all buildings, structures, and utilities, public or private, including poles, signs, services to buildings, utilities in the street, gas pipes, water pipes, hydrants, sewers, drains, and electric and telephone cables, fiber optic lines, fire signals, cable television cables, whether or not they are shown on the Drawings. The Contractor shall carefully support and protect all such structures and utilities from injury of any kind. The Contractor shall notify the owner/operator of the proposed work and proposed protection plan so the owner/operator can review and approve protection measures. The Contractor is required to comply with all provisions of Massachusetts General Laws Chapter 353 entitled "Excavations Public Ways Notice Requirements" otherwise known as Dig Safe. Any damage resulting from the Contractor's operations shall be repaired by him at his expense.
- B. Assistance will be given the Contractor in determining the location of existing services. The Contractor, however, shall bear full responsibility for obtaining all locations of underground structures and utilities. Services to buildings shall be maintained and all costs or charges resulting from damage thereto shall be paid by the Contractor.
- C. Protection and temporary removal and replacement of existing utilities and structures as described in this section shall be a part of the work under the Contract and all costs in connection therewith shall be included in the unit prices established in the Contract. The Contractor will be responsible for the removal and replacement of existing utilities or coordination with the owners/operators of the existing utilities and assisting the existing utilities where required.
- D. If, in the opinion of the Engineer, permanent relocation of a utility owned by the Springfield Water and Sewer Commission is required, that is not shown on the plans or the specifications, he may direct the Contractor, in writing, to perform the work. Work so ordered will be paid for as extra work under provisions of the General Conditions. If relocation of a privately owned utility is required, the Contractor will notify the utility to perform the work as expeditiously as possible. The Contractor shall fully cooperate with the Owner and utility, and shall have no claim for delay due to such relocation. The Contractor shall notify public utility companies in writing at least seven days (excluding Saturdays, Sundays and legal

holidays) before excavating or working in any public way. The Contractor shall notify public utilities 30 days prior to any service call wherever possible.

### 3.7 WATER FOR CONSTRUCTION PURPOSES

- A. The Contractor will be allowed to purchase water from the Springfield Water and Sewer Commission for construction testing and start-up purposes.
- B. The express approval of the Springfield Water and Sewer Commission shall be obtained before water is used. Water shall be metered as specified by the Springfield Water and Sewer Commission. Hydrants shall only be operated under the supervision of Springfield Water and Sewer personnel.
- C. No direct cross connections will be permitted between the public water supply and the new water mains, or any other point where the possibility of backflow of contaminated water exists. All connections to points where there is the possibility of backflow shall be arranged to prevent backflow and shall be approved by the Springfield Water and Sewer Commission's Backflow Prevention Department before they are put into operation.

### 3.8 PROTECTION OF CONSTRUCTION AND EQUIPMENT

- A. All newly constructed Work shall be carefully protected. No driving or wheeling, walking or placing of heavy loads on newly constructed Work shall be allowed. All portions damaged shall be reconstructed, repaired, or replaced by the Contractor at its own expense.
- B. All elements of the Work shall be protected in a manner approved by the Engineer. Should any part of the Work become disturbed, heaved, cracked, or otherwise damaged, all such damaged portions of the Work shall be completely repaired and made good by the Contractor at his own expense and to the satisfaction of the Engineer.
- C. If, in the final inspection of the Work, any defects, faults or omissions are found, the Contractor shall cause the same to be repaired or removed and replaced by proper materials and workmanship without extra compensation for the materials and labor required. Further, the Contractor shall be fully responsible for the satisfactory maintenance and repair of the construction and other work undertaken herein for at least the guarantee period described in the Contract Documents.
- D. The Contractor shall take all necessary precautions to prevent damage to all elements of the Work due to water pressure during and after construction and until such Work is accepted and taken over by the Owner.



### 3.9 CARE AND PROTECTION OF PROPERTY

- A. The Contractor shall be responsible for the preservation of all public and private property, and shall use every precaution necessary to prevent damage thereto. If any direct or indirect damage is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the Work on the part of the Contractor, such property shall be restored by the Contractor at his expense to a condition similar or equal to that existing before the damage was done or he shall make good the damage in another manner acceptable to the Owner and Engineer.
- B. Along the location of this Work, all fences, walks, bushes, trees, shrubbery, and other physical features shall be protected and restored in a thoroughly workmanlike manner. Fences and other features removed by the Contractor shall be replaced in their original location or at a location indicated on the Drawings as soon as conditions permit. All grass areas beyond the limits of construction which have been damaged by the Contractor shall be graded and seeded.
- C. Trees close to the work shall be boxed or otherwise protected against injury. No trees shall be cut, braced, or damaged without prior notification of the City Arborist.
- D. The protection, removal, and replacement of existing physical features along the line of work shall be a part of the work under the Contract, and all costs in connection therewith shall be included in the Bid Proposal unless a Bid Item has been established elsewhere in these Construction Documents for the express payment of that specific item of Work.

### 3.10 INSTALLATION OF EQUIPMENT

- A. Special care shall be taken to ensure proper alignment to all equipment with particular reference to the pumps and electric drives. The units shall be carefully aligned on their foundations by qualified millwrights after their sole plates have been shimmed to true alignment at the anchor bolts. The anchor bolts shall be set in place and the nuts tightened against the shims. After the foundation alignments have been approved by the Engineer, the bed plates or wing feet of the equipment shall be securely bolted in place. The alignment of equipment shall be further checked after securing to the foundations, and after confirmation of all alignments, the sole plates shall be firmly grouted in place. The Contractor shall be responsible for the exact alignment of equipment with associated piping, and under no circumstances, will "pipe springing" be allowed.
- B. All wedges, shims, filling pieces, keys, packing, red or white lead grout, or other materials necessary to properly align, level and secure apparatus in place shall be furnished by the Contractor. All parts intended to be plumb

or level must be proven exactly so. Any grinding necessary to bring parts to proper bearing after erection shall be done at the expense of the Contractor.

### 3.11 SLEEVES AND OPENINGS

- A. The Contractor shall provide all openings, channels, etc., and install anchor bolts and other items to be imbedded in concrete, as required to complete the work under this Contract, together with those required by subcontractors, and shall do all cutting and patching excepting cutting and patching of materials of a specific trade and as stated otherwise in the following paragraph.
- B. Subcontractors shall furnish all sleeves, inserts, hangers, anchor bolts, etc., required for the execution of their work. It shall be their responsibility before the work of the Contractor is begun to furnish him with the above items and with templates, drawings or written information covering chases, openings, etc., which they require, and to follow up the work of the Contractor as it progresses, making sure that their drawings and written instructions are carried out. Failing to do this, they shall be responsible for the cost of any corrective measures which may be required to provide necessary openings, etc. If the Contractor fails to carry out the directions given him, covering details and locations of openings, etc., he shall be responsible for any cutting and refinishing required to make the necessary corrections. In no case shall beams, lintels, or other structural members be cut without the approval of the Engineer.

### 3.12 GREASE, OIL AND FUEL

- A. All grease, oil and fuel required for testing of equipment shall be furnished with the respective equipment. .

### 3.13 REJECTED MATERIALS AND DEFECTIVE WORK

- A. Materials furnished by the Contractor and condemned by the Engineer as unsuitable or not in conformity with the specifications shall forthwith be removed from the work by the Contractor, and shall not be made use of elsewhere in the work. Any errors, defects or omissions in the execution of the work or in the materials furnished by the Contractor, even though they may have been passed or overlooked or have appeared after the completion of the work, discovered at any time before the final payment is made hereunder, shall be forthwith rectified and made good by and at the expense of the Contractor and in a manner satisfactory to the Owner and Engineer. The Contractor shall reimburse the Owner for any expenses, losses or damages incurred in consequence of any defect, error, omission or act of the Contractor or his employees, as determined by the Owner and Engineer, occurring previous to the final payment.

### 3.14 TEMPORARY UTILITIES

- A. Temporary Light and Power: The Contractor shall at his own expense, provide his own temporary light and power as required for the prosecution and completion of work, including light and power for the construction and engineering trailers as well as light and power for dewatering pumps, and trench and staging area lighting.
- B. Temporary Heat: The Contractor shall, at his own expense, provide sufficient temporary heat to maintain minimum temperatures specified elsewhere, in all areas designated elsewhere in these documents.
- C. Temporary Telephone: The Contractor shall have installed at his own expense a job telephone for his use, one for the Engineer, a fax line for the Engineer, and a computer dedicated phone line for the Engineer. The Contractor shall pay all phone charges.
- D. Temporary Water: Water for drinking purposes and other usage will be provided by the Contractor at his own expense.
- E. Sanitary Provisions: The Contractor shall provide and maintain sanitary accommodations for the use of his employees and the Engineer, as may be necessary to comply with the requirements and regulations of the local and state departments of health.
- F. Maintaining Operation of the Existing Facilities:
  - 1. The Contractor shall provide temporary utilities and/or cooperate with utilities to maintain full service to the residences and buildings in the project area. The Contractor shall be responsible for careful consideration of the construction scheduling and anticipation of potential interferences with existing utilities, operations and structures. The Contractor shall maintain close communications with the Engineer and provide the Engineer with a detailed description of each proposed activity sufficiently in advance of its commencement for review and comments to be made.
  - 2. Temporary facilities which may be required include, but are not limited to, electrical power; lighting; heating; cooling; ventilating; telephone; cable television; potable water; fire protection; drainage; sanitary facilities; trench covers; protection of existing utilities; structures; streams; trees and shrubs; access roads; sewage conveyance; piping; and pumping. The Contractor will be responsible for providing, connecting, and maintaining emergency generators to serve homes in the event temporary electrical services cannot be established by the power company. The Contractor will be responsible to furnish a licensed electrician to connect the houses to the emergency generators, maintain the generators 24 hours a day,

and disconnect the houses when service can be reestablished to the power lines. The generators will be provided and maintained at no additional cost to the Owner.

3. The Contractor shall coordinate efforts with the owners and/or operators of the existing facilities to avoid any service interruption. The Contractor shall keep utilities informed of proposed work activity and notify utilities of required work four weeks in advance. The Contractor must schedule work to avoid repeated, unnecessary, or last-minute service calls by the owners/operators of existing facilities.

### 3.15 ACCESS TO THE WORK

- A. The Contractor shall provide sufficient and proper facilities at all times for inspection of all work under this project in preparation or in progress, by the Owner, the agents and employees of the Owner, by authorized representatives of the State of Massachusetts and the Federal Government and by the Engineers.
- B. The Contractor shall furnish the Engineer or his authorized representative and other personnel mentioned above with such facilities and assistance as are necessary to ascertain performance of the work in accordance with the plans and specifications.
- C. The Contractor must provide sufficient and safe access to existing facilities for the owners/operators of existing facilities to maintain service.

### 3.16 POLLUTION CONTROL

- A. The Contractor shall conduct clean-up and disposal operations, as necessary, to comply with state and local ordinances and anti-pollution laws.
- B. Outdoor burning of rubbish and waste material on the site will not be permitted.
- C. Disposal of volatile fluid wastes (such as mineral spirits, oil, gasoline, or paint thinner) in storm or sanitary sewer systems or into streams or waterways is not permitted.

### 3.17 SEDIMENTATION AND EROSION CONTROL

- A. The Contractor shall plan and execute all operations, particularly those associated with excavation and backfilling, in such a manner as to minimize the amount of excavated and exposed fill or other foreign material that is washed or otherwise carried into waterways. The water quality of waterways shall not be degraded due to construction operations. For the

purposes of this Specification Section, the term waterways shall include all conveyance system taking drainage and runoff to an eventual waterway.

- B. The Contractor's plan for siltation control shall be submitted to the Engineer for review and authorization to proceed prior to implementation.
- C. The Contractor shall line all catch basins with filter fabric or silt sacks for erosion and sedimentation control as directed. Filter fabric used to line catch basins must be removed prior to any inclement weather and reinstalled at the direction of the Engineer.
- D. Hay bales shall consist of hay from acceptable grasses and legumes, free from weeds, reeds, twigs, chaff, debris, other objectionable material or excessive amounts of seeds and grain. It shall be free from rot or mold and the moisture content shall not exceed 15 percent by weight at the time of weighing.
- E. Baled hay shall be placed to form temporary water stops, dams, diversions, dikes, berms and for other uses connected with water pollution control; bales shall be disposed of by the Contractor upon completion.
- F. The hay shall be securely baled with biodegradable twine of adequate size to allow for possible rusting while in use and to permit rehandling when the bale is in a saturated condition.
- G. Individual bales shall be of a longitudinal shape not exceeding 100 pounds when weighed.
- H. It is the intent of these Specifications to prevent the unnecessary occurrence of sedimentation or siltation of waterways and private properties. In the event the sedimentation or siltation prevention measures used by the Contractor prove to be inadequate as determined by the Owner and Engineer, the Contractor shall be required to adjust his operations to the extent necessary to prevent any such sedimentation or siltation from occurring.
- I. The Contractor shall keep waterways clear of mud, silt, debris and other objectionable materials resulting from his construction operations.
- J. Existing natural drainage patterns and vegetative cover shall be preserved to the maximum possible extent.
- K. The Contractor shall use temporary vegetation, mulching, and paving to protect areas exposed during construction. He shall minimize the amount of bare earth exposed at any one time during construction, and he shall also minimize the length of time bare earth is exposed.
- L. On sloping terrain, hay bales may be used to trap sediment until vegetation

has become established. The details of their placement shall be as approved by the Engineer.

- M. Water that is being pumped from the trenches or excavations shall not be pumped directly into water courses or pipe conveyance systems. At a minimum, sedimentation control measures shall include portable sedimentation tanks, pumps, and piping, or other means acceptable to the Owner and Engineer to meet the water quality parameters specified in both the DEP Remediation General Permit and these Specifications, whichever is more stringent.
- N. Spoil resulting from the trench excavation shall be leveled or removed to permit free entry of water from adjacent land surfaces without excessive erosion or harmful ponding.

### 3.18 PLANT

- A. The Contractor shall furnish plant and equipment which will be efficient, appropriate and large enough to secure a satisfactory quality of work and a rate of progress which will insure the completion of the work within the time stipulated in the Contract. If at any time such plant appears to the Engineer to be inefficient, inappropriate or insufficient for securing the quality of work required or for producing the rate of progress aforesaid, he may order the Contractor to increase the efficiency, change the character or increase the plant equipment, and the Contractor shall conform to such order. Failure of the Engineer to give such order shall in no way relieve the Contractor of his obligations to secure the quality of the work and rate of progress required.

END OF SECTION 01500

## SECTION 01505

### MOBILIZATION

#### PART 1 – GENERAL

##### 1.1 SUMMARY

- A. This Section describes mobilization consisting of : moving all plant and equipment onto the site required for the first month's operations; furnishing and erecting plants, temporary buildings, and project as well as other construction facilities; erecting project signs and traffic management signs; all as required for the proper performance and completion of the Work.
- B. Mobilization shall further include the following principal items:
  - 1. Providing on-site sanitary facilities and potable water facilities;
  - 2. Arranging for and erection of Contractor's work and storage yard(s);
  - 3. Having all OSHA required notices and establishment of safety programs;
  - 4. Having the Contractor's superintendent at the job site full time;
  - 5. Submitting initial Shop Drawings;
  - 6. Constructing and implementing security features and requirements;
  - 7. Obtaining all required permits.

##### 1.2 RELATED WORK

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Sections apply to the work of this Section.

##### 1.3 SUBMITTALS

- A. Shop Drawings: Submit in accordance with Section 01300 – SUBMITTALS
- B. Submit CPM Schedule in accordance with Section 01311 – SCHEDULING AND REPORTING.
- C. Submit Initial Work Plan in accordance with Section 01500 – TEMPORARY FACILITIES AND CONTROL.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION 01505



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## SECTION 01560

### TEMPORARY ENVIRONMENTAL CONTROLS

#### PART 1 – GENERAL

##### 1.1 DESCRIPTION

- A. This section includes temporary environmental controls necessary for the project including dust abatement, rubbish control, sanitation, chemicals, and cultural resources. Snow removal and sweeping of streets and sidewalks are discussed in Section 01570 - MAINTENANCE AND PROTECTION OF TRAFFIC.

##### 1.2 EXPLOSIVES AND BLASTING

- A. The use of explosives on the Work will not be permitted.

##### 1.3 DUST ABATEMENT AND CONTROL

- A. The Contractor shall prevent its operation from producing dust in amounts damaging to property, cultivated vegetation, or domestic animals, or causing a nuisance to persons living in or occupying buildings in the vicinity. The Contractor shall be responsible for any damage resulting from dust originating from its operations. The dust abatement measures shall be continued until the Contractor is relieved of further responsibility for the Work. Dust abatement measures shall include but not be limited to spraying water, applying calcium chloride, or placing temporary pavement on and around trenches and at work sites.
- B. Dust Control is required in the proximity to active work areas, within the Project Area even outside active work zones, outside of the Project Area if impacted by construction vehicle traffic or tracking debris from the work zone, and around staging areas regardless of location and as otherwise directed by the Owner and Engineer.
- C. During excavation of soil/fill material dust shall be controlled to limit potential spread of contaminants and potential exposure of contaminants to workers and the public.
- D. Ambient dust levels at the site shall be monitored by the Contractor prior to construction. During construction, real-time dust monitoring shall be conducted during any soil/fill handling activities. The monitoring shall consist of total dust testing using MIE, Inc. Miniram PDM-3 Dust Monitors, or like instruments. The total dust criteria at the site shall conform to the requirements of the HASP. Should fugitive dust quantities exceed 20 percent of the ambient level, the Contractor shall perform

additional measures to reduce the total dust concentrations.

- E. Street sweeping shall be performed a minimum of 2 times per week, more if required by the Owner or Engineer, using a water power sweeper/vacuum. Street sweeping shall be performed to minimize the generation of dust during the sweeping activity. Sweeping shall be performed on streets with on-going construction related activities.
- F. Nuisance dust levels may be encountered during regrading activities and excavation. Dust levels shall be reduced by pre-wetting the surface soils and by establishing and maintaining clean access roads. The Contractor's Dust, Vapor, and Odor Control Plan shall describe the procedures and materials to minimize dust. The Contractor shall refer to Section 02080 - SOIL AND WASTE MANAGEMENT for the Dust, Vapor and Odor Control Plan submittal requirements. At a minimum, the Contractor shall provide clean water, free from salt, oil, and other deleterious materials.
- G. Power Brooms without water attachments or watering capabilities shall not be used. Handheld Power Brooms may be used if the surfaces are pre-watered to minimize the generation of dust during the sweeping. Equipment mounted Power Brooms shall have water tank attachments and shall be used daily and as directed by the Owner or Engineer.
- H. Calcium chloride shall be applied on a daily basis, at a minimum at the end of each day, and throughout the work day as may be required or directed by the Owner or Engineer. Calcium chloride shall be applied in the proximity of active work zones and as may otherwise be required by the Owner or Engineer.
- I. Watering surfaces for dust control shall be required unless otherwise directed by the Owner or Engineer. Water shall be applied at a rate sufficient to keep dust down but not too liberally to create a mud issue.
- J. Areas of exposed earth to be excavated shall be lightly sprayed with water before excavation. Additional water spray may be utilized only when any indication of excessive dust is observed. The Contractor shall minimize the use of water within the limits of excavation.
- K. Access roads shall be sprayed with water on a regular basis to minimize the generation of dust.
- L. All stockpiles of imported granular material shall be removed from the project area and shall be stockpiled in the appropriate staging and stockpile area at the end of each day. Any imported granular material stockpiles which are allowed on site overnight, approved by the Owner or Engineer shall be covered with a minimum 3mil polywrap and weighted down.

M. There shall be no excavated material left on site overnight.

#### 1.4 RUBBISH CONTROL

- A. During the progress of the Work, the Contractor shall keep the Site and other areas used by it in a neat and clean condition and free from any accumulation of rubbish. The Contractor shall dispose of all rubbish and waste materials of any nature occurring at the Site and shall establish regular intervals of collection and disposal of such materials and waste. The Contractor shall also keep its haul roads free from dirt, rubbish, and unnecessary obstructions resulting from its operations. Disposal of all rubbish and surplus materials shall be off the Site in accordance with local codes and ordinances governing locations and methods of disposal, and in conformance with all applicable safety laws, and to the particular requirements of Part 1926 of the OSHA Safety and Health Standards for Construction.
- B. In the event that the Contractors work zone restricts municipal trash or recycling collection or makes it difficult for residents to bring trash or recycling to the street, the Contractor shall collect all trash and recycling within the work zone and transport it outside the work zone for municipal collection. Return trash and recycling receptacles back to respective properties.

#### 1.5 SANITATION

- A. Toilet Facilities: Fixed or portable chemical toilets shall be provided wherever needed for the use of employees. Toilets at construction job sites shall conform to the requirements of Part 1926 of the OSHA Standards for Construction.
- B. Sanitary and Other Organic Wastes: The Contractor shall establish a regular daily collection of all sanitary and organic wastes. All wastes and refuse from sanitary facilities provided by the Contractor or organic material wastes from any other source related to the Contractor's operations shall be disposed of away from the Site in a manner satisfactory to the Work and in accordance with all laws and regulations pertaining thereto.

#### 1.6 CHEMICALS

- A. All chemicals used during project construction or furnished for project operation, whether defoliant, soil sterilant, herbicide, pesticide, disinfectant, polymer, reactant or of other classification, shall show approval of either the U.S. Environmental Protection Agency or the U.S. Department of Agriculture. Use of all such chemicals and disposal of residues shall be in

strict accordance with the printed instructions of the manufacturer.

## 1.7 CULTURAL RESOURCES

- A. The Contractor's attention is directed to the National Historic Preservation Act of 1966 (16 U.S.C. 470) and 36 CFR 800 which provides for the preservation of potential historical architectural, archaeological, or cultural resources (hereinafter called "cultural resources").
- B. The Contractor shall conform to the applicable requirements of the National Historic Preservation Act of 1966 as it relates to the preservation of cultural resources.
- C. In the event potential cultural resources are discovered during subsurface excavations at the site of construction, the following procedures shall be instituted:
  - 1. The Engineer will issue a Field Order directing the Contractor to cease all construction operations at the location of such potential cultural resources find.
  - 2. Such Field Order shall be effective until such time as a qualified archaeologist can be called to assess the value of these potential cultural resources and make recommendations to the State Historic Preservation Office.
- D. If the archaeologist determines that the potential find is a bona fide cultural resource, at the direction of the State Historic Preservation Office, the Contractor shall suspend work at the location of the find under the provisions for changes contained in the General Conditions.

## 1.8 NOISE CONTROL

- A. The Contractor shall comply with the City of Springfield Noise Ordinance.

## PART 2 – PRODUCTS

Not Used

## PART 3 – EXECUTION

Not Used

END OF SECTION 01560

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## SECTION 01568

### EROSION CONTROL, SEDIMENTATION AND CONTAINMENT OF CONSTRUCTION MATERIALS

#### PART 1 – GENERAL

##### 1.1 SUMMARY

- A. Provide all work and take all measures to control soil erosion resulting from construction operations, prevent flow of sediment from construction site, and contain construction materials (including excavation and backfill) within protected working area as to prevent damage to any catch basin, stream or wetlands.

##### 1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this section.

##### 1.3 SUBMITTALS

- A. Shop Drawings: Submit the following in accordance with Section 01300 – SUBMITTAL:
  - 1. Sedimentation barriers and accessories.
  - 2. Silt sacks.
  - 3. Siltation bags.
  - 4. Sedimentation filters.

##### 1.4 REFERENCES

- A. ASTM D3776: Standard Test Methods for Mass Per Unit Area (Weight) of Fabric
- B. ASTM D3786: Standard Test Method for Bursting Strength of Textile Fabrics – Diaphragm Bursting Strength Tester Method
- C. ASTM D4355: Standard Test Method for In-Plane Shear Properties for Polymer Matrix Composite Materials by the Rail Shear Method
- D. ASTM D4491: Standard Test Method for Water Permeability of

#### Geotextile of Permittivity

- E. ASTM D4533: Standard Test Method for Trapezoid Tearing Strength of Geotextiles
- F. ASTM D4632: Standard Test Method for Grab Breaking Load and Elongation of Geotextiles
- G. ASTM D4751: Standard Test Method for Determining Apparent Opening Size of a Geotextile
- H. ASTM D4833: Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products

### 1.5 QUALITY ASSURANCE

- A. Use acceptable procedures, including use of water diversion structures, diversion ditches, settling basins, and sediment traps.
- B. Operations restricted to areas of work indicated on drawings and area which must be entered for construction of temporary or permanent facilities.
- C. If construction materials are washed away during construction, remove materials from fouled areas.
- D. Stabilize diversion outlets by means acceptable to Engineer.
- E. Engineer has authority to limit surface area of erodible earth material exposed by clearing and grubbing, excavation, borrow and fill operations and to direct immediate permanent or temporary pollution control measures to prevent contamination of any stream or wetlands, including construction of temporary berms, dikes, dams, sediment basins, sediment traps, slope drains, and use of portable filtration system, temporary mulches, mats, or other control devices or methods as necessary to control erosion.
- F. Prior to initiating construction, Contractor to visually inspect catch basins adjacent to work areas. Any basins containing silt and debris shall be noted by the Contractor prior to construction. A written notice shall be provided to the Engineer listing location of filled basins.

### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Provide in accordance with Section 01600 – PRODUCT, MATERIALS, AND EQUIPMENT.



PART 2 – PRODUCTS

2.1 STRAW WATTLES

- A. Wattles shall be a straw-filled tube of flexible netting material exhibiting the following properties. It shall be a machine-produced tube of compacted rice straw that is Certified Weed Free Forage, by a manufacturer whose principle business is wattle manufacturing. The netting shall consist of seamless, high-density polyethylene and ethyl vinyl acetate and contain ultra violet inhibitors.
- B. Light weight rolled erosion control straw or wood fiber blankets (RECB) rolled up to create a wattle type device shall not be allowed under this specification.
- C. The Wattle shall meet the minimum performance requirements of Table 1. The product must be guaranteed to meet all numeric performance values in Table 1 under the specific conditions as stated

**TABLE 1 – WATTLE PROPERTIES**

<b>Property</b>	<b>Test Method</b>	<b>Units</b>	<b>Min. Value</b>
Mass per Unit Weight	Field Measured	(lbs/ft)	1.6
Dimension	Field Measured	(Dia/Inches)	8.0 - 9.0
Net Strand Thickness	Field Measured	(Inches)	0.030
Net Knot Thickness	Field Measured	(Inches)	0.055
Netting Unit Weight	Certified	(Ounces/ft)	0.35
Sediment Retention Capacity	Rainfall Sim. <sup>1</sup>	(lbs/ft)	30
Installed Free-Board Ht.	Field Measured	(Height/Inches)	6.0 — 7.0
Straw Fiber	Field Measured	Avg. Length (in)	3.0
Soil Loss <sup>1</sup>	Rainfall Sim. <sup>1</sup>	% Effectiveness	58 <sup>2</sup>
De-Stabilizing Moisture	Rainfall Sim. <sup>1</sup>	% Retained (Max.)	11
Fiber Content	Certified	% Rice Straw	100

- D. Straw wattles shall be manufactured by R.H. Dyck, Inc., Greenfix America LLC, California Straw Works, or approved equal.

2.2 WOOD STAKES

- A. 1-inch by 1- inch by 3-feet.

2.3 SILT SACK

- A. Provide woven polypropylene fabric bags to prevent sediment from entering existing catch basins. Bags shall be manufactured by ACF Environmental or equal. Polypropylene fabric shall meet or exceed the following characteristics:

<u>Property</u>	<u>Standard</u>	<u>Minimum Value</u>
Grab tensile strength	ASTM D-4632	300 lbs
Grab tensile elongation	ASTM D-4632	20%
Puncture	ASTM D-4833	120 lbs
Mullen Burst	ASTM D-3786	800 psi
Trapezoid tear	ASTM D-4533	120 lbs
UV resistance	ASTM D-4355	80%
Apparent opening size	ASTM D-4751	40 US sieve
Flow rate	ASTM D-4491	40 gpm/sf
Permittivity	ASTM D-4491	0.55 /sec

2.4 PORTABLE SEDIMENTATION FILTRATION SYSTEM

- A. Portable sedimentation filtration system shall be skid and trailer mounted for mobility and flexibility. The system shall be set up within the road right-of-way so as not to disturb the bordering wetland.
- B. The filtered water shall be discharged directly to resource areas through its natural drainage courses.
- C. Portable filtration system shall be used when directed by the Engineer and in accordance with the manufacturer’s instructions.
- D. Portable filtration system shall be PFSO as manufactured by Rain-For-Rent Co. or approved equal. The bag filters in the system shall be capable of filtering particles up to 0.5 micron in diameter.

2.5 SILTATION BAG

- A. The siltation bag shall be a nonwoven bag made from geotextile fabric with seams test strength of a minimum 60 lb/in. in accordance with ASTM D-4884.

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- B. Each bag shall have an inlet spout large enough to accommodate a 4-inch discharge hose. The bag shall be secured to the hose using straps to prevent pumped water from escaping without being filtered.
- C. Siltation bag shall have a minimum capacity of 80 gal/min./ft<sup>2</sup>.
- D. The geotextile fabric shall have the following properties:

<u>Property</u>	<u>Standard</u>	<u>Minimum Value</u>
Weight	ASTM D-3776	8 oz./yd.
Grab Tensile	ASTM D-4632	203 lbs
Puncture	ASTM D-4833	130 lbs
Flow Rate	ASTM D-4491	80 gpm/sf
Permitivity	ASTM D-4491	1.5 /sec.
Mullen Burst	ASTM D-3786	400 psi
UV Resistant	ASTM D-4355	70%
AOS % Retained	ASTM D-4751	100%

- E. Siltation bags shall be used as directed by the Engineer. Siltation bags shall be installed, used, and maintained in accordance with the manufacturer’s instructions.
- F. Dispose of siltation bags as directed by the Engineer.
- G. Siltation bags shall be “Dirtbag Model 53” as manufactured by ACF Environmental, Inc., Richmond, VA.

**PART 3 – EXECUTION**

**3.1 GENERAL**

- A. Do not discharge chemicals, fuels, lubricants, bitumen, raw sewage and other harmful waste into or alongside any body of water or into natural or man-made channels.

**3.2 INSTALLATION**

- A. Install sedimentation barriers in all locations as directed, surrounding base of all deposits of stored excavated material outside of disturbed area, and where directed by the Engineer.
- B. Install sedimentation barriers immediately after site is cleared and before trench excavation. Locate sedimentation barriers, surrounding stored material, approximately 6 ft. from material.

- C. Protect catch basins from sedimentation by installing silt sacks under grating casting.
- D. Discharge silt-laden water from excavations through a siltation bag to ensure that only sediment-free water is returned to watercourses.
- E. Do not place excavated soil material adjacent to water-course in manner that will cause it to wash away by high water or runoff.
- F. Prevent damage to vegetation by excessive watering or silt accumulation in the discharge area.
- G. Do not dump spoiled material into any streams, wetlands, surface waters, or unspecified locations.
- H. Prevent indiscriminate, arbitrary, or capricious operation of equipment in streams, wetlands or surface waters.
- I. Do not pump silt-laden water from trenches or excavations into surface waters, streams, wetlands, or natural or man-made channels leading thereto.
- J. Prevent damage to vegetation adjacent to or outside of construction area limits.
- K. If required by regulatory authorities, provide a portable filtration system to prevent sediment-laden runoff from occurring in areas adjacent to wetlands or buffer zones.
- L. Do not dispose of trees, brush, debris, paints, chemicals, asphalt products, concrete curing compounds, fuels, lubricants, insecticides, washwater from concrete trucks or hydroseeders, or any other pollutant in streams, wet-lands, surface waters, or natural or man-made channels leading thereto, or unspecified locations.
- M. Do not alter flow line of any stream unless indicated or specified.
- N. Clean and dispose of debris from sedimentation barriers on a weekly basis.
- O. Upon completion of work and upon approval of Conservation Commission and Engineer, remove and dispose of sedimentation barriers.
- P. Clean catch basins, which have become silted-up due to construction.

END OF SECTION 01568

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## SECTION 01570

### MAINTENANCE AND PROTECTION OF TRAFFIC

#### PART 1 – GENERAL

##### 1.1 SUMMARY

- A. Furnish all labor, equipment, and materials and perform all operations in connection with the maintenance and protection of vehicular, bicycle, and pedestrian traffic on all roads, state and local, directly or indirectly affected by the construction. The work of this section also includes maintaining access to all properties adjacent to the work.
- B. The Contractor is responsible for preparing and submitting a plan for traffic management to the Owner and Engineer, including updates as conditions warrant. The Contractor is responsible for design and implementation of revisions to the traffic management procedures during the course of the project at the direction of the Engineer and at no additional cost to the Owner.
  - 1. The Traffic Management Plans provided in the Plans are for bidding purposes only. The Contractor shall submit their own Traffic Management Plans as specified in Paragraph 1.3 of this Section and obtain approval from the City of Springfield Traffic Department and Department of Public Works as well as the Springfield Water and Sewer Commission prior to proceeding with the work.
  - 2. The submitted Traffic Management Plans shall comply with the conditions set forth in the Street Occupancy Permit and Street Excavation Permit issued by the Department of Public Works and obtained by the Contractor.
- C. The Contractor is responsible for coordinating with the Pioneer Valley Transit Authority (PVTA) when developing and implementing the proposed Traffic Management Plans.
- D. Furnish, erect, set, reset, relocate, move, remove, and dismantle sufficient signs, temporary lighting, barrels, flashers, channelizing devices (concrete barriers), fencing, and other traffic control devices on a continuous basis as necessary to protect the work and the general public at all times during construction in accordance with Contractor's approved Traffic Management and Control Plans. The work of this Section shall also include temporary bridging for traffic across excavations.
  - 1. Traffic control devices required only during the working hour operations shall be removed at the end of each working day.

- E. The design, application, and installation of all traffic control devices required by this section shall conform to the requirements of the Manual on Uniform Traffic Control Devices (MUTCD) published by U.S. DOT, latest edition; American Disabilities Act (ADA); and the Commonwealth of Massachusetts, Highway Department (MHD), Standard Specifications for Highways and Bridges, latest edition.
- F. “Approved by the Owner” throughout this Section shall mean the approval of the Springfield Water and Sewer Commission and “Approved by the City” throughout this Section shall mean the approval of the Springfield Department of Public Works and Traffic and Parking Department.
- G. Traffic control during construction also includes street sweeping and snow removal from sidewalks and streets within the work zone as described in Paragraph 3.1 D of this Section. Maintaining rubbish and recyclable removal is also required and described in Section 01560 - TEMPORARY ENVIRONMENTAL CONTROLS.

## 1.2 RELATED WORK

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Sections apply to the work of this Section.

## 1.3 SUBMITTALS

- A. Submit the following Routing Plans and Shop Drawing in accordance with Section 01300 – SUBMITTALS a minimum of four weeks prior to the start of construction for Engineer, Owner, and City review. These Routing Plans shall be certified by a Professional Engineer registered in the Commonwealth of Massachusetts. Particular care shall be taken to establish and maintain methods and procedures that will not create unnecessary or unusual hazards to public safety.
  - 1. Detailed Regional Traffic Management Routing Plan: Before starting any work under this Contract, the Contractor shall prepare a Regional Detouring Plan encouraging vehicles to seek alternate routes to avoid work zone(s). Proposed routes shall take into consideration potential concurrent projects indicated in Paragraph 1.1.H of this Section.
  - 2. Work Zone Traffic Management and Control Routing Plan: Before starting any work under this Contract, the Contractor shall prepare a plan that indicates traffic routing proposed by the Contractor during the various stages and time periods of the Work, along with the location of: temporary pedestrian and bicycle routes; construction facilities; and temporary barricades, signs, drums, and other traffic control devices to be employed to maintain traffic and access to abutting properties.

- a. The Plan shall be reviewed on a daily basis with the Engineer during construction.
  - b. The Plan shall include procedures for the Contractor to coordinate daily with the Owner, City Departments (Department of Public Works, Traffic and Parking Department, Police, Fire) and Emergency Medical Services.
3. Temporary Pedestrian Access Ramp, Temporary Pedestrian Protection, and Temporary Pedestrian Routing Plan: Before starting any work under this Contract, the Contractor shall prepare a proposed plan detailing the location, type, duration, and layout of ramps and proposed means to protect pedestrians. Also included in the Plan shall be proposed pedestrian detour routes around the construction zone(s) and means to protect pedestrians from traffic and construction operations.
4. Truck and Hauling Routing Plan: Prior to mobilizing, the Contractor shall prepare a plan that indicates construction equipment movement throughout the Project. No trucking or hauling will be allowed without the approval of the City of Springfield. No trucking or hauling will be allowed outside the proposed routes without the prior approval of the Engineer, Owner, and City. The Contractor is responsible for obtaining all permits and permissions, and coordinating parking restrictions required to facilitate trucking and hauling.
- a. Submit copy of construction equipment driver's education packet regarding safe operation within roadways, as specified in Paragraph 1.11.A.13 of this Section.
5. Shop Drawings for Safety Signing for Construction Operations: The Contractor shall prepare temporary pedestrian, bicycle, and traffic management sign placement intended to be used to provide the necessary traffic control and protection during the progress of Work. Include in the shop drawings the signage legend and dimensions.
- B. Submit updated Routing Plans (those specified in Paragraph 1.3.A of this Section) in accordance with Section 01300- SUBMITTALS a minimum of three weeks prior to the start of construction at any new location for Engineer, Owner, and City review. These Routing Plans shall be certified by a Professional Engineer registered in the Commonwealth of Massachusetts.

1.4 REFERENCES

- A. Reference is made herein to the Commonwealth of Massachusetts, Highway Department, Standard Specifications for Highways and Bridges, latest edition. References made to particular sections or paragraphs in the Standard



Specifications for Highways and Bridges shall include all related articles mentioned therein.

- B. Manual of Uniform Traffic Control Devices Part VI Standard and Guides for Traffic Controls for Streets and Highway Construction, Maintenance, Utility and Incident Management Operations, latest edition.

#### 1.5 SPECIAL REQUIREMENTS

- A. The Contractor shall provide access for fire apparatus and other emergency vehicles through the work zones to abutting properties at all times.
- B. At the end of each workday, where trenches in areas of public travel are covered with steel plates, each edge of the plates shall be either beveled or protected by a bituminous concrete ramp as accepted by the Engineer. Temporary bituminous patching material may be used to construct the ramps. The cost of patching materials, and their maintenance and removal, will be considered incidental to the Traffic Management item with no separate payment elsewhere. Plates shall be pinned or welded together to eliminate movement, noise or vibration.
- C. Open excavations adjacent to the traveled way or shoulders shall not remain open through non-work hours unless steel plated for the passage of heavy vehicles or protected by concrete barricades or barriers and specifically authorized by the Owner, City and Engineer.
- D. Do not block more than one-side of the roadway at a time when making open cut or other street crossings unless otherwise approved.
- E. The Contractor shall be responsible for the costs in obtaining all permits to perform the Work.
- F. At least one serviceable driveway access to all residences and businesses within the project shall be maintained at all times.
- G. The Contractor shall provide temporary lighting to properly illuminate the work area and approaches in the event of nighttime work.
- H. The Contractor shall not allow unnecessary idling of trucks and/or equipment throughout the entire project area. The City of Springfield prohibits idling of trucks and equipment for periods of time exceeding five minutes when not in use.
- I. The Contractor shall notify the Springfield Fire and Police Departments of any street closings.

## 1.6 SEQUENCING AND SCHEDULING

- A. All streets within or adjacent to the contract limits, not specifically cited shall have their full roadway widths available for traffic or permitted parking at all times except for such restrictions as may be approved by the Owner, City and Engineer.
- B. Notify the Owner, City and Engineer at least 48 hours in advance (not including Saturday or Sunday or Holidays) prior to the access lane restriction of the roadway. Notification shall include the date of the restriction, the hours of the day the roadway access will be restricted, and the estimated completion date.
- C. The Owner, City and Engineer shall be notified of any re-routing of traffic 48 hours in advance (not including Saturday or Sunday or Holidays). Approval shall be obtained from the Owner, City and Engineer prior to any re-routing of traffic (except emergencies).
- D. The Contractor shall verify street sweeping schedules in the work zone. Delivery related parking restrictions will not be permitted on days where street sweeping is scheduled unless otherwise approved.

## 1.7 HAULING AND TRUCK ROUTES

- A. The Contractor is advised that all roads and bridges within or adjacent to the project shall be subject to legal loads, heights of vehicles and vehicle type / use restrictions. The Contractor is responsible for understanding the restrictions and obtaining all necessary permits.
- B. The Contractor is advised that no agreements have been made by the Owner, the City of Springfield, the MassDOT, or with surrounding cities or towns to relieve the Contractor of liability for damage to local roads and bridges caused by the Contractor's operation. The Contractor shall contact appropriate officials of the surrounding cities, towns or agencies concerning hauling over city or town roads and bridges.

## 1.8 STORAGE OF MATERIALS, PARKING OF CONSTRUCTION EQUIPMENT AND WORKER PARKING

- A. No material shall be stored within the work area or on adjacent roadways or residential streets except that which is needed to complete the work for that day.
- B. Construction workers shall park their vehicles within the work zone during work hours, and remove them thereafter. Parking outside the work zone will be required if the vehicles obstruct traffic flow.

- C. The Contractor shall park construction equipment within the work zone and protect equipment with barriers or barricades. Parking outside the work zone will be required if the equipment obstructs traffic flow.

#### 1.9 BARRICADES, WARNING SIGNS AND OTHER PROTECTIVE DEVICES

- A. Install, inspect, remove, maintain, and reset all temporary construction controls as frequently as required and in accordance with an approved construction staging sequence and Traffic Management Plan.
- B. Regulatory and warning devices shall be subject to removal, replacement and repositioning as often as necessary, and as directed by the Owner and Engineer.
- C. Temporary pavement markings and devices shall be used as shown on the approved plans and as required by MUTCD and ADA standards for traffic control and pedestrian safety.

#### 1.10 TRAFFIC OFFICERS SERVICE

- A. Uniformed police officers shall be utilized to maintain safe traffic flow throughout the construction period.
- B. Advance notice of starting work shall be given to the Springfield Police Department. Contractor shall use as many police details as needed to ensure the safety of pedestrians and traffic at all times.
- C. The Contractor shall coordinate all work with the police officers including but not limited to: locations of work, delivery of materials, equipment movement, required traffic management and schedules.

#### 1.11 PEDESTRIAN TRAFFIC

- A. Sidewalks shall be maintained at all times through the construction period. Temporary sidewalks, pedestrian detours and pedestrian and construction facilities shall be constructed as needed to maintain pedestrian traffic and business access.
- B. Pedestrian access shall be provided to abutting land uses and businesses at all times, as approved by the Owner, City and Engineer and in accordance with MUTCD and ADA requirements.
- C. Unobstructed walkways of 4-foot minimum width, unless otherwise approved by the Owner, City and Engineer shall be provided at all times.
- D. Temporary pedestrian walkways shall be separated from roadway and construction areas by barricades and fence as approved by the Owner, City and Engineer.

## 1.12 TRAFFIC CONTROL REQUIREMENTS

- A. The Contractor shall meet the following conditions, unless otherwise specifically approved by the Owner, City, and Engineer:
1. All work shall be prosecuted with proper regard for the convenience of the public and in a manner to permit unimpeded traffic flow whenever possible. The interruption of traffic will not be permitted unless specifically allowed by the Owner, City and Engineer and in accordance with the requirements of the Owner and City and in conformance with MUTCD requirements.
  2. The Contractor shall be responsible for necessary coordination with the City departments affected by the project.
  3. Traffic control devices and signs shall be removed, demounted or properly covered for those periods of the day not in use.
  4. The Contractor shall coordinate the work with the schedules of delivery trucks to the adjacent stores and property owners so as not to impede their access, and cooperate with delivery personnel to facilitate deliveries to properties within the work zone.
  5. No operations shall be conducted, including the loading or unloading of equipment or materials, on or near the traveled lanes or road shoulders without first erecting warning signs and channelizing devices. These precautions shall be maintained at all times while work, loading and unloading is in progress.
  6. Construction signs and channelizing devices shall be used to separate traffic from the work areas and for traffic control. Placement, other than as shown in the plans or the MUTCD, will require prior approval.
  7. Temporary signs and channelizing devices shall not be set up until there is adequate visibility or appropriate construction lighting. The Contractor shall schedule his work so that temporary signs and channelizing devices are removed and traffic is returned to its normal pattern before the end of the work period.
  8. Work requiring overnight lane closures shall not begin until all materials required for the completion of each nights work are delivered or available to the project site, unless otherwise approved by the Owner, City and Engineer.
  9. Accesses to buildings shall be maintained at all times.

10. Work operations shall not be performed on the roadway in such a manner that traffic is obstructed or endangered simultaneously from both sides of the roadway.
11. The Contractor shall keep all roadway areas open to traffic as clear as possible at all times. Materials shall not be stored on any roadway area or within 4-ft. of the traveled way. Material shall be delivered to the installation areas as they are needed to provide a continuous installation. Location of storage areas shall be subject to approval.
12. The Contractor shall remove all equipment and construction vehicles from the traveled way and shoulders open to traffic during non-work hours. Vehicles shall be parked no closer than 4-feet from the traveled way in pre-approved areas unless specifically permitted.
13. Each driver of any vehicle or piece of equipment used on this contract shall be furnished written instructions concerning the manner of operation for that vehicle or piece of equipment. Specifically, these instructions shall warn against stopping on the traveled portions of the roadway, against passing other vehicles, and against traveling in close proximity to other vehicles. A copy of these instructions shall be given to the Engineer.
14. Temporary signs and channelizing devices shall not be set up in inclement weather.

## PART 2 – PRODUCTS

### 2.1 SIGNS AND CHANNELIZING DEVICES

- A. All barricades, drums, cones and other channelizing devices shall meet the requirements for MassDOT Standard Specifications for Highways and Bridges Section 850 Traffic Control for Construction and Maintenance Operation (Latest Revision) and the Manual of Uniform Traffic Control Devices (Latest Revision).
- B. Variable message boards (VMBs) (as required) shall be for the exclusive use of the Owner. The Contractor shall bear all costs associated with relocation and maintenance of the VMBs. Each VMB shall be battery operated, programmable via a hand-held controller and have a minimum display size of 4-feet by 8-feet. The VMB shall be A-1 Roadlines ER200 or equal.
- C. Traffic Control Materials
  1. Materials required for the work of this Section need not be new, but must be in first-class condition and acceptable to the Owner and Engineer. Any materials that in the judgment of the Owner are

unsatisfactory in appearance or performance shall be removed and immediately replaced by acceptable units.

2. Signs, portable barricades, and drums shall have “High Intensity Encapsulated Lens Reflective Sheeting” in accordance with Section M9.30.2 of the 1988 MassDOT Standard Specifications for Highways and Bridges and MUTCD requirements.
3. Signs shall be fabricated with “High Intensity Encapsulated Lens Reflective Sheeting”. Transparent red, blue, yellow or black opaque paint (ink) may be used over “High Intensity Encapsulated Lens Reflective Sheeting” in accordance with the provisions of subsection M9.30.2, “D.2 Surface”, of the MassDOT Standard Specifications for Highways and Bridges, where these colors are specified.
4. Safety signage for construction operations shall consist of furnishing, positioning, repositioning, inspecting, maintaining, and removing regulatory, warning, and guide signs and temporary bus stop signs and taxi stop signs and their supports as approved by the Owner, City and Engineer.
5. Replace all signs and posts, which are damaged or are missing from their location at no additional cost to the Owner.
6. Maintain all signs in a satisfactory manner including the removal of dirt or road film that cause a reduction in sign reflective efficiency.

D. Portable Barricades

1. Furnish, install, relocate, remove, re-install, and maintain portable barricades in accordance with MassDOT and MUTCD requirements or as directed by the Owner, City and Engineer.
2. Portable barricades shall conform to Standard Plate No. 40612 of the MHD (Metric Edition). Reflectorized sheeting shall conform to Section M9.30.2, of the MassDOT Standard Specifications for Highways and Bridges.
3. Eight-foot-long units of portable barricades shall be constructed, as needed.
4. Alternating 152.4 mil wide diagonal stripes shall be orange and white and shall slope downward at 45 a degree toward the end by which traffic is to pass. Barricades that block the passage of traffic or designate the end of the traveled way shall have alternating vertical orange and white stripes on the rails.

5. Barricades shall be maintained in good and serviceable condition throughout the duration of the Contract.
6. Temporary pedestrian and construction facilities shall be kept clean and freshly painted as required.

E. Signs, Covered

1. Cover any existing regulatory and warning signs as directed by the Owner, City and Engineer.
2. Use a cover approved by the Owner, City and Engineer which shall be securely fastened to the existing sign and shall completely cover the legend of the existing sign. The cover shall remain in place as long as necessary at which time it shall be promptly removed.
3. Signs shall be covered without causing any damage to the existing sign.

F. Traffic Signals

1. Traffic lights shall remain operable at all times throughout the duration of the contract unless approved otherwise by the City.
2. It shall be the Contractor's responsibility to maintain the traffic signal system in continuous and good working order. The Contractor at his expense shall repair any damage to the traffic signal system resulting from the Contractor's work.

G. Temporary Precast Concrete Barriers and Work Zone Protection

1. Temporary precast concrete barriers shall be furnished and installed as shown on the approved traffic management plans and where required to protect work zones and excavations which cannot be completed and backfilled or plated within a daily work period. Barriers shall be removed or relocated when no longer required and with the approval of the Owner, City and Engineer.
2. Precast concrete median barrier shall conform to Standard Plate No. 401.15.1 of the MassDOT, as well as be acceptable for temporary pedestrian and construction facilities and signage.
3. Temporary precast barrier for use for temporary pedestrian and construction facilities shall have three sleeves cast in the barrier to receive a post for panel and fence installations.
4. Temporary chain link fence, 4-feet high, shall be erected at work zones abutting pedestrian travel paths and around work zones

hazardous to pedestrians in conjunction with precast barriers to form a “safety zone” 7 feet high, or as directed by the Owner, City and Engineer. The top 2-feet shall be fixed with plywood panels painted as directed by the Owner and Engineer. The barriers and fencing shall be overlapped at the corners of the excavated area to provide a continuous protective screen.

## PART 3 – EXECUTION

### 3.1 GENERAL

- A. Conduct the work in manner that interferes as little as possible with public travel, whether vehicular or pedestrian.
- B. Provide and maintain suitable and safe bridges, detours, or other temporary expedients for accommodation of public and private travel whenever it is necessary to cross, or obstruct roads, driveways, and walks, whether public or private.
  - 1. Give a minimum of 48 hours (not including Saturday, Sunday or Holidays) written notice to owners of private driveways before interfering with them.
- C. Provide temporary surfacing on shoulders when necessary.
- D. Provide snow removal and street sweeping within the work limits to maintain safe and efficient vehicular and pedestrian traffic flow, including accesses and sidewalks. Contractor shall plow snow out of the work zone in all areas where municipal snow removal is prevented by construction in the opinion of the Owner, City and Engineer. The Contractor shall also remove snow from all sidewalks in areas where construction related activities are occurring or have recently occurred. The Contractor shall sweep sidewalks, pedestrian walkways and detours, and streets within the work zone on a daily basis. In the event that the Contractors work zone restricts municipal street sweeping in the area, the Contractor shall sweep the restricted streets (including streets outside the work zone) to a point where municipal street sweeping can continue.
- E. Sufficient and adequate signs, flashers, channelizing devices, lights, arrow boards and other precautions necessary to protect the work and the public, as determined by the Engineer shall be used at all times during construction.
- F. Provide trench bituminous paving repairs on a weekly basis, unless directed or allowed otherwise by the Owner, City and Engineer or applicable agency having jurisdiction.
- G. Pedestrian access shall be maintained at all times. Access shall be a minimum of 4-feet, clear of all obstructions and meet all American with



Disability Act (ADA) requirements. If an existing pedestrian walkway is interrupted, temporary walkways with ramps shall be provided.

- H. Contractor shall post “No Parking” signs 48-hours in advance for residential permit parking locations and 24-hours in advance for metered, public, etc. If work does not take place that day, signs must be reposted. Standard Springfield signs shall be used that provide information regarding proposed construction and parking restriction hours. Signs shall be placed at a minimum of 25-foot intervals.
- I. The Contractor shall provide Police Details in the work areas. Contractor shall coordinate vehicle towing with the Police.

### 3.2 DETOURS

- A. If allowed by the Owner, City, and Engineer, construct and maintain detours around the work to maintain traffic over any construction work in a public street, road, or highway where traffic cannot be maintained on alignment of original roadbed or pavement.
- B. When detours are allowed, Contractor shall provide all detour signs with directional arrows. Signs shall be placed at all streets and intersections to provide required direction to allow motorists to return to the street location beyond the detour.
- C. All detouring and signing shall meet the requirements of the applicable references specified in Parts 1 and 2 of this Section.
- D. The Detour Plan shall be reviewed and approved by the Owner, City, and Engineer prior to establishing any detours.

### 3.3 PROTECTION

- A. Signs and Channelizing Devices:
  - 1. Locate signs and channelizing devices with lights to protect public thoroughfares which are closed to traffic.
  - 2. Ensure that all open trenches and other excavations have signs, channelizing devices and lights to provide protection to the public.
    - a. Provide similar warning signs and lights for obstruction such as material piles and equipment.
    - b. Ensure that the material storage and conduct of the work on or alongside streets causes minimum obstruction and inconvenience to the traveling public.

3. Install and maintain all signs, channelizing devices, lights, and other protective devices in conformity with applicable statutory requirements and as required by the municipalities or agencies having jurisdiction.
4. Illuminate all channelizing devices with flashing lights.
5. No traffic control devices shall be stored adjacent to the roadway.

3.4 VARIABLE MESSAGE BOARDS (VMBs)

- A. Variable Message Boards shall be installed where indicated in the Contract Drawings or as directed by the Owner or Engineer. VMBs shall be installed two weeks prior to the start of construction activities and removed when directed. The Contractor shall coordinate with the Engineer, Owner and City and obtain permission for the placement and location of the VMB.

END OF SECTION 01570

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## SECTION 01600

### PRODUCTS, MATERIALS AND EQUIPMENT

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Furnish and install products, equipment and materials as specified and indicated in accordance with the Contract Documents.
- B. Provide transportation, handling, storage, and protection of all products, materials, and equipment in accordance with the Contract Documents.

##### 1.2 DEFINITIONS

- A. The word "Products," as used herein, is defined to include purchased items for incorporation into the Work, regardless of whether specifically purchased for the project or taken from Contractor's stock of previously purchased products. The word "Materials," is defined as products which must be substantially cut, shaped, worked, mixed, finished, refined, or otherwise fabricated, processed, installed, or applied to form units of work. The word "Equipment" is defined as products with operational parts, regardless of whether motorized or manually operated, and particularly including products with service connections (wiring, piping, and other like items). Definitions in this paragraph are not intended to negate the meaning of other terms used in the Contract Documents, including "specialties," "systems," "structure," "finishes," "accessories," "furnishings," special construction," and similar terms, which are self-explanatory and have recognized meanings in the construction industry.
- B. Neither "Products" nor "Materials" nor "Equipment" includes machinery and equipment used for preparation, fabrication, conveying and erection of the Work.
- C. Spare Parts are defined as subassemblies or components of the Products installed in the Work.

##### 1.3 QUALITY ASSURANCE

- A. Source Limitations: To the greatest extent possible for each unit of work, the Contractor shall provide products, materials, and equipment of a singular generic kind from a single source.
- B. Compatibility of Options: Where more than one choice is available as options for Contractor's selection of a product, material, or equipment, the Contractor shall select an option which is compatible with other products,

materials, or equipment. Compatibility is a basic general requirement of product, material and equipment selections.

#### 1.4 PRODUCT DELIVERY AND STORAGE

- A. The Contractor shall deliver and store products, materials, and equipment for the Work in accordance with manufacturer's written recommendations and by methods and means that will prevent damage, deterioration, and loss including theft. Delivery schedules shall be controlled to minimize long-term storage of materials, products, and equipment at site and overcrowding of construction spaces. In particular, the Contractor shall ensure coordination to ensure minimum holding or storage times for flammable, hazardous, easily damaged, or sensitive products, materials, and equipment to deterioration, theft, and other sources of loss.

#### 1.5 TRANSPORTATION AND HANDLING

- A. Products, materials, and equipment shall be transported by methods to avoid damage and shall be delivered in undamaged condition in manufacturer's unopened containers and packaging.
- B. The Contractor shall provide equipment and personnel to handle products, materials, and equipment by methods to prevent soiling and damage.
- C. The Contractor shall provide additional protection during handling to prevent marring and otherwise damaging products, materials, equipment, packaging, and surrounding surfaces.

#### 1.6 STORAGE AND PROTECTION

- A. Products, materials, and equipment shall be stored in accordance with manufacturer's written instructions and with seals and labels intact and legible. Sensitive products, materials and equipment shall be stored in weather-tight climate-controlled enclosures and temperature and humidity ranges shall be maintained within tolerances required by manufacturer's recommendations.
- B. For exterior storage of fabricated products, materials and equipment, the products, materials, and equipment shall be placed on sloped supports above ground. Products, materials, and equipment subject to deterioration shall be covered with impervious sheet covering and ventilation shall be provided to avoid condensation.
- C. Loose granular materials shall be stored on solid flat surfaces in a well-drained area and shall be prevented from mixing with foreign matter.

- D. Storage shall be arranged to provide access for maintenance and inspection. The Contractor shall periodically inspect to assure products, materials and equipment are undamaged and are maintained under required conditions.

## 1.7 MAINTENANCE OF STORAGE

- A. Stored products, materials and equipment shall be periodically inspected. The Contractor shall maintain a log of inspections and shall make the log available on request.
- B. The Contractor shall comply with manufacturer's product, material and equipment storage requirements and recommendations.
- C. The Contractor shall maintain manufacturer-required environmental conditions continually.
- D. The Contractor shall ensure that surfaces of products, materials and equipment exposed to the elements are not adversely affected and that weathering of finishes and coatings does not occur.
- E. For mechanical and electrical equipment, the Contractor shall provide a copy of the manufacturer's service instructions with each item and the exterior of the package shall contain notice that instructions are included.
- F. Products, materials and equipment shall be serviced on a regularly scheduled basis, and a log of services shall be maintained and submitted as a record document prior to acceptance by the Owner in accordance with the Contract Documents.

## PART 2 – PRODUCTS

### 2.1 GENERAL

- A. Do not use materials and equipment removed from existing premises, except as specifically required by the Contract Documents.
- B. Where similar Products (such as grease fittings, flexible couplings, etc.) are used on different pieces of equipment or in different areas within the Work, standardize the Products by providing all Products from the same Supplier.

### 2.2 SPARE PARTS

- A. Provide spare parts for Products as indicated and specified.
- B. The Contractor shall deliver to the Owner all spare parts except those requiring maintenance in storage, at least 30 days prior to scheduled starting of system. Spare parts that require maintenance in storage shall be

held and maintained by the Contractor until Substantial Completion and then a separate delivery of the remaining spare parts will occur. The spare parts that do not require maintenance in storage shall be packed so that they are protected from damage and the environment during storage.

- C. Tag spare parts and containers to clearly identify them. Cross reference all parts to the Tag ID numbers as indicated and as specified.
- D. All spare parts are to be identical and interchangeable with similar parts installed in the Work.
- E. The Contractor is to submit to the Owner at least 120 days prior to startup, all initial submittals of spare parts for review and approval.
  - 1. Early submittal is encouraged.
  - 2. The Contractor will have all spare parts submittals finalized, submitted and approved, and all spare parts shall be delivered to the Owner at least 30 days prior to scheduled starting of systems.

### 2.3 GENERAL MATERIAL AND EQUIPMENT REQUIREMENTS:

- A. The following requirements shall constitute the acceptable minimum standards for the equipment specified herein. Should these requirements conflict with the Supplier's recommendations or in any way be less stringent than the Supplier's requirements, they shall be superseded by the Supplier's requirements.
- B. CIPP Lining
- C. Cementitious Manhole Lining
- D. Manholes

## PART 3 – EXECUTION

### 3.1 GENERAL MATERIAL AND EQUIPMENT INSTALLATION REQUIREMENTS

- A. The following requirements shall constitute the acceptable minimum standards for installing the equipment specified herein. Should these requirements conflict with the Supplier's recommendations or in any way be less stringent than the Supplier's requirements, they shall be superseded by the Supplier's requirements.
  - 1. Bolts, Anchor Bolts, and Nuts

- a. Set anchor bolts and expansion bolts as indicated and as specified.
- b. If anchor bolts are set before the concrete has been placed, use templates.
- c. Where indicated, or specified, provide anchor bolts with square plates at least 4 in. by 4 in. by 3/8 in., or with square heads and washers set in the concrete forms with pipe sleeves, or both.
- d. If anchor or expansion bolts are set after the concrete has been placed, do all drilling and grouting or caulking without damaging the structure or finish by cracking, chipping, or spalling.

**B. Equipment Foundations and Grouting**

- 1. In setting pumps, motors, and other grouted equipment, make an allowance of at least one inch for grout under the equipment bases. Use steel shims to level and adjust the bases. Shims may be left embedded in the grout, in which case they shall be installed neatly and inconspicuous in the completed work. Use non-shrink grout.
- 2. Mix and place grout in accordance with the recommendations of the Supplier and as indicated and as specified. Place grout through the grout holes in the base, work outward and under the edges of the base, and across the rough top of the concrete foundation to a peripheral form to provide a chamfer around the top edge of the finished foundation.
- 3. After the grout has hardened, remove all forms, hoppers, and excess grout. Patch all exposed grout surfaces, give a burlap-rubbed finish, and coat with at least two coats as specified.

**C. Sleeves and Openings**

- 1. Provide all chases or openings for the installation of the Work or cut the same in existing Work.
- 2. Provide all sleeves or forms at the Work, and set them as indicated and as specified, and in ample time to prevent delays.
- 3. Locate all chases, openings, and sleeves as specified and indicated. If the location is not specified or indicated, locate all openings to avoid interference with equipment and piping.



4. If openings and/or sleeves were not provided prior to concrete placements, the Contractor shall provide and set them afterwards at no additional cost to the Owner. Confine the cutting to the smallest extent possible. In no case shall piers or structural members be cut without the written consent of the Owner.
5. Fit around, close up, repair, patch, and point around the work specified herein to the satisfaction of the Owner.
6. Perform all of this work by workmen using small hand tools. Do not use power tools except where, in the opinion of the Owner, the type of tool proposed can be used without damage to any work or structures and without interference with the operation of any facilities. The Owner's concurrence with the type of tools shall not in any way relieve or diminish the responsibility of the Contractor for such damage, or interference resulting from the use of such tools.
7. Do not cut or alter the work of any subcontractor or any other contractor, nor permit any subcontractor to cut or alter the work of any other contractor or subcontractor, except with the written consent of the contractor or subcontractor whose work is to be cut or altered, and with the written consent of the Owner. All cutting and patching or repairing made necessary by the Contractor or any subcontractors shall be done at no additional cost to the Owner.

END OF SECTION 01600

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## SECTION 01610

### DELIVERY, STORAGE AND HANDLING

#### PART 1 - GENERAL

##### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Division 1 Specification Sections, apply to this Section.

##### 1.2 SUMMARY

- A. This section specifies the general requirements for the delivery, handling, storage and protection for all items required in the construction of the work. Specific requirements, if any, are specified with the related item.

##### 1.3 TRANSPORTATION AND DELIVERY

- A. Transport and handle items in accordance with manufacturer's printed instructions.
- B. Schedule delivery to reduce long term on-site storage prior to installation and/or operation. Under no circumstances shall equipment be delivered to the site more than one month prior to installation without written authorization from the Engineer.
- C. Coordinate delivery with installation to ensure minimum holding time for items that are hazardous, flammable, easily damaged or sensitive to deterioration.
- D. Deliver products to the site in manufacturer's original sealed containers or other packing systems, complete with instructions for handling, storing, unpacking, protecting and installing.
- E. All items delivered to the site shall be unloaded and placed in a manner which will not hamper the Contractor's normal construction operation or those of subcontractors and other contractors and will not interfere with the flow of necessary traffic.
- F. Provide equipment and personnel to unload all items delivered to the site.
- G. Promptly inspect shipment to assure that products comply with requirements, quantities are correct, and items are undamaged. For items furnished by others (i.e. Owner, other Contractors), perform inspection in the presence of the Engineer. Notify Engineer verbally, and in writing, of any problems.

#### 1.4 STORAGE AND PROTECTION

- A. Store and protect products in accordance with the manufacturer's printed instructions, with seals and labels intact and legible. Storage instruction shall be studied by the Contractor and reviewed with the Engineer by him. Instructions shall be carefully followed and a written record of this kept by the Contractor. Arrange storage to permit access for inspection.
- B. Store loose granular materials on solid flat surface in a well-drained area. Prevent mixing with foreign matter.
- C. Cement and lime shall be stored under a roof and off the ground and shall be kept completely dry at all times. All structural, miscellaneous and reinforcing steel shall be stored off the ground or otherwise to prevent accumulation of dirt or grease, and in a position to prevent accumulations of standing water and to minimize rusting. Beams shall be stored with the webs vertical. Precast concrete shall be handled and stored in a manner to prevent accumulations of dirt, standing water, staining, chipping or cracking. Brick, block and similar masonry products shall be handled and stored in manner to reduce breakage, cracking and spalling to a minimum.

#### PART 2 - PRODUCTS

Not Used

#### PART 3 - EXECUTION

Not Used

END OF SECTION 01610

## SECTION 01630

### RESTORATION OF GROUNDS AND CLEANING UP

#### PART 1 – GENERAL

##### 1.1 REQUIREMENTS

- A. The Contractor on or before the completion of the work, except as otherwise expressly directed or permitted in writing by the Owner, shall tear down and remove and legally dispose of all temporary structures built or used by him; shall remove all rubbish and debris of all kinds from all Contract structures and from any grounds which he shall have occupied within the limits of the project site; shall leave the site of the work in a satisfactorily neat and clean condition; shall remove from the land all abandoned materials and plant; and shall leave the spoil areas and the property which may have been affected by his operations in a neat and satisfactory condition. Also included is the restoration of all private grounds, including lawns, landscaped areas, driveway aprons and walkways damaged or disturbed in connection with the new work not elsewhere specified. Unless otherwise specified, all materials salvaged and not required to be reused shall be the property of the Contractor, and shall be legally disposed of off the site of the work.
- B. Included in the work under this Section is the restoration, including replacement of damaged and disturbed shrubs and trees, retaining walls, of all grounds and grassed and landscaped areas removed or disturbed or damaged during the construction of the new work, including pipe laterals within private property areas, and storage and field office areas.
- C. Also included in the work under this Section is the furnishing of all labor, materials, and equipment required to remove, store, and reset or replace bumper posts, stone walls of all types, flagstone walks, fences of all types, railings, signs and signposts, signal posts, and such other miscellaneous objects damaged or disturbed during construction.

##### 1.2. RELATED WORK

- A. Section 02900 – LANDSCAPING

#### PART 2 – PRODUCTS

##### 2.1. RELATED SPECIFICATIONS

- A. See Section 02900 – LANDSCAPING for product requirements.

PART 3 – EXECUTION

3.1. RELATED SPECIFICATIONS

- A. See Section 02900 – LANDSCAPING for execution requirements.

END OF SECTION 01630

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## SECTION 01701

### PROJECT CLOSEOUT

#### PART 1 – GENERAL

##### 1.1 SUMMARY

- A. This Section includes the requirements for project closeout including final clean up, closeout timetable, Owner's manual submittal, final submittals, maintenance and guarantee, and bonds.

##### 1.2 RELATED WORK

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Sections apply to the work of this Section.

##### 1.3 SUBMITTALS

- A. General: Submit the following in accordance with Section 01300 – SUBMITTALS:

1. Final Submittal: prior to requesting final payment, the Contractor shall obtain and submit the following items to the Engineer for transmittal to the Owner:
  - a. Written guarantees, where required.
  - b. New permanent cylinders and key blanks for all locks, if applicable.
  - c. Maintenance stock items; spare parts; special tools.
  - d. Completed as-built / record drawings.
  - e. Certificates of inspection and acceptance by local governing agencies having jurisdiction.
  - f. Releases from all parties who are entitled to claims against the subject project, property, or improvement pursuant to the provisions of law.
  - g. Operation and Maintenance Manuals, where applicable.
  - h. Bond: provide a bond to guarantee performance of the provisions contained in Paragraph 3.4 of this Section, and of the General Conditions.



## PART 2 – PRODUCTS

Not Used

## PART 3 – EXECUTION

### 3.1 FINAL CLEANUP

- A. The Contractor shall promptly remove from the vicinity of the completed work, all rubbish, unused materials, concrete forms, construction equipment, and temporary structures and facilities used during construction. Final acceptance of the Work by the Owner will be withheld until the Contractor has satisfactorily complied with the foregoing requirements for final cleanup of the project site.
- B. The Contractor shall cleanup and restore all areas affected by staging, trailer(s) placement and parking. Restoration includes regrading, re-establishing topsoil, and reseeding.

### 3.2 CLOSEOUT TIMETABLE

- A. The Contractor shall establish dates for equipment testing, acceptance periods, and on-site instructional periods (as required under the Contract). Such dates shall be established as specified elsewhere in the Contract Documents.

### 3.3 OPERATION AND MAINTENANCE

- A. The Contractor's attention is directed to the condition that an additional one percent of the contract price will be deducted from any monies due the Contractor as progress payments, if at the 75% construction completion point, the final O&M manuals complying with Section 01300 – SUBMITTALS and the individual technical specification sections have not been submitted. The aforementioned amount will be retained by the Owner as the agreed, estimated value of the approved O&M manuals. Any such retention of money for failure to submit the approved O&M manuals on or before the 75% construction completion point shall be in addition to the retention of any payments due to the Contractor.

### 3.4 MAINTENANCE AND GUARANTEE

- A. The Contractor shall comply with the guarantee and warranty requirements contained in the General Conditions.
- B. Replacement of earth fill or backfill, where it has settled below the required finish elevations, shall be considered as a part of such required repair work, and any repair or resurfacing constructed by the Contractor which becomes necessary by reason of such settlement shall likewise be considered as a part of such required repair work unless the Contractor shall have obtained a statement in writing from the affected private owner or public agency releasing the Owner from further responsibility in connection with such repair or

resurfacing.

- C. The Contractor shall make all repairs and replacements promptly upon receipt of written order from the Owner. If the Contractor fails to make such repairs or replacements promptly, the Owner reserves the right to do the Work and the Contractor and his surety shall be liable to the Owner for the cost thereof.

END OF SECTION 01701

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## SECTION 01740

### WARRANTIES AND BONDS

#### PART 1 – GENERAL

##### 1.1 SUMMARY

- A. This Section specifies general administrative and procedural requirements for warranties and bonds required by the Contract Documents, including manufacturer's standard warranties on products and special warranties.

##### 1.2 RELATED WORK

- A. Refer to General Conditions of the Contract for the general requirements relating to warranties and bonds.
- B. General closeout requirements are included in Section 01701 – PROJECT CLOSEOUT.
- C. Specific requirements for warranties for the Work and products and installations that are specified to be warranted, are included in the individual Specification Sections.
- D. Certifications and other commitments and agreements for continuing services to Owner are specified elsewhere in the Contract Documents.

##### 1.3 SUBMITTALS

- A. Submit written warranties to the Owner prior to the date fixed by the Engineer for Substantial Completion. If the Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the Owner.
- B. When a designated portion of the Work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Owner within fifteen days of completion of that designated portion of the Work.
- C. When a special warranty is required to be executed by the Contractor, or the Contractor and a subcontractor, supplier or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Engineer for approval prior to final execution.

- D. Refer to individual Specification Sections for specific content requirements, and particular requirements for submittal of special warranties.
- E. At Final Completion, compile two copies of each required warranty and bond properly executed by the Contractor, or by a subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Contract Specifications.
- F. Bind warranties and bonds in heavy-duty, commercial quality, durable 3-ring vinyl covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-in. by 11-in. paper.
- G. Table of Contents: Neatly typed. Identified each item with the number and title of the Specification Section in which the Work and Warranty and Bond requirement was specified, and the name of the product or work item.
- H. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address and telephone number of the installer, supplier, and manufacturer.
- I. Identify each binder on the front and the spine with the typed or printed title "WARRANTIES AND BONDS," the Project title or name, and the name, address, and telephone numbers of the Contractor and equipment supplier.
- J. When operating and maintenance manuals are required for warranted construction, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

#### 1.4 WARRANTY REQUIREMENT

- A. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.
- B. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
- C. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Contract Documents. The Contractor is

responsible for the cost of replacing or rebuilding defective Work regardless of whether the Owner has benefited from use of the Work through a portion of its anticipated useful service life.

- D. **Owner's Recourse:** Written warranties made to the Owner are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights or remedies.
- E. **Rejection of Warranties:** The Owner reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.
- F. The Owner reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.
- G. **Disclaimers and Limitations:** Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

## 1.5 DEFINITION

- A. **Standard Product Warranties** are pre-printed written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner.
- B. **Special Warranties** are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.

## PART 2 – PRODUCTS

Not Used

## PART 3 – EXECUTION

Not Used

END OF SECTION 01740

## SECTION 02010

### SUBSURFACE INVESTIGATION

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. This section includes the basic requirements and expectations of the Contractor in all work pertaining to subsurface conditions.

##### 1.2 GENERAL REQUIREMENTS

- A. The Contractor acknowledges that he has satisfied himself as to the nature and location of the Work; the general and local conditions, particularly those bearing upon groundwater table or similar physical conditions at the site; the characterization and conformation of subsurface materials to be encountered; and all other matters that can in any way affect the work or the cost thereof under this Contract. Any failure by the Contractor to acquaint himself with all available information concerning these conditions will not relieve them from responsibility for estimating properly the difficulty or cost of successfully performing the Work.

#### PART 2 - PRODUCTS

Not Used

#### PART 3 - EXECUTION

Not Used

END OF SECTION 02010

## SECTION 02051

### DEMOLITION, MODIFICATION, AND ABANDONMENT

#### PART 1 – GENERAL

##### 1.1 SUMMARY

- A. The Contractor shall furnish all plant, labor, tools, equipment, materials, and supplies as required for utility and structure removal, demolition, modification, and/or abandonment as specified.
- B. The Work of this Section shall include the following significant items; all other activity shown on the Drawings; and work necessary and defined herein pertaining to the project area: demolition of roadway and sidewalk; removal of existing catch basins and manholes; abandonment of existing catch basin laterals; removal of existing pipe and selective demolition.

##### 1.2 RELATED DOCUMENTS

- A. Section 02160 – TEMPORARY SUPPORT OF EXCAVATION
- B. Section 02210 – EXCAVATION, BACKFILL, COMPACTION, DEWATERING AND GRADING
- C. Section 02590 – BRICK MASONRY FOR UTILITIES
- D. Section 03315 – GROUT

##### 1.3 SUBMITTALS

- A. Submit the following in accordance with Section 01300 – SUBMITTALS:
  - 1. Removal and abandonment procedures that shall provide for safe conduct of the Work, careful removal and disposition of materials and equipment, protection of utilities, structures, property, or other features which are to remain undisturbed and coordination with existing utilities or owners responsible for those nearby elements to remain in service.
  - 2. A detailed work plan to include a list of items to be removed and/or abandoned, a sequence and schedule, and a list of salvageable materials and equipment.
  - 3. Proposed Dust-Control and Noise-Control Measures: Submit statement or drawing that indicates the measures proposed for use, proposed locations, and proposed time frame for their operation.



Identify options if proposed measures are later determined to be inadequate.

B. Schedule of Selective Demolition, Modification and Abandonment Activities

1. The Schedule of Selective Demolition, Modification and Abandonment Activities shall be subject to approval by the Owner and Engineer.

Indicate the following:

- a. Detailed sequence of selective demolition, modification and abandonment work, with starting and ending dates for each activity. Ensure the Owner's operations are uninterrupted.
- b. Interruption of utility services.
- c. Coordination for shutoff, capping, bulkheading and continuation of utility services.
- d. Proposed materials, construction details, locations of temporary utilities, abandonment materials, and means of access.
- e. Coordination of Owner's continuing use of portions of utilities, structures, property or other features and of Owner's partial occupancy of completed Work.

C. Additional Submittals for Selective Demolition, Modification, and Abandonment Activities

1. Inventory: After selective demolition or modifications are complete, submit a list of items that have been removed and salvaged.
2. Pre-demolition Photographs or Videotape: Show existing conditions of adjoining utility construction and site improvements that might be misconstrued as damage caused by selective demolition or modification operations. Submit before Work begins.
3. Landfill Records: Indicate receipt and acceptance of all wastes by disposal facility licensed to accept the wastes to be disposed.

D. Masonry Plugs and Bulkheads

1. For each permanent and temporary bulkhead and masonry plug, the Contractor, at a minimum, shall submit the following, prepared by a Massachusetts Register Professional Engineer:
  - a. Design Loads
  - b. Restraining Mechanisms
  - c. Method of Installation
  - d. Results of Field Inspection After Installation
  - e. Decommissioning Method
2. If temporary pneumatic or hydro plugs are proposed, in addition, the Contractor shall submit the method and maintenance procedure of bladder pressure.

#### 1.4 REPAIR OF DAMAGE

- A. Any damage to existing facilities to remain, as caused by the Contractor's operations shall be repaired at no additional cost to the Owner.
- B. Damaged items shall be repaired or replaced with new materials as required to restore damaged items or surfaces to a condition equal to and matching that existing prior to damage or start of work of this Contract.

#### 1.5 PROTECTION OF EXISTING WORK

- A. Before beginning any cutting, trenching or demolition work, the Contractor shall carefully review the work sequence and examine the Drawings and Specifications to determine the extent of the Work. The Contractor shall take all necessary precautions to prevent damage to existing facilities, which are to remain in place, and be responsible for any damages to existing facilities, which are caused by the operations. Damages to such work shall be repaired or replaced to its existing condition at no additional cost to the Owner. The Contractor shall carefully coordinate the work of this Section with all other work and shall provide shoring, bracing, and supports, as required. The Contractor shall insure that structural elements are not overloaded or compromised and shall be responsible for increasing structural supports or adding new supports as may be required as a result of any cutting, removal, or demolition work performed under any part of this Contract. The Contractor shall remove all temporary protection when the work is complete.
- B. The Contractor shall carefully consider all bearing loads and capacities for placement of equipment and material on site. In the event of any questions as to whether an area to be loaded has adequate bearing capacity, the

Contractor shall consult with the Owner prior to the placement of such equipment or material.

## 1.6 JOB CONDITIONS

- A. The Owner assumes no responsibility for actual condition of the facilities to be removed, abandoned, or modified. The Contractor shall visit the site; inspect all facilities to get familiarized with all existing conditions and utilities.
- B. The Owner may occupy portions of the utilities, structures, properties or other facilities immediately adjacent to selective demolition area. Conduct selective demolition, modification, and abandonment so Owner's operations will not be disrupted. Provide not less than 24 hours' notice to Owner of activities that will affect Owner's operations.
- C. Owner assumes no responsibility for condition of the utilities, structures, properties or other facilities to be selectively demolished.
- D. If materials suspected of containing hazardous or asbestos materials are encountered, do not disturb; immediately notify Engineer.
- E. Storage or sale of removed items or materials on-site will not be permitted.
- F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition, modification and abandonment operations.

## 1.7 QUALITY ASSURANCE

- A. Comply with Section 01400 - QUALITY ASSURANCE.
- B. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Pre-Demolition, Modification, and Abandonment Conference: Conduct conference at Project site, which includes Owner and Engineer. Review methods and procedures related to selective demolition.
- D. Review and finalize selective demolition, modification and abandonment schedule and verify availability of materials, labor, equipment, and facilities needed to make progress and avoid delays.

## 1.8 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

## PART 2 – PRODUCTS

### 2.1 MATERIALS

- A. Comply with material and installation requirements specified in individual Specification Sections.

### 2.2 MATERIALS OWNERSHIP

- A. Coordinate with Engineer and Owner, who will make final determination as to whether an item is to be salvaged or removed. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, demolished materials shall become Contractor's property and shall be removed from Project site.

### 2.3 REPAIR MATERIALS

- A. Use repair materials identical to existing materials. If identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible. Use materials whose installed performance equals or surpasses that of existing materials.

## PART 3 – EXECUTION

### 3.1 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Detach items from existing construction and deliver them to Owner ready for reuse.
- C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.
- D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

### 3.2 PREPARATION FOR WORK

- A. Verify that utilities have been disconnected and capped, shut-off, or bulk headed. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition, modification and abandonment required. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.
- B. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Engineer.
- C. Engage a professional engineer to survey condition of structures to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective demolition operations.
- D. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.
- E. Dangerous Materials: Drain, purge, or otherwise remove, collect, and dispose of chemicals, gases, explosives, acids, flammables, or other dangerous materials before proceeding with selective demolition, modification, and abandonment operations.

### 3.3 SITE ACCESS, TEMPORARY FACILITIES AND PROTECTION

- A. Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used utilities, structures, properties or facilities.
- B. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
- C. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction.
- D. Protect existing site improvements, appurtenances, and landscaping to remain.
- E. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.

- F. Temporary Facilities: Provide temporary barricades and other protection required for demolition security and to prevent injury to people and damage to adjacent utilities, structures, properties and facilities to remain.
- G. Provide protection to ensure safe passage of people around the area.
- H. Temporary Shoring: Provide and maintain in accordance with Section 02160 - TEMPORARY SUPPORT OF EXCAVATION.
- I. Strengthen or add new supports when required during progress of selective demolition.
- J. Existing landscaping materials, structures, pipes and appurtenances, which are not to be removed/abandoned shall be protected and maintained as directed by the Engineer and as specified.

#### 3.4 POLLUTION CONTROL

- A. Water sprinkling, temporary enclosures, and other suitable methods shall be used to limit dust and dirt rising and scattering in the area. Comply with government regulations pertaining to environmental protection. Water shall not be used when it creates hazardous or objectionable conditions such as ice, flooding, or pollution.
- B. Disposal: Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

#### 3.5 CLEANING

- A. During and upon completion of work, the Contractor shall promptly remove unused tools and equipment, surplus materials, rubbish, debris, and dust and shall leave areas affected by work in a clean, approved condition.
- B. All areas shall be cleaned of dust, dirt, and debris caused by demolition, modification, or abandonment and adjacent areas returned to conditions existing prior to start of work.

#### 3.6 UTILITY SERVICES

- A. Existing Utilities: Maintain services indicated to remain and protect them against damage during selective demolition, modification and abandonment operations.
- B. Do not interrupt existing utilities serving occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and to authorities having jurisdiction.

- C. Provide at least 72 hours' notice to Owner if shutdown of service is required during changeover.
- D. Utility Requirements: Locate, identify, disconnect, and seal or cap off indicated utilities serving areas to be selectively demolished or abandoned.
- E. If utility services are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary utilities that bypass area of selective demolition, relocation or abandonment, and that maintain continuity of service to other parts of building.

### 3.7 DEMOLITION AND ABANDONMENT PROCEDURES

- A. Disposal of all materials shall be performed in compliance with applicable local, state, and federal codes and requirements. Provide labor, equipment, and materials to perform work as specified and indicated.
- B. The Contractor shall flush all pipe and structures to be removed or abandoned to remove solids and objectionable material prior to commencing demolition, modification, or abandonment.
- C. When existing pipe is removed, the Contractor shall plug all resulting abandoned connections whether or not shown. Where removed piping is exposed, the remaining piping shall be fitted with a removable cap or plug, or bulk headed. Where existing piping, to include catch basin laterals, is to be abandoned, the Contractor shall cut back the abandoned pipe for a distance of 5 feet from any connecting structures to remain. Pipes to be abandoned in structures to be abandoned may be capped, plugged or bulk headed from inside the structure. All holes at the existing structures shall be repaired. Abandoned pipe smaller than 15 inches diameter shall be capped or plugged at both ends prior to backfill. Abandoned pipe 15 inches diameter and larger shall be filled with Controlled Density Fill (CDF) prior to being capped, plugged, or bulk headed and backfilling unless otherwise noted. Each pipe reach to be abandoned with CDF shall be filled with CDF from the up gradient end of the pipe reach wherever possible. The CDF shall completely fill each pipe reach and flow out the other end. The Contractor can aid the flow of the CDF in the pipe by providing a temporary structure at the access point to build up head or by pumping the CDF or by providing vibration in the pipe reach or access point. Requirements for Controlled Density Fill are described in Section 02210 – EXCAVATION, BACKFILL, COMPACTION, DEWATERING AND GRADING.
- D. Where existing drainage structures such as catch basins, drain manholes, sewer manholes, and combined sewer manholes are to be abandoned in place, the Contractor shall remove the frames, grates, and covers and cut the structures down a minimum of 2 feet below final grade. The

Contractor shall put a minimum of four, 2-inch diameter drainage holes in the invert of each structure and then backfill the structure with flowable fill or sand as specified and as approved by the Engineer. Backfill around the structure shall be in accordance with Section 02210 – EXCAVATION, BACKFILL, COMPACTION, DEWATERING AND GRADING.

- E. Permanent plugs shall be constructed of Class B concrete, brick or other material approved by the Engineer.
- G. Fill excavations with solid fill resulting from earth removal operations and/or with select borrow material in accordance with Section 02210 – EXCAVATION, BACKFILL, COMPACTION, DEWATERING AND GRADING. Final grade to be restored in kind unless otherwise noted.
- H. Exercise precautions for fire prevention. Make fire extinguishers approved for Class A, B and C fires available at all times in areas where performing demolition or abandonment work with burning torches. Do not burn demolition debris on site.

### 3.8 SELECTIVE DEMOLITION

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
  - 1. Neatly cut openings, joints and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
  - 2. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
  - 3. Maintain adequate ventilation when using cutting torches.
  - 4. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
  - 5. Dispose of demolished items and materials promptly.
  - 6. Return elements of construction and surfaces that are to remain to condition existing before selective demolition operations began.



7. Existing Facilities: Comply with Owner's requirements for using and protecting utilities, structures, properties and other facilities.
- B. Removed and Salvaged Items: Comply with the following:
1. Clean salvaged items.
  2. Pack or crate items after cleaning. Identify contents of containers.
  3. Store items in a secure area until delivery to Owner.
  4. Transport items to Owner's storage area designated by Owner.
  5. Protect items from damage during transport and storage.
- C. Removed and Reinstalled Items: Comply with the following:
1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
  2. Pack or crate items after cleaning and repairing. Identify contents of containers.
  3. Protect items from damage during transport and storage.
  4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Engineer, items may be removed to a suitable, protected storage location during selective demolition, cleaned and reinstalled in their original locations after selective demolition operations are complete.

### 3.9 REHABILITATION/MODIFICATION PROCEDURES

- A. Certain areas of existing piping, conduits, and the like will be affected by work necessary to complete modifications under this Contract. The Contractor shall be responsible to rehabilitate those areas affected by his construction activities.
- B. When new piping is installed in existing manholes, catch basins or other structures, the Contractor shall accurately position core-drilled openings in the concrete as shown or otherwise required. Openings shall be of sufficient size to permit a final alignment of pipelines and fittings without deflection of any part and to allow adequate space for satisfactory

installation of a flexible connector to ensure watertightness around openings so formed.

- C. When new piping is to be connected to existing piping, the existing piping shall be cut square and ends properly prepared for the connection shown. Any damage to the lining and coating of the existing piping shall be repaired by the Contractor.

### 3.10 DISPOSAL OF REMOVED/DEMOLISHED MATERIALS

- A. The Contractor shall prepare and transport all demolition debris, materials, refuse, and abandoned equipment to an approved disposal site as part of the work under this section. All costs associated with the proper performance of this work shall be included in the appropriate Bid Items and at no additional cost to the Owner.
- B. Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site. Demolition material shall be reused as fill to the extent possible. Removal of demolition debris, not utilized as fill, shall be conducted to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities which shall not be closed or obstructed without permission from the Owner. Alternate routes shall be provided around closed or obstructed traffic ways.
- C. Burning: Do not burn demolished materials.
- D. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

### 3.11 REPAIR OF DAMAGE

- A. Any damage to existing facilities to remain, as caused by the Contractor's operations shall be repaired at no additional cost to the Owner. Damaged items shall be repaired or replaced with new materials as required to restore damaged items or surfaces to a condition equal to and matching that existing prior to damage or start of work of this Contract.
- B. Promptly repair damage to adjacent construction caused by selective demolition operations.
- C. Patching: Comply with Section 01045 - CUTTING AND PATCHING.
- D. Repairs: Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.
- E. Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.

### 3.12 MASONRY PLUGS AND BULKHEADS

- A. Shall be designed by a Massachusetts Registered Professional Engineer and shall be installed by a qualified mason having experience in the construction of temporary and permanent masonry plugs and bulkheads of the same general nature of those Specified and proposed.

END OF SECTION 02051

## SECTION 02100

### SITE PREPARATION AND TREE PRUNING

#### PART 1 – GENERAL

##### 1.1 SUMMARY

- A. Clear and grub City and private trees designated for removal within the limit of work and as directed and prune City trees within the limit of work and private trees as needed within the limit of work, under the direction of a Massachusetts Certified Arborist. Provide protection of existing trees and vegetation not designated for removal within the limits of work and along truck routes outside the limit of work. Temporarily stump or stockpile as applicable topsoil, shrubs, and vegetation within the limits of work that will interfere with construction and as directed.
- B. Conduct site clearing and pruning operations to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities. Do not close or obstruct streets, walks or other occupied or used facilities without permission from authorities having jurisdiction.
- C. Fully remove and dispose of all existing stumps and root systems of trees.

##### 1.2 RELATED WORK

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Sections apply to the work of the Section.

##### 1.3 SUBMITTALS

- A. General: Submit the following in accordance with Section 01300 – SUBMITTALS.
  - 1. Qualifications of the Contractor’s Certified Arborist prior to clearing and grubbing.

##### 1.4 REFERENCES

- A. ANSI A300: America National Standard for Tree Care Operations “Tree, Shrub and Other Woody Plant Maintenance Standard Practices.

## PART 2 – PRODUCTS

Not Used

## PART 3 – EXECUTION

### 3.1 GENERAL

- A. Remove trees, shrubs, grass and other vegetation, improvements, or obstructions that interfere with installation of new construction and as directed. Removal of stumps includes digging out stumps in their entirety and grubbing roots to at least 30 inches below existing grades or as required to complete the Work shown on the Drawings.
- B. Roots that cannot be avoided during construction shall be carefully and cleanly cut or shaved. Only hand methods for grubbing roots will be accepted inside drip lines of trees to be left standing. All root pruning and shaving must be completed under the supervision of the City Arborist. Root pruning shall include application of root treatment or fertilizer as directed.

### 3.2 PROTECTION OF EXISTING TREES AND IMPROVEMENTS

- A. Provide protection necessary to prevent damage to existing trees, other vegetation, and improvements indicated to remain in place inside or outside of the limit of work. Existing trees and shrubbery to remain shall be protected from injury. Except as otherwise approved, cutting and trimming of existing tree limbs and roots will not be permitted. Existing trees to remain, and which can potentially be damaged by construction operations, shall be boxed and protected. Protection shall be maintained until completion of the work of the Contractor.
- B. Protect trees and improvements on adjoining properties and on Owner's property. Restore improvements damage by Contractor's clearing and construction activities to their original condition, at no additional expense to the Owner. Remove and replace trees damaged by Contractor's clearing and construction activities at no additional expense to the Owner.

### 3.3 MAINTENANCE PRUNING

- A. The primary objective is to maintain or improve tree health and structure, and includes hazard reduction pruning. Maintenance pruning shall consist of one or more of the following pruning types:
  - 1. *Crown Cleaning*: Crown cleaning shall consist of the selective removal of dead, dying diseased, weak branches and water sprouts from the tree's crown.
  - 2. *Crown Thinning*: Crown thinning shall consist of the selective

removal of branches to increase light penetration air movement, and reduce weight. No more than 25% of the tree's living branches shall be removed.

3. *Crown Raising:* Crown raising shall consist of the removal of the lowering branches of a tree in order to achieve pedestrian and vehicular clearance.
4. *Crown Reduction:* Crown reduction shall consist of reducing the height and/or spread of a tree.
5. *Crown Restoration:* Crown restoration shall be used to improve the structure, form and appearance of trees that have been severely headed, vandalized or storm damaged.

### 3.4 YOUNG TREE PRUNING

#### A. During the First Three Years After Planting:

1. A central leader or leaders (as most appropriate for the species and specimen) shall be developed by removing competing leaders and removing vigorously growing branches that compete with the selected leader(s). A strong scaffold branch structure shall be developed by selecting the primary scaffold branches. To improve the scaffold structure, branches that are crossing, have included bark or interfere with the scaffold branches shall be removed. Scaffold branches shall be properly spaced. For deciduous shade trees that will reach or exceed 40 ft in height at maturity, the recommended spacing is approximately 18 in. For smaller species, 6 to 8 in. would be adequate.

#### B. Between Four and Six Years After Planting:

1. The development of a good, structurally sound scaffold branch system should be continued by selective thinning of or on branches and removing dead, interfering, split and broken branches. Large-growing branches with narrow angles of attachment shall be removed from the trunk and canopy. The crown shall be raised for pedestrian clearance and vehicular clearance.

### 3.5 PRUNING TECHNIQUES

#### A. Thinning:

1. A thinning cut shall be used to remove a branch at its point of attachment or to shorten it to a lateral large enough (at least one-half the diameter of the cut being made) to assume the terminal role, also called drop crotching. This also applies to crown reduction pruning.

Thinning cuts shall be used to effectively direct growth and retain the natural form of the tree.

B. Heading:

1. A heading cut shall be used to remove a branch to a stub, a bud or a lateral not large enough to assume the terminal role. This type of cut shall be avoided.

C. Location of Pruning Cuts

1. When removing a live branch, make the pruning cut just outside the branch collar. When removing a dead branch, the final cut shall be made outside the collar even if the collar has grown out along the dead branch.
2. To prevent tearing or stripping the bark when removing a large branch, remove most of the branch by making two cuts, the first from below and the second from above, close to the first cut. The remaining stub shall be removed just outside the collar. This is the "Three Point Cut."

D. Pruning Severity

1. On mature trees the maximum diameter of any undesirable branch (dead, broken, rubbing, structurally unsound) that may be left shall not exceed 2 in. No more than one-third of the live foliage of a tree shall be removed at one time without good reason.
2. Pruning cuts shall be clean and smooth with the bark at the edge of the cut firmly attached to the wood.
3. Large or heavy branches that cannot be thrown clear shall be lowered on ropes to prevent injury to the tree and other property.
4. Climbing and pruning practices shall not injure the tree except for pruning cuts. The use of climbing spurs shall be avoided. Spurs may be used to reach an injured climber or when removing a tree.
5. Rope injury to trees from leading out heavy wood shall be avoided by using a cambium guard or installing a false crotch.

3.6 TEMPORARY REMOVAL OF TOPSOIL, SHRUBS AND VEGETATION

- A. Topsoil, shrubs, and vegetation to be temporarily removed shall be carefully removed over all areas to be excavated, and over all other areas to be disturbed as a result of the Contractor's operations in the performance of the Contract work. The topsoil shall be transported and deposited in storage

piles convenient to the areas which are subsequently to receive the application of topsoil, separate from other excavated materials, and in approved locations. The topsoil shall be stockpiled free of roots, stones and other undesirable material. The Contractor shall take all necessary precautions to prevent other excavated material or other objectionable material from becoming intermixed with the topsoil, either before or after the stripping and stockpiling operations. Shrubs and other vegetation shall be balled and burlapped and then transported and stored until they can be replaced after construction has been completed in that area. The shrubs and vegetation must be watered and maintained to remain healthy while being temporarily stored. Any shrubs and vegetation that do not remain healthy during storage shall be replaced by the Contractor at no additional cost to the Owner.

### 3.7 DISPOSAL OF WASTE MATERIALS

- A. Remove waste materials and unsuitable topsoil from Owner's property and dispose of off site in a legal manner. Waste materials shall include but not be limited to timber, brush, refuse, stumps, roots, vines, debris and other objectionable matter. Removal includes raking and sweeping after completion of clearing and pruning operations.

### 3.8 SPECIAL REQUIREMENTS

- A. For definitions and pruning standards, the Contractor is directed to the ANSI A300, American National Standard for Tree Care Operations "Tree, Shrub and Other Woody Plant Maintenance Standard Practices".

END OF SECTION 02100



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## SECTION 02110

### CLEARING AND GRUBBING

#### PART 1 - GENERAL

##### 1.1 WORK INCLUDED

- A. Clearing site of plant life and grass within the permanent and construction area.
- B. Removing debris.

##### 1.2 REGULATORY REQUIREMENTS

- A. Clearing and grubbing shall conform to federal, state and local permits and regulations.
- B. Conform to applicable local, state and federal regulations for disposal of debris.
- C. Burning or disposing of debris on site is prohibited.

#### PART 2 - PRODUCTS

Not Used.

#### PART 3 - EXECUTION

##### 3.1 PROTECTION

- A. Protect wetlands in accordance with all federal, state, and local permits and regulations.
- B. Protect plant growth and features remaining as final landscaping.
- C. Protect benchmarks and existing work from damage or displacement.
- D. Maintain designated site access for vehicle and pedestrian traffic.
- E. Protect existing trees and other vegetation to remain in place outside of the permanent and/or construction easements against unnecessary cutting, breaking, skinning of roots, skinning and bruising of bark, smothering of trees by stockpiling construction materials or excavated materials within drip line and excess foot or vehicular traffic, or parking of vehicles within drip line.

##### 3.2 CLEARING AND GRUBBING

- A. Clear areas required for access to site and execution of Work.
- B. Remove and dispose of all materials used for mulch and/or ground cover. Do not stockpile or reuse the material.

### 3.3 REMOVAL

- A. Remove debris from site.
- B. Dispose of debris in accordance with local, state and federal regulations.

END OF SECTION 02110

## SECTION 02140

### DEWATERING AND DRAINAGE

#### PART 1 - GENERAL

##### 1.1 SCOPE OF WORK

- A. Design, furnish, install, operate, monitor, protect, maintain and remove a temporary dewatering system as required to lower and control water levels at least 2-ft below subgrades of excavations and to permit construction to proceed in-the-dry.
- B. Furnish, maintain and remove temporary surface water control measures adequate to limit surface water from entering excavations and to drain and remove surface water entering excavations.
- C. Retain the services of a professional engineer registered in the State of Massachusetts to prepare dewatering and drainage system designs and submittals described herein.
- D. Furnish, protect, monitor and remove geotechnical instrumentation required to monitor the performance of the dewatering and drainage system as required herein.
- E. Collect and properly dispose of all discharge water from the dewatering and drainage systems in accordance with the requirements specified herein and all Federal, State and local requirements and permits.
- F. The Contractor shall obtain the required permits for discharge from the Contractor's dewatering systems in accordance with 40 CFR Part 122 and 61 FR 19284. The discharge location shall be in accordance with permit requirements.
- G. Repair damage caused by dewatering and drainage system operations.

##### 1.2 RELATED WORK

- A. Section 01300 – SUBMITTALS
- B. Section 02160 – TEMPORARY SUPPORT OF EXCAVATION
- C. Section 02210 - EXCAVATION, BACKFILL, COMPACTION, DEWATERING AND GRADING

##### 1.3 SUBMITTALS

- A. The dewatering and drainage system designs shall be prepared by a Massachusetts licensed professional engineer retained by the Contractor. The dewatering and drainage system design shall conform to the requirements of the dewatering permits and all other applicable local, State and Federal regulations. The Contractor shall

submit an original and three copies of the licensed professional engineer's certification on the PE form specified in Section 01300. The Contractor shall also submit qualifications as required herein.

- B. At least three weeks prior to start of work, the Contractor shall submit dewatering and drainage system design calculations and shop drawings. The submittal shall include at a minimum:
1. A description of the proposed dewatering system and the proposed installation methods for dewatering and drainage system elements and for observation wells. A description of maintenance and system removal procedures.
  2. Drilling methods, holes sizes, filter sand type and placement techniques, sealing materials, pumps, prime movers, and standby equipment,
  3. A plan including equipment and number and location of dewatering points, observation wells and other geotechnical instrumentation. The plan shall identify the anticipated area influenced by the dewatering system and address impacts to adjacent existing and proposed structures.
  4. Frequency of reading of monitoring wells and other geotechnical instrumentation.
  5. Dewatering system design calculations. The calculations shall include a list of assumptions made for design of dewatering, including but not limited to groundwater levels, soil profile, permeabilities, depth of excavation and duration of pumping.
  6. Erosion/sedimentation control measures, and methods of disposal of dewatering water.
  7. List of all applicable laws, regulations, rules, and codes to which dewatering design conforms.
- C. Coordinate dewatering and drainage submittals with the Geotechnical Instrumentation Monitoring and Support of Excavation submittals.
- D. Do not proceed with any excavation or dewatering activities until the dewatering submittals have been approved by the Engineer and monitoring wells have been installed.

#### 1.4 QUALITY ASSURANCE

- A. Regulations: Perform all work in accordance with current applicable regulations and codes of all Federal, State and local agencies.

- B. The Contractor shall have at least 5 years of experience with work comparable to the Work shown and specified, employing labor and supervisory personnel who are similarly experienced in this type of Work.
- C. The Contractor's design engineer shall be registered in the State of Massachusetts and have a minimum of 5 years of professional experience in the design and construction of dewatering and drainage systems and shall have completed not less than 5 successful dewatering and drainage projects of equal type, size, and complexity to that required for the work.
- D. The Contractor's field representative shall have a minimum of 5 years of experience in installation and operation of at least five (5) successful dewatering projects of equal size and complexity with equal systems within the last five (5) years consisting of system operation and troubleshooting, collection of readings, maintenance of logs and other required documents, collection of samples, coordination of analysis of samples, and compliance with reporting requirements during pumping for projects of similar size, type, and complexity.
- E. The presence of the Engineer shall not relieve the Contractor of its responsibility to perform the Work in accordance with the approved submittals and contract documents, nor shall it be construed to relieve the Contractor from full responsibility for the means and methods of construction producing the required drawdown, protection of site improvements against damage, and for safety on the construction site.
- F. As necessary, provide backup power generation and groundwater control system components and devise emergency procedures for maintaining continuous, uninterrupted surface water control and groundwater control operations.

## 1.5 DESIGN REQUIREMENTS

- A. The Contractor is responsible for the proper design and implementation of methods for controlling surface water and groundwater.
- B. The primary purpose of the groundwater control system is to preserve the natural undisturbed condition of the subgrade soils in the areas of the proposed excavations. Prior to excavation, the Contractor shall lower the groundwater to at least 2-ft below the lowest excavation subgrade elevation. Additional groundwater lowering may be necessary beyond the 2-ft requirement, depending on construction methods and equipment used and the prevailing groundwater and soil conditions. The Contractor is responsible for lowering the groundwater as necessary to complete construction in accordance with the plans and specifications at no additional cost to the Owner.
- C. Design deep wells, well points and sumps, and all other groundwater control system components to prevent loss of fines from surrounding soils. Sand filters shall be used with all dewatering installations unless screens are properly sized by the Contractor's design engineer to prevent passage of fines from surrounding soils.

- D. The Contractor shall be responsible for damage to properties, buildings or structures, sewers and other utility installations, pavements and work that may result from dewatering or surface water control operations.
- E. The Contractor shall be responsible for meeting all applicable permit conditions. The dewatering and drainage system design shall conform to the requirements of the dewatering permits and all other applicable local, State and Federal regulations.
- F. Minimum dewatering zone of influence:
  - 1. For linear excavations such as trenches, the zone of influence for dewatering shall be twice the depth of the trench.
  - 2. For large rectangular, square or circular mass excavations the zone of influence shall be defined by the actual cone of dewatering influence corresponding to a 10% increase in effective vertical stress.

## 1.6 DEFINITIONS

- A. Where the phrase "in-the-dry" is used in this Section, it shall be defined as an excavation subgrade where the groundwater level has been lowered to at least 2-ft below the lowest level of the excavation, is stable with no ponded water, mud, or muck, is able to support construction equipment without rutting or disturbance and is suitable for the placement and compaction of fill material, pipe or and concrete foundations.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Piping, pumping equipment and all other materials required to provide control of surface water and groundwater in excavations shall be suitable for the intended purpose.
  - 1. Provide casings, well screens, piping, hoses fittings, pumps, power and other items required for dewatering system and for the transport of discharge water to the discharge location. Provide standby pumping systems and a source of standby power shall be maintained at all sites.
  - 2. Provide filter material around the well screen. Wrapping geotextile fabric directly around the well screen shall not be allowed.
  - 3. Dewatering equipment, including settling tank, filter bags, and other erosion/sedimentation control devices as indicated in the approved dewatering plan.

- B. When deep wells, well points, or vacuum well points are used, provide pumping units capable of maintaining high vacuum and handling large volumes of air and water at the same time.
- C. Provide settlement markers, piezometers and/or any other geotechnical instruments in accordance with the approved dewatering shop drawings.

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Prior to starting dewatering, obtain all applicable permits to install, operate and maintain the dewatering system as shown on the approved shop drawings and calculations. Obtain all permits to discharge dewatering water in compliance of local, State and Federal laws and regulations.
- B. Work shall not commence until the dewatering submittals have been reviewed and approved by the Engineer with all Engineer's comments satisfactorily addressed, the geotechnical instrumentation has been installed, baselines established and submitted to the Engineer, and the Dewatering Professional is on site and has begun the duties specified herein.
- C. Prevent potential "boils", loss of fines, or softening of the ground during dewatering. If any of these conditions are observed, submit a modified dewatering plan to the Engineer within 48 hours. Implement the approved modified plan and repair any damage incurred. Repair any damage resulting from the failure of the dewatering operations and any damage resulting from the failure to maintain all the areas of work in a suitable dry condition.
- D. Control surface water and groundwater such that excavation to the lowest excavation subgrade elevation is made in-the-dry, the natural undisturbed condition of the subgrade soils are maintained, and softening and/or instability or disturbance due to the presence or seepage of water does not occur. All construction and backfilling shall proceed in-the-dry and flotation of completed portions of work shall be prohibited.
- E. Methods of groundwater control may include but are not limited perimeter groundwater cutoff, well points, ejectors, deep wells and combinations thereof.
- F. Where groundwater levels are above the proposed bottom of excavation level, a pumped dewatering system will be required for pre-drainage of the soils prior to starting excavation, and for maintaining the lowered groundwater level until construction has been completed to such an extent that the structures and pipelines will not be floated or otherwise damaged.



- G. It is expected that the type of system, spacing of dewatering units and other details of the work will have to be varied depending on soil/water conditions at a particular location.
- H. All work included in this Section shall be done in a manner which will protect adjacent structures and utilities and shall not cause loss of ground or disturbance to the structures or pipe bearing soil or to soils which support overlying or adjacent structures. The impact of anticipated subsurface soil/water conditions shall be considered when selecting methods of excavation and dewatering and drainage systems.
- I. Install, monitor and report data from observation wells. Evaluate the collected data relative to groundwater control system performance and modify systems as necessary to dewater the site in accordance with the Contract requirements.
- J. Locate groundwater control system components where they will not interfere with construction activities adjacent to the work area or interfere with the installation and monitoring of geotechnical instrumentation including observation wells. Excavations for sumps or drainage ditches shall not be made within or below 1H:1V slopes extending downward and out from the edges of existing or proposed foundation elements or from the downward vertical footprint of the pipe.

### 3.2 SURFACE WATER CONTROL

- A. Construct surface water control measures, including dikes, ditches, sumps and other methods to prevent, as necessary, flow of surface water into excavations and to allow construction to proceed without delay
- B. Conduct operations to always prevent the accumulation of water, ice and snow in excavations or in the vicinity of excavated areas and from interfering with the progress or quality of the work.

### 3.3 EXCAVATION DEWATERING

- A. At all times during construction, provide and maintain proper equipment and facilities to promptly remove and properly dispose of all water entering excavations. Excavations shall be maintained in-the-dry. Groundwater levels shall be kept at least 2-ft below the lowest excavation level.
- B. Excavation dewatering shall maintain the subgrade in a natural undisturbed condition and until the fill and proposed structures or pipes to be built thereon have been completed to such extent that they will not be floated or otherwise damaged by allowing water levels to return to natural elevations.
- C. Pipe, masonry, and concrete shall not be placed in water or be submerged within 24 hours after being installed. Water shall not flow over new masonry or concrete within four days after placement.

- D. In no event shall water rise to cause unbalanced pressure on structures until the concrete or mortar has set at least 24 hours. Prevent flotation of pipes by promptly placing backfill.
- E. Dewatering shall at all times be conducted in such a manner as to preserve the natural undisturbed condition of the subgrade soils at the proposed bottom of excavation.
- F. If the subgrade of the trench or excavation bottom becomes disturbed due to inadequate dewatering or drainage, excavate below normal grade as directed by the Engineer and refill with structural fill, screened gravel or other material as approved by the Engineer at no additional cost to the Owner.
- G. Evaluate the impact of the anticipated subsurface soil/water conditions on the proposed method of excavation and removal of water. It is expected that the initial dewatering plan may have to be modified to suit the variable soil/water conditions to be encountered during construction. Dewater and excavate, at all times, in a manner that does not cause loss of ground or disturbance to proposed and existing structures and utilities.
- H. Notify the Engineer immediately if any settlement or movement is detected on structures. If the settlement or movement is deemed by the Engineer to be related to the dewatering, the Contractor shall take actions to protect the adjacent structures and submit a modified dewatering plan to the Engineer within 24 hours for review and approval. The Contractor shall implement the modified plan and repair any damage incurred to the adjacent structures at no additional cost to the Owner.
- I. If oil and/or other hazardous materials are encountered after dewatering begins, immediately notify the Engineer.
- J. If the method of dewatering does not properly dewater the excavation as specified, install additional groundwater observation wells as directed by the Engineer and do not place any pipe or structure until the readings obtained from the observation wells indicate that the groundwater has been lowered a minimum of 2-ft below the bottom of the final excavation within the excavation limits.
- K. Dewatering units used in the work shall be surrounded by suitable filter sand and no fines shall be removed by pumping. Pumping from the dewatering system shall be continuous until pipe or structures are adequately backfilled. Stand-by pumps shall be provided.
- L. Water entering the excavation from precipitation or surface runoff shall be collected in shallow ditches around the perimeter of the excavation, drained to a sump and pumped from the excavation to maintain a bottom free from standing water.

### 3.4 WELL POINT SYSTEMS

- A. Where necessary, install a vacuum well point system around the excavation to dewater the excavation. Each well point and riser pipe shall be surrounded by a sand filter. Sand shall be of such a gradation that, after initial development of the well points, the quantity and size of soil particles discharged shall be negligible. Well point systems shall be capable of operating continuously under the highest possible vacuum.
- B. Installation of well point systems shall be in accordance with the approved submittal in the presence of the Engineer.

### 3.5 DEEP WELLS

- A. Where necessary, install a deep well system around the excavation to dewater or depressurize the excavation. Each well shall be surrounded by a sand or gravel filter with adequate gradation such that after development, the quantity and size of soil particles discharged are negligible. Sufficient number of wells shall be installed to lower or depressurize the groundwater level to allow excavation to proceed in-the-dry.
- B. Installation of deep wells shall be in accordance with the approved submittal in the presence of the Engineer.

### 3.6 OBSERVATION WELLS

- A. Install observation wells as required to monitor groundwater levels beneath and around the excavated area until adjacent structures are completed and backfilled.

### 3.7 DEWATERING DISCHARGE:

- A. Treat dewatering water as approved in the shop drawings. Discharge water in accordance with local, State and Federal regulations and permit requirements.
- B. Install sand and gravel, or crushed stone, filters in conjunction with sumps, well points, and/or deep wells to prevent the migration of fines from the existing soil during the dewatering operation.
- C. Transport dewatering water without interference with other work. Provide separately controllable pumping lines. Pump water through a silt filter bag or other approved sedimentation equipment such as a weir tank, prior to discharge in accordance with Federal, State and local regulations.
- D. The Engineer reserves the right to sample discharge water at any time.
- E. Immediately notify the Engineer if suspected contaminated groundwater is encountered. Do not pump water found to be contaminated with oil or other hazardous material to the discharge locations.

- F. Water removed or diverted from excavations must not be allowed to cause nuisance or damage to traffic or any public or private property or service or to cause damage to the environment or pollution to the waters of the state. Dispose of drainage so that flow or seepage back into the excavated area will be limited.

### 3.8 MONITORING DEVICES AND RECORDS:

- A. Install, maintain, monitor and take readings from the observation wells and all other geotechnical instrumentation in accordance with the approved shop drawings.
- B. Perform monitoring well reading in accordance with the approved shop drawings. Coordinate readings of geotechnical instrumentation with approved submittal of Section 02495.
- C. Install and maintain erosion/sedimentation control devices at the point of discharge as indicated or specified and in accordance with the approved dewatering plan.

### 3.9 REMOVAL OF SYSTEMS

- A. At the completion of the excavation and backfilling work, and when approved by the Engineer, all pipe, deep wells, well points, pumps, generators, observation wells, other equipment and accessories used for the groundwater and surface water control systems shall be removed from the site. All materials and equipment shall become the property of the Contractor. All areas disturbed by the installation and removal of groundwater control systems and observation wells shall be restored to their original condition.
- B. Leave in place any casings for deep wells, well points or observation wells located within the plan limits of structures or pipelines or within the zone below 1H:1V planes extending downward and out from the edges of foundation elements or from the downward vertical footprint of the pipe, or where removal would otherwise result in ground movements causing adverse settlement to adjacent ground surface, utilities or existing structures.
- C. Where casings are pulled, holes shall be filled with sand. Where left in place, casings should be filled with cement grout and cut off a minimum of 3-ft below finished ground level or 1-ft below foundation level so as not to interfere with finished structures.
- D. When directed by the Engineer, observation wells should be left in place for continued monitoring. When so directed, cut casings flush with final ground level and provide protective lockable boxes with locking devices. The protective boxes shall be suitable for the traffic and for any other conditions to which the observation wells will be exposed.

END OF SECTION 02140

## SECTION 02160

### TEMPORARY SUPPORT OF EXCAVATION

#### PART 1 - GENERAL

##### 1.1 SCOPE OF WORK

- A. Work shall include all labor, materials, and equipment required to complete the design and installation of the excavation support system. Design, furnish, install, monitor and maintain an excavation support system, including all bracing and associated components, to support excavations in a safe manner and to prevent loss of ground and to limit within acceptable values as specified herein, ground movements. Protect all existing and proposed structure and pipelines from damage.
- B. Retain the services of a professional engineer registered in the State where the work is being performed to prepare excavation support and protection system designs and submittals described herein. The Contractor shall be responsible for choosing and sizing the support of excavation systems. The size of the systems shall, however, be adequate for removal of material as indicated on the Drawings or on the approved shop drawings and to provide adequate space to meet the project's work requirements.
- C. Furnish, install, operate, and maintain ground water control system to control ground water inflows, prevent piping or loss of ground, and maintain stability of the excavation. Coordinate dewatering with Section 02140.
- D. Upon completion of the required construction the system of supports shall be completely removed except at locations where the support system shall be left in place. The excavation and staging area sites shall be restored as discussed herein. The requirement of sheeting left in place in areas indicated on the Drawings or approved shop drawings does not relieve the Contractor from the responsibility of furnishing and installing proper excavation support systems in other areas. Vertical support members installed below mid-diameter of any pipe or within the zone of influence of new or existing structures shall be left in place.
- E. The Contractor shall repair any damages, subsidence, upheaval or cave-ins resulting from lack of proper performance of the excavation support systems and associated dewatering system, if applicable. The Contractor shall be responsible for all claims, costs and damages that arise as a result of the work performed at no additional cost to the Owner.
- F. All excavations and support systems shall conform to applicable OSHA excavation, trenching, and shoring standards which are contained in the U.S. Code of Federal Regulations 29 (C.F.R.) 1926.650-1926.653, other federal, state or local

requirements. In the event of a conflict, comply with the more restrictive applicable requirements.

## 1.2 RELATED WORK

- A. Section 02140 – DEWATERING AND DRAINAGE
- B. Section 02210 – EXCAVATION, BACKFILL, COMPACTION, DEWATERING AND GRADING

## 1.3 REFERENCES

- A. American Society for Testing and Materials (ASTM)
- B. ASTM A36 – Standard Specification for Carbon Structural Steel
- C. ASTM A242 - Standard Specification for High-Strength Low-Alloy Structural Steel
- D. ASTM A252 – Standard Specification for Welded and Seamless Steel Pipe Piles
- E. ASTM A328 – Standard Specification for Steel Sheet Piling
- F. ASTM A572 – Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel
- G. ASTM A690 – Standard Specification for High-Strength Low-Alloy Nickel, Copper, Phosphorus Steel H-Piles and Sheet Piling with Atmospheric Corrosion Resistance for Use in Marine Environments
- H. ASTM C33 – Standard Specification for Concrete Aggregates
- I. ASTM C150 - Standard Specification for Portland Cement
- J. American Welding Society (AWS)
- K. AWS D1.1 Structural Welding Code
- L. Codes
  - 1. U.S. Occupational Safety and Health Administration (OSHA) Regulations, 29 CFR Part 1926 Subpart P – Excavations.

Where reference is made to one of the above standards the revision in effect at the time of the bid opening shall apply.

## 1.4 DEFINITIONS

- A. Benching - A method of protecting workers from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.
- B. Support of Excavation (Earth Retention System) - Any structural system, such as sheeting and bracing or cofferdams, designed to retain in-situ soils in place and prevent the collapse of the sides of an excavation in order to protect employees and adjacent structures.
- C. Excavation - Any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.
- D. Protective System - A method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include earth retention systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.
- E. Registered Professional Engineer - A person who is registered as a professional engineer in the state where the work is to be performed. However, a professional engineer, registered in any state is deemed to be a "registered professional engineer" within the meaning of this standard when approving designs for "manufactured protective systems" or "tabulated data" to be used in interstate commerce.
- F. Shield System - A structure that is designed to withstand the forces imposed on it by a cave-in and thereby protects employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Additionally, shields can be either pre-manufactured or job-built in accordance with 29 CFR 1926.652(c)(3) or (c)(4). Shields used in trenches are usually referred to as "trench boxes" or "trench shields."
- G. Sloping - A method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.
- H. Dewatering and Drainage (Temporary Dewatering) System – A system to lower and control water to maintain stable, undisturbed subgrades at the lowest excavation levels. Dewatering shall be provided for all pipelines, structures and for all other miscellaneous excavations.
- I. Trench - A narrow excavation (in relation to its length) made below the surface of the ground, of at least three feet in depth. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet (4.6 m).

- J. Satisfactory (unsatisfactory) Material – Soil that meets (does not meet) the required soil gradation and compaction characteristics as determined by ASTM D6913 and ASTM D1557, for the intended purpose as outlined in Section 02210.
- K. Bearing Zone (Zone of influence) is defined as a line extending at least 2 feet beyond the outer edge of the structure foundation, then outward and downward at a slope of 1 horizontal to 1 vertical.

## 1.5 SUBMITTALS

- A. Submit to the Engineer calculations and shop drawings for the support of excavation system, prepared, signed and stamped by a Professional Engineer licensed in the State where work is being performed, at least 3 weeks prior to the start of installation of the support of excavation system. The submittal shall be in sufficient detail to disclose the method of operation for each of the various stages of construction required for the completion of the support of excavation or shield system. Submittals shall indicate the following, as a minimum:
  - B. Shop Drawings shall include:
    1. Overall plan layout of the system, indicating clearances, dimensions, material properties, member sizes, locations, spacing and penetration depth of all members, locations of various types of lateral supports. Indicate existing and proposed utilities, structures or other obstructions within the area of influence of the excavation.
    2. Elevation layout showing wall penetration, soil stratigraphy, bottom of excavation and elevation of all proposed excavation bracing.
    3. A schedule of all members and materials used for the excavation support.
    4. Show the overall sequence of installation and removal of bracing, indicating levels to which the work will be carried out before bracing is installed or removed.
    5. Method of preloading bracing (if required) and the preload for each member, and the method of locking-off the preload. Include detailed drawings of the connections, jacking supports and method of shimming.
    6. Details, layout, arrangement, equipment requirements, and method of construction of the proposed support of excavation including the methods of predrilling, driving, cutting, and splicing of all the system members.
    7. Geotechnical instrumentation location and monitoring schedule.
    8. Procedures for resolving difficulties arising from misalignment of members exposed during excavation, and criteria for implementing those procedures.



- C. Design calculations shall include:
1. A list of all design assumptions, including safety factors used for the excavation support system.
  2. Vertical and lateral loads on the support of excavation for all stages of excavation, bracing removal, and concrete placement, including existing structures, material and equipment loads on adjacent ground during construction.
  3. Design of wall and all bracing members and bracing member connections, including all details for all stages of construction.
  4. Theoretical deflections of support of excavation wall and deformation of structures, pipelines, and other improvements located within the area of influence of the excavation.
- D. For excavation support systems left in place, submit the following as-built information prior to backfilling and covering the excavation support systems:
1. Survey locations of the excavation support systems, including coordinates of the ends and points of change in direction.
  2. Type of the excavation support system.
  3. Elevations of top and bottom of the excavation support systems left in place.
- E. If a Shield System such as trench box or sliding trench shields is used for excavation support, submit copy of the trench box manufacturer's specifications, recommendations, and limitations.
- F. Submit quality control measures as required to ensure that the performance of the support of excavation is consistent with the approved shop drawings and the requirements herein.
- G. Submit welder qualifications and weld procedures in accordance with AWS D1.1.
- H. Submit Contractor's and Design Engineer's qualifications as described in herein.
- I. At least one copy of the stamped support of excavation design shall be maintained at the job site during excavation.
- J. Design Engineer's documentation shall include:
1. On-site inspections of support of excavation as the systems are constructed.
  2. Review of quality control measures and performance data.

3. Submit a report, prepared, signed and stamped by the support of excavation designer to the Engineer and Owner that includes installation data, observations and records, and verification that the support of excavation any modifications by Contractor during construction was constructed and installed in accordance with the design documents.

## 1.6 QUALITY ASSURANCE

- A. Perform all work in accordance with current applicable regulations and codes of all Federal, State and local agencies.
- B. When required, the Contractor shall obtain an excavation permit from the local authority having jurisdiction prior to the initiation of any excavation work.
- C. The Contractor shall perform monitoring of the performance of the support of excavation in accordance with Section 02495.
- D. Contractor Qualifications.
  1. The Contractor should have completed at least five (5) projects of similar size and complexity in this type of installation in the last 5 years. Equipment operators for this project shall be fully trained and experienced with the operations of the equipment to be used for this project.
  2. The support of excavation designer shall be a Registered Professional Engineer in the State where the work is being performed with at least 5 years professional experience in the design and construction of support of excavation and shall have completed not less than 5 successful projects of equal type, size, and complexity to that required for the work.

## 1.7 PROJECT CONDITIONS

- A. All excavations and earth retention systems shall conform to applicable OSHA excavation, trenching, and shoring standards which are contained in the U.S. Code of Federal Regulations 29 (C.F.R.) 1926.650-1926.653, other Federal, State or local requirements. In the event of a conflict, comply with the more restrictive applicable requirements
- B. All underground utility lines shall be identified, located, and protected from damage or displacement. Utility companies and other responsible authorities shall be contacted to locate and mark the locations and, if they so desire, direct or assist with protecting the underground installation.
- C. The Contractor shall protect adjacent utilities and structures from damage associated with support of excavation and other associated systems. Damage due to lateral excavation support operations or other Contractor activities shall be repaired immediately by the Contractor at his own expense.

## 1.8 DESIGN CRITERIA

- A. The design of support of excavation is the responsibility of the Contractor. The design calculations and drawings shall be prepared, stamped and signed by a Professional Engineer registered in the state where the work is being performed, with qualifications as defined herein.
- B. Design support of excavation in accordance with minimum lateral earth pressures and requirements outlined in this Section. These criteria are the minimum acceptable standards.
- C. Design of each member or support element shall consider all phases of construction to support the maximum loads that can occur during construction with appropriate factors of safety.
- D. Design the support of excavation to minimize horizontal deflections of the Earth Retention System wall and to protect adjacent structures and utilities from displacement and damage. Maximum horizontal deflection of the excavation wall should not exceed one inch.
- E. Excavations below the level of the base of any adjacent foundation or retaining wall shall not be permitted unless the design of the excavation and bracing includes an analysis of the stability of the structure supported by the foundation and as necessary, incorporates required bracing or underpinning of the foundation.
- F. For support system in which bracing is installed between opposite sides of the excavation, design the support of excavation of both sides to be nearly the same as feasible.
- G. Pipe piles used as soldier piles shall be filled with concrete with a compressive strength not less than 3,000 psi. The strength of the concrete shall not be considered in design of the pipe pile for bending stress.
- H. Receipt of the Contractor's plans and methods of construction by the Engineer does not relieve the Contractor of his responsibility to provide an adequate support system achieving the specified requirements. Design review and field monitoring activities by the Owner or by the Engineer shall not relieve the Contractor of his/her responsibilities for the work.

## PART 2- MATERIALS

- A. All timber, structural steel, and steel sheet piling used for the Earth Retention Systems, whether new or used, shall be intact and free from defects that may impair their strength.
- B. Soldier piles and structural steel members shall conform to ASTM A572 or ASTM A242 unless approved otherwise.

- C. All steel conforming to ASTM A572 shall be Grade 50 or better. No members with permanent deformations are to be provided. Members shall not be spliced unless approved by the Engineer.
- D. Pipe piles used as soldier piles shall conform to ASTM A252, Grade 3 (45 ksi), or better unless approved otherwise.
- E. Steel sheet piling shall conform to ASTM A328 or ASTM A572 or ASTM A690, unless approved otherwise. All steel sheet piling conforming to ASTM A572 shall be Grade 50 or better.
- F. Concrete shall conform to ASTM C33 and ASTM C150 unless otherwise approved.
- G. All welding shall conform to the applicable provisions of ANSI/AWS D1.1.
- H. All timber shall be structural grade with a minimum allowable flexural strength of 1100 psi. Timber lagging shall be at least 3 inches thick and free of large or loose knots.

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Do not proceed with any work activities until the related submittals have been approved by the Engineer. If applicable, do not start support of excavation installation until the dewatering system has been installed and is operational. Do not start any work until all the geotechnical instrumentation has been installed and background readings have been collected.
- B. Methods of construction for excavations shall be such as to ensure the safety of the Work, Contractor's employees, Engineer, and Owner's employees and inspectors, the public and adjacent property and improvements, whether public or private.
- C. Before beginning construction at any location of this project, adequately protect existing structures, utilities, trees, shrubs, and other existing facilities. The repair of or compensation for damage to existing facilities shall be at no additional cost to the Owner.
- D. As a minimum, place fencing, gates, lights, and signs as necessary around the excavations and staging areas to provide for public safety.
- E. Install the support of excavation in accordance with the approved shop drawings and applicable permits.
- F. Care shall be taken to prevent voids outside of the Temporary Earth Retention System, but if voids are formed, they shall be immediately backfilled. Voids in locations that cannot be properly compacted upon backfilling shall be filled with

lean concrete or other material as approved by the Engineer at no additional cost to the Owner.

- G. If flowing or unsatisfactory material is encountered during excavation, all necessary measures shall be taken immediately to contain the unsatisfactory material in place and prevent ground displacement.
- H. Excavations shall be kept free of water at all times and a stable subgrade shall be maintained. Excavations shall be dewatered in accordance the Section 02140.
- I. If settlements or deflections of the support of excavation evaluated during monitoring indicate that the support system requires modification to prevent excessive movements, redesign and resubmit revised shop drawings and calculations to the Engineer at no additional cost to the Owner.
- J. Sufficient quantity of Retention System material shall be maintained on site for protection of work and for use in case of accident or emergency.

### 3.2 PORTABLE TRENCH BOXES

- A. Portable trench boxes or sliding trench shields may be used for the protection of workers only.
- B. When moveable trench bracing such as trench boxes, sliding trench shields, shoring or plates are used to support the sides of the trench, care shall be taken in placing and moving the boxes or support bracing to prevent movement of the pipe/utility being installed, or disturbance of the utility bedding and backfill.
- C. When installing rigid pipes (e.g. Reinforced Concrete), any portion of the trench box extending below the pipe diameter shall be raised above this line prior to moving the box ahead to install the next section to prevent the separation of installed pipe joints due to movement of the box.
- D. When installing flexible pipes (e.g. PVC, DI) trench boxes, sliding trench shields, shoring or plates shall not be allowed to extend below diameter of the pipe. As trench boxes, sliding trench shields, shoring or plates are lifted, backfill shall be placed to fill any voids compacted to provide uniform side support for the pipe.
- E. Additional excavation, backfilling, and surface restoration required as the result of trench box use shall be at no additional cost to the Owner.
- F. Trench boxes or shields shall be designed, constructed, and maintained to meet acceptable engineering and industry standards.
- G. Shields shall be installed in a manner to restrict lateral or other hazardous movement of the shield in the event of the application of sudden lateral loads.

- H. A copy of the trench box or sliding trench shields manufacturer's specifications, recommendations, and limitations shall be in written form and maintained at the job site during all excavation work.
- I. No trench box is allowed for excavations that extend within the bearing zone of existing structures. The bearing zone is defined as a line extending 1 foot beyond of edge of the foundation, then outward and downward at a slope of 1 horizontal to 1 vertical.

### 3.3 SOLDIER PILES

- A. Install soldier piles with the minimum embedment depths shown on approved shop drawings.
- B. Soldier piles shall be installed using an impact hammer, a vibratory hammer, or in predrilled holes.
- C. Soldier piles shall be installed with driving shoes where hard driving is anticipated.
- D. For soldier piles installed in predrilled holes, provide casing or other methods of support as necessary to prevent caving of holes and loss of ground.
- E. Predrilled holes for soldier piles shall be backfilled with concrete from the pile tip elevation to the elevation of the bottom of the excavation. The remainder of the predrilled hole shall be backfilled with lean concrete or sand. Concrete strength shall be in accordance with the approved shop drawings.
- F. The predrilled hole diameter shall be sufficient to allow for proper alignment and concrete backfilling of the pile.
- G. Driven soldier piles shall be advanced without the aid of a water jet.
- H. Provide timber lagging of sufficient thickness to withstand earth pressures and in accordance with the approved shop drawings. Timber lagging shall be at least 3 inches thick and free of large or loose knots.
- I. Install lagging such that ground loss does not occur between adjacent lagging or below the lowest level of lagging. As the excavation proceeds, the maximum height of unsupported wall of excavation shall not exceed 4 feet. Maximum height of unsupported excavation face shall not exceed 2 feet, if water seeps or flows from the face of the excavation or if the face of the excavation becomes unstable.
- J. As installation progresses, backfill the voids between the excavation face and the lagging. Pack with materials such as hay, burlap, or geotextile filter fabric where necessary to allow drainage of ground water without loss of ground.

### 3.4 SHEETING

- A. Install steel sheet piling with the minimum embedment depths as shown on the approved shop drawings.
- B. Drive sheeting in plumb position with each sheet pile interlocked with adjoining sheet piles for its entire length so as to form a continuous diaphragm throughout the length of each run of wall, bearing tightly against original ground. Use care during sheet pile driving so that interlocking members can be extracted without damaging adjacent structures or utilities. The methods of driving, cutting, and splicing shall conform to the approved shop drawings.
  - 1. Systems shall be constructed using interlocking corner pieces at the four corners. Running sheet piles by at the corners, in lieu of fabricated corner pieces, will not be allowed.
  - 2. Drive sheeting ahead of and below the advancing excavation to avoid loss of materials from below and from in front of the sheeting.
  - 3. Sheeting is to be driven to at least the depth indicated on the shop drawings.
  - 4. Check panel plumbness periodically during sheet pile driving.
- C. Use templates or other temporary alignment facilities to maintain piling line.
- D. Prior to installation, the sheet piles shall be thoroughly cleaned and inspected for defects and for proper interlock dimensions. The Contractor shall provide tooling for checking the interlock dimensions.
- E. Each sheet pile shall have sufficient clearance in the interlocks to slide under its own weight into the interlock of the sheet pile already in place.
- F. Excavation shall not be carried in advance of steel sheet piling installation.
- G. Where obstructions are anticipated, pre-excavation or pre-drilling along the sheet pile wall alignment shall be conducted at no additional cost to the Owner. Pre-excavation and pre-drilling shall not extend below the lowest excavation level or into bearing soils for existing or future structures.
- H. Obstructions encountered before the specified embedment for piles shall be removed. Where obstructions cannot be removed, the support of excavation using sheet piles shall be re-evaluated by the Contractor's Design Engineer for the reduced embedment and additional toe stability measure shall be implemented as required or the sheet pile wall alignment shall be modified. A submittal of the proposed measures shall be provided.

- I. Damaged piling or piling with faulty alignment shall be withdrawn and new piling driven properly in its place at no additional cost to the owner.
- J. Do not drive sheeting within 100 feet of concrete less than seven (7) days old.

### 3.5 INTERNAL BRACING

- A. Provide internal bracing to carry maximum design load without distortion or buckling.
- B. Include web stiffeners, plates, or angles as needed to prevent rotation, crippling, or buckling of connections and points of bearing between structural steel members. Allow for eccentricities caused by field fabrication and assembly.
- C. Install and maintain all bracing support members in tight contact with each other and with the surface being supported.
- D. Coordinate excavation work with installation of bracing. Excavation shall extend no more than 2 feet below any brace level prior to installation of the bracing.
- E. Use procedures that produce uniform loading of bracing member without eccentricities or overstressing and distortion of members of system.

### 3.6 REMOVAL OF SUPPORT OF EXCAVATION

- A. Do not remove vertical support members that were installed below mid-diameter of any pipe or within the bearing zone of new or existing structures. Support members installed within this zone shall be cut off at 5 ft below finished grade and not less than 1 foot above the top of the pipe or adjacent structure foundation and abandoned in place. Conduct survey of the locations and final cut-off elevations of the excavation support systems left in place.
- B. Do not remove internal bracing and transfer loads to the permanent structures or pipes without prior acceptance of the Engineer.
- C. Support of excavation removal shall begin at and progress from the bottom of the excavation. Members shall be released slowly as to note any indication of possible failure of the remaining members or possible cave-in of the sides of the excavation.
- D. Backfilling shall progress together with the removal of support of excavation from excavations.
- E. Unless otherwise indicated, remove all portions of Temporary Earth Retention System.
- F. No untreated wood shall remain as part of the abandoned portion of the work.



- G. When removing the Temporary Earth Retention System, do not disturb or damage adjacent buildings, structures, waterproofing material, or utilities. Fill voids immediately with lean concrete or well-graded cohesionless sand, as indicated or as directed by the Engineer.
- H. Remove material of the support of excavation from the site immediately.

END OF SECTION 02160

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## SECTION 02210

### EXCAVATION, BACKFILL, COMPACTION, DEWATERING AND GRADING

#### PART 1 - GENERAL

##### 1.1 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required to perform the work as shown on the Drawings or approved shop drawings, or as indicated by the Engineer and as specified herein
- B. The work shall include, but not necessarily be limited to:
  - 1. Furnish all material, labor and equipment for installation and operation of temporary support of excavation and dewatering systems as indicated on the drawings or on the approved shop drawings. Furnish materials to perform excavation and grading and surplus material disposal. Furnish all backfilling and fill materials. Furnish and monitor all the required geotechnical instrumentation as indicated on the Drawings or approved shop drawings.
  - 2. Perform all clearing and stripping; perform excavation for structures, footings, manholes, conduits, cables, raceways and ducts, pipes and paving. Remove boulders and other obstructions within the excavation limits.
  - 3. Perform preparation of excavation subgrade for structure and utilities; perform all backfilling and fill, compaction; embankment construction and grading as indicated on the drawings or on the approved shop drawings.
  - 4. Grade site to maintain a level ground and to eliminate ponding of surface and subsurface water.
  - 5. Dispose of waste and surplus materials in accordance with local, State and Federal regulations.
  - 6. Perform measurement of compacted backfill as described herein.
- C. All existing facilities to remain which include but are not limited to structures, buildings, utilities, pavements, sidewalks, landscaping, fencing, and other improvements shall be adequately protected during construction. All on and off-site features damaged by the construction shall be replaced with materials fully identical to, and including but not necessarily limited to, the same type, dimension, size, species and conditions before damage to the satisfaction of the Owner.

- D. Immediately notify the Engineer if suspected hazardous materials are encountered and cease operations in that part of work.
- E. Wherever the requirement for compaction is referenced to herein, it shall mean minimum percentage of maximum density as determined by ASTM D1557.
- F. The Owner shall hire an independent soil laboratory to perform in situ evaluation of moisture and density properties of the placed backfill material.

## 1.2 RELATED SECTIONS

- A. Section 01300 – SUBMITTALS
- B. Section 02140 – DEWATERING AND DRAINAGE
- C. Section 02160 – TEMPORARY SUPPORT OF EXCAVATION

## 1.3 REFERENCES

- A. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft<sup>3</sup> (2,700 kN-m/m<sup>3</sup>))
- B. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
- C. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
- D. ASTM D6913 - Standard Test Methods for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis
- E. ASTM D6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
- F. ASTM C33 - Specification for Concrete Aggregates.
- G. ASTM C136 - Sieve Analysis of Fine and Coarse Aggregates.
- H. D4318: Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
- I. 29 CFR Part 1926 Subpart P - OSHA Excavation Regulations 1926.650 through 1926.652 including Appendices A through F
- J. 520 CMR 14.00 Excavation and Trench Safety

- K. 780 CMR 1705.0 Requirements for Structural Tests and Inspections
- L. Commonwealth of Massachusetts Highway Department "Standard Specifications for Highways and Bridges," most recent edition and as amended

#### 1.4 DEFINITIONS

- A. Benching - A method of protecting workers from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.
- B. Support of Excavation (Earth Retention System) - Any structural system, such as sheeting and bracing or cofferdams, designed to retain in-situ soils in place and prevent the collapse of the sides of an excavation in order to protect employees and adjacent structures.
- C. Excavation - Any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.
- D. Protective System - A method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include earth retention systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.
- E. Registered Professional Engineer - A person who is registered as a professional engineer in the state where the work is to be performed. However, a professional engineer, registered in any state is deemed to be a "registered professional engineer" within the meaning of this standard when approving designs for "manufactured protective systems" or "tabulated data" to be used in interstate commerce.
- F. Shield System - A structure that is designed to withstand the forces imposed on it by a cave-in and thereby protects employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Additionally, shields can be either pre-manufactured or job-built in accordance with 29 CFR 1926.652(c)(3) or (c)(4). Shields used in trenches are usually referred to as "trench boxes" or "trench shields."
- G. Sloping - A method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.

- H. Dewatering and Drainage (Temporary Dewatering) System – A system to lower and control water to maintain stable, undisturbed subgrades at the lowest excavation levels. Dewatering shall be provided for all pipelines, structures and for all other miscellaneous excavations.
- I. Trench - A narrow excavation (in relation to its length) made below the surface of the ground, of at least three feet in depth. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet (4.6 m).
- J. Unsuitable (unsatisfactory) material – any soft/loose, frozen, organic material present at the excavation subgrade. Includes material like urban fill, non-engineered fill, soft/organic silt and/or clay, peat, marsh, etc.
- K. Suitable material – See definition for Satisfactory material.
- L. Satisfactory (unsatisfactory) Material – Soil that meets (does not meet) the required soil gradation and compaction characteristics as determined by ASTM D6913 and ASTM D1557, for the intended purpose .
- M. Percentage of compaction (Relative Compaction) is defined as the ratio of the field dry density, as determined by ASTM D1556 to the maximum dry density determined by ASTM D1557 Procedure C, multiplied by 100.
- N. Optimum Moisture Content” is the moisture content (percent by dry weight) corresponding to the maximum dry density of the same material as determined by ASTM D1557.
- O. Zone of influence is defined as a line extending at least 2 feet beyond the outer edge of the structure foundation, then outward and downward at a slope of 1 horizontal to 1 vertical.
- P. Rock Excavation:
  1. Rock excavation in trenches and pits includes removal and disposal of materials and obstructions encountered which cannot be excavated with a 1.0 cubic yard (heaped) capacity, 42-inch wide bucket on track-mounted power excavator equivalent to Caterpillar Model 215, rated at not less than 90HP flywheel power and 30,000 lb. drawbar pull. Trenches in excess of 10 feet 0-inches in width and pits in excess of 30 feet 0-inches in either length or width are classified as open excavation.
  2. Rock excavation in open excavations includes removal and disposal of materials and obstructions encountered which cannot be dislodged and excavated with modern track-mounted heavy-duty excavating equipment without drilling, blasting or ripping. Rock excavation

equipment is defined as Caterpillar Model No. 973 or No. 977K, or equivalent track-mounted loader, rated at not less than 170HP flywheel power and developing 40,000 lb. break-out force (measured in accordance with SAE J732C).

- Q. Determination of rock excavation classification will be made by the Engineer. Typical of materials classified as rock are boulders 1.0 cubic yard or more in volume, solid rock, rock in ledges, and rock-hard cementitious aggregate deposits. Intermittent drilling, chemical splitting, or ripping performed to increase production and not necessary to permit excavation of material encountered will be classified as earth excavation. Do not perform rock excavation work until material to be excavated has been cross-sectioned and classified by Engineer. Visual observation of the completed excavation may be made by the Engineer to modify the excavation classifications.

## 1.5 SUBMITTALS

- A. Submit qualifications of the land surveyor to perform staking of the work.
- B. Drawings and calculations for each dewatering system for the proposed excavation. Design shall include calculations and drawings stamped and signed by a Professional Engineer registered in the Commonwealth of Massachusetts. Coordinate the dewatering submittal with Section 02140
- C. Drawings and calculations for each Support of Excavation System and Shield System required in the Work. The submittal shall be in sufficient detail to disclose the method of operation for each of the various stages of construction required for the completion of the Support of Excavation System or Shield System. Coordinate submittals with Section 02160.
- D. Submit an excavation, backfilling plan at least two weeks prior to start of any earth moving activities. The review will be only for the information of the Owner and third parties for an overall understanding of the project relating to access, maintenance of existing facilities and proper utilization of the site. The Contractor shall be responsible for the adequacy and safety of the means, methods and sequencing of construction. The plan shall include, but not be limited to the following items:
  - 1. Detailed sequence of work.
  - 2. General description of construction methods.
  - 3. Numbers, types, and sizes of equipment proposed to perform excavation and compaction.
  - 4. Details of dust control measures.
  - 5. Proposed locations of stockpiled excavation and/or backfill materials.

6. Proposed surplus excavated material off-site disposal areas and required permits.
  7. Erosion and sedimentation control measures, which will prevent erosion and sedimentation during the earth moving and soil stockpile activities.
- E. Performance data for the compaction equipment to be utilized. Methods and equipment proposed for compaction shall be subject to prior review by the Engineer. Compaction shall be done with vibrating equipment. Static rolling without vibration may be required by the Engineer on sensitive soils that become unstable under vibration.
- F. Certification statement and analytical results shall accompany each physical sample of imported backfill. At a minimum the certification shall state the point of origin and that the material is free of contaminants. The certification shall include representative sample analysis from each point of origin of imported backfill to be used on the site.
1. The sample(s) shall be analyzed by a certified laboratory and meet local, State and Federal requirement for use as on site backfill
  2. On-site soils defined as suitable for reuse in this Section can be used as backfill without providing the certification required above.
  3. All sampling of soils for chemical testing shall be performed by a person experienced in sample collection. Samples of each material shall be submitted to a chemical analytical laboratory, certified by the Massachusetts Department of Environmental Protection.
- G. Three five-gallon bucket of imported backfill material or on-site soil to be reused, at least 3 weeks prior to backfill operations for testing by the Owner's laboratory. Samples for testing shall be submitted with the following frequency:
1. Moisture Density - One per source, except for crushed stone. Repeat the moisture density test for every 5,000 cubic yard of material use, and whenever visual inspection indicates a change in material gradation as determined by the Engineer.
  2. Gradation Analysis - A minimum of one per source and for each moisture density test and whenever visual inspection indicates a change in material gradation.

## 1.6 QUALITY ASSURANCE

- A. All Excavation, Trenching, and related Earth Retention Systems shall comply with the requirements of OSHA excavation safety standards (29 CFR Part
- North Branch Sewer Interceptor Rehabilitation EXCAVATION, BACKFILL,  
 Bid No. 25-08 COMPACTION, DEWATERING AND GRADING  
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1926 Subpart P), 520 CMR 14.00, and other State and local requirements. Where conflict between OSHA and State regulations exists, the more stringent requirements shall apply.

- B. Employ the services of a dewatering specialist or firm when a dewatering system is required to dewater excavations. Dewatering specialist minimum requirements should be as outlined in Section 02140.
- C. Excavations within the zone of influence of any existing structures or utility will require the use of excavation support system. The support of excavation system designer shall be a Registered Professional Engineer in the Commonwealth of Massachusetts with minimum requirements as outlined in Section 02311.
- D. The Contractor should have completed at least five (5) projects of similar size and complexity in this type of installation in the last 5 years. Equipment operators for this project shall be fully trained and experienced with the operations of the equipment to be used for this project.
- E. All construction layout, staking and surveying shall be performed by a Professional Land Surveyor or Professional Engineer registered by the State of Massachusetts experienced and skilled in construction layout, staking and surveying of the type required under this Contract, and acceptable to the Engineer and Owner.

#### 1.7 PROJECT CONDITIONS

- A. Notify all stakeholders including utility owners and obtain subsurface utility clearance identification numbers.
- B. Notify utility owners in reasonable advance of the work and request the utility owner to stake out on the ground surface the underground facilities and structures. Notify the Engineer in writing of any refusal or failure to stake out such underground utilities after reasonable notice.
- C. Make explorations and excavations (test pits) to determine the location of existing underground structures, pipes, house connection services, and other underground utilities/facilities.
- D. The Contractor shall be solely responsible for making all excavations in a safe manner. All excavation, trenching, and related sheeting, bracing, etc. shall comply with the requirements of OSHA excavation safety standards indicated herein.
- E. The Contractor shall plan his operations to allow adequate time for laboratory tests and to permit taking of field density tests during compaction.



- F. Additional laboratory compaction testing may be required when there is evidence of a change in the quality of moisture control or the effectiveness of compaction. Any costs associated with correcting and retesting as a result of a failure to meet compaction requirements shall be borne by the Contractor.

**PART 2 - PRODUCTS**

**2.1 SOIL MATERIALS**

- A. Fill material is subject to the approval of the Engineer and may be either material removed from excavations or borrow from off site. Fill material, whether from the excavations or from borrow, shall be of such nature that after it has been placed and properly compacted, it will make a dense, stable fill.
  - 1. Satisfactory fill materials shall include materials classified by ASTM D 2487 as GW, GP, GM, GP-GM, GW-GM, SP, SW, SP-SM and SW-SM.
  - 2. Satisfactory fill shall be granular material consisting of hard durable particles, and free from clay, stones over six inches in diameter trash, ice and snow, tree stumps, roots, vegetation and other organic and deleterious or organic matter. Satisfactory fill materials shall not contain frozen materials nor shall backfill be placed on frozen material.
  - 3. Excavated surface and/or pavement materials such as gravel or trap rock that are salvaged may be used as a sub-grade material, if processed to the required gradation and compacted to the required degree of compaction.
- B. Common Fill: Common fill and on-site material geotechnically suitable for reuse on-site as backfill shall be used in landscaping areas or as trench backfill not underneath paved areas. Topsoil, organic soils, silt and clay shall not be considered common fill. Common fill and on-site material geotechnically suitable for reuse on-site as backfill shall conform to the following gradation requirements.

Sieve Size	Percent Finer by Weight
6-inch	100
No. 4	20-100
No. 50	5-50

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Sieve Size	Percent Finer by Weight
No. 200	0-20

- C. Structural Fill: Structural fill shall be used for replacement of unsuitable materials, such as soft organic soils or existing fill, below pipe and inverts and below structures, as pavement base and for other over-excavations. Structural fill shall conform to the following gradation requirements.

Sieve Size	Percent Finer by Weight
3-inch	100
½-inch	50-100
No. 4	30-85
No. 10	20-75
No. 60	5-35
No. 200	0-10 below buildings 0-5 for free draining material

- D. Gravel Subbase shall be crusher run coarse aggregates of crushed stone combined with fine aggregates uniformly premixed with a predetermined quantity of water. The crusher run aggregates shall consist of inert material that is hard, durable particles of stone. Materials that break up when alternately frozen and thawed or wetted and dried shall not be used. The fine aggregates shall consist of natural or crushed sand. Gravel subbase shall be used underneath paved areas as backfill up to the base subgrade.

Sieve Size	Percent Finer by Weight
3-inch	100
1- ½-inch	70-100

Sieve Size	Percent Finer by Weight
¾ -inch	50-85
No. 4	30-50
No. 200	0-10

- E. Dense grade crushed stone for use as subbase shall be free from loam and clay, surface coatings, and other plastic and deleterious materials. It shall conform to the following gradation requirements.

Sieve Size	Percent Finer by Weight
2-inch	100
1 ½-inch	70-100
¾-inch	50-85
No. 4	30-55
No. 50	8-24
No. 200	3-10

- F. Crushed Stone: Crushed stone shall consist of durable crushed rock or durable crushed gravel stone, free from ice and snow, sand, clay, loam, or other deleterious or organic material. Crushed stone may be used underneath structures in lieu of Structural Fill. The crushed stone shall be uniformly blended and shall conform to the following requirements.

	Percent Passing by Weight	
Sieve Size	¾-inch Stone	1 ½-inch Stone
2-inch		100

Sieve Size	Percent Passing by Weight	
	¾-inch Stone	1 ½-inch Stone
1 ½-inch		95-100
1-inch	100	35-70
¾-inch	90-100	0-25
½-inch	10-50	---
3/8-inch	0-20	---
No. 4	0-5	---

- G. Filter Fabric: Filter Fabric used as a drainage medium shall consist of a nonwoven fabric made from polypropylene or polyethylene filaments or yarns. The fabric shall be inert to organic chemicals commonly encountered in the soil. Edges and ends of filter fabric shall overlap a minimum of two feet.
- H. Controlled density fill shall be flowable, excavatable and shall require no vibration for placement. Compressive strength at 28 days shall be 30 to 80 psi and the slump shall be 10 to 12 inches.

2.2 DEWATERING MATERIALS

- A. Provide suitable haybales and silt fence as necessary to perform excavation and trench dewatering. Dewatering materials shall be as described in Section 02140.

PART 3- EXECUTION

3.1 GENERAL

- A. Do not excavate or fill until the Engineer has reviewed all the required submittals. Perform utility clearance before beginning excavations. Before excavating within 20 feet of utility poles and after pipeline stake out, coordinate construction with the appropriate utility company. Contact utility companies to determine the cost of any pole relocations or support as well as underground utility relocations and include the cost of the work in the bid
- B. Utilize excavation equipment suitable to complete the work. Equipment shall include smooth-edge and toothed buckets, excavator hammers, hand tools,

grading equipment and 10,000 pound vibratory rollers and 2,000pound hand-operated plate compactors to compact subgrades.

- C. Displacement of, or damage to existing utilities or structure shall be avoided. Replace or repair damages as directed by the Engineer to a condition at least equal to that in which they were found immediately before work commenced at no expense to the Owner.

### 3.2 PREPARATION

- A. Carefully support and protect from damage, existing structures and utilities as well as any poles, wires, fences, curbing, property line markers, and other structures, as indicated on the Drawings or approved shop drawings or as directed by the Engineer. Should such items be damaged, restore at no additional cost to the Owner, to at least as good condition as that in which they were found immediately before the work was begun.
- B. Sawcut the existing pavement in the vicinity of the excavation prior to the start of excavation in paved areas, so as to prevent damage to the paving outside the requirements of construction. Remove loam and topsoil, loose vegetable matter, stumps and large roots from areas upon which material will be placed for grading
- C. Public Safety and Convenience
  1. Adhere to the requirements of 520 CMR 14.00 for all excavation work.
  2. Take precautions for preventing injuries to persons or damage to property in or about the Work.
  3. Provide safe access for the Owner and Engineer at site during construction.
  4. Do not obstruct site drainage, natural watercourses or other provisions made for drainage.

### 3.3 CONSTRUCTION

- A. Support of Excavation and Dewatering System
  1. Provide support of excavation and excavation dewatering as necessary for safety of personnel and protection of the Work, adjacent work, utilities, and structures.
  2. Maintain support of excavation and operate the dewatering system for the duration of the Work as per the approved shop drawings and calculations.

3. Coordinate Dewatering with Section 02140; coordinate support of excavation with Section 02160.

B. Excavation - General

1. Perform excavation to the lines and grades indicated on the Drawings. When excavations have reached the required subgrade, including any allowances for working mats or base materials, prior to the placement of working mats or base materials, notify the Engineer to verify the suitability of the existing subgrade soils. If the existing subgrade soils are determined to be unsuitable, direction will be provided by the Engineer regarding removal and replacement with suitable materials as described herein.
2. Excavation shall be performed in-the-dry. Perform excavation in such a manner as to prevent disturbance of the final excavation subgrade. The Engineer or Owner may require the final six inches of excavation be performed by hand, with the use of a smooth-faced bucket, or other means acceptable to the Engineer or Owner, at no additional cost, if subgrade disturbance is considered excessive as judged by the Engineer or Owner or when in proximity of other underground utilities.
3. The final cuts to excavation subgrade shall be delayed if possible in order to minimize the time during, which subgrade surfaces are exposed to traffic and the elements. The Contractor shall take care to avoid excess traffic on the excavated subgrades prior to placement of fill, utilities or concrete foundations. In no case shall the foundation subgrade be plowed, scraped or excavated by any means so near to the finished subgrade that would disturb the finished subgrade. If construction is performed during freezing weather, excavations shall be backfilled as soon as possible. Insulating blankets or other means shall be used for protection against freezing at the discretion of the Engineer or Owner.
4. When excavation ends in naturally deposited clay, silt, fine sand the final excavation shall be performed with a smooth-edge bucket to mitigate disturbance of the subgrade soils. For structure excavations in such materials, place a minimum 4-inch-thick lean concrete mud mat or 12 inches of screened gravel or crushed stone wrapped in filter fabric or compacted structural fill directly on the undisturbed subgrade.
5. During excavation, material satisfactory for backfill shall be stockpiled in an orderly manner at a distance from the sides of the excavation equal to at least one half the depth of the excavation, but in no case closer than 2 feet.

- a. Excavated material not required or not suitable for backfill shall be removed from the site and disposed in compliance with Federal, State and local regulations.
  - b. Perform grading to prevent surface water from flowing into the excavation. Grade or create berms or swales to direct surface water from excavations to appropriate structures designed to accommodate storm water. If no structures exist, direct water to areas that minimize impacts to adjacent structures and properties.
  - c. Pile excavated material in a manner that will endanger neither the safety of personnel in the excavation nor the Work itself. Avoid obstructing sidewalks and driveways.
  - d. Hydrants under pressure, valve pit covers, valve boxes, manholes, curb stop boxes, fire and police call boxes, or other utility controls shall be left unobstructed and accessible until the Work is completed.
6. Demolish and remove all existing below grade concrete slabs, walls, concrete encasements and any other buried structure within the zone of influence of the proposed structure as shown on the Contract Drawings.
  7. Establish limits of excavation to allow adequate working space for installing forms and for safety of personnel. Excavate to elevations indicated, or deeper, as directed by the Engineer, to remove unsatisfactory material. Exercise care to preserve material below and beyond the lines of excavations.
  8. Place excavated material at the approved stockpile locations and in no case closer than 3 feet from edge of excavations to prevent cave-ins of bank slides.
  9. Boulders exposed at subgrade level shall be removed to a minimum 12-inch clearance around the bottom and sides of all the foundations and utilities. Bedrock or other rock mass shall be broken into pieces that can be removed by an excavator by means of ripping, breaking with a hoe ram, or chemical splitting.
  10. Excavate test pits when determination of exact location of pipe or other underground structure is necessary for doing work properly at no additional cost to the Owner. Promptly notify the Engineer when any unexpected subsurface facilities are encountered during excavation such as utility lines and appurtenances, walls, slabs and foundations.

11. When excavation is performed beyond limits indicated on the drawings or approved shop drawings, authorized or unauthorized, backfill the excavation with satisfactory material at no additional cost to the owner.

C. Trench Excavation

1. Make trenches as narrow as practicable and keep the sides of the trenches undisturbed until backfilling has been completed. Provide a clear distance of 12 inches on each side of the pipes and conduits. Account for space for support of excavation, geotechnical instrumentation and dewatering equipment.
2. Perform trench excavation in such a manner as to prevent disturbance of the final subgrade.
  - a. Grade the excavation bottom to provide uniform bearing and support for the bottom quadrant of each section of the utility.
  - b. Excavate bell holes at each joint to prevent point bearing.
  - c. Remove stones greater than six inches in any dimension from the bottom of the trench to prevent point bearing.
3. When pipe is to be laid in gravel bedding or concrete cradle, excavate trench by machinery to, or just below designated subgrade. If material remaining at bottom of trench is disturbed, re-compaction shall be required.
4. When pipe is to be laid directly on bottom of trench, do not excavate lower part of trenches by machinery to subgrade. Remove remainder of material to be excavated just before placing of pipe by use of hand tools. Form a flat or shaped bottom, true to grade, so pipe will have a uniform and continuous bearing. Support on firm and undisturbed material between joints, except for limited areas where use of pipe slings have disturbed bottom. Do not lay or embed pipe in standing or running water. At all times, prevent runoff and/or surface water from entering trench.
5. Excavate trenches to depths so as to permit pipe to be laid at elevations, slopes, or depths of cover indicated on drawings, and at uniform slopes between indicated elevations.

D. Subgrade Preparation

1. Prior to backfilling or placement of structures and utilities, excavated subgrades shall be proof compacted with either 10 passes of a 10,000 pound vibratory drum roller for open excavations or six passes of a



2,000 pound large, reversible, walk behind vibratory compactor for trenches.

2. If satisfactory materials are not encountered at the final excavation subgrade, excavate unsatisfactory materials to the depth directed by the Engineer and properly dispose of the unsatisfactory material in accordance with Federal, State and local regulations. Backfill the resulting extra depth of excavation with satisfactory fill materials and compact in accordance with the provisions of this Section. Unsatisfactory material shall be over excavated within the zone of influence of structure and utilities.
  - a. Unsatisfactory material shall be removed as directed by the Engineer within the zone of influence to a depth of 4 feet below the bottom of new utilities to be installed and to the top of naturally deposited suitable soil layers underneath structure foundations.
3. Any acceptable subgrade material which becomes disturbed due to failure of the dewatering system, trafficking on the subgrade, or other Contractor activities, or other failure or neglect to conduct the excavation work properly shall be over excavated and replaced with acceptable material as described herein or as directed by the Engineer at no additional cost to the Owner.
4. Backfill or fill shall not be placed on a frozen subgrade or subgrade covered by snow or ice, nor shall snow, ice or frozen earth be incorporated in the compacted backfill. backfill shall not be placed over organic soils (including peat and topsoil) and loose inorganic silt material. These materials shall be removed prior to fill placement as specified in this Section unless approved by the Engineer.

E. Backfill and Compaction - General

1. Unless otherwise specified or indicated on the Drawings, use satisfactory material removed during on-site excavation for backfilling excavations for structures and trenches. Carefully remove acceptable material from excavated areas and store separately for further use as backfill material. The Engineer may require stockpiling, drying, blending and reuse of materials from sources on the Project.
  - a. On-site material shall meet the gradation requirements specified herein to be reused as backfill.
  - b. On-site material that does not meet the analytical testing requirements in the soil management plan shall not be reused on site.

2. When excavated material is specified for backfill and there is an insufficient amount of this material at a particular location on the Project due to rejection of a portion thereof, consideration will be given to the use of excess material from one portion of the Project to make up the deficiency existing on other portions of the Project.
  - a. Use borrow material if there is no excess of excavated material available at other portions of the Project or if the excavated material does not meet the gradation and analytical requirement herein.
3. Fill or backfill shall not include stone or rock fragment larger than six inches in diameter.
4. Fill and backfill shall not be placed and compacted when the materials are too wet to properly compact either from rain or from excess application of water (i.e., the in-place moisture content of the soil at that time is no more than three percentage points above the optimum moisture content of that soil as determined by the laboratory test of the moisture-density relation appropriate to the specified level of compaction). At such times, work shall be suspended until the previously placed and new materials have dried sufficiently to permit proper compaction.
5. The Contractor shall not place backfill against or on structures until they have attained sufficient strengths to support the loads to which they will be subjected, without distortion, cracking, or other damage. As soon as possible after the structures are adequate, they shall be backfilled with suitable backfill material.
6. Backfill and fill material to be utilized are:
  - a. Structural fill– underneath structures and utilities or as pavement base
  - b. crushed stone (3/4”) – 12” underneath structures (underneath footings)
  - c. crushed stone (1-1/2”) – underneath structures up to 12” below footings
  - d. Dense-graded crushed stone - underneath utilities
  - e. Gravel subbase – underneath pavement up to the base level
  - f. Common fill – landscape areas or as trench backfill in unpaved areas

7. Spread and compact the material promptly after it has been deposited on the prepared subgrade or backfill. Do not drop large masses of backfill material into open excavation or trench endangering the pipe or adjacent utilities.
8. Maximum loose lift height for backfilling existing or borrow material shall be 12 inches or 6 inches in restricted areas.
9. Backfill shall be proof compacted with either 10 passes of a 10,000 pound vibratory drum roller for open excavations or six passes of a 2,000 pound large, reversible, walk behind vibratory compactor for trenches.
10. Backfilling and compaction methods shall attain 95% of maximum dry density at within +/- 2% of optimum moisture content as determined in accordance with ASTM D1557. 92% of ASTM D1557 is allowed in landscape areas. Backfill lifts that do not attain the specified maximum dry density and moisture content characteristics will require additional compaction until the specified compaction is achieved.
11. Install utilities in rock or soil trenches on a 6-inch minimum. Shape the stone bedding at the pipe bells to provide uniform support. Compact utility bedding with a walk-behind plate compactor as described herein.
12. After placement of the pipeline, backfill from the bottom of the trench to the springline. Backfill is to be placed in layers of no more than six inches and thoroughly compacted with hand tampers around the pipe.
13. Place and compact backfill around manholes, vaults, pumping stations, gate boxes or other structures in six-inch layers, from a point one foot over the pipe. Exercise care to protect and prevent damage to the structures.
14. Along the length of all pipeline and duct trenches, construct impervious dams or bulkheads of clay or concrete in the trench bottom at 300-ft intervals or at manholes and structures, whichever is less, to obstruct the free flow of groundwater after construction is completed. Install impervious dams at all points where a pipe trench enters an excavated area where a permanent underdrain system is installed.

### 3.4 TESTING OF BACKFILL

- A. Testing of backfill placed and compacted by the Contractor will be performed by the Owner's Engineer/Subcontractor. The Contractor shall give at least 5

days advance notice of backfill and compaction operations to allow for scheduling of testing.

- B. Perform in-place soil density testing to confirm that fill material has been compacted in accordance with the requirements of this Section. The Engineer or Owner may conduct additional soil testing. Cooperate fully in obtaining the information desired and allowing free access to the work. Compaction testing shall be as follows:
  - 1. Structures and Embankments - At least one density and moisture content test for each 3,000 square feet of surface area, for each lift of backfill placed.
  - 2. Trench Excavations - At least one nuclear density and moisture content test shall be conducted at a maximum of 50-ft intervals for each lift of fill placed or as directed by the Engineer.
  - 3. Additional tests as determined by the Engineer.
- C. Testing shall be performed using nuclear density (Troxler) gauges (ASTM D6938) or sand cone (ASTM D1556) for each lift placed and compacted or as directed by the Engineer.
- D. The locations and lifts to be tested are as described herein. The Contractor shall plan his operations to allow adequate time for laboratory tests and to permit taking of field density tests during compaction.
- E. Earthwork activities performed without properly scheduled inspection are subject to removal and replacement or additional testing as directed by the Engineer at no expense to the Owner.

### 3.5 PROTECTION

- A. Protection of Existing Structures
  - 1. All existing foundations, conduits, wall, pipes, wires, poles, fences, property line markers and other items which the Engineer decides must be preserved in place without being temporarily or permanently relocated, shall be carefully supported and protected from damage by the Contractor. Should such items be damaged, they shall be restored by the Contractor to at least as good condition as that in which they were found immediately before the Work began.

END OF SECTION 02210

## SECTION 02252

### MANHOLES

#### PART 1 - GENERAL

##### 1.1 SUMMARY

- A. This Section includes all labor, equipment, appurtenances, and materials required for the provision and installation of precast concrete sewer manholes and storm drain manholes, complete and in place, in accordance with the Drawings and Specifications, and as directed.
- B. Refer to SWSC Guidelines and Polices, SWSC Material Specification, and associated Detailed Drawings appended to these Specifications herein referred to as “SWSC Guidelines” for standard and drop manholes, pipe connections, and frames and covers. Refer to Civil General sheets for larger diameter standard manhole details.
- C. In the event the installation of a manhole disturbs traffic signal loop detectors, coordinate their removal and replacement with the City.

##### 1.2 RELATED WORK

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Sections apply to the Work of the Section.
- B. Section 01300 – SUBMITTALS
- C. Section 01400 – QUALITY ASSURANCE
- D. Section 02160 – TEMPORARY SUPPORT OF EXCAVATION
- E. Section 02210 – EXCAVATION, BACKFILL, COMPACTION, DEWATERING AND GRADING
- F. Section 02590 – BRICK MASONRY FOR UTILITIES
- G. Section 03300 – CAST-IN-PLACE CONCRETE
- H. Section 03315 – GROUT
- I. Section 07160 – BITUMINOUS DAMPPROOFING

##### 1.3 SUBMITTALS

- A. Submit the following in accordance with General Conditions of Contract and Section 01300 prior to fabrication:

1. Shop drawings, product data sheets, and affidavits stating Project Documents, ASTM, AIS, ACI or AASHTO conformance for:
    - a. Typical precast manhole including dimensions and material thicknesses of base, riser and cone or top slab;
    - b. Manhole accessories including: steps, bituminous damp-proofing, joint gaskets, and pipe sleeves/seals;
    - c. Manhole frames and covers (pressure and non-pressure) including weights and:
      - 1) Certified statement that product(s) of the same make and model bid, regardless of the year of manufactured, shall have interchangeable components parts and that the parts availability and delivered shall remain firm for ten (10) years.
      - 2) A warranty stating the finished product(s) shall be free from all defects in material, coatings, and workmanship under normal use of the product from time of delivery for a minimum ten (10) year time period.
  2. A diagram of pipe penetrations and invert elevations for each manhole.
  3. Precaster and manhole accessory manufacturers' references.
  4. Manufacturer's recommended installation instructions, for informational purposes.
- B. Submit the following test results prior to requisition of payment for the respective structure:
1. Factory Concrete Strength Tests
  2. Manhole Leakage Test Results as specified in Section 01400

#### 1.4 REFERENCES

- A. AASHTO M105: Standard Specification for Gray Iron Castings
- B. AASHTO M306: Standard Specification for Drainage, Sewer, Utility and Related Castings
- C. ACI 318: Building Code Requirements for Structural Concrete

- D. ACI 350R: Code Requirements for Environmental Engineering Concrete Structures
- E. ASTM A48: Standard Specification for Gray Iron Castings
- F. ASTM A536: Standard Specification for Ductile Iron Castings
- G. ASTM A615: Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement
- H. ASTM C443: Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets
- I. ASTM C478: Standard Specification for Precast Reinforced Concrete Manhole Sections
- J. ASTM C923: Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals
- K. ASTM C990: Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants
- L. ASTM D4101: Standard Specification for Polypropylene Injection and Extrusion Materials

## 1.5 QUALITY ASSURANCE

- A. Material and equipment shall be the end products of one manufacturer in order to provide standardization for appearance, operation, maintenance, spare parts and manufacturer's service.
- B. The quality of all materials, processes of manufacture, and the finished manhole sections shall be subject to inspection and approval of the Owner. Such inspection may be made at the place of manufacture and/or on the site. The manhole sections shall be subject to rejection at any time because of failure to meet any of the specification requirements, even though sample manhole sections may have been accepted as satisfactory.
  - 1. Manhole sections which do not conform to specification requirements will be rejected and shall be removed immediately from the site and replaced by the Contractor at no additional cost to the Owner.
- C. Two concrete strength tests shall be made for each 100 vertical feet of manhole sections used. Testing may be conducted at the manufacturer's plant or at an approved testing laboratory and shall be the responsibility of

the Contractor to obtain the test results at no additional expense to the Owner.

- D. Manhole sections shall not be shipped for at least five days after manufacture when cured by subjecting them to thoroughly saturated steam at a temperature between 100°F and 150°F for a period of not less than 8 hours and have attained 5,000 psi compression strength.
- E. Minor repairs to pre-cast concrete sections, if required, are not acceptable unless authorized by the Owner.
- F. Certificates: Manufacturer's notarized certificates of compliance shall be furnished by the Contractor.
- G. Workmanship and methods shall be in accordance with the best practices of modern shops for this type of work.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. All manhole sections shall be inspected upon delivery. The Contractor shall furnish all labor and facilities necessary to assist the Owner in inspecting the material.
- B. Manhole sections shall be handled into position in the trench by means of a boom, straps, chains, or other suitable tools or equipment. The sections shall not be dropped or dumped into the trench but lowered in such a manner and by such means as to prevent damage to materials and protective coatings or linings, and as recommended by the manufacturer. Lifting manholes may be permitted provided suitable stoppers are provided for plugging and sealing the holes watertight. Spreader bar shall be used when lifting the manholes.
- C. Arrange for the delivery of manhole sections at approved locations in the vicinity of where the structure is to be placed. Sections shall be stored in an approved orderly manner to minimize the handling from the storage area into the final position in the work, and to minimize obstructing and inconveniencing traffic.
- D. Deliveries shall be scheduled so that the progress of the work is at no time delayed, and so that large quantities of manhole sections shall not be stored on areas over utility structures which might be damaged by the superimposed load. The storage of manhole sections will be restricted to approved or permitted areas.
- E. Store structure sections in a manner that prevents water on the ground and/or animals from entering the unit until the product is installed.



## PART 2 - PRODUCTS

### 2.1 SANITARY MANHOLES

#### A. Precast Concrete Base, Risers, and Top

1. Manhole bases, risers and top sections shall be of the sizes and types indicated, or as directed, and conform to the requirements of ASTM C478, except as modified herein and/or on the drawings.
2. The manhole sections shall be manufactured by the centrifugal, roller suspension, or vertical cast processes.
3. Design Criteria
  - a. Manhole base, riser, transition top, cone-type or flat-slab top and grade ring shall be designed for a minimum H-20 loading plus earth load. Design earth load shall be 130 Pounds per Cubic Foot (PCF).
  - b. Structure walls shall be designed for a lateral pressure based on an equivalent fluid unit weight of 90 lbs/ft<sup>3</sup> (PCF). Pressure diagram shall originate at finished grade. Lateral pressure from vehicles shall be included in accordance with AASHTO.
  - c. Discontinuities in structures produced by openings and joints shall be considered in the design. Additional reinforcing around openings shall be provided. Frame openings shall carry full design loads to support walls.
  - d. Manhole shall be designed against flotation with ground water level at finished grade. Flotation prevention shall be achieved by dead weight of manhole and soil load above it. Skin friction, soil friction, or weight of equipment in manhole, if any, cannot be considered in the design against flotation.
  - e. Manhole shall be designed with a minimum number of joints. Maximum number of structure sections, including top slab, shall be four.
  - f. Pressure manholes as detailed in the Contract Drawings and all related elements shall be designed to accommodate an internal hydraulic pressure of 13 psi.

4. Lifting lugs or holes in each pre-cast section shall be provided for proper handling. Lifting lugs shall be provided for the top and bottom slab.
5. Pre-cast concrete manholes bottom slab thickness, riser wall thickness, shall be as shown on the Contract Drawings.
6. Pre-cast concrete manhole sections shall have a formed, tapered circular opening larger than the intended pipe size (outside diameter).
7. Base slab and walls shall be cast together to form a monolithic base section. The height and diameter of base shall be as required to accommodate size of pipe used, as approved.
8. The manhole risers shall be available in 1, 2, 3, and 4-foot lengths. The bases and risers sections shall have the wall thicknesses as stated in the Details.
9. Eccentric cone-type tops shall be 3- or 4-foot lengths with 30-inch inside diameter opening in the top, unless otherwise noted as shown in the details. Cones shall taper to a minimum wall thickness of 8 inches at the top.
10. Manholes larger than 4 feet in diameter at the base shall be reduced in diameter to 4 feet at the top riser section where possible, unless noted otherwise on the plans.
11. Eccentric cone tops shall be used where cover over the pipe exceeds 4 feet. Top section shall be a flat slab where cover over top of pipe is 4-ft or less. The slab thickness shall be 8 inches or greater and reinforced as indicated, with a 30-inch man-way opening unless noted otherwise.
12. Access openings, wall sleeves, and knockouts shall be provided at locations where indicated by the Owner or shown on the Drawings and as follows:
  - a. Integrally cast knockout panels shall be sized for intended pipe sizes. Knockout panels shall have no steel reinforcing.
  - b. Pre-cast manhole sections shall have a formed, tapered circular opening larger than the intended pipe size (outside diameter).
  - c. Horizontal wall joints shall be located a minimum of 18 inches from the horizontal centerline of the wall openings.

13. Structures shall be marked on the inside of each pre-cast section with the date of manufacture, name and trademark of manufacturer.
14. Wall sleeves shall be provided by the pre-cast concrete manufacturer.

B. Concrete

1. Precast concrete manholes shall be manufactured with concrete that meets the following requirements:
  - a. Minimum compressive strength shall be 5,000 psi at 28 days;
    - 1) Pre-cast concrete sections shall not be shipped until after concrete has attained a minimum 5,000 PSI compressive strength.
  - b. Maximum water-to-cement ratio shall be 0.40 by weight;
  - c. Minimum cement content shall be 600 pounds of cement per cubic yard of concrete;
  - d. Shall conform to American Concrete Institute (ACI) 318 and ACI 350R;
  - e. When "fy" exceeds 40,000 psi, "z" (ACI 318) shall not exceed 95 kips/in, "fs" shall be completed and shall not exceed 50 percent of "fy";
  - f. Products shall be designed to support their own weight, weight of soil at 130-PCF, and a live load equal to AASHTO HS-20 applied to top slab.
  - g. For sewage bearing structures, design concrete with specialty crack self-healing and microbial induced corrosion inhibitor admixtures in accordance with Section 03300.

C. Manhole Joints

1. The top of the monolithic bases; each end of the risers; and the bottom of the cone-type or flat-slab tops shall be provided with bell-and-spigot or tongue-and-groove joints formed on machined rings to insure accurate joint surfaces.

D. Manhole Steps

1. Reinforced steel, copolymer polypropylene, 14-in wide manhole steps shall be provided in manhole bases, risers and cone type tops and shall be integrally cast approximately 12 inches on-center in the bases, risers, and tops.
    - a. Copolymer polypropylene shall conform to ASTM D4101 Classification PP0344 B33534 Z02.
    - b. Steel reinforcing shall be 1/2-in diameter, conforming to ASTM A615, Grade 60 and shall be continuous throughout rung.
  2. Manhole steps shall meet all OSHA requirements
  3. Manufactures:
    - a. PF Series by M.A. Industries Inc.;
    - b. or equal.
- E. Exterior Dampproofing
1. All exterior concrete surfaces shall be coated with bituminous dampproofing as per Section 07160.
- F. Brick Masonry
1. Provide masonry and mortar for manhole benches and inverts along with the chimney per Section 02590.
- G. Manhole Frames and Covers for Sanitary Sewer Manholes.
1. Refer to the details in the SWSC Guideline for dimensional information regarding Standard, Gasketed, and Pressure (locking) Manhole frames and covers.
    - a. Standard Manhole Frame and Cover 32-inch by 8-inch
      - 1) Standard Manhole Frame and Covers 32-inch by 8-inch dimensions shall be in accordance with 32" x 8" Sewer Frame and Cover Detail (S-02.5).
      - 2) 32-inch Standard Manhole Covers shall have two (2) penetrating pick-holes on each opposite side and one (1) 1-1/4-inch diameter penetrating pick-hole shall offset a minimum of 4-inches from the center, a 31-11/16-inch (plus or minus 1/16-inch) diameter

cover, the rim shall be 1-3/4-inch thick (plus or minus 1/16-inch).

- 3) Standard Manhole Frames 32-inch by 8-inch shall have a minimum 30-inch diameter access opening.

b. Gasketed Manhole Frame and Cover 32-inch by 8-inch

- 1) Gasketed Manhole Frame and Covers 32-inch by 8-inch shall meet all the requirements of the Standard Manhole Frame and Covers 32-inch by 8-inch with the following exceptions:
- 2) Gasketed Manhole Frame and Cover 32-inch by 8-inch dimensions shall be in accordance with 32" x 8" Gasketed Sewer Frame and Cover Detail (S-02.7).
- 3) The 32-inch Gasketed Manhole Cover shall have two (2) non-penetrating pick bars on each side that are approximately 1-inch by 1-1/2-inch with the slot/channel approximately 1-inch wide by 4-1/2-inch long.
- 4) The 32-inch Gasketed Manhole Cover shall also include a continuous, self-sealing gasket cemented in a machine groove on the underside of the cover or as otherwise approved by the Commission.
- 5) The 32-inch Gasketed Manhole Frame shall have a minimum 30-inch diameter access opening.

c. Standard Manhole Cover 32-inch

- 1) Standard Manhole Covers 24-inch dimensions shall be in accordance with 32" x 8" Sewer Frame and Cover Detail (S-02.5), and the following:
- 2) 24-inch Standard Manhole Covers shall have two (2) penetrating pick-holes on each opposite side and one (1) 1-1/4-inch diameter penetrating pick-hole shall offset a minimum of 4-inches from the center, a 23-3/4-inch (plus or minus 1/16-inch) diameter cover, the rim shall be 1-1/4-inch thick (plus or minus 1/16-inch).
- 3) The dimensions of the cover must match existing frames and covers such that parts are

interchangeable with both the new and existing manhole frame and covers.

d. Gasketed Manhole Cover 32-inch

- 1) Gasketed Manhole Frame and Cover 32-inch by 8-inch dimensions shall be in accordance with 32" x 8" Gasketed Sewer Frame and Cover Detail (S-02.7).
- 2) The 32-inch Gasketed Manhole Cover shall have two (2) non-penetrating pick bars on each side that are approximately 1-inch by 1-1/2-inch with the slot/channel approximately 1-inch wide by 4-1/2inch long.
- 3) The 32-inch Gasketed Manhole Cover shall also include a continuous, self-sealing gasket cemented in a machine groove on the underside of the cover or as otherwise approved by the Commission.
- 4) The dimensions of the cover must match existing frames and covers such that parts are interchangeable with both the new and existing manhole frame and covers.

2. Manhole frames and covers shall be strong, durable, even grained ductile iron or cast iron, smooth, free from scale, lumps, blisters, sand holes and defects of any kind.

- a. An HS20 load rating is required.
- b. Cast iron shall conform to American Society of Testing and Materials (ASTM) A48, Class 35B.
- c. Ductile iron shall conform to ASTM A 536 Grade 80-55-06.
- d. Manhole covers and frame seats shall be machined to a true surface so that the cover does not rock in the frame no matter the position of the cover.
- e. If applicable, the finished coating shall be tough and tenacious when cold and not brittle or with any tendency to scale off under seasonable temperature changes.

3. Covers shall be cast with a diamond pattern cast on the top.

4. Manhole Frame and Cover shall be provided with individual permanent markings that are easily discernable and show the following:
  - a. Name of the producing foundry and country of manufacture preceded by the words “Made in”, such as “Made in USA”;
  - b. AASHTO designation or ASTM designation number;
  - c. Class by a number, followed by a letter indicating the minimum tensile strength and size of test bar,
  - d. Heat identification and cast date (MM/DD/YY),
  - e. The word “SEWER”, or other appropriate designation, shall be raised relief in accordance with Sewer Frame and Cover Details (S-02.5 and S-02.6).
  - f. The words “SPRINGFIELD WATER & SEWER COMMISSION”, “SEWER”, the Commission Logo, and/or other appropriate designation shall be raised relief in accordance with Sewer Frame and Cover Details (S-02.5 and S-02.6).
  - g. The above markings are required, but the Commission will allow some variation in how the above markings are provided on the finished product. The design and location of the markings must meet and be subject to the approval of the Commission’s aesthetic judgment.
5. The manhole frame and cover shall be certified to meet American Association of State Highway and Transportation Officials (AASHTO) M 306 Drainage, Sewer, Utility, and Related Casting Specification and M 105 Class 35B strength of materials requirements.
6. Cast iron shall conform to ASTM A48, Class 35B.
7. Ductile iron shall conform to ASTM A536 Grade 80-55-06.
8. Manhole Frame and Covers be subjected to proof load testing as follows:
  - a. Testing shall be in accordance with the National Institute of Standards Technology (NIST) standards.
  - b. The frame and covers shall show no detrimental deformation or cracks when a proof load of 40,000-pounds

is concentrated on an 9-inch by 9-inch area at the center of the cover for a 1-minute period of time.

- c. Permanent deformation shall not exceed 1/8-inch.
  - d. All testing shall be at the supplier's expense.
9. Manhole frame and covers shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows AIS;
- a. "North America" shall mean the United States, Canada, and Mexico;
  - b. "Cast" shall mean molten metals poured into a mold to create casting(s) for a finished product;
  - c. "Assembled" shall mean castings and sourced parts are put together to build a finished product;
  - d. Incidental parts may be purchased/obtained from other countries to provide a finished product, in accordance with these Material Specifications;
  - e. The finished product shall meet all the requirements of the AIS language guidance issued by the EPA in 2014 and 2015. For any Massachusetts State Revolving Fund (SRF) project this requirement is governed by AIS.
10. The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.
- a. East Jordan Iron Works
    - 1) Standard MHF&C 24-inch by 8-inch, Part #: 00124674C03
    - 2) Standard MHF&C 32-inch by 8-inch, Part #: 00200662C03
    - 3) Gasketed MHF&C 24-inch by 8-inch, Part #: 00124674C03GS
    - 4) Gasketed MHF&C 32-inch by 8-inch, Part #: 00200662C03GS



- 5) Standard MHC 24-inch, Part #: 00124811
- 6) Standard MHC 32-inch, Part #: 00200662
- 7) Gasketed MHC 24-inch, Part #: 00124811GS
- 8) Gasketed MHC 32-inch, Part #: 00200662GS
- 9) Pressure (locking) MHF&C 26-inch by 7-inch, Part #: 42339048W01
- 10) Pressure (locking) MHF&C 32-inch by 7-inch, Part #: 41
- 11) 420041W01

b. Approved equal of another manufacturer provided the product(s) are manufactured as per these specifications.

H. Bell-and-Spigot and Tongue-and-Groove Joint Gaskets.

- 1. Gaskets shall assure water tightness and permanent seal under all conditions of service, including movement due to expansion, contraction, and normal settlement.
- 2. Gaskets for Bell-and-Spigot Joints
  - a. Seal Bell-and-Spigot joints with butyl rubber flexible rope-like gasket material conforming to ASTM C990 produced from blends of butyl rubber, refined hydro carbons, resins, and plasticized compounds reinforced with inert mineral filler that is solvent free.
  - b. Gaskets shall have a self-adhesive nature and furnished in 1-inch diameter coils.
- 3. Gaskets for Tongue-and-Groove Joints
  - a. Seal Tongue-and-Groove joints with O-ring gaskets conforming to ASTM C443 produced from neoprene with a tensile strength of 1200 psi.
  - b. Gasket shall be a continuous ring of round solid cross section having smooth surfaces free from blisters, porosity, and/or other defects.
  - c. The elongation shall be such that 2-inch gauge marks shall not exceed 9-inches.

4. Exterior Joint Wraps
  - a. Joints greater than 15 feet below grade shall utilize exterior butyl rubber joint wraps in addition to Bell-and-Spigot or Tongue-and-Groove Joint Gaskets. The butyl rubber joint wraps shall meet or exceed ASTM C877 (Type III) Standard Specification for External Sealing Bands for Concrete Pipe, Manholes, and Precast Box Sections.

I. Flexible Pipe Sleeves/Seals

1. Manhole pipe sleeves, gaskets, and sealants shall assure water tightness and permanent seal capable of meeting a 13-psi differential hydraulic pressure and conform to ASTM C923.
2. Manhole sleeves, gaskets and sealants shall be furnished complete with lubricants, stainless steel stops, inserts, clamps, etc.
3. The pipe seal manufactures listed below supersede those in the Material Specifications Section 7.7 of the SWSC Guidelines.
4. Flexible sleeves/seals from Pre-cast Concrete Manhole Manufacturer shall be:
  - a. New Lok Joint Flexible Sleeve by Interpace,
  - b. A-Lok Manhole sleeve by L & L Concrete Products,
  - c. Press Wedge II by Pre-Seal Basket Corporation,
  - d. or equal products of another manufacturer.
5. Flexible sleeves/seals Field Applied shall be:
  - a. Kor N Seal boot,
  - b. or equal products of another manufacturer.
6. Waterstop grouting rings:
  - a. For large diameter smooth wall pipe connections where boots are not utilized, provide a rubber ring which is compressed around the pipe circumference using stainless steel clamps and encased in the mortared joint. Manufacturer shall be:
    - 1) Press-Seal Corporation
    - 2) A-LOK

3) or equal products of another manufacturer.

J. Non-shrink Grout

1. Provide Non-shrink Grout per Section 03315.

2.2 DRAIN MANHOLES

A. Provide drain manholes as specified in Paragraph 2.1 of this Section, with the following exception(s):

1. Manhole cover shall be marked "DRAIN" without the "Springfield Water and Sewer Commission" labeling.

PART 3 - EXECUTION

3.1 TRENCH AND BACKFILLING

A. Conduct excavation, trench supporting, structure bedding installation, and backfill operations in accordance to Section 02210.

3.2 SEWER AND DRAIN MANHOLE INSTALLATION

A. Exterior Dampproofing

1. Apply field-coat of bituminous dampproofing to the exterior of the precast concrete manhole per Section 07160.

B. Manhole Placement and Leveling

1. Manhole base grades shall be set so that any grade adjustment required to bring the manhole frame and cover to final grade does not exceed 8 inches.
2. Concrete barrel sections and structures shall be set plumb with a 1/4-in maximum out of plumb tolerance allowed.
3. Cast-in-place bases, if required, shall be constructed in accordance with the manufacturer's recommendations.

C. Anti-floatation Provisions

1. All work shall be protected at all times against flooding and/or flotation.

D. Jointing and Joint Sealing

1. Manhole sections shall be installed using a neoprene "O-Ring" type gasket (Tongue-and-Groove joint), or butyl rubber sealants

(Bell-and-Spigot joint) for sealing joints. Jointing shall be performed in accordance with the manhole manufacturer's recommendations, and as approved.

2. The interior and exterior seam of joints shall be filled with non-shrink mortar and finished flush with the adjoining surfaces.
3. Exterior joint wraps shall be installed per manufacturer instruction.
4. Water shall not be permitted to rise over newly made joints until after inspection as to their acceptability. All jointing shall be done in a manner to insure watertight joints.
5. Joints shall be allowed to set for at least 14 hours before backfilling, unless a shorter period is specifically approved by the Engineer.
6. After the manhole is backfilled if any joint that develops a leak, it shall be repaired with non-shrink grout to the satisfaction of the Engineer.

E. Lift-hole Sealing

1. Holes required for handling the manhole sections shall be plugged with a non-shrinking grout, or concrete plugs in combination with non-shrinking grout. Finish flush on the inside.

F. Pipe Penetrations and Sealing

1. Factory-cast openings, including pipe seals, shall be appropriately sized for the proposed pipe.
2. Where openings cannot be determined at the time of casting, they shall be cut in the field. The coring diameter shall be a minimum of 2 inches greater than the pipe outside diameter. Field-cut openings shall be circular, not square, and shall be made by the appropriate cutting or coring operation.
3. Flexible watertight sleeves or boots are required for small and mid-size diameter smooth wall pipe penetrations. For large diameter smooth wall pipe penetrations, provide waterstop grouting rings encased in non-shrink grout. Non-shrink grout with waterstop is required for concrete pipe material penetrations. Refer to Section 03300 for waterstop installation around pipe.
4. Care shall be taken to assure that the openings are made to permit setting of the entering pipe at its correct elevation as indicated or directed. Openings which are cut in the field shall be carefully

made so as not to damage the section. Damaged sections will be rejected and shall be replaced at no additional cost to the Owner.

5. Core pipe penetrations prior to setting manhole sections in place to prevent jarring that may loosen mortared joints.

G. Construction of Bench and Channel

1. Manhole inverts shall be brick masonry or concrete and shall have a cross-section shaped to conform to connecting pipes. Changes in channel diameter shall be made gradually and evenly and constructed as indicated and specified.
  - a. Lay bricks as stretchers and on edge.
  - b. Concrete shall conform to Section 03300.
2. The shelf in the manholes shall consist of bricks laid flat. The top of the shelf shall match the elevation of the pipe crown and slope toward the channel.

H. Chimney Construction and Casting Setting

1. The chimney shall consist of brick and non-shrink mortar or pre-cast concrete grade rings and shall be used to adjust manhole frame and cover to final grade.
2. The inside and outside of the chimney shall be sealed with non-shrink grout.
3. Castings shall be thoroughly cleaned and subject to hammer inspection
4. Castings shall be set on the chimney in non-shrink grout that extends 4-inches above the flange making the chimney-casting seam watertight.

3.3 TESTING

- A. Perform visual inspections and vacuum or leakage testing on all installed or rehabilitated structures.
- B. Visual Inspection
  1. The Contractor shall visually inspect each of the sewer manholes installed or rehabilitated during this project in the presence of the Engineer. The Contractor shall repair any defects found until there are no defects or visible leaks.

2. Inspect for visible leakage after backfill with ground water at normal level.
3. Locate visible leakage and repair.

#### C. Vacuum Test

- a. Assemble precast concrete structure, filling lift holes. Prior to constructing inverts, and setting frame and cover, plug all pipes connected to structure. Seal test head to manhole opening and draw a 10-in Hg vacuum. Shut off pump, maintaining a closed valve and record the time it takes for the vacuum inside the structure to drop 1 inch of Hg (9 inches Hg). Compare the time with the allowable duration listed in the table on 15.1.9 – Standard Method for Sewer Manhole Vacuum Test Forms.

#### D. Leakage Tests

##### a. Infiltration Test

- i. Assemble precast concrete structure, filling lift holes. Prior to constructing inverts, allow groundwater to return to a level above the highest joint, and temporarily plug all influent pipes (pneumatic plugs shall not be used on brick pipe). If no water is observed moving down the interior surface, then the structure is satisfactorily watertight.

##### b. Exfiltration Test

- i. Assemble precast concrete structure, filling lift holes. Prior to constructing inverts and backfilling around manhole, plug all pipes connected to structure (pneumatic plugs shall not be used on brick pipes) and lower groundwater table to below the bottom of the base. Fill structure with water. If no water is observed moving down the exterior surface, then the structure is satisfactorily watertight.

- c. In the event a structure does not pass the Leakage Test(s), locate, repair or replace defective manhole segment, and retest. Repeat as necessary at no additional cost to the Owner until the Leakage Rate does not exceed the requirements for the respective Leakage Test.

- E. All inspecting, testing, and reworking within the warranty period shall be provided at no additional cost to the owner.

END OF SECTION 02252

## SECTION 02498

### RESTORATION OF DISTURBED AREAS

#### PART 1 - GENERAL

##### 1.1 SUMMARY

- A. Provide all plant, labor, equipment, appliances and materials, and in performing all operations in connection with restoration to preconstruction conditions of all areas affected by work under this Contract, complete in accordance with the drawings and specifications.

##### 1.2 RELATED WORK

- A. Drawings and general provisions of the Contract, including General and Supplementary General Conditions and Division 1 Specification Sections, apply to this section.
- B. Section 01300 – SUBMITTALS
- C. Section 02900 – LANDSCAPING

##### 1.3 EXCAVATIONS NOT IN PAVED AREAS

- A. Where excavation occurs adjacent to paved streets in shoulders, sidewalks, or in cross-country areas, the Contractor shall thoroughly mechanically compact the backfill and shall maintain the surface as the work progresses. If settlement takes place, the Contractor shall immediately deposit additional fill to restore the level of the ground. In areas adjacent to streets and highways which are not to be loam and seeded, the top 12-inch layer of trench backfill shall consist of compacted dense-blend gravel borrow or sand and gravel as required to match existing conditions. Excavation backfill in unpaved roadways shall have the top 12-inch layer of backfill consist of compacted sand and gravel.
- B. If in the opinion of the Engineer, the top 12-inch layer is unsuitable for use as base course, Engineer may order the Contractor to remove this layer and to provide material that meets specifications.
- C. Loam and seed or sod work shall be performed as specified in Section 02900.

#### PART 2 - PRODUCTS

Not Used

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Remove and reset or replace all fencing, guardrails, trees, shrubs, lawns, posts, curbing, signs, roadways, driveways, sidewalks, and other items which interfere with the progress of the work. Shore, hold, or guy any utility pole as required by the utility company.
- B. Contractor shall make arrangements and notify property owners 72 hours prior to work which will affect their properties and indicate what will be done to restore the area after construction is completed.
- C. Contractor shall notify all utility companies and local, state and federal authorities who will be affected by his work 72 hours prior to beginning work.
- D. Wherever streets, lawns, roadways, driveways or sidewalks within or outside the contract limit lines have been excavated in fulfilling the work required under this Contract, the Contractor shall furnish and install all materials to bring finished surfaces level with the existing adjacent surfaces and returned to its original condition.
- E. If, during the progress of the Work, any water pipe, sewer, conduit, drain, or other utility (public or private) is damaged as a result of operations under this Contract, the Contractor, as determined by the Owner, shall repair all such damage and restore work to its original condition, at no additional cost to Owner.
- F. Restoration work shall be completed to the satisfaction of the Owner. Work not deemed satisfactory by the Owner shall be redone by the Contractor at the Contractor's expense.

END OF SECTION 02498



## SECTION 02500

### PAVING AND SURFACING

#### PART 1 – GENERAL

##### 1.1 DESCRIPTION

- A. Furnish and install paving on all roadway and parking areas as indicated on the Contract Drawings and specified.
- B. Pavement and surfacing shall be constructed in courses as shown on the Contract Drawings and as directed in accordance with these specifications and in close conformity with the lines, grades, compacted thickness and typical cross section shown on the plans.
- C. The Contractor shall take all reasonable measures to assure proper drainage on the final surface of the roadway. Pavement that does not drain properly due to poor workmanship shall not be accepted by the Owner and shall be replaced by the Contractor at no additional cost to the Owner.
- D. Reference is made herein to the Commonwealth of MassDOT, Standard Specifications for Highways and Bridges, latest edition, hereinafter referred to as the "Standard Specifications." All references to method of measurement, basis of payment, and payment items in the standard specifications are hereby deleted. References made to particular sections or paragraphs in the Standard Specifications shall include all related articles mentioned therein.

##### 1.2 RELATED WORK

- A. Division 1- General Requirements
- B. Section 02210 – EXCAVATION, BACKFILL, COMPACTION, DEWATERING AND GRADING
- C. Section 03300 – CAST-IN-PLACE CONCRETE

##### 1.3 SUBMITTALS

- A. Shop Drawings: Submit the following in accordance with the General Conditions of Contract and Section 01300 – SUBMITTALS:
  - 1. Provide copies of materials certificates signed by material producer and Contractor, certifying that each material item complies with, or exceeds, specified requirements.
  - 2. Design Data: Submit design mix for bituminous base, binder, and

top course.

#### 1.4 GRADE CONTROL

- A. Establish and maintain required lines and elevations.

#### 1.5 QUALITY ASSURANCE

- A. The Engineer may require the Contractor to remove at his/her own expense, any defective mix not conforming to the specified job mix formula within the stipulated tolerances. Samples of the actual mixture in use will be taken as many times daily as necessary and the mixtures shall be maintained uniform for the project. The Engineer may suspend further approval for use of the Plant mixtures if the mixtures do not conform to the specified requirements.
- B. Do not place materials when underlying surface is muddy, frozen, or has frost, snow, or water thereon.

#### 1.6 GUARANTEE

- A. During the one-year guarantee period, the Contractor shall maintain the surfacing and shall promptly fill with similar material in compliance with the specifications, any depressions and holes that may occur so as to keep the surfacing in a safe and satisfactory condition for traffic.

### PART 2 – PRODUCTS

#### 2.1 MATERIALS

- A. Gravel Subbase
  - 1. Materials including preparation of subgrades shall meet the requirements of the applicable sections of the Specifications.
  - 2. The gravel subbase shall be used in the upper 1-foot of trench backfill material immediately below pavements and graded in accordance with MassDOT “Standard Specifications” specification section M1.03.1 and applicable subsections of Section 02210 – EXCAVATION, BACKFILL, COMPACTION, DEWATERING AND GRADING.
- B. Class I Bituminous Concrete Base Course
  - 1. Bituminous Base Course and Bituminous Tack Coat shall conform to the applicable subsections of Section 460, Class I Bituminous Concrete Pavement, Type I-1 of the Massachusetts Highway Department’s “Standard Specifications”.

2. Tack coat shall be RS-1 emulsion.
- D. Class I Bituminous Concrete Pavement – Top Course
1. Bituminous Top Course, otherwise known as Hot Mix Asphalt shall conform to the applicable subsections of Section 460, Class I Bituminous Concrete Pavement, Type I-1 of the Massachusetts Highway Department’s “Standard Specifications” for Highways and Bridges, most recent revision.

### PART 3 – EXECUTION

#### 3.1 SUBGRADE PREPARATION AND PROTECTION

- A. Bring subgrade to required grade as necessary prior to placing subbase material.
- B. As directed by the Engineer, over-excavate on-site fill material and any unacceptable materials below the subgrade. Utilize excavating equipment equipped with a toothless or smooth edged, excavating bucket to expose the on-site fill material and unacceptable materials to avoid disturbance of the bearing surface.
- C. Proof roll the over excavated subgrade prior to placing crushed stone.
- D. Backfill the over excavation with crushed stone and compact as indicated in Section 02210 – EXCAVATION, BACKFILL, COMPACTION, DEWATERING AND GRADING.

#### 3.2 PLACEMENT OF SUBBASE

- A. Do not begin placement of subbase and paving work until deficient subgrade areas have been corrected and are ready to receive paving.
- B. Subbase under roadway shall be installed and compacted as covered in the Contract Drawings and in Section 02210 – EXCAVATION, BACKFILL, COMPACTION, DEWATERING AND GRADING.

#### 3.3 CLASS I BITUMINOUS CONCRETE BASE COURSE

- A. Weather Limitations
  1. Apply prime and tack coats when ambient temperature is above 50 deg.F (10 deg.C), and when temperature has not been below 35 deg.F (1 deg.C) for 12 hours immediately prior to application. Do not apply when subbase is wet or contains an excess of moisture.
  2. Base course pavement for temporary pavement may be placed

when air temperature is above 30 deg.F (-1 deg.C) and rising.

B. Placement

1. Base course shall be spread and compacted to a finished thickness indicated on the Contract Drawings. A smooth even surface shall be produced.
2. Base course placement for trench paving shall be performed on a weekly basis or as otherwise approved by the Owner and Engineer. Cold Patch for temporary pavement shall not be allowed with the exception of in an emergency or to cover steel road plate edges.
3. Base course placed as temporary paving shall be maintained until removed prior to final paving.

3.4 CLASS I BITUMINOUS CONCRETE TOP COURSE

A. Weather Limitations

1. Construct asphalt concrete surface course when atmospheric temperature is above 40 deg.F (4 deg.C) and when base is dry.

B. Placement

1. Top course shall be spread and compacted, to the width required in the Contract Documents and to a finished thickness indicated in the Contract Documents. A smooth, even surface shall be produced. Full width overlays shall be installed after the street has been cold planed or as approved by the Owner and Engineer.
2. Apply tack coat at a rate of 0.05 to 0.10 gallons per square yard over the binder course. Apply material to penetrate and seal, but not flood, surface. Cure and dry as long as necessary to attain penetration and evaporation of volatile.

C. Placing Mix

1. Place bituminous concrete mixture on prepared surface, spread and strike-off. Spread mixture at minimum temperature of 225 deg.F (107 deg.C). Place inaccessible and small areas by hand. Place each course to required grade, cross-section, and compacted thickness. Protect all adjacent construction from staining with mix or damage by mechanical equipment. Clean, repair or replace any construction stained or damaged at no additional cost to the Owner.
2. Place pavement in strips not less than 2-feet wide, unless otherwise

acceptable to Engineer. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete binder course for a section before placing top course.

3. The Contractor shall supply an approved Dial Type Asphalt Thermometer (Range 10° C to 260° C) for each paving machine in operation on the project. The thermometer shall remain the property of the Contractor upon completion of the project.

#### D. Rolling

1. Begin rolling when mixture will bear roller weight without excessive displacement. Compact mixture with hot hand tampers or vibrating plate compactors in areas inaccessible to rollers.
2. Breakdown Rolling: Accomplish breakdown or initial rolling immediately following rolling of joints and outside edge. Check surface after breakdown rolling, and repair displaced areas by loosening and filling, if required, with hot material.
3. Second Rolling: Follow breakdown rolling as soon as possible, while mixture is hot. Continue second rolling until mixture has been thoroughly compacted.
4. Finish Rolling: Perform finish rolling while mixture is still warm enough for removal of roller marks. Continue rolling until roller marks are eliminated and course has attained maximum density.
5. Patching: Remove and replace paving areas mixed with foreign materials and defective areas. Cut-out such areas and fill with fresh, hot bituminous concrete. Compact by rolling to match the surrounding surface density and smoothness.
6. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked by wheel traffic.

#### F. Existing Pavement/Joints

1. The edges of existing pavement which is to remain shall be saw cut to an even, straight edge. This includes road and trench edges. Any joints at junction of old and new pavements shall be sealed with an asphalt emulsion and covered with sand.
2. Make joints between old and new pavements, or between successive days' work, to ensure continuous bond between

adjoining work. Construct joints to have same texture, density and smoothness as other sections of bituminous concrete course. Clean contact surfaces and apply tack coat.

G. Compaction

1. The bituminous mixture shall be compacted to at least 95% of the density achieved on the laboratory testing of the design mix for the project. Density will be checked by the Nuclear Density Gage Method, ASTM D2950. Testing shall be completed by Contractor at no expense to Owner for every 200 square yards of surface area placed.

H. Field Quality Control

1. Thickness: Test in-place asphalt concrete courses for compliance with requirements for thickness. Repair or remove and replace unacceptable paving as directed by Engineer, and at no additional cost to the Owner. In-place compacted thickness will not be acceptable if exceeding following allowable variation from required thickness:
  - a. Binder Course: 1/4-inch, plus or minus.
  - b. Surface Course: 1/4-inch, plus or minus.

I. Crack Sealing

1. Crack sealing shall be performed where directed by the Engineer with modified asphalts (e.g. rubber asphalt sealer). Prior to sealing a crack all compressible material shall be removed by high-pressure air or routing. If grass or vegetation is present in the crack the Contractor shall inject a liquid herbicide to prevent future growth. For small hairline cracks, an asphalt slurry mixture type SS-1, SS-1h shall be squeegeed over the surface and forced in the cracks. The slurry shall be maintained at a significant fluidity to be able to flow into the hairline cracks. Sealing of cracks shall be considered to be complete upon review and approval by the Engineer.

J. Liquid Asphalt Emulsion

1. Liquid Asphalt Emulsion shall be applied prior to installation of asphalt as incidental to all pavement pay items. Emulsion shall be AC-20 conforming to AASHTO M226 and shall be applied at a temperature over 38 degrees C by an emulsion truck.
2. The emulsion truck shall have pneumatic tires of such width and

number that the load produced on the surface shall not exceed 12 kg/mm of tire width, and it shall be designed, equipped, and operated so that at an even heat the emulsion may be applied uniformly on variable widths of surface at readily controlled rates from .20 to .90 liters per square meter as directed by the Engineer.

3. The emulsion shall be applied within a pressure range of 0.17 to 0.52MPa. Distributor equipment shall include a tachometer, pressure gauges, volume-measuring devices, and a thermometer for reading the temperature of tank contents. The distributor shall be self-powered and shall be equipped with a power unit for the pump and full circulation spray bars adjustable laterally and vertically.

### 3.5 RAISING AND ADJUSTING CASTINGS

- A. Prior to top course paving, all existing City or Owner owned catch basin and manhole castings and curb and valve boxes shall be raised, if necessary, to the proper grade by the Contractor.
- B. Castings owned by private utilities shall be raised by the responsible utility. The Contractor shall be responsible for coordinating this work.
- C. The method of adjusting these castings shall be as follows: Cut around catch basin or manhole castings a minimum of 8 inches from casting. Excavate and if required rebuild up to 12 inches of masonry below the bottom of the casting. Backfill with suitable material and compact to bottom of casting. Place high, early strength cement or bituminous concrete collar, as directed by the Authority, to approximately 1½ inches below the raised casting grade. Masonry work shall conform to Section 02252 - MANHOLES and Section 02590 – BRICK MASONRY.
- D. The method of raising valve boxes shall be as follows: Cut around valve box a minimum of 8 inches from valve box. Excavate as required and raise the valve box. Pour high early strength cement or bituminous concrete collar, as directed, to approximately 1½ inches below the top of the valve box.

END OF SECTION 02500

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## SECTION 02577

### PAVEMENT MARKINGS

#### PART 1 – GENERAL

##### 1.1 SUMMARY

- A. Furnish and apply pavement markings in accordance with the Commonwealth of Massachusetts Highway Department, Standard Specifications for Highways and Bridges, latest edition, hereinafter referred to as the "Standard Specifications." All references to method of measurement, basis of payment, and payment items in the standard specifications are hereby deleted. References made to particular sections or paragraphs in the Standard Specifications shall include all related articles mentioned therein.
- B. Throughout this Section, "Owner" means the Springfield Water and Sewer Commission, and "City" means the Springfield Department of Public Works.

##### 1.2 RELATED WORK

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Sections apply to the Work of the Section.
- B. Section 02500 – PAVING AND SURFACING

##### 1.3 SUBMITTALS

- A. Shop Drawings: Submit the following in accordance with Section 01300 – SUBMITTALS:
  - 1. Product data and specification submittals.
  - 2. For information purposes only, submit manufacturer's printed installation instructions.

#### PART 2 – PRODUCTS

##### 2.1 MATERIALS

- A. M7.01.03 White Thermoplastic Reflectorized Pavement Markings.
- B. M7.01.04 Yellow Thermoplastic Reflectorized Pavement Markings.

- C. M7.01.23 Fast Drying White-Borne Traffic Paint.
- D. M7.01.24 Fast Drying Yellow-Borne Traffic Paint.
- E. M7.01.18 Preformed Permanent Plastic Pavement Markings or Legend.
- F. M7.01.07 Glass Beads

**PART 3 – EXECUTION**

**3.1 GENERAL**

- A. Apply Pavement Markings as follows:

<b>Material</b>	<b>Material Application Temperature °F</b>	<b>Line Thickness Mils</b>	<b>Reflectorized Application</b>
M7.01.03	400-425	125-188	1lb/10 SF Drop On
M7.01.04	400-425	125-188	1lb/10 SF Drop On

- B. The ambient air temperature for Thermoplastic application shall be minimum of 45°F and rising at the time of marking operations. If work has started and air temperatures fall below 45°F [7.2°C] and continuous cooling is indicated, work shall be stopped. In cool weather conditions, temporary drops in temperature down to 40°F [4.4°C] may be tolerated, providing temperatures also vary upwards. Sustained striping (greater than one hour) at 40°F [4.4°C] shall not be allowed. Starting work at air temperatures lower than 45°F [7.2°C] shall not be allowed.
- C. Apply markings at cross walks and stop lines at the locations directed by the Engineer or as shown in the drawings.
- D. Align new markings to match existing in color, dimensions and spacing, and extend new markings where directed.
- E. Marking widths for crosswalks and stop lines shall be 12 inches, and applied within a tolerance of five percent. Deviation of straight strips shall not exceed ½-inch in 50 feet.
- F. Existing pavement markings no longer required shall be completely removed, by grinding method, prior to placement of any temporary lines.
- G. Pavement markings for crosswalks, fog lines, and stop lines shall be white. Pavement markings for centerlines shall be yellow.

- H. All temporary pavement markings and parking lot markings shall be traffic paint. All permanent pavement markings shall be thermoplastic.

END OF SECTION 02577

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## SECTION 02590

### BRICK MASONRY FOR UTILITIES

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. The work covered under this Section includes the furnishing of all labor, equipment, appliances and materials, and in performing all operations in connection with providing brick masonry, as directed, for furnishing and installing manhole walls, cones, chimneys and corbel sections masonry plugs, manhole benches and for all other necessary appurtenant work complete and accepted in accordance with the Drawings and Specifications and as directed.

##### 1.2 RELATED WORK

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Sections apply to the Work of the Section.
- B. Section 01300 – SUBMITTALS
- C. Section 01400 – QUALITY ASSURANCE
- D. Section 02770 – SEWER MANHOLE REHABILITATION
- E. Section 02767 – CURED-IN-PLACE PIPELINING

##### 1.3 SUBMITTALS

- A. Shop Drawings: Submit the following in accordance with Section 01300.
  - 1. Submit manufacturer specification sheets for and shop drawings for all masonry items, mortar and appurtenances.

##### 1.4 REFERENCES

- A. ASTM C32: Standard Specification for Sewer and Manhole Brick (made from clay or shale),
- B. ASTM C33: Standard Specification for Concrete Aggregate,
- C. ASTM C40: Standard Test Method for Organic Impurities in Fine Aggregates for Concrete,
- D. ASTM C62: Standard Specification for Building Brick (Solid Masonry Units made from Clay or Shale),

- E. ASTM 150: Standard Specification for Portland Cement,
- F. ASTM C207: Standard Specification for Hydrated Lime for Masonry Purposes

## 1.5 QUALITY ASSURANCE

- A. All workmanship shall conform to the best standard practice, and all brick masonry shall be laid by skilled workmen. Brick masonry walls shall be constructed to the thickness indicated.

## PART 2 - PRODUCTS

### 2.1 BRICKS

- A. Bricks for masonry shall be sound, hard, uniformly burned, regular and uniform in shape and size. Under burned or salmon brick are not acceptable. Only whole brick shall be used.
- B. Bricks in general shall be clay or shale brick or similarly naturally occurring earthy substance and subjected to a heat treatment process at elevated temperatures and shall conform in all respects to ASTM C32, latest revision, Grade SS. Bricks that are broken, warped, cracked or of improper size or quality, or otherwise defective shall not be used in the work and shall be removed from the site.
- C. Brick for extending manhole frames to grade shall be concrete brick conforming to ASTM C62.
- D. Bricks for channels and shelves tested so that the mean of five tests for absorption shall not exceed 8 percent and no individual brick exceed 11 percent.

### 2.2 CEMENT

- A. Cement shall conform to the standard specifications for Portland cement of ASTM C150, latest revision, Type II, unless otherwise directed. Whenever directed by the Owner, a quick-setting cement (Type III) shall be used for any desired purpose at no additional cost to the Owner.

### 2.3 SAND

- A. Sand for mortar shall be graded uniformly from fine to coarse and when dry, shall pass a No. 4 sieve and conform to ASTM C33. Sand shall consist of aggregate having clean, hard, durable, strong, uncoated grains and free from injurious amounts of dust, lumps, soft or flaky particles, shale, alkali, organic matter, loam or other deleterious substances. The sand shall be washed clean before loading on delivery trucks. Natural

sand which shows a color darker than the standard color when tested in accordance with the Colorimetric Test for Sands as described in ASTM C40, latest revision, will be cause for rejection.

#### 2.4 LIME

- A. Lime shall be hydrated lime conforming to ASTM C207, latest revision.

#### 2.5 WATER

- A. Mixing water for concrete and mortar shall be clean and free from oil, acid, alkali, injurious amounts of vegetable matter and other impurities. Potable water obtained from a municipal supply is preferable.

#### 2.6 MORTAR

- A. Mortar and mortar plaster shall be composed of one-part Type II Portland cement, and two parts sand to which a small amount of hydrated lime, not to exceed 10 lbs. to each bag of cement, shall be added. Only a sufficient amount of water shall be added to make a stiff plastic mortar of a consistency and texture satisfactory to the Owner. Retempering of mortar in which the cement has started to set will not be permitted.

### PART 3 - EXECUTION

#### 3.1 GENERAL

- A. Masonry shall include brick masonry for manhole walls, cones, chimneys and corbels, plugs for pipes and structures, manhole invert tables, cement mortar plaster on interior and exterior surfaces of masonry walls, mortar and related work. Brick masonry plugs for pipes and structures shall be 8 inches thick, unless otherwise shown or directed. Other brick masonry shall be provided to the details and the dimensions specified, indicated or as directed.
- B. All exterior surfaces of masonry walls shall be plastered with mortar plaster to provide a minimum thickness of 1/2 inch. Mortar plaster shall be applied with sufficient pressure to insure a dense plaster completely filling all voids and thoroughly bonded to the masonry wall. Masonry construction shall be done in a manner to insure watertight construction and all leaks in masonry shall be sealed.
- C. Brick shall be wetted as required and shall be damp but free of any surface water when placed in the work. Bed joints shall be formed of a thick layer of mortar which shall be smoothed or furrowed slightly. Head joints shall be formed by applying to the brick to be laid a full coat of mortar on the entire end, or on the entire sides as the case requires, and then shoving the mortar-covered end or side of the brick tightly against the bricks laid

previously; the practice of buttering at the corners of the brick and then throwing mortar or scrapings into the empty joints will not be permitted. Dry or butt joints will not be permitted. Joints shall be uniform in thickness and shall be approximately 3/8-inch thick. Joints on the inside face of walls shall be tooled slightly concave with an approved jointer when the mortar is thumbprint hard; the mortar shall be compressed with complete contact along the edges so as to seal the surface of the joints. Brickwork shall be constructed accurately to dimensions, and brickwork at top of manholes shall be to the dimensions of the flange of the cast iron frames.

- D. No water shall be allowed to flow against brickwork or to rise on the masonry for 60 hours after it has been laid, and any brick masonry damaged in this manner shall be replaced as directed at no additional expense to the Owner. Adequate precautions shall be taken in freezing weather to protect the masonry from damage by frost. Plaster shall be troweled to a smooth hard finish and no backfill shall be placed until the mortar has thoroughly hardened.

END OF SECTION 02590



## SECTION 02623

### POLYVINYL CHLORIDE GRAVITY PIPE

#### PART 1 – GENERAL

##### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Division 1 Specification Sections, apply to this Section.

##### 1.2 SUMMARY

- A. This section includes the following:
  - 1. Providing and testing of pipe, pipe fittings and specials, jointing materials, and accessories, of various sizes, classes, joints and types, and appurtenant work, at the locations and to the lines and grades as indicated and/or as directed, complete in place, in accordance with the drawings and specifications.
  - 2. The pipe specified under this section shall include all gravity flow sanitary sewers.
- B. Related sections include the following:
  - 1. Section 02210 – EXCAVATION, BACKFILL, COMPACTION, DEWATERING AND GRADING

##### 1.3 SUBMITTALS

- A. Shop Drawings: Submit the following in accordance with Section 01300 - SUBMITTAL:
  - 1. Submit shop drawings or descriptive literature, or both, showing pipe dimensions, joints, joint gaskets, and other details for each size of pipe to be furnished for the project. All pipe furnished shall be manufactured only in accordance with the specifications and the drawings.

##### 1.4 QUALITY ASSURANCE

- A. Provide in accordance with Section 01400 and as specified.

## 1.5 DELIVERY, STORAGE AND HANDLING

- A. Provide in accordance with Section 01610.

## PART 2 - PRODUCTS

### 2.1 General

- A. All PVC pipe and fittings shall be continuously and permanently marked on the outside indicating the manufacturer's name, nominal diameter, applicable ASTM standard conformance, schedule, and pipe or pressure rating or stiffness in psi. All PVC pipe shall be continuously and permanently marked with the manufacturer's name, pipe size, applicable ASTM standard conformance, and pressure rating or stiffness in psi.
  - 1. The Contractor shall also require the manufacturer to mark the date of extrusion on the pipe. This dating shall be done in conjunction with records to be held by the manufacturer for 2 years, covering quality control tests, raw material batch number, and other information deemed necessary by the manufacturer.
- B. Proposed building sanitary services shall have a minimum diameter of 6-inches. Proposed building storm services shall have a minimum diameter of 8-inches. Reconnect to existing building services using pipe stub-outs that match the diameter of the existing lateral.
- C. Sewer lines shall be green in color, or as approved by the Owner.
- D. All pipe furnished shall be either in 13-foot, 18-foot or 20-foot lengths. Straight pipe shall be furnished in lengths according to ASTM D3034

### 2.2 PVC PIPE

- A. PVC pipe installed at depths between 4-feet and 15-feet shall conform to the following requirements for the respective pipe diameters:
  - 1. 4-inch to 15-inch: conform to ASTM D3034 for solid wall PVC. The PVC pipe shall have an SDR ratio of 32.5 and a pipe stiffness of 125 psi.
  - 2. 18-inch and greater: conform to ASTM F679 for larger diameter pipe. The PVC pipe shall have an SDR ratio of 21 and a pipe stiffness of 200 psi.

- B. PVC pipe installed at depths between 16-feet and 30-feet shall conform to the following requirements for the respective pipe diameters:
  - 1. 4-inch to 15-inch: conform to ASTM D3034 for solid wall PVC. The PVC pipe shall have an SDR ratio of 26 and a pipe stiffness of 160 psi.
  - 2. 18-inch and greater: conform with ASTM F679 for large diameter pipes. The PVC pipe shall have an SDR ratio of 21 and a pipe stiffness of 200 psi.
  
- C. Manufacturers :
  - 1. North American Pipe Corporation,
  - 2. JM Eagle,
  - 3. Diamond Plastics Corporation,
  - 4. or equal.

### 2.3 PIPE FITTINGS

- A. All fittings shall conform to the requirements of ASTM D 3034 or ASTM F 679. The bell-and-spigot joint and gasket shall be compatible with PVC pipe ends. The bell shall consist of an integral wall section with a solid cross-section elastomeric gasket securely locked in place to prevent displacement during assembly. Installation of elastomeric gasketed joints and performance of the joint shall conform to ASTM F477, ASTM D3139 or ASTM D3212.
  
- B. The strength class of the fittings shall be not less than the strength class of any adjoining pipe.
  
- C. PVC pipe fittings shall be full-bodied, either injection molded or factory fabricated. Wye fittings shall be furnished in lengths of not more than 3 feet. Saddle wyes are not allowed.
  
- D. Flexible couplings shall be shielded or non-shielded from the following manufactures:
  - 1. Shielded Flexible Couplings:
    - a. 5000 Repair Series; Fernco Inc.,
    - b. Flex-Seal Repair Series: Mission Rubber Company,

c. Heavy Duty Repair Series; Indiana Seal (GPK Products Company),

d. or equal.

2. Non-Shielded Flexible Couplings:

a. Stock and Eccentric Series; Fernco Inc.,

b. Flex-Seal Stock Series: Mission Rubber Company,

c. Stock Series; Indiana Seal (GPK Products Company),

d. Or equal

2.4 PIPE JOINTS

A. All PVC pipe shall be joined by bell-and-spigot, push-on joints unless otherwise shown or specified. The bell shall consist of an integral wall section with a solid cross-section elastomeric gasket securely locked in place to prevent displacement during assembly.

B. Gaskets shall be flexible elastomeric rings securely locked in the joint bell and shall conform with ASTM F 477, ASTM D3139, or ASTM D3212.

2.5 LATERAL CONNECTIONS

A. Connections of sanitary and storm service lines to storm and sanitary main lines shall be made with full bodied tees or wye fittings wherever possible for existing lines less than 18-inches in diameter and with tapping saddles as approved by Engineer for existing lines greater than 18-inches in diameter and in odd sizes.

B. Sewer Service Connections shall consist of a PVC hub, rubber sleeve and stainless steel band.

C. Sewer Service Connection shall be a compression fit into the cored wall of a mainline pipe. Hub shall be made from heavy-duty PVC material.

D. Sewer Service Connection shall be provided with a stainless steel clamping assembly and shall be made from minimum 301 grade stainless steel.

E. Sewer Service Connections gaskets shall be installed by the manufacturer. The manufacturer shall use a water-based solution during assembly. Pipe lube is not allowed.

- F. The Sewer Service Connection's rubber sleeve and gasket, when applicable, shall meet the requirements of ASTM F477, ASTM D3139 or ASTM D3212.
- G. Sewer Service Connections shall be manufactured by Inserta Tee or acceptable equivalent product

## 2.6 INSPECTION, TESTS AND ACCEPTANCE

- A. All pipe delivered to the job site shall be accompanied by test reports certifying that the pipe and fittings conform to the above-mentioned ASTM Specifications. In addition, the pipe shall be subject to thorough inspection and tests, as deemed necessary by the Engineer.
- B. All tests shall be made in accordance with the methods prescribed by the above-mentioned ASTM Specifications, and the acceptance or rejection shall be based on the test results.
- C. The Contractor shall furnish all labor to assist the Engineer in inspecting the pipe. Pipe will be inspected upon delivery, and such as does not conform to the requirements of this contract shall be rejected and shall immediately be removed from the project site by the Contractor.

## PART 3 - EXECUTION

### 3.1 HANDLING PIPE

- A. All pipe shall be stored at the site until installation in a manner which will keep the pipe at ambient outdoor temperatures. Temporary shading shall be provided as required to meet this requirement. Simply covering the pipe which allows temperature build-up when exposed to direct sunlight will not be permitted.
- B. Care shall be taken to avoid damaging the pipe and fittings.

### 3.2 INSTALLATION

- A. Each pipe unit shall be inspected before being installed. No single piece of pipe shall be laid unless it is generally straight. The centerline of the pipe shall not deviate from a straight line drawn between the centers of the openings at the ends of the pipe by more than 1/16-inch per foot of length. If a piece of pipe fails to meet this requirement for straightness, it shall be rejected and removed from the site. Any pipe unit or fitting discovered to be defective either before or after installation shall be removed and replaced with a sound unit.

- B. No pipe or fitting shall be permanently supported on saddles, blocking, or stones. Crushed stone and sand shall be as specified in Section 02210.
- C. Suitable bell holes shall be provided, so that after placement, only the barrel of the pipe receives bearing pressure from the supporting material. Special care shall be taken to hold the trench width at the crown of the pipe to the maximum width indicated in the Trench Detail on the Contract Drawings.
- D. All pipe and fittings shall be cleared of all debris, dirt, etc., before being installed and shall be kept clean until accepted in the completed work.
- E. Pipe and fittings shall be installed to the lines and grades indicated on the Drawings. Care shall be taken to ensure true alignments and gradients.
- F. Before any joint is made, the previously installed unit shall be checked to assure that a close joint with the adjoining unit has been maintained and that the inverts are matched and conform to the required grade. The pipe shall not be driven down to the required grade by striking it with a shovel handle, timber or other unyielding object.
- G. All joint surfaces shall be cleaned. Immediately before jointing the pipe, the bell or groove shall be lubricated in accordance with the manufacturer's recommendation. Each pipe unit shall then be carefully pushed into place without damage to pipe or gasket. Suitable devices shall be used to force the pipe units together so that they will fit with minimum open recess inside and outside and have tightly sealed joints. Care shall be taken not to use such force as to wedge apart and split the bell or groove ends.
- H. Joints shall not be "pulled" or "cramped" unless permitted by the Engineer.
- I. Where any two pipe units do not fit each other closely enough to enable them to be properly jointed, they shall be removed and replaced with suitable units and new gaskets.
- J. Details of gasket installation and joint assembly shall follow the directions of the manufacturers of the joint materials and of the pipe, all subject to review by the Engineer. The resulting joints shall be watertight and flexible.
- K. All premolded gasket joint polyvinyl chloride pipe of a particular manufacturer may be rejected if there are more than five unsatisfactory joint assembly operations or "bell breaks" in 100 consecutive joints, even though the pipe and joint conform to the appropriate ASTM Specifications as hereinbefore specified. If the pipe is unsatisfactory, as determined above, the Contractor shall, if required, remove all pipe of that manufacturer of the

same shipment from the work and shall furnish pipe from another manufacturer which will conform to all of the requirements of these specifications.

- L. Open ends of pipe and branches shall be closed with polyvinyl chloride stoppers secured in place in an acceptable manner.
- M. After each pipe has been properly bedded, enough bedding material shall be placed between the pipe and the sides of the trench, and thoroughly compacted, to hold the pipe in correct alignment. Bell holes, provided for jointing, shall be filled with bedding material and compacted, and then bedding material shall be placed and compacted to complete the pipe bedding.
- N. The Contractor shall take all precautions to prevent flotation of the pipe in the trench.
- O. At all times pipe installation is not in progress, the open ends of the pipe shall be closed with temporary watertight plugs, or by other acceptable means.
- P. If water is in the trench when work is to be resumed, the plug shall not be removed until suitable provisions have been made to prevent water, earth, or other substances from entering the pipe.
- Q. Pipelines shall not be used as conductors for trench drainage during construction.
- R. During backfilling operations, a brightly colored polyethylene tape manufactured specifically for warning and identification of buried utility lines shall be buried 2 feet below the ground surface along the entire length of the pipe from the pumping station to the point of discharge. Tape shall be provided in rolls, 6-inches minimum width, color coded for intended service with warning and identification imprinted in bold black letters continuously and repeatedly over entire tape length. Warning and identification shall be "CAUTION BURIED SEWAGE PIPE BELOW" or similar wording. Code and letter coloring shall be permanent, unaffected by moisture and other substances contained the trench backfill material.

### 3.3 ALLOWABLE PIPE DEFLECTION

- A. Pipe provided under this Specification shall be so installed as to not exceed a maximum deflection of 5.0 percent. Such deflection shall be computed by multiplying the amount of deflection (nominal diameter less minimum diameter when measured) by 100 and dividing by the nominal diameter of

the pipe.

- B. Upon completion of a section of pipe, including placement and compaction of backfill, the Contractor shall measure the amount of deflection by pulling a specially designed gage assembly through the completed section. The gage assembly shall be in accordance with the recommendations of the pipe manufacturer, and be reviewed by the Engineer. The section of pipe must be placed and backfilled for a minimum of 90 days before the deflection can be measured.
- C. Should the installed pipe fail to meet this requirement, the Contractor shall do all work to correct the problem without additional compensation.

### 3.4 CLEANING

- A. Care shall be taken to prevent earth, water and other materials from entering the pipeline. As soon as possible after the pipe and manholes are completed, the Contractor shall clean out the pipeline and manholes being careful to prevent soil, water and debris from entering any existing pipe.

### 3.5 CONTRACT CLOSEOUT

- A. Provide in accordance with Section 01701.

END OF SECTION 02623



## SECTION 02760

### PIPELINE CLEANING AND INTERNAL INSPECTION

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. This Section includes the following:
1. Furnishing, and performing gravity-flow infrastructure cleaning and inspection work for various ranges of pipe diameters ranges in accordance with these Specifications.
  2. Work shall include cleaning and videotaping of existing, reconstructed, rehabilitated, or new sewers and drains, as well as flow handling and/or bypass pumping of existing flows in accordance with Section 02761 – BYPASS FLOW HANDLING as needed to perform the cleaning and inspection.
  3. Requirements for the testing of removed sediment and its proper disposal.
  4. Performing the work in a sequence that is the least disruptive to vehicular and pedestrian traffic and in a manner that shall protect the public from damage to persons and property.
  5. Heavy cleaning is defined cleaning of deposits in the pipeline that require 3 or more passes with the jet nozzle or additional cleaning efforts not categorized as light cleaning. Any damage to the pipe as a result of cleaning method used shall be repaired by the Contractor at no cost to the Owner.
- B. Pre-construction and lining work shall verify or identify pipe defects to be repaired prior to lining, in accordance with Section 02600 – Section 02767 – CURED-IN-PLACE PIPELINING

##### 1.2 RELATED WORK

- A. Section 01010 – SUMMARY OF WORK
- B. Section 01300 – SUBMITTALS
- C. Section 01400 – QUALITY ASSURANCE
- D. Section 01500 – TEMPORARY FACILITIES AND CONTROLS
- E. Section 02761 – BYPASS FLOW HANDLING

F. Section 02767 – CURED-IN-PLACE PIPELINING

1.3 SUBMITTALS

A. Submit the following in accordance with Section 01300:

1. Proposed method of pipe cleaning and dewatering including the equipment to be used and OSHA-compliant confined space entry procedures.
2. Proposed method of managing wastewater, erosion controls, solid waste management, and which, if any, additional permits are required,
3. A list of lawful disposal sites proposed for transport and disposal of debris from cleaning operations.
4. Work Plan including: hours of operation, location of proposed access manholes, sequencing of work description, number of shifts, number of crews, expected time to complete the work, and location for debris disposal.
5. Vehicular and Pedestrian Management Plan including: access, avoiding damage to existing trees, preventing leakage from hoses, and minimizing noise from pumps. The contractor shall reference and provide additional information in the Traffic Management and Control Plan and Temporary Pedestrian Protection and Detour Work Plan submitted in accordance with Section 01570 – MAINTENANCE AND PROTECTION OF TRAFFIC.
6. Weigh slips for all cleaning debris disposed of as part of the work.
7. Internal Inspection Report including:
  - a. Pre-construction internal inspection: After cleaning and CCTV inspection by the Contractor of all proposed infrastructure to be rehabilitated and before beginning any repairs of the infrastructure, the Contractor shall submit one electronic copy of the pre-installation inspection video and inspection report to the Owner/Engineer for review, in accordance with this Section.
  - b. Pre-lining internal inspection logs and video: After completion of pipe repairs by the Contractor of all proposed infrastructure to be rehabilitated and before beginning lining of any infrastructure, the Contractor shall submit one electronic copy of the pre-installation inspection video and inspection report to the Owner/Engineer for review, in

accordance with this Section.

- c. Post-rehabilitation internal inspections logs and video: After the rehabilitation or maintenance of the infrastructure, the Contractor shall submit one electronic copy of the post-installation inspection video and inspection report to the Owner/Engineer for their records, in accordance with this Section.
  - d. Summary highlighting results of the investigations.
    - 1) All documentation shall be cross-referenced by footage meter device to enable the reviewer to identify a particular location being viewed.
    - 2) These records shall be in printed form showing: the Owner's name; type of project; Contractor's name; date; manhole location; depth to invert; section cleaned and televised; the number of lateral connections to the section televised; type (e.g. sanitary sewer, combined sewer, or storm drain); street address and type of all laterals connected to storm drain; diameter of pipe; length of section; exact location(s) of pipeline defects; type of equipment used; and any special remarks concerning the conditions of the pipe line, manholes, and separation plates.
    - 3) Contractor shall identify any deviations from the existing conditions defined in the contract documents.
8. Rehabilitation Report: If the Scope of Work consists of rehabilitation (cured-in-place lining) of existing pipe, the report includes:
- a. Details and documentation for areas in need of point repairs (as per pipe inspection firm, as directed by the Owner). Point repairs shall be completed before rehabilitation of the sewer or drain can commence.
  - b. The post-rehabilitation inspection report shall detail the condition of rehabilitated items and describe recommendations for repair of any defects.
    - 1) All areas where the rehabilitated sewer or drain is defective due to, but not limited to, poor

workmanship and/or chemical deterioration, shall be identified by the Contractor. Contractor shall make all the necessary arrangements to repair the defective area.

- 2) Defective areas shall be repaired in accordance with the manufacturer's recommendations.
  - 3) All repaired areas shall be inspected by the Owner and/or a representative of the manufacturer. Closed-circuit television inspection results shall be provided to the Owner as specified.
  - 4) Once approval of repaired areas has been granted, the Contractor shall return all sewage and/or drain flows to normal, remove all equipment and debris, and restore all disturbed areas to their original conditions, as indicated on the Drawings.
9. An electronic deliverable showing the quality of work obtained by the proposed assembly prior to internal inspection work. The quality of work shall be acceptable to the Owner.

#### 1.4 QUALITY CONTROL

- A. Provide in accordance with Section 01400 and as specified.
- B. The Contractor cleaning and internally inspecting the pipeline shall have completed at least five (5) projects of similar size and complexity as this project in the United States within the past five (5) years. Contractor may employ the services of a subcontractor that specializes in this work to fulfill this requirement.
- C. Rejection of any subcontractor and/or manufacturer by the Engineer due to insufficient qualifications shall not be grounds for modifications to the Contract Documents such as change in scope, time of completion or contract amount.
- D. The sewerage and storm water systems to be cleaned and televised may be equipped with flow metering devices, telemetry hardware or other appurtenant equipment. It is the Contractor's responsibility to verify if this type of equipment is installed within the vicinity of the cleaning and televising operations. If the Contractor encounters this type of equipment, the Contractor shall notify the Owner, so that the Owner may remove this equipment before cleaning and televising operations begin. The Contractor will be responsible for the cost to replace or repair any flow metering devices, telemetry hardware or other appurtenant equipment damaged

during his/her operations.

- E. The cleaning and inspection of the infrastructure may require manned entry in the sewer or drain to place or remove equipment, or to facilitate manual cleaning of the pipeline. All confined space entry procedures must be in compliance with OSHA regulations.

## PART 2 - PRODUCT

### 2.1 VIDEO RECORDINGS

- A. The camera and vehicle assembly shall be an industry standard for internally inspecting pipelines.
  - 1. The camera shall be a Radial View Camera (RVC) able to view 360° and has the capability to pan and tilt in any direction. Picture quality shall be such as to produce a continuous 600-line resolution picture showing the entire periphery of the pipe. Picture quality and definition shall be such that the interior of the pipe can be clearly seen in detail.
  - 2. The camera and appurtenances shall be capable of operation in 100 percent humidity conditions.
  - 3. The camera shall be capable of being moved through the sewer or drain pipe in either direction at uniform slow rate by means of manual cable winches, motorized mechanical equipment of indirect drive type, or carried by Confined Space Certified personnel.
  - 4. The camera vehicle assembly shall be capable of slowing down or stopping at areas of interest.
  - 5. At areas of interest, the camera shall be capable of rotating its lens to obtain a clearer, more direct viewing angle.
  - 6. The camera vehicle assembly shall also have a high intensity light (50 to 100 foot-candles) feature so as to provide the proper amount of light for recording purposes.
  - 7. When a mechanized crawler or floats are used, measurement along the pipeline shall be accurate to 0.10 feet. For large pipes that required personnel to transport the camera, measurement along the pipeline shall be accurate to 1.0 foot.

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Contractor shall perform all work in accordance with municipal, state and federal requirements including OSHA.
- B. Contractor shall obtain relevant permits required to perform work prior to the commencement of construction at no additional cost to the Owner.
- C. Contractor shall maintain the inspection limits dry, bypassing existing flows around the work during cleaning and inspection operations in accordance with Section 02761 – BYPASS FLOW HANDLING.

### 3.2 PIPE CLEANING

- A. The purpose for cleaning of the sewer or drain is to facilitate the inspection and/or rehabilitation of the sewer or drain.
- B. It is the intent of this Contract that sewers or drains be cleaned by either hydroflushing with jetting and vacuum truck, or manual scouring using pressure washing and vacuum truck.
  - 1. Hydraulic equipment shall consist of high velocity type equipment, capable of jetting up to 2,000 psi and 125 gpm of water. No hydraulic equipment that operates under a “head of water” or that would cause excessive internal pressure shall be permitted without written approval of the Engineer.
  - 2. Pipe cleaning requiring cleaning of deposits in the pipeline that require 3 or more passes with the jet nozzle or additional cleaning efforts not categorized as light cleaning. Contractor shall require written authorization from the Engineer (or Owner’s Representative) prior to using this item.
- C. The sewer shall be cleaned using mechanical, hydraulically-propelled, and/or high-velocity pipe cleaning equipment, which does not exert internal pressures great enough to damage sewer or drain pipe and manholes. Selection of the cleaning equipment shall be based on the condition of the sewer or drain at the time work commences based on the Pre-rehabilitation/cleaning inspection. The equipment and methods selected shall be reviewed by the Owner.
- D. Satisfactory precautions shall be taken to protect the sewer or drain from damage that could be inflicted by improper use of cleaning equipment. Any damage inflicted upon the sewer or drain due to improper use of cleaning equipment, regardless of the technique used, shall be repaired by the Contractor to the satisfaction of the Owner, at no additional cost to the

Owner.

- E. If areas of misalignment of pipe, dropped joints, infiltration, structural failures, or other obstructions are suspected during cleaning operations, and confirmed during exploratory televising, the Contractor shall record the approximate location of the defective area and notify the Owner.
- F. All sludge, dirt, sand, rocks, grease, and other solid or semi-solid materials that may cause an obstruction in the sewer or drain or impair the inspection or rehabilitation of the sewer or drain shall be removed from the sewer or drain and site during cleaning operations (at least once each work day) in suitable watertight containers, and disposed of in a manner acceptable to the Engineer and in strict conformance with all applicable federal, state, and local laws and regulations, at no additional cost to the Owner. It shall be the responsibility of the Contractor to secure a legal dump site for the disposal of the material.
  - 1. The Contractor shall collect all data required by all permits or their issued conditions. It shall consist of periodic sampling and analysis of system effluents and discharge quantities.
- G. All amounts of sludge, dirt, sand, rock, roots, grease, and other solids or semi-solid material shall be removed from the pipe interior with a collection device and disposed of by the Contractor at no additional cost to the Owner. All such material, may cause an obstruction or impair in the inspection or rehabilitation of the sewer, and shall be flushed downstream and removed at each downstream manhole of the reach being cleaned with a collection device.
- H. Clean-up operations shall include all removal of debris out of manholes and off the ground around manholes and access pits. The Contractor shall not be allowed to accumulate debris and cleaning discharge materials on the project site unless stored in totally enclosed watertight containers approved by the Owner.
- I. Acceptance of the sewer cleaning shall be made upon the successful completion of the television inspection and shall be to the satisfaction of the Engineer. For the purposes of these specifications cleaning prior to lining shall be considered complete based on the CIPP material manufacturer's recommendations. If the television inspection indicates that the cleaning has not been completed in accordance with these Specifications, the Contractor shall be required to re-clean and re-inspect the sewer or drain line until the cleaning is shown to be satisfactory, at no additional cost to the Owner. The Owner may require the Contractor to pull a double squeegee (with each squeegee the same diameter as the sewer or drain) through each manhole section as evidence of adequate cleaning. Particular attention should be given to the adequacy of the cleaning to provide for the

proper installation of the lining system. Refer to Section 02767 – CURED-IN-PLACE PIPELINING

- J. The Contractor shall be responsible for locating and uncovering all known buried manholes required to complete the work at no additional cost to the Owner.
- K. Maintain flow around the work in a manner that will not cause excessive surcharging of sewers or drains, and that will protect the public and private property from damage and flooding. Bypass pumping may be required to comply with this task. Refer to Section 02761 – BYPASS FLOW HANDLING for the anticipated flow through the system and weather restrictions.
- L. No debris, equipment, tools, or other foreign matter shall be left in the sewers, drains and manholes, or at the work sites, as a result of the Contractor's operations.
  - 1. A manhole may be used as a temporary collection point for debris. The debris shall be completely removed from the manhole by a vacuum truck, clamshell or other mechanical means before televising any type of pipe. Sandbags, or suitable equal, may be required to prevent flushed material from continuing downstream.
  - 2. Any debris that migrates past the Contractor's efforts to collect the loosed material and then deposits in downstream pipes shall be removed from the pipes at no additional costs to the Owner per Section 01500.
- M. All amounts of sludge, dirt, sand, rock, roots, grease, and other solids or semi-solid material shall be removed from the pipe interior with a collective device and disposed of by the Contractor at no additional cost to the Owner. All such material, may cause an obstruction or impair in the inspection or rehabilitation of the sewer or drain, and shall be flushed downstream and removed at each downstream manhole of the reach being cleaned with a collection device.
- N. All of Contractor's personnel shall be thoroughly familiar with all phases of sewer or drain line cleaning to ensure optimum performance, without causing damage to the sewer, drain, manholes, and appurtenances.
- O. When water from fire hydrants is necessary to avoid delay in normal work procedures, the water shall be conserved and not used unnecessarily. No fire hydrant shall be obstructed at any time, nor shall a hydrant be used for the work described in these Contract Documents, unless a reduced pressure backflow preventer is provided by the Contractor and prior approvals have been obtained from the City of Springfield Fire Department for use of the



fire hydrant. Use of the backflow prevention device shall be in accordance to Massachusetts Department of Environmental Protection (DEP) Regulation 310. CMR 22.22 and the OWNER's Cross Connection Control Program. The Contractor shall be responsible for all related charges for the set-up, including the water usage bill. All expenses shall be considered incidental to the cleaning of the existing sewer or drain.

P. During the course of cleaning, when obstructions are encountered, an attempt shall be made to clean from both the upstream and downstream manholes. Should the obstruction(s) prevent the line from being cleaned, the Engineer shall be immediately notified. If, in the opinion of the Engineer, a repair is required to facilitate cleaning, cleaning shall be completed upon satisfactory completion of the repair. The repair may be completed by the Owner or completed by the Contractor as a change order. No additional compensation will be paid to the Contractor for any portion of the sewer/drain, which requires re-cleaning after successful completion of the repair.

Q. Approved type of equipment for pipe cleaning shall include, at a minimum, the following:

1. High velocity equipment shall have a minimum of 800 feet of high-pressure hose and carry its own water tank, auxiliary engines and pumps and hydraulically driven hose reel. Install a gauge to indicate working pressure on the discharge of high-pressure water pumps.
  - a. For unmanned jetting method, two or more high velocity nozzles shall be available. The nozzles shall be capable of producing a scouring action for 15 degrees to 45 degrees in all size lines designated to be cleaned. All controls shall be located so that the equipment can be operated above ground.
  - b. For manned pipe and manhole cleaning method, a high velocity gun shall be capable of producing flows from a fine spray to a long distance solid stream. Hand tools or intrinsically safe power tools may also be required.
2. Mechanical cutting device suitable for root removal shall be available for use as necessary.
3. Footage metering devices shall be used for location of all equipment, devices, points of reference, on measuring target that is known at all times at the ground level. Footage metering device shall be designed so that distance recorder can be set at zero when equipment or device is at entrance of pipe inside manhole. Entering device shall have an occurrence of not less than one-tenth of a foot. Marking of cable, or similar means, that require interpolation of

depth of manhole shall not be permitted. The accuracy of the metering devices shall be checked daily by the Contractor by the use of a walking meter, roll-a-tape, or other suitable device.

- R. The Contractor shall be responsible for removal of any equipment that may become lodged or hung up in the system being cleaned. The Contractor will not be reimbursed for work, including television inspection, required to retrieve lost equipment.
- S. The walls and inverts of all manholes within the reaches of lines shall be cleaned thoroughly with a high velocity water spray.
- T. Do not allow solids removed in the cleaning process to be released onto streets or into ditches, surface waters, catch basins, cleanouts, storm drains, or sewer or drain manholes.
- U. Acceptance of sewer and storm drain cleaning work is subject to review by the Engineer. If visual inspection or internal television inspection shows solids, soil, sand, grit, or other debris remaining in the line, cleaning will be considered unsatisfactory. Repeat cleaning, and inspection of the storm drain line until the Engineer judges cleaning satisfactory.
- V. Repair manholes dismantled or damaged during the cleaning process and replace manhole frames and covers damaged during the cleaning process.

### 3.3 CLOSED CIRCUIT TELEVISION

- A. The method of internal inspection of pipelines and manholes is dependent on pipe size. The height of the camera shall be a level that is within the middle third of the pipe, preferably at the springline to equally capture the crown and invert of the pipe. The camera shall be at a level that can look up the first 12 inches of service laterals.
  - 1. Where permitted, the preferred method of inspection shall be by use of a robotic camera vehicle assembly, capable of being controlled from an aboveground command center.
  - 2. For larger pipes where the height of the camera crawler can't not be adjusted to the middle of the pipe, the inspection shall be obtained by use of manned entry and "walking the pipe".
- B. The Contractor shall follow all OSHA standards or other applicable regulations related to work in confined spaces.
- C. The Contractor shall provide to the Owner two (2) sets of electronic deliverables of all internal inspections.
  - 1. All field electronic deliverables must be submitted in a casing with

the names of all streets displayed on the front and side cover with field reports.

2. All final reports submitted along with the electronic deliverable must be bound together using an approved method, have street names with electronic deliverable numbers listed in alphabetical order along with the project title on the cover and have a clear plastic cover on the front. Electronic deliverables must be clearly labeled so that future viewers will be able to easily identify at any point of the video what location and type of sewer line was televised. The street address and type of all lateral connections to the storm drain shall be verbally noted on the electronic deliverable and in the report.
- D. The reporting of observations during the TV inspection of sewer and drains from one manhole to the next, and the database shall follow the format published in the Pipeline Assessment and Certification Program (PACP) as developed by the National Association of Sewer Service Companies (NASSCO). The Owner may require additional database fields.
1. At the beginning and end of each continuous pipeline inspection, the total pipeline shall be described by the narrator stating the size, type, start and end location, street name, intersecting street, invert elevation, and limits of each pipe section.
- E. The Contractor shall utilize the Commission's manhole identification numbering system when reporting the results of TV inspections. Contractor shall also provide written description or site map of each manhole such that the location of the manhole is clearly defined and retrievable. If a buried manhole is discovered during the televising of any mainline, the Contractor should allocate a new manhole number (supplied by Owner) and record it.

### 3.4 PROCEDURES

- A. Prior to the internal inspection work, the Contractor shall be responsible for diverting all flows from the area to be inspected. Prior review and approval by the Engineer of the Contractor's intended methods shall be required for any flow control, diversion, bypassing, or dewatering activities.
- B. During the internal inspection of pipelines, the Owner shall be able to view the pipe interior as it is being inspected on a TV monitor set up in the command center.
- C. All video recordings must, by electronic means, display continuously and simultaneously generated transparent digital information to include the date of recording, street name, pipe diameter, access manholes ID number, and the linear footage of the television crawler location. Below, is a sample of

the text to be displayed on the screen.

**Example:** York Street M040CI → CSO 016  
84” CSO  
06-13-2017 210’ 7”

- D. All video recordings of manholes and structures shall have a time, date, and location display, as detailed in paragraph 3.3.D of this Section.
- E. All inspections including videos and inspection reports shall be documented in electronic deliverables.
- F. During the inspection, the camera shall be stopped at the points where one or more of the following conditions are observed:
  - 1. Infiltration/Inflow Sources
  - 2. Lining Defects
  - 3. Structural Defects, including broken pipe, collapsed pipe, cracks, and all other structural abnormalities.
  - 4. Abnormal joint conditions, such as root intrusion, protruding pipes, in-line pipe size changes, mineral deposits, grease, obstructions, etc.
  - 5. Pipe Connections
  - 6. Obstructions, offset joints, misalignments, or other conditions that may affect pipe bursting, slip-lining or cured-in-place pipe rehabilitation operations.
- G. All such conditions shall be recorded and shall be considered a point repair if the conditions inhibit rehabilitation work. Color photographs of all questionable conditions shall be taken and labeled as to location, condition, and date for subsequent review.
- H. The Contractor will take and label still pictures for all extruding laterals, any locations where sections of the sewer pipe are missing or the pipe is near collapse or whenever directed by Owner. The Contractor shall provide a sketch showing tie distances from at least three permanent features to the starting and ending manhole. A distance between the starting and ending manhole, as measured on the ground, shall be provided.
- I. For large pipe that exceed the limits of the mechanical crawler and required manned entry to “walk the pipe”, intrinsically safe 2-way communication must be maintained between entrant(s) and spotter(s) and also between entrant(s) and command center to facilitate procedure in Paragraphs 3.3.G

and 3.3.H of this Section.

1. Care shall be taken to accurately measure the footage throughout the inspection. If measurements recorded via cable length is inaccurate due to slack created while “walking the pipe”, distances shall be obtained by alternate means (e.g. intrinsically safe laser measuring) and recorded in the written logs as such. Verbal correction on the audio track shall override any conflicting digital footage on the video display.
- J. The Contractor shall be responsible for access to the sewer or drain system, including; locating, uncovering, and opening manholes, flow control diversion bypassing and/or dewatering within manholes, or pipe reaches, dewatering, surface restoration, and all other work required to perform the specified work to the Engineer's satisfaction.
- K. All internal inspections shall be performed by a firm specializing in large diameter sewer/drain line inspections and shall be witnessed by representative of the Pipelining Manufacturer (when applicable) and the Owner/Engineer.

### 3.5 DYE TRACING

- A. In the event that a building or catch basin lateral requires dye tracing confirmation during the time of the television inspection, the Contractor shall coordinate the private property access with the television operations.
- B. The Contractor shall introduce the dye into the system (e.g. catch basin, internal plumbing) and be responsible for recording the test result and providing to the Owner.

### 3.6 ACCEPTANCE

- A. Internal inspection operations, both pre- and post-construction/cleaning, shall be considered for approval upon receipt by the Owner of the following:
  1. An electronic deliverable of the internal inspection reports and videos including: showing pipelines, manholes, and structure inspections, and photographs complete with location, time, and date stamp depicting all information described in Paragraph 3.4.G in this Section.
- B. The rehabilitated sewer or drain shall not receive acceptance until final approval by the Owner.

END OF SECTION 02760

## SECTION 02761

### BYPASS FLOW HANDLING

#### PART 1 - GENERAL

##### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Division 1 Specification Sections, apply to this Section.

##### 1.2 SUMMARY

- A. This Section includes the following:
  - 1. Furnishing all plant, labor, equipment and materials, as well as performing all operations associated with handling bypass flows from the existing system around the work indicated on the Drawings in accordance with these Specifications.
  - 2. Maintaining flow from main pipelines without interruption of service, and maintaining flow in lateral connections with minimal interruption of service.
  - 3. Performing the work in a sequence that is the least disruptive to vehicular and pedestrian traffic and in a manner that shall protect the public from damage to persons and property.
- B. Related Sections include the following:
  - 1. Section 02210 – EXCAVATION, BACKFILL, COMPACTION, DEWATERING AND GRADING
  - 2. Section 02622 - HDPE GRAVITY PIPE
- C. Contractor shall design the bypass flow handling system.

##### 1.3 SUBMITTALS

- A. Submit the following in accordance with Section 01300– SUBMITTALS:
  - 1. Shop drawings and/or manufacturer’s descriptive literature indicating materials, equipment and methods to complete bypass flow handling operations.
  - 2. A Bypass Pumping Work Plan complete with Certificate of Design Certified by a Professional Engineer registered in the

Commonwealth of Massachusetts for each site in which bypass pumping is proposed which includes the following proposed items:

- a. Location, configuration and cross-country routing of bypass flow handling pipes and hoses and anticipated duration at each site including suction and discharge location.
- b. Manufacturer's shop drawings and descriptive literature for the following equipment:
  - i. Proposed pump(s) indicating; materials, flow curves, equipment and accessories;
  - ii. The proposed bypass pipe(s) and hose(s), suction line(s), header(s), and discharge line(s) indicating diameter(s), material(s) and quantity;
  - iii. Temporary plugging mechanisms
- c. Calculations for sizing/estimating the following:
  - i. Pump(s);
  - ii. Generator(s) and/or power source(s);
  - iii. Suction and discharge piping;
  - iv. Temporary pipe supports;
  - v. Temporary pump plugging or bulkheading including the anticipated time for activating and deactivating along with the method(s) to restrain plug(s) in the event of plug failure;
  - vi. Bypass Pumping System Average and Maximum Daily Flows;
  - vii. Static lift, friction losses, and flow velocity
- b. Staging area(s) for pumps and other equipment.
- c. Upstream flow collection location and/or bulkheads.
- d. Downstream discharge location.
- e. Method of protecting structures that accept discharge flows.

- f. Locations of individual bypass flow handling systems.
  - g. Sample notification of property owner service shutdown.
  - h. Traffic management plan.
  - i. Roadway crossing details including hose ramps or trench details.
  - j. Noise pollution abatement plan.
3. List of 24-hour emergency telephone numbers at which the Contractor may be reached.
- B. Contractor shall submit a Certificate of Design (refer to SECTION 01300 – SUBMITTALS) for the bypass flow handling system.  
2010 Flow records from the flow meter located at the intersection of Alden Street and Bonnyview indicate high flow periods of 4 to 6 MGD. See 1.3.D for 2023 dry-weather flows and wet-weather flows during select storm events provided solely for the purpose of showing the general increase in flows during wet weather. Actual flows during this project may be lesser or greater than these and there will be no additional cost associated with the need to bypass pump flows in excess as these shown in the table.

Contractor to observe flows prior to completing flow bypass design and shall be responsible for the design of the following system components:

- 1. Pumps.
- 2. Generators and power sources.
- 3. Suction and discharge piping.
- 4. Temporary pipe supports and anchoring.
- 5. Pipe plugging and bulkheads.
- 6. Noise control equipment.
- 7. Calculation of average and maximum daily flows.
- 8. Calculations of static lift, friction losses, flow velocity and flow rate.
- 9. Systems testing and start-up.
- 10. Maintenance of system for off-construction hours.



- 11. Contingency plan and equipment for system failures.
- C. Contractor shall submit complete documentation of qualifications as specified herein.
- D. 2023 dry-weather flows and wet-weather flows during select storm events:

SMH ID#	Sewer Type	Pipe Size (in)	Dry-Weather Flow				Storm Events	
			ADWF (MGD)	ADWF Flow Depth (in)	PDWF (MGD)	PDWF Flow Depth (in)	3-month, 24-hr (MGD)	2-yr, 24-hr (MGD)
B57	Sanitary	24"	0.41	8.64	0.49	9.6	-	-
434E	Sanitary	39"	2.69	8.64	3.30	9.6	-	-
792	Sanitary	36"	2.28	8.64	2.81	9.6	4.0	4.8

1.4 QUALITY ASSURANCE

- A. Provide in accordance with Section 01400 and as specified.
- B. The Contractor designing and installing the bypass flow handling system shall have completed at least five (5) projects of similar size and complexity as this project in the United States within the past three (3) years. Contractor may employ the services of a subcontractor that specializes in this work to fulfill this requirement.
- C. Rejection of any subcontractor and/or manufacturer by the Engineer due to insufficient qualifications shall not be grounds for modifications to the Contract Documents such as change in scope, time of completion or contract amount.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Provide in accordance with Section 01610.

PART 2 - PRODUCTS

2.1 EQUIPMENT

- A. The bypass flow handling equipment shall be of sufficient size and material to convey existing flows from one access structure to at least the next access structure immediately downstream of the work without overflow, spillage or discharge to the surrounding environment.

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- B. The bypass flow handling system shall pass a test run before putting in to use. The test run duration shall be equivalent to anticipated duration of the CIPP lining or manhole install, whichever is longer.
- C. Contractor shall keep one bypass flow handling system operator on site (24 hours per day and 7 days per week) while the bypass flow handling system is in use. The operator shall be fully equipped to operate and respond to any repair or replacement of the system.
- D. Contractor shall incorporate noise reduction equipment to minimize impact on the surrounding environment. Such measures shall include insulated enclosures, hospital grade silencers or mufflers, equipment modifications and/or special equipment to limit noise to eighty (80) dBA at seven (7) feet or sixty (60) dBA at the nearest residence or business.

## PART 3 – EXECUTION

### 3.1 PREPARATIONS

- A. Contractor shall perform all work in accordance with municipal, state and federal requirements.
- B. Contractor shall obtain relevant permits required to perform work prior to the commencement of construction at no additional cost to the Owner.
- C. Prior to the commencement of construction, Contractor shall perform all possible preparatory work. The Contractor shall, at all times, conduct operations to interfere as little as possible with existing flows.
- D. Contractor shall verify flow conditions in the existing system prior to the commencement of construction. The Contractor shall have no claim for additional compensation by reason of delay or inconvenience in adapting its operations to the need for maintaining existing flows.
- E. Twice, prior to start-up of bypass flow handling system, Contractor shall notify, in writing, each property owner whose service shall be temporarily shut down within seven (7) days prior to the shut down and twenty-four (24) hours prior to the shut down. Contractor shall prepare notifications in accordance with Owner's requirements.

### 3.2 GENERAL

- A. Contractor shall design the layout and routing of the bypass flow handling system to minimize disturbance to public and private land and to maintain access for pedestrians and traffic.

- B. The Contractor shall maintain traffic throughout the duration of bypass flow handling in accordance with the requirements of the “Manual on Uniform Traffic Control Devices”, latest edition.
- C. If excavation is required across roadways, all work shall be performed in accordance with municipal and/or state requirements.
- D. Contractor shall check weather patterns and plan bypass operations to occur during dry periods whenever possible. Contractor shall notify Owner of bypass startup at least (1) week in advance
- E. Contractor shall furnish, install, maintain and operate all temporary facilities such as dams, pumping equipment, conduits and all other labor and equipment necessary to intercept the flow before it reaches points where it would interfere with the work.
- F. Contractor may utilize pipelines in an existing parallel system as an alternative to installing a full bypass flow handling system pending approval by the Engineer and the Owner. Contractor shall submit a Certificate of Design prior to utilizing the parallel system and shall restore the parallel system to pre-construction conditions upon completion of construction.
- G. Contractor shall design, furnish and install individual bypass flow handling systems for flowing lateral connections or high occupancy buildings.
- H. Upon completion of construction, the Contractor shall remove plugging and/or bulkheads in a manner that permits the existing flows to slowly return to pre-construction conditions and prevent surcharging, flooding or causing any other disturbances downstream.

### 3.3 CONTRACT CLOSEOUT

- A. Provide in accordance with Section 01701.

END OF SECTION 02761

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## SECTION 02767

### CURED-IN-PLACE PIPELINING

#### PART 1 - GENERAL

##### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Division 1 Specification Sections, apply to this Section.

##### 1.2 SUMMARY

- A. This Section includes the following:
  - 1. Inspecting and measuring the interior of the pipe to be lined.
  - 2. Grout sealing of leaks which may interfere with installation and/or curing of the lines. Sealing shall include all required materials including packers.
  - 3. Furnishing all plant, labor, equipment and materials as well as performing all operations associated with the installation of cured-in-place pipelining (CIPP) inside the existing pipeline where indicated on the Drawings and in accordance with municipal, state and federal requirements, including OSHA, and these Specifications. Including excavated point repairs, trenchless CIPP spot repairs or otherwise.
  - 4. Furnishing all plant, labor, equipment and materials as well as performing all operations associated with the rehabilitation of identified active sewer laterals extending from a mainline sewer towards the house with a sealed connection without the need of a cleanout.(NA)
  - 5. Performing the work in a sequence that is the least disruptive to vehicular and pedestrian traffic and in a manner that shall protect the public from damage to persons and property within the limits and for the duration of the work.
  - 6. Handling and disposal of discharge water from the CIPP curing operation.
- B. Related Sections include the following:
  - 1. Section 02210 – Earth Excavation, Backfill, Fill and Grading
  - 2. Section 02760 – Pipeline Cleaning and Internal Inspection
  - 3. Section 02761 – Bypass Flow Handling

##### 1.3 SUBMITTALS

- A. Submit each item in this article according to the conditions of the Contract and Division 1, Section 01300 – Submittal Procedures.
- B. After Notice to Proceed, and before beginning Pre-inspection work in preparation for CIPP construction, the Contractor shall submit:

1. Shop drawings and/or manufacturer's descriptive literature indicating materials, equipment and methods specific to this project to be used to complete CIPP operations.
  - a. Material Safety Data Sheets (MSDS's) for all materials used during preparation and installation.
  - b. Certification stating that the Contractor is fully licensed by the CIPP manufacturer (if different).
  - c. Method(s) and equipment for repairs of any uncured areas, defects, and test sample section repairs or other deformities in the completed product.
  - d. Certified copies of all test reports on the material properties of the cured liner by the material manufacturer indicating that the supplied materials conform to the design criteria used in calculating the liner thickness.
  - e. For UV cured CIPP liners provide CIPP System Manufacturer's product specific data for the glass fiber tube for this project; including the maximum allowable pulling force that will not damage the tube or compromise the physical properties of the finished CIPP liner.
  - f. Description of odors anticipated as a result of the curing process and methods to mitigate odors to prevent migration outside of the pipeline.
  - g. Confined Space Entry Certifications for all Contractors' personnel entering pipeline or access structures.
  - h. Name(s) of all supervisory personnel to be directly involved with each cured-in-place pipelining method of pipe rehabilitation for this project. Supervisory personnel shall meet the experience requirements listed under Section 1.4 of this specification. Attach resumes of each person named. Resume information shall include, as a minimum, educational background, the number of years in a supervisory capacity and a list of projects worked on within the past five years, describing the type of construction, project description, complexity, and contract amounts.
  
2. A work plan to include the following items:
  - a. Details and description of construction methods and any intended variances from the specified methods, materials, equipment, and process description, including on-site or off-site tube wet out, insertion procedure, curing and cool down procedure, access structures and lateral connection details, method of cutting lateral connections, method for sealing ends of liner and lateral cut-outs, water sources and method of cure-water/steam discharge.
  - b. Description of surface activities including access structures, staging and inversion locations.

- c. A plan for maintaining vehicular and pedestrian access, avoiding damage to existing trees, preventing leakage from hoses, and minimizing noise from pumps.
  - d. A description of the process or technique(s) to be used to progressively round the liner tube to remove all trapped water between the liner pipe and the existing pipe.
  - e. Detailed action plan and description of techniques and equipment used in the event of odor migration into public and/or private property (indoors as well as outdoors).
  - f. Traffic and pedestrian management plan.
  - g. A written description of curing water or steam condensate disposal method, if one of these methods is proposed to be used.
  - h. The name, address, and EPA identification number of the transporter and disposal facility in the event a treatment or disposal facility is used for cure water discharge. Test results and disposal documentation from the facility shall also be submitted.
    - i. The Contractor shall submit method of repair of any rejected inversion/installation length for review and approval by the Owner prior to any such repair or replacement.
- C. After Pre-Inspection, and prior to CIPP installation, the Contractor shall submit:
- 1. Pre-installation inspection videos and reports as specified herein.
  - 2. Design calculations specific to each inversion. The submittal shall provide documentation supporting the basis of the values used in the design calculations. The calculations shall be prepared and stamped by a Professional Engineer registered in the state within which the work shall take place in accordance with the requirements of ASTM F1216. For pulled-in systems, Contractor shall submit design calculations for the maximum allowable pulling force on tube as well as the type of equipment and monitoring provisions to measure such forces during installation.
  - 3. Curing tables indicating resin\liner manufacturer's recommended water\steam temperature during the cure period; or for UV cure systems the UV lamp firing rate, pull back speed, air pressure, and liner surface temperature for the liner diameter, thickness and length to be installed. Curing tables for UV systems shall specifically indicate the acceptable liner surface temperature range which will assure that the cure will complete.

4. A certification stating that the sources of all lateral connections identified during internal inspection have been investigated within the pipeline as well as in adjacent buildings and structures and that the Contractor has secured these connections to prevent the migration of odors.
- D. The Contractor shall submit curing logs within 24 hours of cool-down completion for each inversion consisting of the specified monitoring reports from the curing process.
- E. For UV cured CIPP liners the Contractor shall also submit hardening documentation in the form of a contemporaneous logging of the light intensity(s) and length of exposure time as the light train moves along the length of the subject reach of pipe. This log shall also be imprinted with the air pressure maintained inside of the liner during the hardening process. The data shall be recorded in a digital format that is tamper proofed.
- F. The Contractor shall submit final CIPP testing reports and post construction inspection videos and reports after CIPP construction as specified herein.

#### 1.4 QUALITY ASSURANCE

- A. Provide in accordance with Section 01400 and as specified herein.
- B. The Contractor installing the CIPP system shall have completed at least three (3) projects, in the United States, within the past two (2) years and projects that included CIPP installation lengths of at least 600 continuous linear feet, on-site or off-site wet-out or resin impregnation of the liner tube, and design and installation of at least 36-inch diameter CIPP with a wall thickness based on a fully deteriorated condition.

Note: A combination of projects satisfying each of the above provisions may be acceptable as long as two (2) projects have been successfully completed for each provision.

- C. Supervisory personnel shall have a minimum of five (5) years experience and shall have completed at least two (2) projects of similar size and complexity as this project in the United States within the past five (5) years. Resume information shall include, at a minimum, educational background, the number of years in a supervisory capacity and a list of completed projects within the past five (5) years, including project description, complexity and contract total amounts.
- D. Rejection of any subcontractor and/or manufacturer by the Engineer due to insufficient qualifications shall not be grounds for modifications to the Contract Documents such as change in scope, time of completion or contract amount.
- E. Designated supervisory personnel shall be directly involved with and used on this project. Substitutions of personnel will not be allowed without written authorization of the Engineer.



- F. At the time of manufacture, inspect each lot of liner for defects. At the time of delivery, the liner shall be homogeneous throughout, uniform in color, free of cracks, holes, foreign materials, blisters, or deleterious faults.
- G. All Contractor's personnel entering pipeline or access structures shall be Confined Space Entry trained per OSHA, Title 29 CFR 1910.46 and shall have a copy of their certification available on site at all times.
- H. The CIPP liner shall be designed/stamped/signed by a Professional Engineer licensed in Massachusetts.

## 1.5 ASTM STANDARDS

- A. CIPP work and materials shall comply with all applicable sections of the following ASTM standards.
  - 1. ASTM D790 – Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
  - 2. ASTM D2412 – Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading.
  - 3. ASTM D2990 – Standard Test Methods for tensile, compressive, and flexural creep and creep-rupture of plastics
  - 4. ASTM F1216 – Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube.
  - 5. ASTM F1743 – Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Pull in and inflate and Curing of a Resin-Impregnated Tube.
  - 6. ASTM F2561 – 06 Standard Practice for Rehabilitation of a Sewer Service Lateral and Its Connection to the Main Using a One Piece Main and Lateral Cured-in-Place Liner
  - 7. ASTM – D5813 Standard Specification for Cured-in-Place Thermosetting Resin Sewer Pipe
- B. If conflicts exist between the specifications and the above-referenced standards, the more stringent requirements, as determined by the Engineer, shall apply.

## 1.6 PRODUCTS, MATERIALS AND EQUIPMENT

- A. Provide in accordance with SECTION 01610 - Delivery, Storage and Handling.

## 1.7 WARRANTY REQUIREMENT

- A. As a minimum, all project work and components shall be warranted for one (1) year from the date of substantial completion or Authority's acceptance.
- B. **Related Damages and Losses:** When correcting warranted Work that has failed, remove, and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.
- C. **Reinstatement of Warranty:** When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
- D. **Replacement Cost:** Upon determination that Work covered by a warranty has failed, replace, or rebuild the Work to an acceptable condition complying with requirements of Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Authority has benefited from use of the Work through a portion of its anticipated useful service life.
- E. **Authority's Recourse:** Written warranties made to the Authority are in addition to implied warranties, and shall not limit the duties, obligations, rights, and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Authority can enforce such other duties, obligations, rights, or remedies.
- F. **Rejection of Warranties:** The Authority reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.
- G. The Authority reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.
- H. **Disclaimers and Limitations:** Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

A. Cured-In-Place Liner

1. Designed and constructed in accordance with ASCE MOP 145 for “Design of Close-Fit Liners for the Rehabilitation of Gravity Pipes”, as well as ASTM F1216 for “Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube”, and/or ASTM F2019 for “Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Pulled in Place Installation of Glass Reinforced Plastic (GRP) Cured-in-Place Thermosetting Resin Pipe (CIPP)” and these Specifications.
2. The CIPP shall be designed for a life of 50 years or greater.
3. The CIPP shall be continuous and joint-less from manhole to manhole or access point to access point and shall be free of all defects that will affect the long term life and operation of the pipe.
4. The CIPP shall be fabricated to a size that, when installed, shall neatly fit the internal circumference of the existing pipeline. Allowances shall be made for circumferential stretching during installation.
5. The CIPP shall consist of one or more layers of flexible needled felt, or an equivalent woven, non-woven or combination material.
6. The CIPP shall be capable of carrying resin withstanding installation pressures and curing temperatures. Curing the liner shall form a continuous, hard, impermeable, tight-fitting lining between each installed reach.
7. The CIPP shall be sealed with hydrophilic waterstop to terminate CIPP system at each manhole penetration.
  - a. Hydrotite or approved equal.
8. The finished product in place shall meet the minimum chemical resistance requirements for domestic sanitary sewer applications as listed in table X2.1 of ASTM F1216. Exposure shall be for a minimum of 30 days at 73.4°F (23°C). At least three (3) specimens shall be used for each material being tested and for each chemical solution involved. Specimens shall be removed from each chemical solution and tested. If any specimen fails to meet the 30 days requirements specified herein, the material will be subject to rejection. During this period, CIPP test specimens shall lose no more than 20 percent of their initial flexural strength and flexural modulus when tested in accordance with Section 8 of ASTM F1216.
9. For glass fiber reinforced liner materials, the Contractor shall provide chemical resistance test reports required under ASTM 3681

“Chemical Resistance of ‘Fiberglass’ (Glass-Fiber, Thermosetting-Resin) Pipe in a Deflected Condition” as indicated herein.

10. The resin shall be corrosion resistant polyester or vinyl ester resin and catalyst system or other approved material compatible with the inversion/installation process that provides cured physical strength properties specified herein. When properly cured within the tube composite the CIPP shall meet the requirements of ASTM F1216, ASTM F1743 or F2019, the physical properties herein, and those which are to be utilized in the design of the CIPP for this project.

**B. Lateral Connection Grout Seal**

1. The sealing material shall be an acrylamide based gel with a minimum of ten (10) percent acrylamide base material by weight in the total sealant mix. The chemical sealing material shall have a viscosity of approximately two (2) centipoises, which can be increased with additives, and a controllable reaction time from ten (10) seconds to one (1) hour. The application of the sealant shall be through a lateral sealing packer. Joint sealing shall be accomplished by forcing chemical sealing materials through the lateral packer into the surrounding soil through the leaking joint, crack or other lateral defect. Final acceptance of the sealed lateral will be accomplished via an air test of the joint or a visual inspection to verify that water is not leaking through the repaired lateral connection. This lateral connection shall be used solely in areas of infiltration on sewer mains of 8” and greater, as directed by the Engineer.

**C. Preliners**

1. Preliner tubes shall be manufactured to a dimension that will tightly fit the interior dimension of the host pipe.
2. Preliner tubes shall consist of a three or four-ply laminate with inner and outer film layers surrounding one or two layers of grid reinforcing.
3. Preliner tubes shall have the following minimum properties:

Property	ASTM test method	Value
Weight	D-751	62 LB/1000 FT2
3” Load @ Yield	D-882	175 LBF
Tongue Tear	D-2261	35 LBF

PPT Resistance	D-2582	45 LBF
Dart Impact Strength	D-1709	3.1 LBS
Permeance	E-96	0.019 Grain/Hr•Ft2 •in.Hg

## 2.2 DESIGN CRITERIA

### A. General

- The CIPP shall be designed to have sufficient structural strength to support all dead loads, live loads, and groundwater load imposed, with the assumption that the existing pipeline is fully deteriorated and cannot share any loading or contribute to structural integrity of the CIPP.
- All CIPP shall have a wall thickness that, when tested by the parallel plate deflection method in accordance with ASTM D2412, shall have a minimum pipe stiffness of six (6) psi.
- The properties of the CIPP, when cured, shall have the following minimum values and shall be verified by ASTM testing as indicated in the table below:

Property	ASTM Test Method	Initial <sup>1</sup> psi	Long Term <sup>2</sup> psi
Flexural Strength	D790	4,500	NA
Flexural Modulus	D790 & D2990	300,000	150,000

Notes: <sup>1</sup>Initial values are determined by ASTM D790.

<sup>2</sup>Long term value is defined as fifty (50) years and is determined by ASTM D2990.

- The lining material shall be a resin-impregnated, flexible polyester felt, glass fiber reinforced plastic or equivalent material tube, matching the diameter of the lateral pipe, which is inserted into the service lateral to be rehabilitated and cured-in-place by an acceptable curing method. The resin shall be suitable for the design conditions as well as the curing process. The liner shall provide a minimum service life of 50 years.

### A. Design Performance Limits and Design Parameters

- The CIPP shall be designed such that the lining shall not fail, collapse, buckle, crack or delaminate under load. The maximum long-term fifty (50) years calculated deflection under all loads shall

not exceed five (5) percent. For glass fiber reinforced liner pipe, the bending strain fifty (50) years developed shall not exceed the higher of the minimum long-term value in ASTM D3262 for the pipe stiffness supplied or that substantiated by long-term strain tests done in accordance with ASTM D3681 using 1.0 *N* sulfuric acid.

- B. The following design parameters shall be used and all criteria shall apply to each CIPP installations:

Depth of Cover Above Crown of Pipe <sup>1</sup>	The greatest of actual depth for each pipe reach
Depth of Groundwater Above Crown (Perm.)	Ground Surface
Specific Weight of Soil	120 pcf
Wheel Load <sup>2</sup>	16,000 lbs.
Railroad Load <sup>3</sup>	N/A
Temperature	80° F
Deflection Lag Factor, D <sub>L</sub>	1.0 (Initial)      1.5 (50 years)
Modulus of Soil Reaction E'	1,200 psi
Ovality Correction Factor	2%.
Long Term Modulus of Elasticity	50 years under constant stress, when submerged in water, to be used for constrained buckling resistance design for combined external loads from groundwater and earth cover.
Minimum Factor of Safety (Perm.)	2.0, unless otherwise specified
Bedding Deflection Coefficient	0.103
Manning's Roughness Coefficient, n	0.010

Notes: <sup>1</sup>Design of the CIPP shall be based on prism load on the liner pipe, using the outside diameter of the liner in the calculations.

<sup>2</sup>Impact factors to be included when depth of cover is less than three (3) feet per values recommended by AASHTO.

<sup>3</sup>Impact factors to be included when depth of cover is less than ten (10) feet per criteria established by AREA "Manual of Recommended Practice".

- C. The minimum thickness of the CIPP shall be as determined for the design parameters imposed. Calculations for the determination of the required liner pipe stiffness shall be the largest pipe stiffness for each CIPP installation reach (inversion/installation access structure to termination point), as determined by calculations provided for the following parameters: (1) Maximum Deflection; (2) Minimum Pipe Stiffness; (3) Ring Bending Strain; and (4) Constrained Buckling Resistance Using Long Term Modulus of Elasticity. The design calculations shall consider all cases of loading to the CIPP and the liner thickness required shall withstand these loads without collapsing.

- D. The Owner shall have the right to modify/change the required liner thickness, depending upon field conditions evident from the videotape(s). An analysis of design criteria and calculations for the liner thickness, if different, shall be provided to the Engineer for approval, whose decision approved in writing by the engineer prior to the commencement of the work.
- E. Point repairs shall be defined as repairs to the existing pipeline that are required to facilitate renewal work. Point repairs shall be identified during internal inspection. The Contractor shall perform point repairs after cleaning and preinstallation internal inspection has been complete. The Contractor shall notify the Engineer not less than 48 hours in advance of making any such point repairs.

### PART 3 - EXECUTION

#### 3.1 GENERAL

- A. Contractor shall perform all work in accordance with municipal, state and federal requirements.
- B. Contractor shall obtain all permits required to perform work prior to the commencement of construction.
- C. The length of the CIPP shall equal the length indicated on the Drawings unless otherwise directed by the Engineer. The Contractor shall verify the internal pipe diameter/dimension(s) and lengths in the field prior to liner manufacture.
- D. All work associated with CIPP operations shall be accomplished without excavation from existing ground surface, except in areas specifically designated on the Drawings or as approved by the Owner.
- E. Individual inversions/installations may be performed via one or more existing access structures as determined by the Contractor and as approved by the Owner.
- F. The CIPP shall be performed with minimal excavation or removal of existing structures. Excavation for point repairs or emergencies shall be permitted, but only as approved by the Owner.
- G. Contractor shall review all existing conditions data prior to the commencement of construction including TV logs attached in the appendices of these Specifications.
- H. Contractor shall inspect clean and CCTV the existing pipe prior to commencement of CIPP operations, including flow diversion as necessary, and provide the Engineer the opportunity to verify the condition of the pipe for CIPP operations.

- I. Contractor shall commence CIPP operations at the beginning of a period of at least 24- hours of anticipated dry weather or otherwise directed by the Owner and as directed by the Engineer.

### 3.2 PREPARATION

#### A. Cured-in-Place Liner

1. Contractor shall perform all preparation operations in accordance with Section 02760 and Section 02761.
2. Contractor shall notify Owner at least three business days prior to the start of the work. Owner shall notify all abutters via written notice of the upcoming work two business days prior to work taking place. The written notice shall be submitted for approval by the Engineer.
3. Contractor shall inspect interior of the pipelines to determine locations of any conditions which may prevent proper installation of the liner. Inspections shall note protruding service taps, collapse/crushed pipe and reductions in cross-sectional area that could impact lining of the pipe.
4. Contractor shall clear the line of obstructions such as solids, dropped joints, protruding lateral connections or collapsed pipe that will hinder the installation. If inspection reveals an obstruction that cannot be removed by conventional cleaning equipment, then the Contractor shall make a “point repair” excavation to uncover and remove or repair the obstruction. Such excavation shall be approved in writing by the Engineer prior to the commencement of the work. Point repairs shall be defined as repairs to the existing pipeline that are required to facilitate renewal work. Point repairs shall be identified during internal inspection. The Contractor shall perform point repairs after cleaning and pre-installation internal inspection has been complete. The Contractor shall notify the Engineer not less than 48 hours in advance of making any such point repairs.
5. Contractor shall grout seal visible leaks prior to installation of the liner material.
6. Contractor shall investigate and determine the purpose and source of all lateral connections. Methods shall include, but are not limited to, internal inspections within adjacent buildings, smoke testing and dye testing. Contractor shall record location, size, material and relative invert elevation of each lateral connection with respect to the pipeline. Contractor shall note presence of floor drains or other outlet pipes in adjacent buildings. Contractor shall obtain written approval from the Owner and property owner(s) prior to any testing and/or building entry. Contractor shall verify that lateral connections have been installed according to plumbing codes and have traps to prevent the



migration of odors into buildings. The contractor shall reestablish only active laterals and laterals for unoccupied, abandoned or vacant lots unless otherwise directed by the Engineer.

### 3.3 INSTALLATION

#### A. Cured-in-Place Liner

1. Contractor shall install a resin impregnated flexible tube inverted/installed into the existing pipe utilizing a vertical inversion standpipe and hydrostatic head method, air pressure inversion method, pulled-in and inflate method or other method approved by the Engineer.
2. Curing shall be accomplished by circulating hot water, steam or other approved methods to cure the resin into a hard, impermeable pipeline. When cured, the new material shall extend over the length of the inversion/installation reach in a continuous, tight-fitting, watertight pipe-within-a-pipe.
3. The Contractor shall designate the locations where the reconstruction tube will be vacuum impregnated prior to installation. The Contractor shall allow the Engineer and the Owner to inspect the materials and “wet-out” procedure. A catalyst system compatible with the resin and reconstruction tube shall be used.
4. The wet-out reconstruction tube shall be inserted through an existing access structure or other access point by approved techniques/processes of the Contractor. Tubes that are pulled in place shall be done in a manner that shall not damage the tube. The winch shall be equipped with a dynamometer to record the pulling forces required during installation. Pull forces shall not exceed manufacturer’s recommendations that shall be based on a maximum longitudinal stretch of five (5) percent of the total tube length. Inversion heads for tubes that are inverted in place shall not exceed manufacturer’s recommendations so as not to overstress the tube material or exceed 5% longitudinal stretch. Progressive rounding of the liner shall be performed, prior to curing, to eliminate all trapped water between the liner and the existing pipeline. The Contractor shall describe the process or technique(s) to be used to progressively round the liner tube to remove all trapped water between the liner pipe and the existing pipe.

#### Water/Steam Cured

5. After inversion/installation is completed, the Contractor shall supply a suitable heat source and fluid recirculation equipment or other approved methods. The equipment shall be capable of delivering hot

water/steam throughout the section by means of a pre-strung hose to uniformly raise the water/steam temperature above the temperature required to affect a cure for the resin. This temperature shall be determined by the CIPP manufacturer and based on the resin/catalyst system employed.

6. The heat source shall be fitted with suitable monitors to gauge the temperature of the incoming and outgoing water/steam supply. Another such gauge shall be placed between the impregnated reconstruction tube and the pipe invert at the terminating manhole to determine the temperatures during cure. Water/steam temperature in the line during the cure period shall be recommended by the resin manufacturer.
7. Initial cure shall be deemed to be completed when inspection of the exposed portions of cured liner appear to be hard and sound and the remote temperature sensor indicates that the temperature is of a magnitude to realize an exotherm. The cure period shall be of a duration recommended by the resin manufacturer, as modified for the CIPP process, during which time the recirculation of the water/steam and cycling of the heat exchangers to maintain the temperature continues. Curing temperatures and duration shall be in accordance with previously submitted data and information.
8. The Contractor shall cool the hardened pipe to a temperature below 100 degrees F before relieving the static head. Cool-down may be accomplished by the introduction of cool water or air, as applicable, into the inversion standpipe to replace water being drained from a small hole made in the downstream end. If Contractor elects to drain cure-water via the upstream end, the water shall be pumped to a discharge location approved by the Owner at no additional cost to the Owner. Care shall be taken in the release of the static head so that a vacuum shall not develop that could damage the newly installed pipeline.
9. After completion of pipeline curing, the Contractor shall dispose of curing water in accordance with all federal, state, and local requirements.
10. The Contractor shall note the time requirements that may be needed for approval by Springfield Water and Sewer Commission. The point of discharge to the Springfield Water and Sewer Commission sewer system shall be designated by the Springfield Water and Sewer Commission Wastewater Operations Director. Alternatively, the Contractor may elect to transport the curing water off site for disposal utilizing a uniform hazardous waste manifest. The transporter shall be appropriately licensed and the disposal facility shall be a licensed

wastewater treatment facility. The Contractor shall sample and analyze appropriate samples as required by the disposal facility.

11. Contractor shall verify with the Owner that discharging the cure-water directly into the existing system is acceptable. If deemed unacceptable, Contractor shall collect and pump cure-water to a location to be determined by the Contractor and approved by the Owner.
12. Contractor shall mitigate all odors onto public or private property due to renewal operations immediately after notification from the Owner or the Engineer including, but not limited to, forced-air ventilation and/or chemical cleaning of buildings at no additional cost to the Owner.
13. If odors persist on public or private property to a point that air sampling and/or associated testing is required by the Owner, the Engineer or a regulatory agency, the Contractor shall perform this work at no additional cost to the Owner.
14. Contractor shall repair all uncured areas, defects, test sample section repairs or other deformities in the liner during inversion operations in accordance with the manufacturer's recommendations.
15. The finished CIPP shall be continuous over the entire length of an inversion/installation run and be as free as commercially practicable from visual defects such as foreign inclusions, dry spots, pinholes, wrinkles, blisters, delamination or other deformities. Any such conditions deemed by the Owner shall be repaired and/or replaced at no additional cost to the Owner.

### 3.4 SYSTEM REINSTATEMENT

- A. Once a section of liner has been cured completely, the Contractor shall reinstate all access structures located along its alignment. For intermediate access structures, the Contractor shall cut the top portion of the liner to match the opening in the riser section providing a smooth, clean cut and continuous transition. At inversion/installation or termination access structures, the Contractor shall extend the liner a sufficient distance into the structure to allow for a smooth, clean cut to match the configuration of the riser and base sections. The CIPP shall make a tight fitting seal with the existing pipe(s) in the manhole using hydrophilic waterstop, per 2.1.A.7.
- B. Lateral connections shall be reestablished with a cutting device specifically designed for cutting CIPP. The Contractor shall reestablish only active laterals and laterals for unoccupied, abandoned or vacant lots unless otherwise directed by the Engineer. The Contractor shall determine exact location and number of lateral connections to be reestablished during the

internal inspection(s) and/or in the field using as smoke testing, dye testing, and internal inspection and/or building investigations as necessary. The Contractor's shall ensure that all active service connections are reconnected. Shape of pipeline cut-out shall match shape of lateral connection. The annular space between the liner pipe and the lateral connection shall be sealed with a resin mixture and/or epoxy compatible with the CIPP.

Lateral connections in areas of infiltration, as determined by the engineer, shall be reestablished using a lateral seal as directed by the engineer.

- C. Lateral connections shall be reinstated by experienced operators so that no blind attempts are made in the liner. Location shall be re-verified carefully with pre-construction videotapes for accuracy, especially where dimples are not defined or clearly ascertained. The cut shall be smooth and circular with no jagged edges. The hole shall be a maximum of 100 percent and a minimum of 95 percent of the lateral pipe inside diameter. It shall be properly aligned and be concentric to the existing connection.
- D. The Contractor shall minimize the time that an inversion/installation access point remains open. Consideration shall be provided to complete and coordinate all work including pipeline cleaning, pre installation internal inspection, pipeline renewal and post installation internal inspection to minimize disturbance to adjacent property owners.

### 3.5 TESTING

#### A. Cured-in-Place Liner

1. For each separate length of CIPP installed, the Contractor shall prepare at least two (2) samples in accordance with ASTM F1216, Section 8.1.1 or Section 8.1.2 for testing at a laboratory approved by the Engineer. For samples used per section 8.1.1, the Contractor shall hold the pipe in place by a suitable heat sink, otherwise this method will not be acceptable.
2. If flat plate samples are used for testing, the samples shall be taken from a section of the length of CIPP to be installed. Flat plate samples cured by a suitable heat sink and tested in accordance with ASTM 1216, section 8.1 shall be considered as passing if they exceed the design value criteria. Flat plate samples cured in the downtube or in the silencer in accordance with ASTM F1216, Section 8.1 shall be considered as passing the design value criteria if the arithmetic mean of the tested samples, as defined in ASTM D790, is greater than or equal to parameters set forth in this Section after the arithmetic means is reduced to 80% of its original calculated value.
3. The Contractor shall provide one sample for each inversion to the Engineer for independent testing. The samples shall be labeled with each pipe inversion identification and date.

4. Samples secured as specified shall be tested to verify that the pipe flexural modulus and flexural strength of the CIPP is at least equal to that required by the approved design submittal, and the wall thickness is at least equal to that required in the approved design submittal. Wall thickness shall be verified at each inversion, intermediate manholes, and termination access at four equidistant points around the perimeter.
5. If any sample fails the verification tests specified, the Contractor shall take five (5) additional samples throughout the length of the inversion/installation and retested to ensure the specified criteria has been met. If any sample fails these retests, the entire inversion/installation length shall be rejected.
6. Any rejected inversion/installation shall be relined or replaced by the Contractor at no additional cost to the Owner. The Contractor shall submit method of repair of the rejected inversion/installation length for review and approval by the Owner prior to constructing any repair work. Any samples taken from within the final completed liner pipe shall be repaired by the Contractor, in accordance with the shop drawings, at no expense to the Owner.
7. Contractor shall submit curing water or condensate test reports as required by discharge permit requirements.
8. Contractor shall submit the names, address, and EPA identification number of the transporter and disposal facility in the event a treatment or disposal facility is used for cure water discharge. Test results and disposal documentation from the facility shall also be submitted.

### 3.6 ACCEPTANCE

#### A. Cured-in-Place Liner

1. Prior to final acceptance, any defects that may affect the integrity or strength of the pipeline in the opinion of the Engineer shall be repaired by the Contractor at no additional cost to the Owner. Wrinkles or fins in the bottom half of the lined pipe shall not exceed 2% of nominal pipe diameter and shall not have an adverse effect on the flow. If in excess, the liner shall be repaired and/or removed and replaced at no additional cost to the Owner.
2. Pipeline shall be true to line and grade, with no bulges, sags, protrusions, wrinkles transverse to the flow, deflections, offset joints, leaking joints, or other visible infiltration, or other defects that would impair the intended use of the completed pipeline.
3. Final acceptance of work shall not be granted until all defective areas are repaired in accordance with the CIPP manufacturer's recommendations and to the Owner's satisfaction.

4. Any repairs required by the Engineer as a result of the post construction internal inspection shall be performed by the Contractor.
5. Contractor shall perform a post construction internal inspection in accordance with Section 02760. Final acceptance of the work shall not be granted until post installation inspection has been reviewed and approved by the Engineer.
6. Contractor shall perform testing as specified. Final acceptance of the work shall not be granted until the appropriately formatted testing results have been reviewed and approved by the Engineer.

### 3.7 PROJECT CLOSEOUT

- A. Provide in accordance with Section 01700 – Contract Closeout.

END OF SECTION 02767

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## SECTION 02770

### SEWER MANHOLE REHABILITATION

#### PART 1 - GENERAL

##### 1.1 EXTENT OF WORK

- A. The Work includes the furnishing of all labor, equipment, and materials, and performing all operations necessary to complete the rehabilitation of existing sewer manholes as indicated on the Drawings and specified in this section.
  - 1. All manholes shall be lined with a cementitious coating except for those for which an epoxy coating is specified on the Drawings.
  - 2. Manholes at the terminus or thru-lined under SECTION 02767 – CURED IN PLACE PIPELINING are not exempt from this work.
  - 3. Concrete to be formed and cast on site is included in Section 03300 – CONCRETE.
  - 4. Preparation for sealing and coating of manhole components is specified in this section.
- B. The cementitious and/or epoxy coating shall be applied to the manhole chimney/corbel, cone, shelf, wall, invert, base, and incoming pipe connections.
- C. All work shall be performed by personnel with sufficient experience in rehabilitation of sewer manholes.

##### 1.2 RELATED WORK

- A. Section 01300 – SUBMITTALS
- B. Section 02761 – BYPASS FLOW HANDLING

##### 1.3 REFERENCES

- A. The following standards form a part of these Specifications:
  - 1. American Society for Testing and Materials (ASTM)
    - a. ASTM C109 Compressive Strength Hydraulic Cement Mortars
    - b. ASTM C191 Standard Test Methods for Time of Setting of Hydraulic Cement by Vicat Needle



c. ASTM F2551 Installing a Protective Cementitious Liner System in Sanitary Sewer Manholes

d. ASTM F1216 Chemical Resistance Requirements

#### 1.4 SUBMITTALS

A. The Contractor shall submit the following information for review in accordance with Section 01300:

B. Contractor's Qualifications

1. Five (5) recent references indicating successful application by the Contractor of coating products of the same material type as specified in this section.
2. Submit qualifications of the Contractor's proposed personnel for completing the sewer manhole rehabilitation.
2. Current documentation from the coating product manufacturer certifying Contractor is a licensed applicator of the coating product.

C. Product Data

1. The Contractor shall submit Technical Data Sheets and Material Safety Data Sheets (MSDS) for each product used.
2. Copies of independent testing performed on the coating product indicating the product meets the requirements as specified.
3. Technical data sheet and project specific data for repair materials including application, cure time and surface preparation procedures.

D. Test Results

1. The Contractor shall submit test results from the testing performed in accordance with paragraph 3.04 herein.

#### 1.5 PREPARATION FOR SEALING AND COATING

A. The Contractor shall provide all labor, materials, equipment, and supervision necessary to provide and/or restore a proper structural substrate of manhole defects prior to sealing. The work may include plugging, patching, and coating with mortars to improve the structural condition for subsequent chemical sealing.

## 1.6 SEALING AND COATING

- A. The Contractor shall provide all labor, materials, equipment, and supervision necessary to properly seal and coat each of the manholes so designated on the Contract Drawings, and as directed by the Engineer.
1. Manhole sealing in general shall include chemical sealing by grout injection through the walls and inverts into the surrounding soil to allow the grout to penetrate back through cracks, defects, etc., into the manhole.
  2. Manhole coating shall include the application of a cementitious and/or epoxy coating.

## PART 2 - PRODUCTS

### 2.1 MATERIALS AND EQUIPMENT

- A. **Materials:** The materials used shall be designed, manufactured, and intended for sewer manhole rehabilitation and the specific application in which they are used. The materials shall have a proven history of performance in sewer manhole rehabilitation. The materials shall be delivered to the job site in original unopened packages and clearly labeled with the manufacturer's identification and printed instructions. All material shall be stored and handled in accordance with recommendations of the manufacturer and the American Concrete Institute. All materials shall be mixed and applied in accordance with the manufacturer's written instructions. Materials used for specific applications shall be as follows:
1. Stopping active leaks in concrete and masonry manholes:
    - a. A premixed fast-setting, volume-stable waterproof cement plug consisting of hydraulic cement, graded silica aggregates, and special plasticizing and accelerating agents. It shall not contain chlorides, gypsums, plasters, iron particles, aluminum powder or gas-forming agents, or promote the corrosion of steel it may come in contact with. Set time shall be approximately 1 minute. Ten-minute compressive strength (ASTM C-109) shall be approximately 500 psi, and the ultimate compressive strength (ASTM C-109) shall be a minimum of 5,000 psi.
    - b. A silicate-based liquid accelerator, field mixed with neat Portland cement. The set time shall be approximately 1 minute.
    - c. The elastomeric polyurethane resin-soaked method, using dry twisted jute oakum, or resin-rod with polyurethane resin (water activated).

2. Patching, repointing, filling, and repairing nonleaking holes, cracks, and spalls in concrete and masonry manholes:
  - a. A premixed non-shrink cement-based patching material consisting of hydraulic cement, graded silica aggregates, special plasticizing and accelerating agents, which have been formulated for vertical or overhead use. It shall not contain chlorides, gypsums, plasters, iron particles, aluminum powder, or gas-forming agents, or promote the corrosion of steel it may come in contact with. Set time (ASTM C-191) shall be less than 30 minutes. One-hour compressive strength (ASTM C-109) shall be a minimum of 200 psi, and the ultimate compressive strengths (ASTM C-109) shall be a minimum of 5,000 psi.
  
3. Chemical Sealing Materials: A listing of chemical sealing materials, including basic requirements, properties, and characteristics of each, is as follows:
  - a. Acrylamide base gel sealing material:
    - i. A minimum of 10% acrylamide base material by weight in the total sealant mix. A higher concentration (%) of acrylamide base material may be used to increase strength or offset dilution during injection.
    - ii. The ability to tolerate some dilution and react in moving water during injection.
    - iii. A viscosity of approximately 2 centipoise that can be increased with additives.
    - iv. A constant viscosity during the reaction period.
    - v. A controllable reaction time from 10 seconds to 1 hour.
    - vi. A reaction (curing) that produces a homogeneous, chemically stable, nonbiodegradable, firm, flexible gel.
    - vii. The ability to increase mix viscosity, density and gel strength by the use of additives.
    - viii. A latex-based gel reinforcement additive shall be used to increase compressive and tensile strength and reduce dehydration. The product shall be AV-257 ICO set from Avanti International, Webster, Texas or equal.

c. Urethane base gel chemical sealing material:

- i. 1-part urethane prepolymer thoroughly mixed with between 5 and 10 parts of water by weight. The recommended mix ratio is 1-part urethane prepolymer to 8 parts of water (11% prepolymer).
- ii. A liquid prepolymer having a solids content of 77% to 83%, specific gravity of 1.04 (8.65 pounds per gallon), and a flash point of 20°F.
- iii. A liquid prepolymer having a viscosity of 600 to 1200 centipoise at 70°F that can be pumped through 500 feet of 1/2-inch hose with a 1000 psi head at a flow rate of 1 ounce per second.
- iv. The water used to react with the prepolymer should have a pH of 5 to 9.
- v. A cure time of 80 seconds at 40°F, 55 seconds at 60°F, and 30 seconds at 80°F when 1-part prepolymer is reacted with 8 parts of water only. Higher water ratios give longer cure times.
- vi. A cure time that can be reduced to 10 seconds for water temperatures of 40°F to 80°F when 1-part prepolymer is reacted with 8 parts of water containing a sufficient amount of gel control agent additive.
- vii. A relatively rapid viscosity increase of the prepolymer/water mix. Viscosity increases from about 10 to 60 centipoise in the first minute for a 1 to 8 prepolymer/water ratio at 50°F.
- viii. A reaction (curing) that produces a chemically stable and nonbiodegradable, tough, flexible gel.
- ix. The ability to increase mix viscosity, density, gel strength and resistance to shrinkage by the use of additives to the water.

4. Cementitious Coating:

- a. Coating shall be manufactured from Type II Portland cement and enhanced with silica fume and high-density chemically stable

aggregates and applied in accordance with the manufacturer's requirements. The material shall provide protection from hydrogen sulfide. Coating shall be applied to a minimum thickness of ½", in a one pass monolithic application. The coating shall be Quadex, QM-1s Restore or equal.

- b. The coating shall meet the following minimum physical properties:
  - i. Compressive Strength (ASTM C109) - >10,000 psi @ 28 days
  - ii. Flexural Strength (ASTM C293) - >1,250 psi
  - iii. Bond Strength (ASTM C321) - Brick failure before bond
  - iv. Permeability (AASHTO T-277) - Not to exceed 350 coulombs
  - v. Freeze-Thaw (ASTM C666) – No damage in 300 cycles
  - vi. Material Wet Density – Minimum 127 +/- 5 PCF

4. Epoxy Coating:

- a. Coating shall be a 100% solids high build epoxy coating formulated to provide long term corrosion protection and structural enhancements to manholes subject to high levels of corrosion and/or abrasion and applied in accordance with the manufacturer's requirements.

The coating shall be applied at 200 mils in a single pass. The coating shall be Quadex, Structure Guard Epoxy or equal.

- b. The coating shall meet the following minimum physical properties:
  - i. Gel Time, 150 grams at 25°C (ASTM D2471) – 18 minutes
  - ii. Tensile Strength (ASTM D638) – 7,200 psi
  - iii. Elongation (ASTM D638) – 1.5%
  - iv. Flexural Modulus (ASTM D790) – 530,000 psi
  - v. Compressive Strength (ASTM D695) - 13,500 psi
  - vi. Flexural Strength (ASTM D790) - 11,700 psi
  - vii. Shore D Hardness (ASTM D2240) – 85

- viii. Taber Abrasion, CS 17 Wheel (ASTM D4060) - <100 mg loss (1 kg load / 1000 cycles)
- ix. Adhesion to Concrete (ASTM D4541) - >2,000 psi (substrate failure)
- x. Water Vapor Transmission (ASTM D1651) 3.0 grams / m2 (24 hours)
- xi. Water Absorption (ASTM D570) – 0.18%
- xii. Volatile Organic Content (ASTM D2580) – N/A (<10 grams/liter)

B. Equipment. The basic equipment necessary for chemical sealing and/or grouting of existing sanitary sewer manholes shall consist of properly designed and constructed chemical pumps, chemical containers, injection packers, hoses, valves and all necessary equipment and tools required to seal manholes. The chemical injection pumping system shall be equipped with pressure gauges that will provide for monitoring pressure during the injection of the chemical sealants. When necessary, fluid bypass lines equipped with pressure regulated bypass valves will be incorporated into the pumping system.

### PART 3 - EXECUTION

#### 3.1 PREPARATION FOR SEALING AND COATING

- A. Safety: The Contractor shall perform all work in strict accordance with all applicable OSHA standards. Attention is drawn to those safety requirements regarding confined space entry.
- B. Cleaning: All concrete and masonry surfaces to be rehabilitated must be clean. All grease, oil, laitance, coatings, loose bricks, mortar, unsound concrete, and other foreign materials must be completely removed. High pressure water blasting at a minimum pressure of 5,000 psi utilizing proper nozzles shall be the primary method of cleaning; however, other methods such as wet or dry sandblasting, acid wash, concrete cleaners, degreasers, or mechanical means may be required to properly clean the surface. All surfaces on which these other methods are used shall be thoroughly rinsed, scrubbed, and neutralized to remove cleaning agents and their reactant products.
- C. Stopping infiltration: After surface preparation and prior to the application of mortars and coatings, infiltration shall be stopped by chemical grout sealing. Plugging with products conforming to this section and channeling infiltration through "bleed" pipes installed at the bottom of the manhole may be used in conjunction with chemical grout sealing.

- D. Patching: All large holes or voids around steps, joints or pipes, all spalled and honeycomb areas, all exposed rebars, and all holes caused by missing or cracked concrete or brick shall be patched, and all missing mortar repointed using a non-shrink patching mortar, conforming to the requirements of this section. All cracked or disintegrated material shall be removed from the area to be patched or repointed, exposing a sound subbase. All cracks not subject to movement and greater than 1/16 inch in width shall be routed out to a minimum width and depth of 1 inch and patched with non-shrink patching mortar, conforming to the requirements of this section.

### 3.2 SEALING AND COATING

- A. Sealing. At each point of leakage within the manhole structure, a hole shall be carefully drilled from within the manhole that shall extend through the manhole wall and invert to the surrounding soil. Additional grouting holes may be required to provide a grout curtain surrounding the manhole to stop all leakage. Into the previously drilled holes, chemical sealant injection devices shall be placed in such a way that they will provide a watertight seal between the hole and the injection device. A hose, or hoses, shall be attached to the injection device from an injection pump. A mixture of chemical sealants shall then be pumped through the hose until material refusal is recorded on the pressure gauge mounted on the pumping unit, or a predetermined quantity of sealant has been injected. Care shall be taken during the pumping operation to ensure that excessive pressures do not develop and cause damage to the manhole structure. Upon completion of injection, the injection devices shall be removed, and the remaining holes filled with mortar and troweled flush with the surface. The mortar used shall be of the "fast set" type and "non-shrinking".
- B. Manhole Sealing Verification:
1. After the manhole sealing operation has been completed, the manhole shall be inspected by the Engineer to verify that there is no active infiltration entering the manhole.
  2. All manholes that are still leaking shall be corrected according to above specifications.
- C. Coating: Cementitious and/or epoxy coating of the manholes shall be performed only after the other structural rehabilitation work and the chemical sealing work have been completed and inspected, and all active leaking has been eliminated. A coating conforming to the requirements of this section shall be applied to all surfaces, from and including the manhole invert to the bottom of the frame seal. When completed, the coating shall be free of any cracks or holes. Coating product shall interface with adjoining construction materials throughout the manhole structure to effectively seal and protect brick, concrete or masonry substrates from infiltration and attack by corrosive elements. Sewage flow shall

be stopped, bypassed or diverted as required per manufacturer recommendations for application of the coating products to the interface with pipe materials.

### 3.3 RECORDS

- A. Complete records shall be kept of all manholes being rehabilitated as described above, including the type of sealing received; the materials, products and equipment used in the performance of each sealing; inspection results; and the amount of initial and final infiltration measured.

### 3.4 TESTING AND INSPECTION:

- A. One 2"x2" sample cube shall be taken daily from the cementitious coating to be used. Samples shall be sent by the Contractor to an independent test laboratory for compression strength testing in accordance with ASTM C109. Materials not meeting the requirements set forth in these specifications must be removed and replaced until conformance with ASTM C109 is confirmed at no expense to the Commission. The associated necessary costs shall be considered incidental to the unit price cost to cementitious line existing SMH's.
- B. Thickness of the applied cementitious and/or epoxy coating shall be verified with a wet gage as directed by the Engineer.
- C. A visual inspection for any cracks or holes shall be made by the Engineer and any deficiencies in the finished coating shall be repaired by the Contractor at no additional cost.
- D. Leakage tests manholes may be made using vacuum testing equipment in accordance with ASTM C1244. For this test, manhole shall be tested under 10 inch of Hg vacuum. The test shall pass if the vacuum remains at 10 inch Hg or drops no lower than 9 inch Hg after 60 seconds for manholes 0 to 10 feet deep, 75 seconds for manholes 10 to 15 feet deep or 90 seconds for manholes 15 to 25 feet deep.

### 3.5 GUARANTEE

- A. All sewer rehabilitation work performed shall be guaranteed against leakage, delamination of coating, faulty workmanship and/or materials for a period of 5 years after the established date of completion.

END OF SECTION 02770



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## SECTION 02900

### LANDSCAPING

#### PART 1 – GENERAL

##### 1.1 SUMMARY

- A. This section includes providing loam, fertilizer, seed, plants and related work as indicated and specified.

##### 1.2 RELATED WORK

- A. Section 01630 – RESTORATION OF GROUNDS AND CLEANING UP
- B. Section 02498 – RESTORATION OF DISTURBED AREAS

##### 1.3 SHOP DRAWING SUBMITTALS

- A. Shop Drawings: Submit the following in accordance with Section 01300 - SUBMITTALS:
  - 1. Certify, invoice, and order plants for each shipment grown, free of disease and insect pests. Submit certificates to Engineer.
  - 2. Prior to placement of any mulch, deposit, at a location on site suitable to Engineer, 1/2 cu. yd. sample of mulch for examination. After mulch sample is reviewed by the Engineer, provide mulch conforming to accepted sample.
  - 3. Submit to Engineer a sample of proposed soil separator mat and manufacturer's specification for mat.
  - 4. Submit with seed, certificates concerning seed mixture, purity, germinating value, and crop year identification.
  - 5. Submit test samples of loam to a certified soils consultant to determine fertilizer and lime requirements and return two copies of results for implementation.
  - 6. For hydroseeding, provide written description containing seed analysis, fertilizer, and lime addition data.
  - 7. Submit list of plant material to be used and source.

8. Prior to end of maintenance period, furnish two copies of written maintenance, instructions for maintenance and care of installed plants and lawn areas.

#### 1.4 QUALITY ASSURANCE

- A. Investigate sources of supply and make assurances that plants will be supplied as indicated in Schedule of Plant Material in sizes, variety and quality noted and specified before submitting bid. Failure to take this precaution will not relieve responsibility for furnishing and installing plant material in accordance with Contract requirements and without additional expense to Owner.
- B. Upon delivery and before planting, Engineer will inspect plants. Inspection and approval by Engineer of plants is for quality, size and variety only and in no way impairs the right of rejection for failure to meet other requirements during progress of work.
- C. General:
  1. Provide only nursery grown plants having been transplanted at least once and growing in a nursery for at least two years. Allow Engineer to determine fitness of any plant.
  2. Provide container-grown stock in containers long enough for root system to develop sufficiently to hold soil together firm and whole when removed from container. Use no plants loose in the container.
  3. Check plant material prior to commencing of planting operations. Plant no material prior to inspection by Engineer. Notify Engineer at least 48 hours in advance of all planned planting operations and identify specific material and its location.
  4. Furnish suitable quantities of water, hose and appurtenances.
  5. Use loam, having prior vegetative growth that did not contain toxic amounts of either acid or alkaline elements.
  6. Begin maintenance after each portion of lawn is seeded and continue for minimum of 45 days.
  7. Correct defective work as soon as possible within guarantee period. Repair or replace seeded areas, plants, and shrubs which, in judgment of Engineer, have not survived and grown in a satisfactory manner, for a period of one year after acceptance.

8. Provide as specified seedings or plantings replacements of the same type and size as specified.
9. Dry loam test samples to constant weight at temperature of 230 deg. F, plus or minus 9 degrees.
10. The Engineer reserves the right to test and reject any material not meeting specifications by utilizing tests in accordance with methods adopted by the Association of Official Agricultural Chemists. Costs for these tests shall be paid by the Contractor.

#### 1.5 STORAGE AND HANDLING OF MATERIALS

- A. Store plants in ground or other acceptable media if not to be planted within 4-hrs. Protect roots of plant material from drying or other possible injury. Water plants as necessary until planted.
- B. Do not drop plants. Do not pick up container or B & B plants by stem or trunks.

#### 1.6 WARRANTY

- A. Provide as specified.
- B. Guarantee new plant material through one full growing season after plants are installed. Guarantee plants replaced under this for one full growing season from date of replacement.
- C. Repair damage to plants or lawns during plant replacement. Guarantee lawn areas for duration of one full year after seeding to be alive and in satisfactory growth at end of guarantee period.
- D. For purpose of establishing an acceptable standard, scattered bare spots, none of which is larger than 1 sq. ft. will be allowed up to a maximum of 3% of lawn area.

### PART 2 – PRODUCTS

#### 2.1 STAKES

- A. Wood stakes, minimum of 2-in. by 2-in. square and 8 in length, of uniform size, straight, reasonably free from knots, treated with wood preservative and painted green.

## 2.2 METAL EDGE STRIPS AND STEEL STAKES

- A. 1/4-in. by 5-inch steel plate edge strips, painted green.
- B. 16-in. tapered steel stakes.

## 2.3 MAT

- A. 1/4-in. to 1/2-in. thick mat consisting of lime or silicate glass fibers with average fiber diameter to 9 microns and 2-in. to 4-in. strands of fiber bonded with phenol formaldehyde resin, 100 percent textile glass fiber, roll type, water permeable with a minimum thickness of 1/4-in., a maximum thickness of 1/2-in, and a density of not less than 3 pounds per cubic foot.

## 2.4 LOAM

- A. Fertile, friable, natural topsoil typical of locality, without admixture of subsoil, refuse or other foreign materials, and obtained from well-drained arable site. Free of stumps, roots, heavy or stiff clay, stones larger than 1 inch in diameter, lumps, coarse sand, noxious weeds, sticks, brush or other deleterious matter.
- B. Not less than 4 percent nor more than 20 percent organic matter as determined by loss on ignition of oven-dried samples.

## 2.5 LIME, FERTILIZER AND SEED

- A. Ground agricultural limestone containing not less than 85 percent of total carbonates.
- B. Commercial type fertilizer, uniform in composition, free flowing, conforming to state and federal laws, and at least 50 percent of nitrogen derived from natural organic sources of ureaform and containing following percentages by weight: Nitrogen 10 percent, Phosphorus 10 percent, Potash 10 percent.
- C. Turf grass seed, clean, high in germinating value and latest year's crop mixture as follows:

Name	Minimum proportion by weight	Percent purity	Percent germination
Kentucky bluegrass	20%	87%	85%
Merio Kentucky bluegrass	20%	87%	85%
Red Chewings Fescue	45%	98%	85%
Manhattan Rye	15%	98%	90%

D. Turf grass seed, clean high in germinating value and of the latest year's crop mixed as follows:

Name	Minimum proportion by weight
Creeping Red Fescue	50%
Domestic Ryegrass	20%
Redtop	5%
Kentucky Bluegrass	25%

E. Weeds shall not exceed 0.25 percent.

## 2.6 SOD

- A. Established, nursery grown Kentucky or Merion Bluegrass sod, vigorous, well rooted, healthy turf, free from disease, insect pests, weeds, other grasses, stones, and any other harmful or deleterious matter.
- B. Sod harvested by machine at uniform soil thickness of approximately 1 inch but not less than 3/4 of an inch. Measurement for thickness excludes top growth and thatch. Prevent tearing, breaking, drying or any other damage.

## 2.7 CRUSHED STONE

- A. Crushed stone made from light colored granite. Stone screened to insure uniformity of size. No flat, elongated stone used. Size of stone in mowing strips and other areas as indicated on drawings, conforming to following requirements:

Size of square screen	Percent passing
1-1/4 inch	95% minimum
3/4 inch	15% maximum

## 2.8 PEAT MOSS

- A. Shredded, loose, substantially free of mineral and waste matters. Minimum organic matter by weight on a dry basis: 80 percent.

## 2.9 MULCH

- A. Shredded pine bark free of wood chips, stones, branches, or other deleterious material. Bark shredded in strips not larger than 3-inches in any dimension and aged for a period of not less than six months after removal from original logs.

## 2.10 TREE PLANTING

- A. Tree replacement shall be *Ulmus Americana*- American Elm, 2”-2.5” Caliper. Tree shall be delivered in full bag and burlap.

## PART 3 – EXECUTION

### 3.1 GENERAL

- A. It is the intent of this specification that existing trees within grading and seeding limits, not disturbed by building operations, be saved and protected, except where specified to be removed. Tree clearing, protection, and planting shall be performed based on the applicable specification sections and as indicated in the drawings or by the Engineer. Engineer directs variations required in grading on the job.

### 3.2 PLANTING SEASON

- A. Recommended Spring Planting Season: From time soil can be satisfactorily worked until following dates at end of planting season:
  - 1. Lawns - April 15.
- B. Recommended Fall Planting Season: Commence and terminate at time listed below:
  - 1. Lawns - August 1 to October 1.
- C. Perform actual planting only when weather and soil conditions are suitable in accordance with locally accepted practice.
- D. Deciduous plants shall be planted only when dormant either prior to bud break, before leaves appear in the spring, or subsequent to their loss in the fall, unless otherwise directed by the Engineer.

### 3.3 PROTECTION

- A. Protect seeded and planted areas against damage by trespass and other causes. Protect work until accepted. Replace, repair, restake, or replant as directed by Engineer, and at own expense, seeding or planting which is damaged.
- B. If planting is done after lawn preparation, protect lawn areas, repair damage resulting from planting operations.
- C. Wherever landscape work must be executed in conjunction with construction of other work, arrange a schedule of procedures that will permit execution of landscape work as specified.

### 3.4 PLANTING PITS

- A. Excavate with vertical sides and in accordance with following requirements:
  - 1. Plant shrubs in pits 12 inches greater in width than diameter of root ball or container and minimum of 18 inches deep below finished grade, or as necessary to properly set plant at finished grade.
  - 2. Adjust depth of planting beds and pits to provide minimum of 8 inches of planting soil mixtures under roots of all plants.
  - 3. Set plants in center of pits, plumb and straight and at level that top of root ball is 1 inch lower than surrounding finished grade after settlement.
- B. Compact topsoil mixture thoroughly around base of root ball to fill all voids, when plant material is set. Cut all burlap and lacing and remove from top 1/3 of root ball. Do not pull burlap from under any root ball. Backfill tree and shrub pits halfway with planting soil mixture and thoroughly puddle before backfilling tree or shrub pit. Water tree or shrub again, when each backfill operation is complete.

### 3.5 PLANTING SOIL MIXTURE

- A. Thoroughly mix all loam used in backfilling planting pits, with peat moss at rate of 2 parts loam to 1 part peat moss, to obtain required planting soil mixture.



### 3.6 PLANTING

- A. Thoroughly compact topsoil planting mixture around root balls and water. Immediately after plant pit is backfilled, form a shallow saucer slightly larger than pit with ridge of soil to facilitate and contain watering. After planting, cultivate soil in all shrub beds between shrub pits. Grub out sod or other growth and remove from bed area. Rake bed area smooth and neat and outline. Mulch all tree pits and shrub beds with a minimum of 3 inches of shredded pine bark mulch as indicated on drawings. Do not use admixture of wood chips in mulch.

### 3.7 BARK MULCH SURFACES

- A. Mulch, with shredded pine bark, all tree pits, shrub pits and beds, and all areas planted with ground cover, immediately after planting operations are completed.
  - 1. For tree and shrub pits and beds, provide a minimum 3 in. of mulch.
  - 2. For ground cover beds, provide a minimum 2 in. of mulch.
- B. Limit mulching for trees and individual shrubs to pit area inside of saucer and for shrub, tree and ground cover beds and panels planted with multiple trees. Define limits of beds in turf areas or where no building wall or curb exists by installed metal edging as indicated.

### 3.8 METAL EDGE STRIPS

- A. Install metal edge strips around all edges of mowing strips and planting beds as indicated. Fasten metal edge strips securely in place with tapered steel stakes driven through slots punched in strip at 30-in. (76.2cm) intervals. Set edge strips to finished grades indicated.

### 3.9 MOWING STRIPS AND AREAS OF CRUSHED STONE

- A. Construct mowing strips adjacent to all exterior building and structure walls where indicated on drawings. Provide mowing strips with metal edge strips.
- B. Install mat under crushed stone and pin in place.
- C. Place 6-in. minimum layer of crushed stone between edge strip and building or structure. Consolidate stone by means satisfactory to Engineer.

### 3.10 LOAM

- A. Spread loam on areas to be seeded, to required depth indicated on Contract Drawings or as directed by Engineer, fine grade and compact. Specified depth shall be that after compaction.

### 3.11 LIME, FERTILIZER AND SEEDING

- A. Apply lime by mechanical means at rate of 50 pounds per 1,000 sq. ft., or as soil analysis recommends. Apply fertilizer at rate of 50 pounds per 1,000 sq. ft., or as soil analysis recommends.
- B. If any delays in seeding lawn areas cause weeds to grow on surface or loam is washed out prior to sowing seed, remove weeds or replace loam and reestablish finish grades without additional compensation. Sow seed at rate of 4 pounds per 1,000 sq. ft. on calm day, by mechanical means. Sow one-half of seed in one direction, and other half at right angles to original direction. Rake seed lightly into loam, to depth of not more than 1/4 inch and compact by means of an acceptable lawn roller weighing 100 to 150 pounds per linear foot of width.
- C. Water lawn areas adequately at time of sowing and daily thereafter with fine spray, and continue throughout maintenance and protection period. Loam, lime, fertilize and seed required areas outside of perimeter same as lawn areas. Apply seed at rate of 80 pounds per acre. Rake seed lightly, after sowing, into top 1/4 in. of loam, and compact by suitable rollers weighing 100 to 150 pounds per linear foot of width.

### 3.12 SOD

- A. Install sod not more than 48 hours after cutting. Provide lime, fertilizer, etc, preparation for sod same as stated above for seed.

### 3.13 CRUSHED STONE

- A. Place crushed stone to depth of 6 inches, and thoroughly consolidate by means of suitable vibrator or mechanical tamper. Add stone, as necessary, after tamping or vibrating to finish depth of 6 inches.

### 3.14 CLEAN-UP

- A. Remove soil or similar material which has been brought onto paved areas, keeping these areas clean. Upon completion of planting, remove excess soil, stones and debris which has not previously been cleaned up and legally dispose of off-site.

- B. Prepare lawns and planting areas for final inspection. Protect slopes and embankments against erosion until work is accepted. Repair eroded portions of seeded or sodded areas by refilling, resodding, remulching and reseeding as required by condition and to satisfaction of Engineer. Protection may be by installation of sod strips or other methods.

### 3.15 MAINTENANCE

- A. Maintain lawn areas and other seed areas at maximum height of 2-1/2 inches by mowing at least three times. Weed thoroughly once and maintained until time of final acceptance. Reseed and refertilize with original mixtures, watering or whatever is necessary to establish over entire area of lawn and other seeded areas a close stand of grasses specified, and reasonably free of weeds and undesirable coarse native grasses.
- B. Begin maintenance immediately after each portion of lawn is seeded and continue for minimum of 45 days or until final acceptance of work. Water, mulch, weed, prune, spray, fertilize, cultivate and otherwise maintain and protect all plants.
- C. Reset settled plants to proper grade and position, and restore planting saucers and remove dead material. Tighten and repair guys.

### 3.16 FINAL INSPECTION

- A. Upon written request by the Contractor, the Engineer shall inspect all lawn areas to determine completion of contract work. This request must be submitted at least 10 days prior to the anticipated date. The lawns will become acceptable if they show a uniform, thick, well developed stand of grass that may be occupied by the Owner for their intended use. When acceptance is made in writing to the Contractor, the Contractor's responsibility for maintenance shall terminate.
- B. The Contractor shall furnish to the Owner complete written instructions for maintenance of all lawn areas at time of acceptance. Acceptance of the lawn area shall not occur before acceptance of the entire facility.

END OF SECTION 02900

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## SECTION 03250

### CONCRETE ANCHORS

#### PART 1 – GENERAL

##### 1.1 SUMMARY

- A. This Section specifies drilled-in anchors and rebar for concrete.

##### 1.2 PERFORMANCE REQUIREMENTS

- A. **Structural Performance:** Basis of design on the Drawings is Hilti KWIK Bolt TZ expansion anchor and Hilti HIT-HY 200 adhesive for fastening to concrete. If the Contractor chooses to use an alternate anchor the Contractor shall hire a professional structural engineer registered in the Commonwealth of Massachusetts to design concrete anchor connections required by the Contract Documents to withstand loads indicated to meet the requirements of the Massachusetts State Building Code – 8<sup>th</sup> Edition or latest edition.
- B. **Engineering Responsibility:** If the Contractor does not select the specified anchor for the basis of design specified in this Specification or on the Drawings the Contractor is to engage a qualified professional structural engineer licensed in the Commonwealth of Massachusetts to prepare calculations, Shop Drawings, and other structural data for concrete anchor connections.

##### 1.3 RELATED WORK

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Sections apply to the work of this Section.
- B. Section 03300 – CAST-IN-PLACE CONCRETE

##### 1.4 SUBMITTALS

- A. **General:** Submit the following in accordance with Section 01300 – SUBMITTALS.
  - 1. Product specifications with recommended design values and physical characteristics for epoxy anchors and rebar.
  - 2. Calculations stamped by a Professional Engineer registered in the Commonwealth of Massachusetts showing that the anchor's

capacity is adequate if chosen anchor differs from what is shown on the Contract Drawings.

3. Samples: Representative length and diameters of each type anchor shown on the Contract Drawings.
4. Quality Assurance Submittals:
  - a. Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.
  - b. Certificates:
    - 1) ICC ES Evaluation Reports.
5. Manufacturer's installation instructions.
6. Installer Qualifications and Procedures: Submit installer qualifications as stated in Section 1.6 of this Section. Submit a letter of procedure stating method of drilling, the product proposed for use, the complete installation procedure, manufacturer training date, and a list of the personnel to be trained on anchor installation.
7. Certifications that grouts used on the project contain no chlorides or other chemicals that cause corrosion.
8. Submit manufacturer's written warranty as indicated herein.
9. Name and telephone number of grout manufacturer's representative who will give on-Site service. The representative shall have at least one year of experience with the indicated grouts.

## 1.5 REFERENCES

- A. ASTM A615: Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
- B. ASTM F593: Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs
- C. ASTM F594: Standard Specification for Stainless Steel Nuts

## 1.6 QUALITY ASSURANCE

- A. Installer Qualifications:

1. Drilled-in anchors shall be installed by an installer with at least three years of experience performing similar installations
- B. Installer Training: Conduct a thorough training with the manufacturer or the manufacturer's representative for the installer on the project. Training shall consist of a review of the complete installation process for drilled-in anchors, and not limited to the following:
1. Hole drilling procedure,
  2. Hole preparation & cleaning technique,
  3. Adhesive injection technique & dispenser training / maintenance,
  4. Anchor and rebar dowel preparation and installation,
  5. Proof loading/torqueing.
- C. Certificates: Unless otherwise authorized by the Engineer, anchors shall have the following certification.
1. ICC ES Evaluation Report indicating conformance with current applicable ICC ES Acceptance Criteria (ICC ES AC308 for adhesive anchors).
  2. Each installer shall be re-qualified every 6 months for the duration of the Project by the same qualifying procedure.
- D. Professional Engineer Qualifications: A professional structural engineer who is legally authorized to practice in Massachusetts and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for projects with concrete anchors that are similar to that indicated for this Project in material, design, and extent.
- E. Testing and inspection: Contractor to retain independent testing laboratory to perform testing and inspection of expansion anchors in accordance with the requirements of this Section. The cost of special inspection of adhesive and mechanical anchors shall be paid by the Owner.

## 1.7 DELIVERY, STORAGE AND HANDLING

- A. Provide in accordance with Section 01600 – PRODUCTS, MATERIALS, AND EQUIPMENT.

1. Store anchors in accordance with manufacturer's recommendations.

## PART 2 – PRODUCTS

### 2.1 MATERIALS

- A. Contractor shall review Contract Drawings for specific information regarding spacing, embedment and type of anchor at each location where anchors are used.
- B. Fasteners and Anchors:
  1. Stainless Steel Bolts, Hex Cap Screws, and Studs: ASTM F593.
  2. Stainless Steel Nuts: ASTM F594.
  3. Reinforcing Dowels: ASTM A615, Grade 60, deformed and uncoated.

### 2.2 DRILLED-IN ANCHORS

- A. Cartridge Injection Adhesive Anchors: Threaded steel rod, inserts or reinforcing dowels, complete with nuts, washers, polymer or hybrid mortar adhesive injection system, and manufacturer's installation instructions. Type and size as indicated on Contract Drawings.
  1. Exterior Use: As indicated on the Contract Drawings, provide stainless steel anchors. Stainless steel anchors shall be AISI Type 304 stainless steel provided with stainless steel nuts and washers of matching alloy group and minimum proof stress equal to or greater than the specified minimum full-size tensile strength of the externally threaded fastener. All nuts shall conform to ASTM F594 unless otherwise specified. Avoid installing stainless steel anchors in contact with galvanically dissimilar metals.
  2. Reinforcing dowels shall be A615 Grade 60, deformed and uncoated.
  3. Where anchor manufacturer is not indicated on plans, subject to compliance with requirements and acceptance by the Engineer, provide the following:
    - a. HILTI-HIS stainless-steel threaded rods with RE 500-SD Injection Adhesive Anchoring System for anchorage to concrete, ICC ESR-2232



- B. Wedge Anchors: Wedge type, torque-controlled, with impact section to prevent thread damage complete with required nuts and washers. Provide anchors with length identification markings conforming to ICC ES AC193. Type and size indicated on Contract Drawings.
1. Exterior Use: As indicated on the Contract Drawings, provide stainless steel anchors. Stainless steel anchors shall be AISI Type 304 stainless steel provided with stainless steel nuts and washers of matching alloy group and minimum proof stress equal to or greater than the specified full-size tensile strength of the externally threaded fastener. Stainless steel nuts shall conform to ASTM F594 unless otherwise specified. Avoid installing stainless steel anchors in contact with galvanically dissimilar metals.
  2. Available Products: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Hilti Kwik Bolt 3 Expansion Anchor

## PART 3 – EXECUTION

### 3.1 INSTALLATION

- A. Cartridge Injection Adhesive Anchors: Drill hole with manufacturer's specified drill bit and drill bit diameter. Clean all holes per manufacturer instructions to remove loose material and drilling dust prior to installation of adhesive. Inject adhesive into holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive. Follow manufacturer recommendations to ensure proper mixing of adhesive components. Sufficient adhesive shall be injected in the hole to ensure that the annular gap is filled to the surface. Remove excess adhesive from the surface. Shim anchors with suitable device to center the anchor in the hole. Do not disturb or load anchors before manufacturer specified cure time has elapsed.
1. Observe manufacturer recommendations with respect to installation temperatures for cartridge injection adhesive anchors and capsule anchors.
  2. Relocation of drilled holes and adjustments or modifications to anchored or fastened items shall be considered part of the Work and shall be provided at no additional cost to the Owner.

- B. Wedge Anchors:
1. Drill holes with rotary impact hammer drills using carbide-tipped bits. Drill bits shall be of diameters as specified by the anchor manufacturer. Unless otherwise shown on the Drawings, all holes shall be drilled perpendicular to the concrete surface.
    - a. Embedded Items: Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Use non-destructive testing as required to determine position of existing reinforcing. Exercise care in coring or drilling to avoid damaging existing reinforcing steel or embedded items. Notify the Engineer if reinforcing steel or other embedded items are encountered during drilling. Take precautions as necessary to avoid damaging prestressing tendons, electrical and telecommunications conduit, and gas lines.
    - b. Base Material Strength: Unless otherwise specified, do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
  2. Perform anchor installation in accordance with manufacturer's instructions.
  3. Wedge anchors: Protect threads from damage during anchor installation. Set anchors to manufacturer's recommended torque, using a torque wrench. Following attainment of 10% of the specified torque, 100% of the specified torque shall be reached within 7 or fewer complete turns of the nut. If the specified torque is not achieved with the required number of turns, the anchor shall be removed and replaced unless directed by the Engineer.

### 3.2 REPAIR OF DEFECTIVE WORK

- A. Remove and replace misplaced or malfunctioning anchors. Fill empty anchor holes and patch failed anchor locations with high-strength non-shrink, nonmetallic grout. Anchors that fail to meet proof load or installation torque requirements shall be regarded as malfunctioning.
- B. Defective anchors noted by the Special Inspector shall be replaced and re-installed by the Contractor without any additional compensation.

### 3.3 FIELD QUALITY CONTROL

- A. Testing: 10% of each type and size of drilled-in anchor shall be proof loaded by the independent testing laboratory. Adhesive anchors and capsule anchors shall not be torque tested unless otherwise directed by the Engineer. If any of the tested anchors fail to achieve the specified torque or proof load within the limits as defined on the Contract Drawings, all anchors of the same diameter and type as the failed anchor shall be tested, unless otherwise instructed by the Engineer.
1. Torque shall be applied with a calibrated torque wrench.
  2. Proof loads shall be applied with a calibrated hydraulic ram. Displacement of adhesive and capsule anchors at proof load shall not exceed  $D/10$ , where  $D$  is the nominal anchor diameter.
- B. Minimum anchor embedment, proof loads and torques shall be as shown on the Contract Drawings.

END OF SECTION 03250

## SECTION 03300

### CAST-IN-PLACE CONCRETE

#### PART 1 – GENERAL

##### 1.1 SUMMARY

- A. This section specifies cast-in-place concrete, including formwork, reinforcement, concrete materials, mix design, placement procedures, and finishes.
- B. Cementitious Materials: Shall be a combination of Portland cement and Blast Furnace slag.

##### 1.2 RELATED WORK

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Sections apply to the Work of the Section.

##### 1.3 SUBMITTALS

- A. Shop Drawings: Submit the following in accordance with Section 01300 - SUBMITTALS:
  - 1. Product Data: For each type of manufactured material and product indicated.
  - 2. Design Mixes: For each concrete mix. Include alternate mix designs when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.
    - a. Indicate amounts of mix water to be withheld at plant for later addition at Project site.
    - b. The Contractor shall design and submit for review and approval a concrete mix for the cast-in-place field collars, prepared and stamped by a Professional Engineer licensed in the Commonwealth of Massachusetts. The concrete mix shall be a high early strength concrete with a minimum 28-Day compressive strength of 4,500 psi and shall achieve a minimum compressive strength of 3,000 psi within 24 hours. The design mix submittal shall include testing results demonstrating that compression test cylinders yield a minimum strength of 3,000 psi at 24 hours.

3. Delivery Tickets: Where ready-mix concrete is used, the Contractor shall furnish certified delivery tickets at the time of delivery of each load of concrete. Each ticket shall show the state certified equipment used for measuring, and the total quantities, by weight, of cement, sand, each class of aggregate, admixtures, the amounts of water in the aggregate, added at the batching plant, and the amount allowed to be added at the Site for the specific design mix. In addition, each certificate shall state the mix number, total yield in cubic yards, and the time of day to the nearest minute, corresponding to the time when the batch was dispatched, when it left the plant, when it arrived at the Site, when unloading began, and when unloading was finished.
4. Steel Reinforcement Shop Drawings: Details of fabrication, bending, and placement, prepared according to ACI 315. Include material, grade, bar schedules, stirrup spacing, bent bar diagrams, arrangement, and supports of concrete reinforcement. Include special reinforcement required for openings through concrete structures.
5. Welding Certificates: Copies of certificates for welding procedures and personnel.
6. Material Certificates: Signed by manufacturers certifying that each of the following items complies with requirements:
  - a. Cementitious materials and aggregates,
  - b. Form materials, form-release agents and related accessories,
  - c. Steel reinforcement and reinforcement accessories,
  - d. Admixtures,
  - e. Waterstops,
  - f. Curing materials and methods,
  - g. Bonding agents,
  - h. Adhesives,
  - i. Ready-mix concrete producer,
  - j. Repair materials,

- k. Grout
  - l. Mill tests for cement,
  - m. Bearing pads,
  - n. Neoprene sponge,
  - o. Preformed joint filler.
- 7. Minutes of preinstallation conference.
  - 8. Detailed cold-weather protection methods.
  - 9. Waterstops: Contractor shall submit shop drawings to include product specifications, typical waterstop details and joint and lap details.

#### 1.4 REFERENCES

- A. ACI 117: Specification for Tolerances for Concrete Construction and Materials
- B. ACI 211.1: Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete
- C. ACI 301: Specifications for Structural Steel
- D. ACI 305R: Specification for Hot Weather Concreting
- E. ACI 306.1: Standard Specification for Cold Weather Concreting
- F. ACI 309R: guide for Consolidation of Concrete
- G. ACI 315: Details and Detailing of Concrete Reinforcement
- H. ACI 318: Building Code Requirements for Structural Concrete
- I. ACI 347R: Guide to Formwork for Concrete
- J. ASTM A82: Standard Specification for Steel Wire, Plain, for Concrete Reinforcement
- K. ASTM A185: Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete

- L. ASTM A615: Standard Specification for Deformed and Plain Carbon-Steel for Concrete Reinforcement
- M. ASTM A706: Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement
- N. ASTM A 775: Standard Specification for Epoxy-Coated Steel Reinforcing Bars
- O. ASTM C31: Standard Specification for Making and Curing Concrete Test Specimens in the Field
- P. ASTM C33: Standard Specification for Concrete Aggregates
- Q. ASTM C39: Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
- R. ASTM C42: Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
- S. ASTM C94: Standard Specification for Ready-Mixed Concrete
- T. ASTM C143: Standard Test Method for Slump of Hydraulic-Cement Concrete
- U. ASTM C150: Standard Specification for Portland Cement
- V. ASTM C171: Standard Specification for Sheet Materials for Curing Concrete
- W. ASTM C172: Standard Practice for Sampling Freshly Mixed Concrete
- X. ASTM C173: Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method
- Y. ASTM C231: Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
- Z. ASTM C260: Standard Specifications for Air-Entraining Admixtures for Concrete
- AA. ASTM C404: Standard Specification for Aggregates for Masonry Grout
- BB. ASTM C494: Standard Specification for Chemical Admixtures for Concrete

- CC. ASTM C881: Standard Specification for Epoxy-Resin-Base Bonding System for Concrete
- DD. ASTM C989: Standard Specification for Slag Cement for Use in Concrete and Mortars
- EE. ASTM C1059: Standard Specification for Latex Agents for Bonding Fresh TO Hardened Concrete
- FF. ASTM C1064: Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete
- GG. ASTM C1077: Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation
- HH. ASTM C1107: Standard Specification for Packaged Dry, Hydraulic-Cement Grout (nonshrink)
- II. ASTM C1315: Standard Specification for Liquid Membrane-Forming Compound Having Special Properties for Curing and Sealing Concrete
- JJ. ASTM D1752: Standard Guide for Measuring Physical and Rheological Properties of Radioactive Solutions, Slurries, and Sludges
- KK. ASTM D3963: Standard Specification for Fabrication and Jobsite Handling of Epoxy-Coated Steel Reinforcing Bars
- LL. ASTM E329: Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection
- MM. ASTM E548: Standard Guide for General Criteria Used for Evaluating Laboratory Competence
- NN. AWS D1.4: Structural Welding Code – Reinforcing Steel
- OO. CRD C572: US Army Corp of Engineers, Specifications for Polyvinylchloride Waterstop

## 1.5 QUALITY CONTROL

- A. Provide in accordance with Section 01400 – QUALITY ASSURANCE and as specified.
- B. Installer Qualifications: An experienced installer who has completed concrete Work similar in material, design, and extent to that indicated for



this Project and whose work has resulted in construction with a record of successful in-service performance.

- C. **Manufacturer Qualifications:** A firm experienced in manufacturing ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.
  - 1. Manufacturer must be certified according to the National Ready Mixed Concrete Association's Certification of Ready Mixed Concrete Production Facilities.
  
- D. **Testing Agency Qualifications:** Contractor shall employ a testing agency, acceptable to the Engineer and qualified according to ASTM C 1077 and ASTM E 329 to conduct the testing indicated, as documented according to ASTM E 548.
  - 1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
  
- E. **Source Limitations:** Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, each aggregate from one source, and each admixture from the same manufacturer.
  
- F. **ACI Publications:** Comply with the following, unless more stringent provisions are indicated:
  - 1. ACI 301, "Specification for Structural Concrete."
  - 2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
  
- G. **Preinstallation Conference:** Conduct conference at Project site during Progress Meeting required in Section 01040 – PROJECT COORDINATION AND MEETINGS.
  - 1. Before submitting design mixes, review concrete mix design and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
    - a. Contractor's superintendent,
    - b. Independent testing agency responsible for concrete design mixes,

- c. Ready-mix concrete producer,
- d. Concrete subcontractor,

#### H. Field Compression Tests

1. Compression test specimens shall be taken during construction from the first placement of each class of concrete herein and at intervals thereafter as selected by the Engineer to ensure continued compliance with these Specifications. Each set of test specimens will be a minimum of 4 cylinders.
2. Compression test specimens for concrete will be made in accordance with Section 9.2 of ASTM C 31 - Standard Practice for Making and Curing Concrete Test Specimens in the Field. Specimens will be 6-inches diameter by 12-inches high cylinders.
3. Compression tests will be performed in accordance with ASTM C 39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens. One test cylinder will be tested at 7 Days and 2 at 28 Days. The remaining cylinder will be held to verify test results, if needed.
  - a. For the high early strength concrete used in the pile caps, one additional test cylinder shall be taken at each pile cap and tested at 24 Hours to verify the required strengths are reached before formwork is removed and the pile caps are loaded.

#### I. Evaluation and Acceptance of Concrete

1. Evaluation and acceptance of the compressive strength of concrete will be according to the requirements of ACI 318 - Building Code Requirements for Reinforced Concrete, Chapter 5 "Concrete Quality", and as indicated herein.
2. If any concrete fails to meet these requirements, immediate corrective action shall be taken to increase the compressive strength for subsequent batches of the type of concrete affected.
3. Concrete that fails to meet the ACI requirements and these Specifications is subject to removal and replacement as part of the Work

#### J. Construction Tolerances: The Contractor shall set and maintain concrete forms and perform finishing operations so that the concrete is within the

tolerances herein. Surface defects and irregularities are defined as finishes and are to be distinguished from tolerances. Tolerance is the permissible variation from lines, grades, or dimensions indicated. Where tolerances are not indicated, permissible deviations will be in accordance with ACI 117 - Standard Tolerance for Concrete Construction and Materials.

1. The variation from required lines or grades shall not exceed 1/4-inch in 10-feet and there shall be no offsets or visible waviness in the finished surface.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Provide in accordance with Section 01600 – PRODUCTS, MATERIALS AND EQUIPMENT and as specified.
- B. Deliver, store, and handle steel reinforcement to prevent bending and damage.
  1. Avoid damaging epoxy coating on steel reinforcement.
  2. Repair damaged epoxy coating on steel reinforcement according to ASTM D 3963/D 3963M.

## PART 2 – PRODUCTS

### 2.1 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
  1. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
    - a. Medium-density overlay, Class 1, or better, mill-release agent treated and edge sealed.
- B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.
- C. Forms for Cylindrical Columns, Pedestals, Light Pole Piers, and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber tubes that will produce surfaces with gradual or abrupt irregularities not exceeding specified formwork surface class. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.

- D. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch, minimum.
- E. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
- F. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
1. Furnish units that will leave no corrodible metal closer than 1-1/2 inch to the plane of the exposed concrete surface.
  2. Furnish ties that, when removed, will leave holes not larger than 1 inch in diameter in concrete surface.
  3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing and for walls which are part of water containing tanks or structures.
- G. Forms and falsework to support the roof and floor slabs shall be designed for the total dead load, plus a live load of 50 psf (minimum). The minimum design load for combined dead and live loads shall be 100 psf.

## 2.2 STEEL REINFORCEMENT

- A. Reinforcing Materials shall have a recycled content of 30% or greater and shall conform to the following standards:
1. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.
  2. Low-Alloy-Steel Reinforcing Bars: ASTM A 706/A 706M, deformed.
  3. Plain-Steel Wire: ASTM A 82, as drawn.
  4. Plain-Steel Welded Wire Fabric: ASTM A 185, fabricated from as-drawn steel wire into flat sheets.

## 2.3 REINFORCEMENT ACCESSORIES

- A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete or fiber-reinforced concrete of greater compressive strength than concrete, and as follows:
  - 1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected or CRSI Class 2 stainless-steel bar supports.
  - 2. Concrete blocks (dobies) used to support and position reinforcement steel shall have the same or higher compressive strength than required for the concrete in which they are located. Where concrete blocks are used on concrete surfaces exposed to view, the color and texture of the concrete blocks shall match that required for the finished surface. Wire ties shall be embedded in concrete block bar supports.
- B. Joint Dowel Bars: Plain-steel bars, ASTM A 615/A 615M, Grade 60. Cut bars true to length with ends square and free of burrs.

## 2.4 MECHANICAL COUPLERS

- A. Mechanical couplers shall be provided where indicated and where approved by the Engineer. Couplers shall develop a tensile strength that exceeds 125% of the yield strength of the reinforcing bars being spliced at each splice.

## 2.5 WELDED SPLICES

- A. Welded splices shall be provided where indicated and where approved by the Engineer. Welded splices of reinforcement steel shall develop a tensile strength exceeding 125% of the yield strength of the reinforcing bars that are connected.
- B. Materials required to perform the welded splices to the requirements of AWS D1.4 shall be provided.

## 2.6 CONCRETE MATERIALS

- A. Portland Cement: ASTM C 150, Type II.
- B. Ground Granulated Blast-furnace slag: ASTM C 989, Grade 100 or better.

- C. Normal-Weight Aggregate (NW): ASTM C 33, uniformly graded, and as follows:
  - 1. Class: Severe weathering region, but not less than 3S.
  - 2. Nominal Maximum Aggregate Size: 3/4 inch.
- D. Water: Potable and complying with ASTM C 94.

## 2.7 GROUT

- A. Cement Grout: Portland cement, ASTM C 150, Type I; and clean, natural sand, ASTM C 404, Size No. 2. Mix at ratio of 1 part cement to 2-1/2 parts sand, by volume, with minimum water required for placement and hydration.
- B. Nonmetallic, Shrinkage-Resistant Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, Portland cement, shrinkage compensating agents, plasticizing and water-reducing agents, complying with ASTM C 1107, of consistency suitable for application, and a 30-minute working time.

## 2.8 ADMIXTURES

- A. General: Admixtures certified by manufacturer to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material and to be compatible with other admixtures and cementitious materials. Do not use admixtures containing calcium chloride.
- B. Air-Entraining Admixture: ASTM C 260.
- C. Water-Reducing Admixture: ASTM C 494, Type A.
- D. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.
- E. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.

## 2.9 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete. This product shall not be used as a substitution for curing compounds.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. dry.

- C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- D. Water: Potable.
- E. Volatile Organic Compounds (VOC) shall meet maximum emission limits of authorities having jurisdiction at project site.
- F. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.
  - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Evaporation Retarder:
      - i. Eucobar; Euclid Chemical Co,
      - ii. E-Con; L&M Construction Chemicals, Inc,
      - iii. Confilm; Master Builders, Inc,
      - iv. Waterhold; Metalcrete Industries,
      - v. or equal.
    - b. Clear, Waterborne, Membrane-Forming Curing Compound, 18 to 22 percent Solids:
      - i. Klear-Kote WBII 20 percent; Burke Chemicals,
      - ii. Dress & Seal WB; L&M Construction Chemicals, Inc,
      - iii. Vocomp-20; W. R. Meadows, Inc,
      - iv. or equal.
    - c. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound:
      - i. Klear-Kote Cure-Sealer-Hardener, 30 percent solids; Burke Group, LLC (The),

- ii. Lumiseal WB Plus; L&M Construction Chemicals, Inc,
- iii. Vocomp-30; W. R. Meadows, Inc,
- iv. or equal.

## 2.10 RELATED MATERIALS

- A. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.
- B. Epoxy-Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class and grade to suit requirements, and as follows:
  - 1. Types IV and V Epoxy Bonding/Grouting Adhesive, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
    - a. Sikadur 32, Hi-Mod LPL, Sika Corporation.

## 2.11 JOINT MATERIALS

- A. Materials for joints in concrete shall conform to the following requirements:
  - 1. Joint filler material shall be of the preformed non-extruding type joint filler constructed of cellular neoprene sponge rubber or polyurethane of firm texture. Bituminous fiber type will not be permitted. Non-extruding and resilient-type preformed expansion joint fillers shall conform to the requirements and tests set forth in ASTM D 1752 - Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction; for Type I, except as otherwise indicated.
  - 2. Elastomeric joint sealer shall conform to ASTM C 920 Elastomeric Joint Sealants.
  - 3. Mastic joint sealer shall be a material that does not contain evaporating solvents; that will tenaciously adhere to concrete surfaces; that will remain permanently resilient and pliable; that will not be affected by continuous presence of water and will not in any way contaminate potable water; and that will effectively seal the joints against moisture infiltration even when the joints are subject to movement due to expansion and contraction. The sealer



shall be composed of special asphalts or similar materials blended with lubricating and plasticizing agents to form a tough, durable mastic substance containing no volatile oils or lubricants and shall be capable of meeting the test requirements set forth hereinafter, if testing is required by the Engineer.

B. Excavatable Flowable Fill

1. Excavatable Flowable Fill (Controlled Density Fill (CDF)) material is a flowable, self-consolidating, rigid setting, low density material to be used for pipe trench backfill and roadway subbase, as shown in the Contract Drawings.
2. Excavatable Flowable Fill shall be excavatable and very flowable.
  - a. The design mix shall be a mixture of Portland Cement, sand and other course and fine aggregate, and water designed to provide strengths within the range specified in Section 2.13.F.6.
  - b. Excavatable mixes shall be hand tool excavatable and shall have a maximum strength of 100 psi.
  - c. The design mix shall have very flowable characteristics needed for filling small or far areas that later may need to be removed.
3. Excavatable Flowable Fill is to be batched at a ready mix plant and is to be used at a high or very high slump of approximately 10-inches to 12-inches. It shall be flowable, require no vibration and after it has been placed can be excavated by hand tools and/or small machines.
  - a. In lieu of the slump test, a 6-inch long, 3-inch diameter tube may be filled to the top and the slowly raised. The diameter of the resulting “pancake” may be measured, and the range of the diameter shall be 9-inches to 14-inches.
4. Excavatable Flowable Fill ingredients shall comply with the following:
  - a. Portland Cement: ASTM C-150, Type II.
  - b. Aggregate: course and fine aggregate consisting of well graded crushed stone.

c. Sand:

- i. Sand shall be composed essentially of clean, hard, strong, durable, and impermeable particles, resistant to wear and frost, inert to cement and water, reasonably free from structurally weak grains, organic matter, loam, clay, silt, salts, mica, or other fine materials that may affect bonding of the cement paste. Sand shall be taken from a natural deposit. The sand particles shall be relatively spherical in shape and shall have gritty surfaces.
- ii. Sand for cement concrete shall be properly washed to satisfactorily remove deleterious materials and surface coatings and shall be stockpiled after washing for a period as long as necessary to drain off all excess water.
- iii. The sand shall conform to the following requirements:

Sand Composition Requirements		
	ASTM Test Method	Maximum Percent by Weight
Clay Lumps and Friable Particles	C142	3.0
Coal and Lignite	C123	0.5
Materials Passing No. 200 Sieve	C117	3.0
Organic Impurities	C40	*Pass
Soundness (Na <sub>2</sub> SO <sub>4</sub> ) – 5 Cycles	C88	10

\* Sand when tested for mortar making properties, as specified above, shall produce a compressive strength, at any period of time, equal to or greater than that developed by mortar of the same proportions and consistency made of the same cement and sand after the sand has been treated in a 3% solution of sodium hydroxide in accordance with ASTM C87.

- 1. Sand not conforming to the requirements specified above for organic impurities, shall be rejected unless the 28-day strength tests show the color is due to impurities not detrimental to the strength of the concrete.

- iv. The sieve analysis of the sand shall show it to be well graded and conforming to the following:

Sieve Analysis for Sand		
Sieve Designation	Fine Aggregate Minimum	Fine Aggregate Maximum
3/8-inch	100	N/A
No. 4	95	100
No. 16	45	80
No. 50	10	30
No. 100	2	10
No. 200	0	

- v. The fineness modulus of fine aggregate shall be not less than 2.5 and not greater than 3.0. For the purpose of determining the degree of uniformity, a fineness modulus determination will be made upon representative samples from any one source. Fine aggregate from any one source having variation in fineness modulus greater than 0.20 either way from the representative sample will be rejected.
- vi. The fineness modulus of fine aggregate shall be determined by adding the cumulative percentages, by weight, of materials retained on U.S. Standard Sieves numbered 4, 8, 16, 30, 50, 100, and dividing by 100.
- vii. Fine aggregate failing to pass the minimum requirements for material passing the No. 50 and/or No. 100 sieves may be used, provided an approved inorganic fine material is added to correct the deficiency in grading.

d. Air Entraining Admixtures: ASTM C260-10a

- i. Calcium Chloride, or any other admixture containing chloride salts, shall not be used in any Cement Concrete.

e. Water shall be clean and free from oils, acid, and organic matter.

- 5. The following mix design is for information only. The actual design submitted by the ready mix operator, in accordance with the

Contract Drawings and Specifications, must be confirmed by trial batches.

Excavatable Flowable Fill Mix Design (Informational Only)	
Material	Mix Design
Cement	50 lbs.
Sand	2,700 lbs.
Water	60 gal.

6. Excavatable Flowable Fill must meet the requirements set forth in the table below:

Excavatable Flowable Fill Functional Requirements	
Flowable Fill	Design Properties
Compressive Strength @ 28 Days	30 psi to 80 psi
Compressive Strength @ 90 Days	100 psi maximum
Slump	10 in. to 12 in.

2.12 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.13 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94, and furnish batch ticket information.
1. When air temperature is between 85 and 90 F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 F, reduce mixing and delivery time to 60 minutes.

PART 3 – EXECUTION

3.1 FORMWORK

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until concrete structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

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- C. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:
1. Class A, 1/8 inch, for concrete surfaces exposed to view.
  2. Class C, 1/2 inch, for other concrete surfaces.
- D. Construct forms tight enough to prevent loss of concrete mortar.
- E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical. Kerf wood inserts for forming keyways, reglets, recesses, and the like, for easy removal.
1. Do not use rust-stained steel form-facing material.
- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
- G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- H. Chamfer exterior corners and edges of permanently exposed concrete where indicated on Drawings.
- I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
- J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

### 3.2 EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use Setting Drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
  - 1. Install anchor bolts, accurately located, to elevations required.

### 3.3 REMOVING AND REUSING FORMS

- A. General: Formwork, for sides of beams, walls, columns, and similar parts of the Work, that does not support weight of concrete may be removed after cumulatively curing at not less than 50°F for 72 hours after placing concrete provided concrete is hard enough to not be damaged by form-removal operations and provided curing and protection operations are maintained. When cold weather concrete requirements apply, formwork shall be left-in-place for a minimum of 7 days.
- B. Leave formwork, for beam soffits, joists, slabs, and other structural elements, that supports weight of concrete in place until concrete has achieved the following:
  - 1. At least 75% of 28-day design compressive strength.
  - 2. Determine compressive strength of in-place concrete by testing representative field cured test specimens according to ACI 301.
  - 3. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.
- C. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.
- D. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Engineer.

### 3.4 SHORES AND RESHORES

- A. Comply with ACI 318, ACI 301, and recommendations in ACI 347R for design, installation, and removal of shoring and reshoring.

- B. In multistory construction, extend shoring or reshoring over a sufficient number of stories to distribute loads in such a manner that no floor or member will be excessively loaded or will induce tensile stress in concrete members without sufficient steel reinforcement.
- C. Plan sequence of removal of shores and reshore to avoid damage to concrete. Locate and provide adequate reshoring to support construction without excessive stress or deflection.

### 3.5 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials. Reinforcement steel shall always be protected from conditions conducive to corrosion until concrete is placed around it.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain required concrete cover. Do not tack weld crossing reinforcing bars, unless indicated on the Drawings.
  - 1. Shop- or field-weld reinforcement according to AWS D1.4, only where indicated on the Drawings.
  - 2. Do not install reinforcement into previously placed concrete.
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- E. Install welded wire fabric in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

### 3.6 SPLICING

- A. General: Reinforcement bar splices shall only be used at locations indicated. When it is necessary to splice reinforcement at points other than where indicated, the character of the splice shall be reviewed and accepted by the Engineer.
- B. Splices of Reinforcement

1. The length of lap for reinforcement bars, unless otherwise indicated, shall be in accordance with ACI 318, Section 12.15.1 for a Class B splice.
2. Welded splices shall be performed in accordance with AWS D1.4.
3. Laps of welded wire fabric shall be in accordance with the ACI 318. Adjoining sheets shall be securely tied together with No. 14 tie wire, one tie for each 2 running feet. Wires shall be staggered and tied in such a manner that they cannot slip.

### 3.7 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Engineer.
  1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated.
  2. Form using bulkhead forms with keys, unless otherwise indicated. Leave-in-place bulkhead forms are prohibited.
  3. Use a bonding agent at locations where indicated on Drawings, and where fresh concrete is placed against hardened concrete surfaces.

### 3.8 WATERSTOPS

- A. Flexible Waterstops: Install in construction joints as indicated to form a continuous diaphragm. Install in longest lengths practicable. Support and protect exposed waterstops during progress of Work. Field-fabricate joints in waterstops according to manufacturer's written instructions.
- B. Self-Expanding Strip Waterstops: Install in construction joints and at other locations indicated, according to manufacturer's written instructions, bonding or mechanically fastening and firmly pressing into place. Install in longest lengths practicable.

### 3.9 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.



- B. Do not add water to concrete during delivery, at Project site, or during placement, unless approved in writing by Engineer.
- C. Deposit concrete continuously or in layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as specified. Deposit concrete to avoid segregation.
- D. Deposit concrete in forms in horizontal layers no deeper than 24 inches and in a manner to avoid inclined construction joints. Place each layer while preceding layer is still plastic, to avoid cold joints.
1. Limit drop height of concrete off of chute to 48-inches.
  2. Consolidate placed concrete with mechanical vibrating equipment. Use equipment and procedures for consolidating concrete recommended by ACI 309R.
  3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations no farther than the visible effectiveness of the vibrator. Place vibrators to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mix constituents to segregate.
- E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
  2. Maintain reinforcement in position on chairs during concrete placement.
  3. Screed slab surfaces with a straightedge and strike off to correct elevations.
  4. Slope surfaces uniformly to drains where required.

5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, free of humps or hollows, before excess moisture or bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.
  6. Pulling of welded wire fabric through wet concrete from subgrade is prohibited.
- F. Temperature of Concrete: The temperature of concrete when it is being placed shall be not more than 90°F nor less than 40°F in moderate weather, and not less than 50°F in weather during which the mean daily temperature drops below 40°F. Concrete ingredients shall not be heated to a temperature higher than that necessary to keep the temperature of the mixed concrete, as placed, from falling below the required minimum temperature. If concrete is placed when the weather is such that the temperature of the concrete would exceed 90°F, the Contractor shall employ effective means, such as precooling of aggregates and mixing water, using ice, or placing at night, as necessary to maintain the temperature of the concrete, as it is placed, below 90°F. The Contractor shall be entitled to no additional compensation on account of the foregoing requirements.
- G. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
1. When air temperature has fallen to or is expected to fall below 40 F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 F and not more than 80 F at point of placement.
  2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
  3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators, unless otherwise specified and approved in mix designs.
- H. Hot-Weather Placement: Place concrete according to recommendations in ACI 305R and as follows, when hot-weather conditions exist:
1. Cool ingredients before mixing to maintain concrete temperature below 90 F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent

of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.

2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
  3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.
- I. Casting New Concrete Against Old: Where concrete is to be cast against old concrete (defined as any concrete which is greater than 60 Days of age), the surface of the old concrete shall be thoroughly cleaned and roughened by hydroblasting (exposing aggregate) prior to the application of an epoxy bonding agent. Application shall be according to the bonding agent manufacturer's instructions and recommendations.

### 3.10 TAMPING AND VIBRATING

- A. As concrete is placed in the forms or in excavations, it shall be thoroughly settled and compacted, throughout the entire depth of the layer which is being consolidated, into a dense, homogeneous mass, filling all corners and angles, thoroughly embedding the reinforcement, eliminating rock pockets, and bringing only a slight excess of water to the exposed surface of concrete. Vibrators shall be high speed power vibrators (8000 to 12,000 rpm) of an immersion type in sufficient number and with at least one standby unit as required.
- B. Concrete in walls shall be internally vibrated and at the same time rammed, stirred, or worked with suitable appliances, tamping bars, shovels, or forked tools until it completely fills the forms or excavations and closes snugly against all surfaces. Subsequent layers of concrete shall not be placed until the layers previously placed have been worked thoroughly. Vibrators shall be provided in sufficient numbers, with standby units as required, to accomplish the required results within 15 minutes after concrete of the prescribed consistency is placed in the forms. The vibrating head shall not contact the surfaces of the forms. Care shall be taken not to vibrate concrete excessively or to work it in any manner that causes segregation of its constituents.

### 3.11 FINISHING FORMED SURFACES

- A. The finish of formed surfaces shall proceed concurrently with, or immediately after the repair of surface defects. The selection of finishes shall be as indicated in the table below.

Concrete Finishes (Formed Surfaces) Location	Finish
All concrete	Rough-Formed Finish

- B. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defective areas repaired and patched. Remove fins and other projections exceeding ACI 347R limits for class of surface specified.
- C. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defective areas. Remove fins and other projections exceeding 1/8 inch in height.
  - 1. Apply to concrete surfaces exposed to public view or to be covered with a coating or covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, or painting.
- D. Smooth Rubbed Finish to Permanently Exposed Surfaces: Apply the following to smooth-formed finished concrete:
  - 1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.
- E. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

### 3.12 MISCELLANEOUS CONCRETE ITEMS

- A. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete Work.

### 3.13 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-

weather protection and with recommendations in ACI 305R for hot-weather protection during curing.

- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing by one or a combination of the following methods:
- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces, by one or a combination of the following methods:
  - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
    - a. Water.
    - b. Continuous water-fog spray.
    - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
  - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
    - a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
    - b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.

- c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer recommends for use with floor coverings.
3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

### 3.14 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas when approved by Engineer. Remove and replace concrete that cannot be repaired and patched to Engineer's approval.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.
- C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
  1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension in solid concrete but not less than 1 inch in depth. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
  2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
  3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Engineer.
- D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface.

Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
2. After concrete has cured at least 14 days, correct high areas by grinding.
3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
6. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least 3/4 inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mix as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
7. Repair random cracks and single holes 1 inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact

patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

- E. Perform structural repairs of concrete, subject to Engineer's approval, using epoxy adhesive and patching mortar.
- F. Repair materials and installation not specified above may be used, subject to Engineer's approval.

### 3.15 FIELD QUALITY CONTROL

- A. Testing Agency: Contractor shall employ qualified independent testing and inspecting agency to sample materials, perform tests, and submit test reports during concrete placement according to requirements specified in this Article.
- B. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
  - 1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete, plus one set for each additional 50 cu. yd. or fraction thereof.
    - a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mix, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
  - 2. Slump: ASTM C 143; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mix. Perform additional tests when concrete consistency appears to change.
  - 3. Air Content: ASTM C 231, pressure method, for normal-weight concrete; ASTM C 173, volumetric method, for structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mix.
  - 4. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40°F and below and when 80°F and above, and one test for each composite sample.
  - 5. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of four standard cylinder specimens for each composite sample.



- a. Cast and field cure one additional set of four standard cylinder specimens for each composite sample, when outside air temperature is below or expected to fall below 40°F (4.4°C) that night. Also provide field cured cylinders to determine strength for form removal.
6. Compressive-Strength Tests: ASTM C 39; test one laboratory-cured specimen at 7 days, two at 28 days, and one at 56 days.
  - a. High early strength concrete for use in the pile caps is to be tested at the 24-hour mark, for each pile cap, to ensure a minimum strength of 3,000 psi to allow form removal and installation of pipeline elements on the pile caps.
- C. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
- D. Strength of each concrete mix will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
- E. Test results shall be reported in writing via Fax to Engineer, Owner, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7-and 28-day tests.
- F. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Engineer. Testing and inspecting agency shall conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42 or by other methods as directed by Engineer. Petrographical analysis to determine water/cement ratio cement content, hydrated cement content, etc. shall be performed by the testing and inspection agency as directed by the Engineer when test results indicate requirements have not been met.

3.16 CONTRACT CLOSEOUT

- A. Provide in accordance with Section 01701 – PROJECT CLOSEOUT.

END OF SECTION 03300

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## SECTION 03315

### GROUT

#### PART 1 – GENERAL

##### 1.1 DESCRIPTION

- A. Furnish all materials for installation of grout in accordance with the provisions of this Section. This section includes the work to form, mix, place, cure, repair, finish, and do all other work as required to produce finished grout, in accordance with the requirements of the Contract Documents.
- B. The following types of grouts shall be covered in this Section:
  - 1. Non-Shrink Grout: This type of grout is to be used wherever grout is shown in the Contract Documents unless another type is specifically referenced.
  - 2. Cement Grout: Cement grout shall be composed of one part cement, three parts sand, and the minimum amount of water necessary to obtain the desired consistency.
  - 3. Epoxy Grout: Epoxy grout shall be a pourable, non-shrink, 100% solids system.

##### 1.2 RELATED WORK

- A. Section 03300 – CAST-IN-PLACE CONCRETE
- B. Section 02252 – MANHOLES

##### 1.3 SUBMITTALS

- A. Shop Drawings: Submit the following in accordance with Section 01300 – SUBMITTALS:
  - 1. Submit certified test results verifying the compressive strength, shrinkage, and expansion requirements specified herein; and manufacturer's literature containing instructions and recommendations on the mixing, handling, placement, curing and appropriate uses for each type of non-shrink and epoxy grout used in the work.

2. Certifications that grouts used on the project contain no chlorides or other chemicals that cause corrosion.
3. Manufacturer's certification that its non-shrink grout does not contain aluminum, zinc, or magnesium powders as a method of expansion
4. Submit manufacturer's written warranty as indicated herein.
5. Name and telephone number of grout manufacturer's representative who will give on-Site service. The representative shall have at least one year of experience with the indicated grouts.

#### 1.4 REFERENCES

- A. ASTM C109: Standard Test Method for Compressive Strength of Hydraulic Cement Mortars
- B. ASTM C307: Standard Test Method for Tensile Strength of Chemical-Resistant Mortar, Grout, and Monolithic Surfacing
- C. ASTM C531: Standard Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes
- D. ASTM C579: Standard Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithics Surfacing, and Polymer Concretes
- E. ASTM C580: Standard Test Method for Flexural Strength and Modulus of Elasticity of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes
- F. ASTM C881: Standard Practice for Determining Chemical Resistance of Thermosetting Resins Used in Glass-Fiber-Reinforced Structures Intended for Liquid Service
- G. ASTM C882: Standard Specification for Contact-Molded Reinforced Thermosetting Plastic (RTP) Laminates for Corrosion-Resistant Equipment
- H. ASTM D648: Standard Test Method for Breaking Strength of Ceramic Tile
- I. ASTM D695: Standard Test Method for Compressive Strength of Carbon and Graphite

- J ASTM D696: Standard Test Methods for Chemical, Mass Spectrometric, and Spectrochemical Analysis of Nuclear-Grade Uranium Dioxide Powders and Pellets
- K. CRD-C 621: US Army Corp of Engineers, Specification for Non-Shrink Grout

## 1.5 QUALITY CONTROL

### A. Field Tests:

#### 1. Cement Grout

- a. Compressive strength of cement grout shall be tested in accordance with the requirements of ASTM C 109. The frequency of tests shall conform to the requirements of Section 03300 – CAST-IN-PLACE CONCRETE.

#### 2. Prepackaged Grout

- a. Compression test specimens shall be taken during construction from the first placement of each type of grout, and for each different batch number of each type of grout thereafter. The specimens will be made by the Owner or its representative.
- b. Compression tests and fabrication of specimens for non-shrink grout shall be performed as specified in ASTM C 109. A set of three specimens shall be made for testing at 24 hour, 28 days, and each additional time period as appropriate.
- c. Compression tests and fabrication of specimens for epoxy grout shall be performed as specified in ASTM C 579, Method B. A set of three specimens shall be made for testing at 24 hours, and each earlier time period as appropriate.

- 3. All grout, already placed, which fails to meet the requirements of these specifications, is subject to removal and replacement at the cost of the Contractor.
- 4. The cost of all laboratory and field tests on grout shall be borne by the Contractor, and the Contractor shall assist the Owner in

obtaining specimens for testing. The Contractor shall supply all materials necessary for fabricating the test specimens.

- B. Construction Tolerances: Construction tolerances shall be as specified in the Section 03300 – CAST-IN-PLACE CONCRETE except as modified herein and elsewhere in the Contract Documents.

## 1.6 SPECIAL CORRECTION OF DEFECTS PROVISIONS

### A. Manufacturer's Warranty

1. Furnish one-year warranty for Work provided under this Section.
2. Manufacturer's warranty shall not contain a disclaimer limiting responsibility to the purchase price of products or materials.

## PART 2 – GENERAL

### 2.1 CEMENT GROUT

- A. Cement Grout: Cement grout shall be composed of one part cement, three parts sand, and the minimum amount of water necessary to obtain the desired consistency. The minimum compressive strength at 28 days shall be 4,000 psi.
- B. Cement grout materials shall be as specified in Section 03300 – CAST-IN-PLACE CONCRETE.

### 2.2 PREPACKAGED GROUTS

#### A. Non-Shrink Grout:

1. Non-shrink grout shall be a prepackaged, inorganic, non-gas-liberating, non-metallic, cement-based grout requiring only the addition of water. Manufacturer's instructions shall be printed on each bag or other container in which the materials are packaged. The specific formulation for each class of non-shrink grout specified herein shall be that recommended by the manufacturer for the particular application.
2. Class A non-shrink grouts shall have a minimum 28-day compressive strength of 7500 psi; shall have no shrinkage (0.0%) and a maximum 4.0% expansion in the plastic state when tested in accordance with ASTM C-827; and shall have no shrinkage (0.0%) and a maximum of 0.2% expansion in the hardened state when tested in accordance with CRD C 621.

3. Class B non-shrink grouts shall have a minimum 28-day compressive strength of 5,000 psi and shall meet the requirements of CRD C 621.
4. Application:
  - a. Class A non-shrink grout shall be used for the repair of all holes and defects in concrete members which are water bearing or in contact with soil or other fill material, grouting under all equipment base plates, and at all locations where grout is specified in the contract documents; except, for those applications for Class B non-shrink grout and epoxy grout specified herein. Class A non-shrink grout may be used in place of Class B non-shrink grout for all applications.
  - b. Class B non-shrink grout shall be used for the repair of all holes and defects in concrete members which are not water-bearing and not in contact with soil or other fill material, grouting under all base plates for structural steel members, and grouting railing posts in place.
5. Manufactures: The grout manufactures listed below supersede those in the Material Specifications Section 7.8 of the SWSC Guidelines.
  - a. Non-Shrink Precision Grout #1585-00, by Quikrete
  - b. Crystex, by L&M Construction Chemicals, Inc.,
  - c. 1107 Advantage Grout, Dayton Superior Corporation.

B. Epoxy Grout:

1. Epoxy grout shall be a pourable, non-shrink, 100% solids system. The epoxy grout system shall have three components: resin, hardener, and specially blended aggregate, all pre-measured and prepackaged. The resin component shall not contain any non-reactive diluents. Resins containing butyl glycidyl ether (BGE) or other highly volatile and hazardous reactive diluents are not acceptable. Variation of component ratios is not permitted unless specifically recommended by the manufacturer. Manufacturer's instructions shall be printed on each container in which the materials are packaged. Epoxy grout shall be:



- a. Five Star DP Epoxy Grout by Five Star Products, Inc.,
  - b. Masterflow 648 CP Plus by BASF,
  - c. Sikadur 42 Grout-Pak by Sika Corporation,
  - d. Or equal.
2. The chemical formulation of the epoxy grout shall be that recommended by the manufacturer for the particular application.
  3. The mixed epoxy grout system shall have a minimum working life of 90 - 120 minutes at 70°F.
  4. The epoxy grout shall develop a compressive strength of 9000 psi in 24 hours and 13,000 psi in seven days when tested in accordance with ASTM C 579, Method B. There shall be no shrinkage (0.0%) and a maximum 4.0% expansion when tested in accordance with ASTM C 827.
  5. The epoxy grout shall exhibit a minimum effective bearing area of 95%. This shall be determined by a test consisting of filling a 2-inch diameter by 4-inch high metal cylinder mold covered with a glass plate coated with a release agent. A weight shall be placed on the glass plate. At 24 hours after casting, the weight and plate shall be removed and the area in plan of all voids measured. The surface of the grout shall be probed with a sharp instrument to locate all voids.
  6. The peak exotherm of a 2-inch diameter by 4-inch high cylinder shall not exceed 95°F when tested with 75°F material at laboratory temperature. The epoxy grout shall exhibit a maximum thermal coefficient of  $30 \times 10^{-6}$  inches/inch/degree F when tested according to ASTM C 531 or ASTM D 696.
  7. Non-shrink epoxy grout shall have the following minimum properties when tested at 7 Days:
    - a. Minimum bond strength to concrete of 3,000 psi per ASTM C882 modified.
    - b. Minimum bond strength to steel of 1,700 psi per ASTM C 882 modified.
    - c. Minimum flexural strength of 2,500 psi per ASTM C 580.

- d. Minimum tensile strength of 2,000 psi per ASTM C 307 -- Standard Test Method for Tensile Strength of Chemical-Resistant Mortar, Grouts, and Monolithic Surfacing.

## 2.3 CURING MATERIALS

- A. Curing materials shall be as specified in Section 03300 – CAST IN PLACE CONCRETE, for cement grout and as recommended by the manufacturer of prepackaged grouts.

## 2.4 CONSISTENCY

- A. The consistency of grouts shall be that necessary to completely fill the space to be grouted for the particular application.
- B. The slump for topping grout shall be adjusted to match placement and finishing conditions but shall not exceed 4 inches.

## 2.5 MEASUREMENT OF INGREDIENTS

- A. Measurements for cement grout shall be made accurately by volume using containers. Shovel measurement shall not be allowed.
- B. Prepackaged grouts shall have ingredients measured by means recommended by the manufacturer.

# PART 3 – EXECUTION

## 3.1 GENERAL

- A. All surface preparation, curing, and protection of cement grout shall be as specified in Section 03300 – CAST-IN-PLACE CONCRETE. The finish of the grout surface shall match that of the adjacent concrete.
- B. The manufacturer of Class A non-shrink grout and epoxy grout shall provide on-site technical assistance upon request.
- C. Base concrete or masonry must have attained its design strength before grout is placed, unless authorized by the Engineer.

## 3.2 GROUTING PROCEDURES

- A. Prepackage Grouts: All mixing, surface preparation, handling, placing, consolidation, curing, and other means of execution for prepackaged

grouts shall be done according to the instructions and recommendations of the manufacturer.

**B. Base Plate Grouting:**

1. For base plates, the original concrete shall be blocked out or finished off a sufficient distance below the plate to provide for a one-inch thickness of grout or a thickness as shown on the drawings.
2. After the base plate has been set in position at the proper elevation by steel wedges or double nuts on the anchor bolts, the space between the bottom of the plate and the original pour of concrete shall be filled with non-shrink-type grout. The mixture shall be of a trowelable consistency and tamped or rodded solidly into the space between the plate and the base concrete. A backing board or stop shall be provided at the back side of the space to be filled with grout. Where this method of placement is not practical or where required by the Owner, alternate grouting methods shall be submitted for acceptance by the Engineer.

**C. Concrete/Grout Fill**

1. Mechanical, electrical, and finish Work shall be completed prior to placement of concrete/grout fill. To ensure bonding to the base slab, the base slab shall be given an exposed aggregate finish. Alternatively, where accepted by the Engineer, the base slab shall be given a roughened textured surface by a close-spaced rake while the surface is green. After curing, high pressure washing shall expose the aggregates and produce not less than a 3/16-inch amplitude roughness. Jackhammers or chipping hammers shall not be used.
2. The minimum thickness of concrete/grout fill shall be one-inch. Where the finished surface of concrete/grout fill is to form an intersecting angle of less than 45° with the concrete surface it is to be placed against, a key shall be formed in the concrete surface at the intersection point. The key shall be a minimum of 3-1/2 inches wide by 1-1/2 inches deep.
3. Grout placed on sloping slabs shall proceed uniformly from the bottom of the slab to the top, for the full width of the placement.
4. The surface shall be tested with a straight edge to detect high and low spots which shall be immediately eliminated. When grout fill has hardened sufficiently, it shall be steel troweled to a smooth

surface free from pinholes and other imperfections. An approved type of mechanical trowel may be used as an assist in this operation, but the last pass over the surface shall be by hand-troweling. During finishing, no water, dry cement, or mixture of dry cement and sand shall be applied to the surface.

- 5 As soon as fill finishing is completed, coat surface with curing compound. After the topping is set and sufficiently hard in clarifiers and where required by the Engineer, the tank shall be filled with sufficient water to cover the entire floor for 14 days.

### 3.3 CONSOLIDATION

- A. Grout shall be placed in such a manner, for the consistency necessary for each application, so as to assure that the space to be grouted is completely filled.

### 3.4 CURING

- A. Cement based grouts shall be cured per the manufacturer's recommendations.

END OF SECTION 03315

## SECTION 03700

### CONCRETE REPAIR AND REHABILITATION

#### PART 1 – GENERAL

##### 1.1 SUMMARY

- A. This Section specifies concrete repair products and methods required to rehabilitate existing concrete infrastructure. Remove, repair, or rehabilitate existing concrete members and surfaces as indicated.
- B. Repair defects in newly placed concrete as specified in Section 03300 – CAST-IN-PLACE CONCRETE.
- C. Provide all labor, materials, tools and equipment necessary to accomplish the Work.
- D. Repair damage to concrete and concrete surfaces which results from the removal of embedded items, from construction activities, or which existed previously in structures indicated to be repaired.
- E. Refer to Section 01313 – CONSTRUCTION AND SCHEDULE CONSTRAINTS

##### 1.2 RELATED WORK

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Section apply to the Work of this Section.
- B. Section 03300 – CAST-IN-PLACE CONCRETE
- C. Section 03315 – GROUT

##### 1.3 SUBMITTALS

- A. Submit the following in accordance with the requirements of Section 01300 – SUBMITTALS.
  - 1. Manufacturer's product information and recommended placement procedures for repair materials.
  - 2. Work Plan: provide proposed method for supporting existing structures, equipment, and piping during demolition and repair activities along with means of removing debris and water from

structures. Include means of removing compromised material while protecting reinforcement and concrete to remain. Provide drawings for strengthening required around new openings.

3. Documentation verifying the requirements of Paragraph 1.5 of this Section is satisfied.

#### 1.4 REFERENCES

- A. ACI 201.1R-92: Guide for Making a Condition Survey of Concrete in Service
- B. ACI 546R-96: Concrete Repair Guide
- C. ANSI/NSF Standard 61 – Drinking Water System Components – Health Effects
- D. ASTM C109: Standard Test Method for Compressive Strength of Hydraulic Cement Mortars
- E. ASTM C666: Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing
- F. ASTM C882: Standard Test Method for Bond Strength of Epoxy-Resin System Used With Concrete by Slant Shear

#### 1.5 QUALIFICATIONS

- A. The concrete restoration Work shall be performed by an experienced firm customarily engaged in performing similar repair work on cast-in-place concrete structures.
- B. The restoration firm shall have completed at least 5 similar projects in the last 5 years.
- C. The restoration firm shall be certified by the manufacturer of the repair materials.

#### 1.6 QUALITY ASSURANCE

- A. Field Tests of Cement Based Mortars and Grouts
  1. The Engineer will take compression test specimens during construction from the first placement of each type of mortar or grout, and at intervals thereafter as selected by the Engineer in

order to ensure continued compliance with the indicated requirements.

2. The Contractor shall assist the Engineer in obtaining specimens for testing.
3. The compression tests and fabrication of specimens for repair mortar and non-shrink grout shall be performed as specified in ASTM C 109.
4. A set of 3 specimens will be made for testing at 7 days, 28 days, and additional time periods as appropriate.
5. Any material, already placed, which fails to meet the indicated performance requirements is subject to removal and replacement as part of the Work.
6. The cost of laboratory tests on mortar and grout shall be paid by the Owner, but the Contractor shall be responsible for the cost of any additional tests and investigation on the Work that does not meet the indicated requirements.
7. The Contractor shall supply all necessary materials for fabricating the test specimens.

B. Repair Concrete

1. Repair concrete shall be tested as required in Section 03300 – CAST-IN-PLACE CONCRETE.

C. Epoxy Grout

1. Epoxy grout shall be tested as required in Section 03315 – GROUT.

D. Construction Tolerances

1. Construction tolerances shall comply with the requirements of Section 03300 – CAST-IN-PLACE CONCRETE, except as otherwise indicated.

## PART 2 – PRODUCTS

### 2.1 REPAIR MORTAR

- A. Provide repair mortar as a pre-packaged, 2-component, polymer-modified, cementitious, non-sag mortar, specifically formulated for the repair of surface defects.
- B. Provide the mortar with a penetrating corrosion inhibitor.
- C. Repair mortar shall have the following properties:

Physical Property	Value	ASTM Standard
Compressive Strength (min.) at 7 days      7000 psig at 28 days     2200 psig	6000 psig 7000 psig	C-109
Bond Strength (min.) 98% at 28 days	2200 psig	C-882 (modified)
Freeze/Thaw resistance (min.) 300 cycles	98 percent	C-666

- D. Provide a minimum repair thickness of 1/4 inch, unless otherwise indicated.
- E. Repair Mortar Manufacturer, or Equal
  - 1. Sika Corporation, SikaTop 123 Plus

2.2 NON-SHRINK GROUT

- A. Provide non-shrink grout conforming to the requirements of Section 03315 – GROUT.

2.3 CONCRETE MATERIALS

- A. Cement
  - 1. Use Type II Portland cement unless otherwise indicated.
  - 2. Where repairs are to be made on wall surfaces open to view and above normal water surface elevations, blend white Portland cement with the Type II cement as needed in order to match the color of the adjacent existing concrete surface.



B. Repair Concrete

1. Where required, provide repair concrete composed of structural concrete with maximum one- inch coarse aggregate meeting the requirements of Section 03300 – CONCRETE.
2. Provide a minimum repair thickness of 3 inches.

C. Cement Grout

1. Provide cement grout that meets the requirements of Section 03315 – GROUT.
2. Provide a minimum repair thickness of one inch.

D. Miscellaneous Materials

1. For concrete construction materials not covered specifically in this Section, conform to the requirements of Section 03300 – CAST-IN-PLACE CONCRETE.

2.4 AGGREGATE

- A. Obtain the permission of the manufacturer and Engineer before using aggregate to extend repair mortar and non-shrink grout products.
- B. If allowed and unless otherwise indicated, provide aggregate consisting of 3/8-inch clean, washed gravel or crushed stone as required in Section 03300 – CAST-IN-PLACE CONCRETE.

2.5 BONDING AGENT AND ANTI-CORROSION COATING

- A. Provide a bonding agent that is a solvent-free, moisture-tolerant, epoxy-modified, cementitious product, specifically formulated as a bonding agent and anti-corrosion coating.
- B. Bonding Agent Manufacturer, or Equal
  1. Sika Corporation, Armatec 110 EpoCem

2.6 EPOXY GROUT

- A. Provide an epoxy grout conforming to the requirements of Section 03315 – GROUT.

2.7 EPOXY RESIN

- A. For crack injection, provide a 2-component, moisture-tolerant, low-viscosity, high-strength epoxy resin adhesive that is specially formulated for that usage.
- B. Provide a minimum bond strength of 2900 psig when tested per ASTM C 882 at 14 days, moist cured.
- C. Epoxy Resin Manufacturer, or Equal
  - 1. Sika Corporation, Sikadur 35, Hi-Mod LV

## 2.8 PROTECTIVE COATING

- A. Waterproofing
  - 1. Provide a 2-component, polymer-modified, cementitious waterproofing and protective slurry mortar for concrete.
  - 2. The waterproofing shall be certified as being in conformance with ANSI/NSF Standard 61 – Drinking Water System Components – Health Effects.
  - 3. Apply the material in 2 coats, with a coverage of 40 sq ft/gal/coat.
  - 4. Waterproofing Manufacturer, or Equal
    - a. Sika Corporation, Sika Top Seal 107

## 2.9 FORMWORK

- A. Where needed, provide formwork that meets the requirements of Section 03300 – CAST-IN-PLACE CONCRETE.

## 2.10 REINFORCEMENT STEEL

- A. Where required, provide reinforcing steel that meets the requirements of Section 03300 – CAST-IN-PLACE CONCRETE.

## 2.11 POLYURETHANE SEALANT

- A. Provide a 2-part polyurethane, gun-grade sealant, certified as being in conformance with ANSI/NSF Standard 61 – Drinking Water System Components – Health Effects.
- B. Polyurethane Sealant Manufacturer, or Equal

1. Sika Corporation, Sikaflex – 2C

#### 2.12 EPOXY GEL

- A. Provide a high strength epoxy gel for surface patching or sealant prior to polyurethane grout injection.
- B. Epoxy Gel Manufacturer, or Equal
  1. De Neef Construction Chemicals, Inc., Denepox Rapidgel

#### 2.13 POLYURETHANE CHEMICAL GROUT

- A. Use polyurethane chemical grout for non-structural crack repair.
- B. Polyurethane Chemical Grout Manufacturer, or Equal
  1. Sika Corporation, SikaFix HH

#### 2.14 EXPANSION JOINTS

- A. Provide an expansion joint system for repair of the existing expansion joints, consisting of a Hypalon sealing strip and an epoxy adhesive in order to provide a watertight seal.
- B. Expansion Joint System Manufacturer, or Equal
  1. Sika Corporation, Sikadur Combiflex

#### 2.15 HYDROPHILIC WATERSTOP

- A. Provide hydrophilic waterstop of the type, which expands in the presence of water to form a watertight joint seal without damaging the concrete in which it is cast.
- B. Provide hydrophilic waterstop that is bentonite-free, and manufactured from chloroprene rubber and modified chloroprene rubber with hydrophilic properties.
- C. Hydrophilic Waterstop Manufacturer, or equal
  1. Greenstreak Group, Inc., Hydrotite RSS-040 P
  2. Adeka Ultra Seal, KM 4mm String

## PART 3 – EXECUTION

### 3.1 GENERAL

#### A. Repairs

1. Repair techniques will be reviewed during the pre-construction meeting between the Contractor, Engineer, and Owner.
2. The Contractor shall be familiar with the cause of deteriorated concrete and shall choose the right equipment, repair materials and techniques to be used for each particular repair.
3. Choose repair materials to match the adjacent concrete surface in color and texture.
4. Apply repair materials in strict accordance with the manufacturer's printed instructions, including temperature and moisture requirements throughout application and curing.
5. Protect adjacent portions of the structure, including all valves, pipes, mechanical equipment, and filter media from debris generated by repair activities.
6. For portions of the structure that are not identified to be repaired, maintain in their original condition.

#### B. Structural Stability

1. Use caution not to weaken the structural capacity of a beam, column, wall, slab, walkway, or other concrete member during concrete removal.
2. For severely deteriorated concrete members, consult with the Engineer before removing a major portion of any structural member.
3. Shoring may be required in order to support the structure and to protect workers.

#### C. Provide off-site disposal of debris generated as a result of repair procedures.

#### D. Provide concrete construction procedures not specifically addressed in this Section in accordance with the requirements of Section 03300 – CAST-IN-PLACE CONCRETE.

## 3.2 REPAIR SEQUENCING

- A. Unless otherwise indicated, perform concrete repairs in the following sequence, starting no activity in an area until previous activities in that area have been completed, including curing, cleanup, and the like:
1. Removal of equipment, miscellaneous metals, and other surface features that would interfere with the repair;
  2. Removal of concrete sections that require complete replacement;
  3. Surface preparation hydroblasting over the entire area to be repaired;
  4. Embedded metal repair;
  5. Crack repair;
  6. Filter trough-to-wall connection repair;
  7. Spalled and delaminated concrete repair;
  8. Scaled concrete repair;
  9. Pop-out repair, and repair of other surface damage, deterioration, or defects;
  10. Patching of holes in concrete;
  11. Replacement of concrete sections that require complete replacement;
  12. New construction;
  13. Application of protective coatings;
  14. Expansion joint repair; and,
  15. Installation of traffic topping.
- B. For areas which require combinations of spalled and delaminated concrete repair, scaled concrete repair, and pop-out repair, perform these repairs at the same time.

- C. Limit the size of the repair area in order to permit the repairs to be performed together, without sacrificing the quality of the individual repairs.

### 3.3 EMBEDDED METAL REPAIR

- A. Unless otherwise indicated, repair anchor bolts and other embedded metal, except rebar, that are exposed at the concrete surface and are showing signs of corrosion, as follows:
  - 1. Cut off or otherwise remove corroded metal fastened at the surface;
  - 2. Burn back embedded metals to a depth of at least 1.5 inches beyond the surface of sound concrete;
  - 3. Chip away unsound concrete around the embedded metal.
  - 4. Apply epoxy grout to the repair area until level with the surface of the surrounding sound concrete.
- B. Unless otherwise indicated, repair embedded rebar that is exposed at the concrete surface following the procedures outlined in the appropriate concrete repair subsection, below.

### 3.4 CRACK REPAIR

- A. Structural versus Non-Structural Cracks
  - 1. Repair structural cracks with epoxy resin.
  - 2. Repair non-structural cracks with polyurethane chemical grout.
- B. Efflorescence
  - 1. Prior to the crack repair, clean efflorescence from the cracks and the surrounding area.
  - 2. Clean the efflorescence by light hydro-blasting or scrubbing.
- C. Pressure Injection: Pressure Injection to be performed prior to leak testing and roof membrane installation.
  - 1. General

- a. The indicated repair materials have been selected to minimize the loss of material during the injection process. The areas selected for crack repair are to be identified by the Contractor or Engineer and be determined prior to leak tests and roof membrane installation. The injection of cracks may also be required as a result of the leak test.
  - b. In order to avoid excessive loss of injected material at the lower exposed portions of the cracks, space the injection ports a distance no greater than the thickness of the wall being repaired.
2. Open through thickness structural cracks are to be repaired to deliver a watertight hydraulic structure passing the specified leakage test. Open through thickness structural cracks with lengths of at least 3 feet on each side of the wall and roof, at least 2 feet of length on the foundation or floor slab are to be injected unless they do not accept grout. All 3-foot long minimum or greater through thickness cracks greater than a minimum 40 mil thickness in the walls are to be injected unless they do not accept grout. All 2-foot long minimum through thickness cracks greater than 30 mil thickness in the foundation and floor slabs and roof are to be injected unless they do not accept grout. Perform structural crack repairs by pressure injection in accordance with the manufacturer's directions, and in accordance with the following basic procedure:
- a. Rout the crack when unsound and foreign materials are present on the surface to establish the surface as a sound material.
  - b. Remove any contamination by flushing with water or solvent, allowing adequate time for air-drying or blow out the solvent with compressed air. Any solvents must be fully flushed from the joint unless ANSI/NSF 61 approved.
  - c. Install the injection ports in accordance with the manufacturer's directions.
  - d. Sealing
    - i. Seal the surface in order to keep the pressure injecting materials from leaking out before it has set or gelled.
    - ii. Seal a surface by brushing an epoxy over the surface of the crack and allowing it to harden.

- iii. Use high injection pressures to cut-out the cracks in a 'V' shape, fill with an epoxy, and strike off flush with the surface.
  - iv. Surface patching or sealant shall be performed where needed to provide for complete penetration of the injected polyurethane grout and to prevent wastage. Seal surface of crack with fast setting hydraulic cement or high strength epoxy gel. The floor surface along the cracks shall be cleaned and all wasted grout and surface seal material shall be completely removed from the concrete surface following completion of the repair work.
- e. Inject the repair materials, with consideration of the following items:
- i. Carefully select the pressure of the hydraulic pump or other device, because too much pressure can extend the existing cracks and cause more damage.
  - ii. For vertical cracks, start by pumping material into the entry port at the lowest elevation until the material level reaches the entry port above, then cap the lower injection port and repeat the process at successively higher ports until the crack has been completely filled.
  - iii. For horizontal cracks, start at one end of the crack and work to the other end, filling the crack until the pressure can be maintained.
  - iv. For very fine cracks, start the injection of repair material at the widest end and proceed toward the thinner end, using low-viscosity repair material.
- f. Cleanup
- i. Remove the surface seal by grinding or other appropriate means.
  - ii. Coat fittings and holes at injection ports with an epoxy patching compound.



iii. If crack repairs are part of repair for surface defects, painting with epoxy is not necessary and surface preparation may be started after crack repairs have been completed.

3. Open through thickness non-structural cracks are to be repaired to deliver a water tight hydraulic structure passing the specified leakage test. Open through thickness cracks with lengths of at least 3 feet on each side of the wall and roof, at least 2 feet of length on the foundation or floor slab are to be injected unless they do not accept grout. All 3-foot long minimum or greater through thickness cracks greater than a minimum 15 mil thickness in the walls are to be injected unless they do not accept grout. All 2-foot long through thickness cracks greater than 10 mil thickness in the floors and roof are to be injected unless they do not accept grout. Perform non-structural crack repairs in accordance with the manufacturer's directions, and in accordance with the following basic procedure:

- a. Rout the crack when unsound and foreign materials are present on the surface to establish the surface as a sound material.
- b. Remove contamination by flushing with water or solvent, allowing adequate time for air-drying or blow out the solvent with compressed air. Any solvents must be fully flushed from the joint unless ANSI/NSF 61 approved.
- c. Install the injection ports in accordance with the manufacturer's directions.
- d. Moisture
  - i. For non-structural cracks, moisture must be present for the chemical grout to react.
  - ii. Prior to injecting the repair materials, inject the crack with a small amount of water in order to completely moisten the crack.
- e. Inject the repair materials, with consideration of the following items:
  - i. Carefully select the pressure of the hydraulic pump or other device, because too much pressure can extend the existing cracks and cause more damage.

- ii. For vertical cracks, start by pumping material into the entry port at the lowest elevation until the material level reaches the entry port above, cap the lower injection port and repeat the process at successively higher ports until the crack has been completely filled, and then, starting again at the lowest port, re-inject into all ports in order to ensure that all voids are properly sealed off.
  - iii. For horizontal cracks, start at one end of the crack and work to the other end, filling the crack until the pressure can be maintained.
  - iv. For very fine cracks, start the injection of repair material at the widest end and proceed toward the thinner end.
- f. Cleanup
- i. Remove excess surface material by grinding or other appropriate means.
  - ii. Coat fittings and holes at injection ports with an epoxy patching compound.
  - iii. If crack repairs are part of repair for surface defects, painting with epoxy is not necessary and surface preparation may be started after crack repairs have been completed.

### 3.5 SPALLED AND DELAMINATED CONCRETE REPAIR

- A. Repair spalls and delaminated concrete using repair mortar.
- B. Surface Preparation
  - 1. Remove all delaminated concrete and all unsound concrete beyond the spalled or delaminated area.
  - 2. Boundaries
    - a. Determine the boundaries of the patch and sawcut to a depth of at least 1/4 inch up to one inch deep.
    - b. The boundaries shall such to reduce boundary edge length.

- c. Avoid excessive or complex edge conditions.
3. Sawcuts
  - a. Perform sawcuts perpendicular to the surface or slightly undercut.
  - b. Perform sawcuts in maximum 1/4-inch increments.
  - c. After each incremental cut, inspect the cut surface in order to ensure that the existing reinforcement has not been cut.
  - d. If at any depth the reinforcement becomes exposed, terminate the sawcut and notify the Engineer.
4. Chip away concrete within the repair area to a depth sufficient to expose sound concrete over the entire repair area, or to a minimum depth required by patching material, whichever is greater.
5. Base the selection of partial depth concrete removal equipment on the size of repair area, depth of concrete to be removed, and the location of the deteriorated concrete such as wall, slab-on-grade, underside or top of elevated slab.
6. Removal
  - a. The maximum allowable pneumatic chipping hammer shall be a 30-lb class hammer.
  - b. Hydroblast removal shall use a maximum pressure of 40,000 psig.
  - c. Sand blasting is not permitted.
  - d. Hydroblast concrete removal is recommended for large area of surface defects.
  - e. Remove water blasting debris daily in order to prevent it from setting up.
  - f. If a chipping hammer is used, ensure that the existing reinforcement is not damaged during the concrete removal operations.

- g. Remove protrusions, such as mortar spatter or fins, by grinding or by striking with a hammer or other tool.

## 7. Reinforcement

- a. Remove concrete from around reinforcement when the rebar is rusted, more than half the rebar perimeter is already exposed, the concrete bond around the rebar is broken, and if the concrete is unsound or honey-combed.
- b. Remove concrete in order to provide a clear space of minimum one inch on each side of the reinforcement, such that the rebar can be cleaned and the repair material will completely surround the rebar.
- c. Clean exposed reinforcement by water blasting or wire brushing.
- d. After fully exposing and cleaning the reinforcement, check for steel deterioration, and if the cross-sectional area of the steel has been reduced by more than 10 percent, whether by deterioration, surface preparation, or a combination of both, provide additional reinforcement.
- e. Consult with the Engineer before adding or replacing rebar.

## C. Repairing Surface Defects

1. Clean the concrete surface after removing unsound concrete, repairing cracks, and cleaning the reinforcement.
2. Ensure that the concrete surface and reinforcement are free of form-release agents, curing compounds, surface hardeners, oils, grease, food, chemicals, and other contaminants.
3. Remove dust, including new dust generated by surface preparation or scarifying.
4. Prior to application of the bonding agent, apply anti-corrosion coating to exposed rebar in accordance with the manufacturer's recommendations, allow the coating to dry, reapply the coating, and allow to dry again.
5. Prior to applying the repair mortar, apply bonding agent in accordance with the manufacturer's recommendations.

6. Repair Mortar
  - a. Apply repair mortar in accordance with the manufacturer's recommendations.
  - b. Apply a minimum and maximum thickness of each lift of repair material in accordance with the manufacturer's recommendations, with the minimum thickness being not less than 1/4 inch.
7. Fully consolidate the repair material, working the material into the substrate to completely fill all pores and voids in the area to be filled.
8. Bring the repair surface into alignment with the adjacent existing surfaces in order to provide a uniform, even surface.
9. Match the repair surface to adjacent existing surfaces in texture by applying necessary coatings and surface treatments.
10. Float-finish the repaired surface using wood or sponge floats.
11. For repaired surfaces to receive a protective coating, brush-finish the surface in order to produce a roughened substrate for the coating.
12. Minimum and maximum ambient and surface temperatures shall be as recommended by repair material manufacturer.

D. Curing

1. Curing of repair mortar to receive waterproofing shall be as follows:
  - a. Keep the mortar continuously wet by the application of water for a minimum period of at least 7 consecutive days, beginning immediately after the mortar has reached final set;
  - b. Weigh the curing blankets or otherwise hold them in place in order to prevent being dislodged by wind or other causes, and to be substantially in contact with the concrete surface;
  - c. Ensure that edges are continuously held in place; and,

- d. Keep the curing blankets and concrete continuously wet by the use of sprinklers or other means, both during and after normal working hours.
2. If the repair mortar is not to receive waterproofing, provide curing in accordance with the manufacturer's recommendations except that the minimum cure period shall be 7 days.
3. During cold weather, maintain the repair material temperature above 50°F for at least 3 days after placement.

### 3.6 SCALED CONCRETE REPAIR

A. Repair scaling and pop-outs using repair mortar.

B. Surface Preparation

1. Prior to repair, prepare the surface in accordance with the repair mortar manufacturer's recommendations with the following minimum requirement.
2. Remove unsound concrete from surfaces by high-pressure water blasting, using a minimum pressure of 10,000 psig and maximum pressure of 40,000 psig.
3. Clean exposed reinforcement by water blasting or wire brushing.

C. Repairing Surface Defects

1. Clean the concrete surface after removing unsound concrete, repairing cracks, and cleaning reinforcement.
2. Ensure that the concrete surface and reinforcement are free of form-release agents, curing compounds, surface hardeners, oils, grease, food, chemicals, and other contaminants.
3. Remove dust, including new dust generated by surface preparation or scarifying.
4. Prior to application of the bonding agent, apply anti-corrosion coating to exposed rebar in accordance with the manufacturer's recommendations, allow the coating to dry, reapply the coating, and allow to dry again.
5. Prior to applying the repair mortar, apply bonding agent in accordance with the manufacturer's recommendations.

6. Apply repair mortar in accordance with the manufacturer's recommendations, using a minimum repair material thickness of 1/4 inch.
  7. Fully consolidate the repair material, working the material into the substrate to completely fill all pores and voids in the area to be filled.
  8. Bring the repair surface into alignment with the adjacent existing surfaces in order to provide a uniform, even surface.
  9. Match the repair surface to adjacent existing surfaces in texture by applying necessary coatings and surface treatments.
  10. Float-finish the repaired surface using wood or sponge floats.
- D. Provide strip joint in newly placed mortar at the location of repaired cracks.
- E. Curing
1. Curing of repair mortar to receive waterproofing shall be as follows:
    - a. Keep the mortar continuously wet by the application of water for a minimum period of at least 7 consecutive days, beginning immediately after the mortar has reached final set;
    - b. Weigh the curing blankets or otherwise hold them in place in order to prevent being dislodged by wind or other causes, and to be substantially in contact with the concrete surface;
    - c. Ensure that edges are continuously held in place; and,
    - d. Keep the curing blankets and concrete continuously wet by the use of sprinklers or other means, both during and after normal working hours.
  2. If the repair mortar is not to receive waterproofing, provide curing in accordance with the manufacturer's recommendations except that the minimum cure period shall be 7 days.

3. During cold weather, maintain the repair material temperature above 50°F for at least 3 days after placement.

3.7 POP-OUT REPAIR, AND REPAIR OF OTHER SURFACE DAMAGE, DETERIORATION, OR DEFECTS

- A. Repair pop-outs and other surface damage, deterioration, and defects which are 1/4 inch deep or shallower, using the procedures described under Paragraph 3.6 of this Section.
- B. Repair other pop-outs and surface damage, deterioration, and defects using the procedures described under Paragraph 3.5 of this Section.

3.8 REPLACEMENT OF CONCRETE SECTIONS WHICH REQUIRE COMPLETE REPLACEMENT

- A. Refer to the Drawings for locations where the level of concrete deterioration is such that complete removal and replacement of the deteriorated section is required.
- B. At these locations, remove the deteriorated concrete in accordance with the details on the Drawings and the requirements of this Section.
- C. Limits
  1. The limits of concrete removal shall be as indicated on the Drawings.
  2. If no limits of removal are indicated, determine the limits in accordance with the procedures described under Paragraph 3.5.B.2 of this Section.
- D. Provide sawcuts in accordance with the procedures described under Paragraph 3.5.B.3 of this Section.
- E. After removal of the concrete, prepare the area and provide repair concrete in accordance with the details on the Structural Drawings and the requirements of this Section.
- F. Unless otherwise indicated, match the finished cross-section of the repaired concrete to the cross-section of the adjacent undamaged concrete.

3.9 PATCHING OF HOLES IN CONCRETE

- A. General



1. For the purposes of this Section, holes are defined as penetrations completely through the concrete member and with interior surfaces approximately perpendicular to the surface of the existing member.
2. Interior surface areas which are inclined and do not meet this criteria shall be chipped as needed to meet this requirement.
3. The perimeter of holes at the surface shall form a regular shape composed of curved or straight-line segments.
4. Provide the minimum depth of placement for the material used; score the existing concrete by sawcutting, and chip as needed to meet this requirement.
5. Roughen the interior surface of holes less than 12 inches in diameter to a minimum of 0.125-inch amplitude, and roughen larger holes to a minimum of 0.25-inch amplitude.
6. At holes, coat the existing surface to be repaired with a bonding agent.

**B. Patching Small Holes**

1. For holes which are less than 12 inches in their least dimension and extend completely through concrete members, fill with non-shrink grout as required in Section 03315 – GROUT.

**C. Patching Large Holes**

1. Fill holes which are larger than 12 inches in their least dimension with non-shrink grout.
2. Provide large holes which are normally in contact with water or soil with hydrophilic waterstop placed in a groove, approximately 1/16 inch deep.
3. Grind the groove into the interior edge of the hydrophilic waterstop.
4. Alternatively, bond the hydrophilic waterstop to the surface using an epoxy grout that completely fills all voids and irregularities beneath the waterstop material.
5. Install the waterstop in accordance with the requirements of Section 03300 – CAST-IN-PLACE CONCRETE.

6. Provide reinforcing steel in layers matching existing reinforcement location, except that concrete cover as required in the Documents for the service condition shall be provided.
7. For holes smaller than 48 inches, provide reinforcement consisting of a minimum of No. 5 bars at 12 inches on center in each layer required.
8. At holes larger than 30 inches, drill the reinforcement and grout into the existing concrete.
9. For holes larger than 48 inches, refer to the Drawings for reinforcement details.

### 3.10 PATCHING OF LINED HOLES

#### A. General

1. This Work applies to those openings which have embedded material over all or a portion of their inside edge.
2. The requirements for repairing holes in concrete, as indicated above, apply as modified herein.
3. The Engineer will determine whether the embedded material is allowed to remain.

B. Where embedded material is allowed to remain, trim it back a minimum of 2 inches from the concrete surface.

C. Roughen or abrade the embedded material in order to promote good bonding to the repair material.

D. Remove substances that interfere with good bonding.

E. Completely remove embedded items that are not securely and permanently anchored into the concrete.

F. Completely remove embedded items which are larger than 12 inches in their least dimension, unless they are composed of a metal to which reinforcing steel can be welded; where reinforcement is required, weld it to the embedded metal.

G. The following requirements shall apply to concrete members which are in contact with water or soil:

1. Using epoxy grout, fill lined openings which are less than 4 inches in their least dimension;
2. Using an epoxy bonding agent, coat lined openings which are greater than 4 inches but less than 12 inches in their least dimension, prior to being filled with non-shrink grout.
3. Using an epoxy bonding agent, coat lined openings which are greater than 12 inches in their least dimension, and provide a hydrophilic waterstop bonded to the interior of the opening with epoxy adhesive, prior to being filled with approved repair material.

### 3.11 APPLICATION OF PROTECTIVE COATINGS

#### A. Waterproofing

1. Apply waterproofing in accordance with the manufacturer's printed instructions.
2. Do not begin waterproofing Work until repairs and new construction in the affected area have been completed.

### 3.12 EXPANSION JOINT REPAIR

#### A. Repair deteriorated expansion joints as follows:

1. Completely remove existing sealant;
2. Remove defective backer materials in the joint;
3. Sand-blast the joint and prepare the surface in accordance with the sealant manufacturer's instructions;
4. Prepare the wall surface on each side of the joint in accordance with the expansion joint manufacturer's instructions;
5. Ensure that the prepared surface is clean, sound, and bare concrete;
6. Place backer material in the joint;
7. Apply a primer recommended by the sealant manufacturer;
8. Fill the joint with polyurethane sealant;
9. Allow a minimum of 3 days curing prior to installing the expansion joint;

10. Install the expansion joint in accordance with the manufacturer's instructions.

END OF SECTION 03700

## SECTION 07160

### BITUMINOUS DAMPPROOFING

#### PART 1 – GENERAL

##### 1.1 DESCRIPTION

- A. The Work covered under this Section of the specifications includes furnishing all plant, labor, equipment, appliances and materials and performing all operations in connection with the furnishing and application of bituminous dampproofing and, at all manholes, catch basins and structures, including surface preparation and appurtenant work, complete in place, in accordance with the Drawings and Specifications.
- B. The products specified in this Section supersede the Damp Proof Coatings listed in Section 7.2 of the Springfield Water and Sewer Material Specifications.

##### 1.2 RELATED WORK

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Section apply to the Work of this Section.
- B. SECTION 02252 – MANHOLES
- C. SECTION 03300 – CAST-IN-PLACE CONCRETE

##### 1.3 SUBMITTALS

- A. Submit the following in accordance with the requirements of Section 01300 – SUBMITTAL.
  - 1. Manufacturer's technical product data on the bituminous dampproofing and installation instructions for all materials required under this Section.

##### 1.4 REFERENCES

- A. ASTM D1187: Standard Specifications for Asphalt-based Emulsion For Use As Protective Coatings for Metal,
- B. ASTM D1227: Standard Specifications for Asphalt Used As A Protective Coating For Roofing.

## 1.5 QUALITY ASSURANCE

- A. Bituminous dampproofing shall be applied in strict accordance with the printed instructions of the approved manufacturer.

## PART 2 – PRODUCTS

### 2.1 BITUMINOUS DAMPPROOFING

- A. Bituminous Dampproofing agent applied to the exterior faces of underground concrete structures shall be an asphalt emulsion and conform to ASTM D1187 and D1227. Available manufacturers include:
  - 1. Hydrocide 700B by Sonneborn (BASF),
  - 2. Dehydratine 75 by Euclid Chemical Company,
  - 3. Sealmastic Emulsion Type II by W. R. Meadows Inc.,
  - 4. Or equal.

## PART 3 – EXECUTION

### 3.1 APPLICATION

- A. The surface must be clean and free of all foreign matter. Do not apply over a frost-covered surface. All cracks, voids, honeycombs, etc., shall be filled and repaired with mortar to provide a sound structural surface.
- B. No heating or thinning is required. If thinning is absolutely necessary, use a small amount of water.
- C. Apply by brush or spray in a continuous unbroken film free from pinholes or other surface breaks.
- D. All surfaces to be dampproofed shall receive two coats. Each coat shall dry a minimum of 20 to 24 hours before application of the next coating. The second coat shall be applied perpendicular to the first. Allow a minimum of 48 hours for drying before backfilling. Each coat shall be applied at a rate of approximately 40 square feet per gallon.
- E. Bituminous dampproofing can be factory applied providing application meets coating manufacturer's requirements.

- F. Additional field coatings must be applied, as directed by the Engineer, to repair any coating imperfections and chipped or damaged areas.

END OF SECTION 07160

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## CCTV Sewer Inspection Forms

Last Modified: 04/09/2025 at 10:39AM EDT

## NWMCC INSPECTION REPORT

### PACP Rating Description

<b><u>1:</u></b>	<p><b>Excellent Condition</b></p> <p><b>Minor Defects - Failure unlikely in the foreseeable future</b></p>
<b><u>2:</u></b>	<p><b>Good Condition</b></p> <p><b>Defects that have not begun to deteriorate - Pipe unlikely to fail for at least 20 years.</b></p>
<b><u>3:</u></b>	<p><b>Fair Condition</b></p> <p><b>Moderate defects that will continue to deteriorate - Pipe may fail in 10-20 years.</b></p>
<b><u>4:</u></b>	<p><b>Poor Condition</b></p> <p><b>Severe Defects that will become Grade 5 defects within the foreseeable future - Pipe will probably fail in 5-10 years.</b></p>
<b><u>5:</u></b>	<p><b>Immediate Attention</b></p> <p><b>Defects require immediate attention - Pipe has failed or will likely fail within the next 5 years or sooner.</b></p>

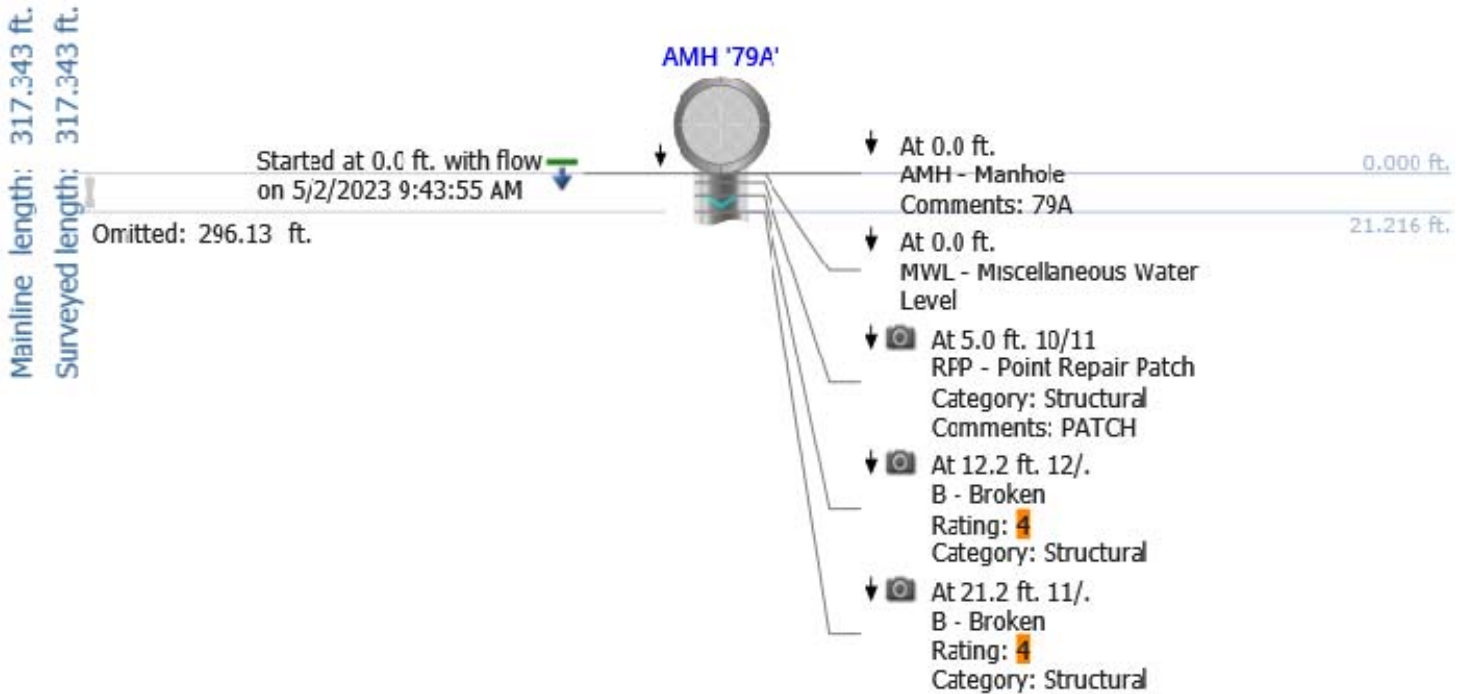
Last Modified: 04/09/2025 at 10:39AM EDT

## NWMCC INSPECTION REPORT

Start date/time: <b>20230502 09:43</b>	Weather: <b>Dry Weather/Wet Ground</b>	Surveyed by: <b>B. DEGROATE</b>	Certificate number: <b>0218-070300747</b>	Pipe segment ref.: <b>P2E53</b>	
Owner:	Customer:	Pre-cleaning: <b>No Pre-Cleaning</b>	Date cleaned:	Project name: <b>KLE005-30</b>	
City: <b>SPRINGFIELD MA</b>	Street: <b>ABERDEEN EASEMENT</b>	Location code:	Pipe use: <b>Sanitary Sewage Pipe</b>	Drainage area: _____	Flow control: _____
Upstream MH No: <b>79A</b>	Downstream MH No: <b>799</b>	Direction: <b>D</b>	Total length: <b>317.343 ft.</b>	Length surveyed: <b>317.343 ft.</b>	
Purpose:	Pipe joint length:	Height: <b>36 in.</b>	Material: <b>Clay Tile (not vitrified clay)</b>	LateralsCounter:	Additional info:

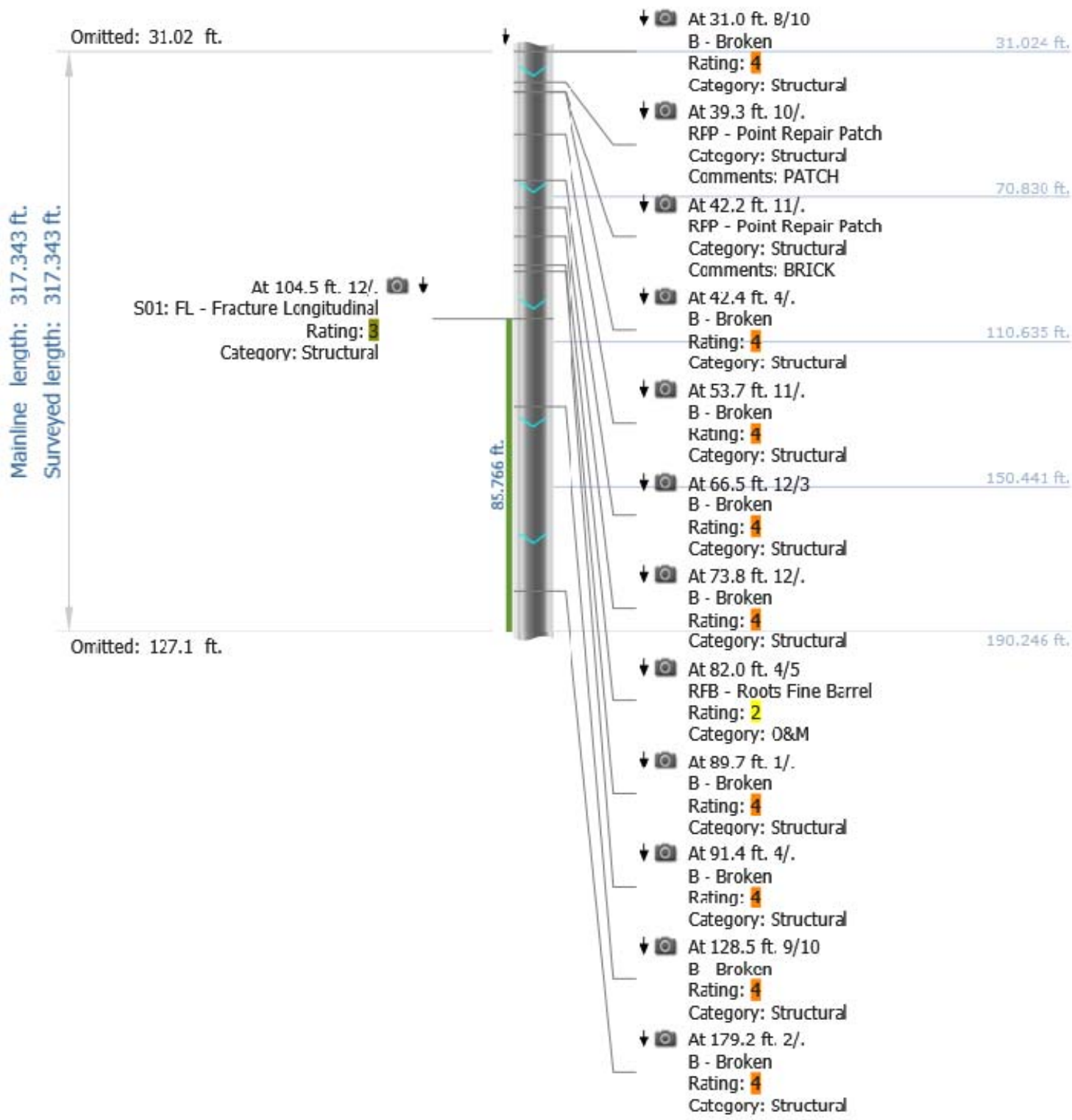
### Pipe Ratings

Grade	Structural:					O&M:					Overall:			Risk
	Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Pipe Rating	Pipe Rating Index	LoF	
1	0	0	123	4B3B	3.5	0	0	2	2100	2.0	125	3.5	5.0	
2	0	0				0	2							
3	0	51				0	0							
4	0	72				0	0							
5	0	0				0	0							



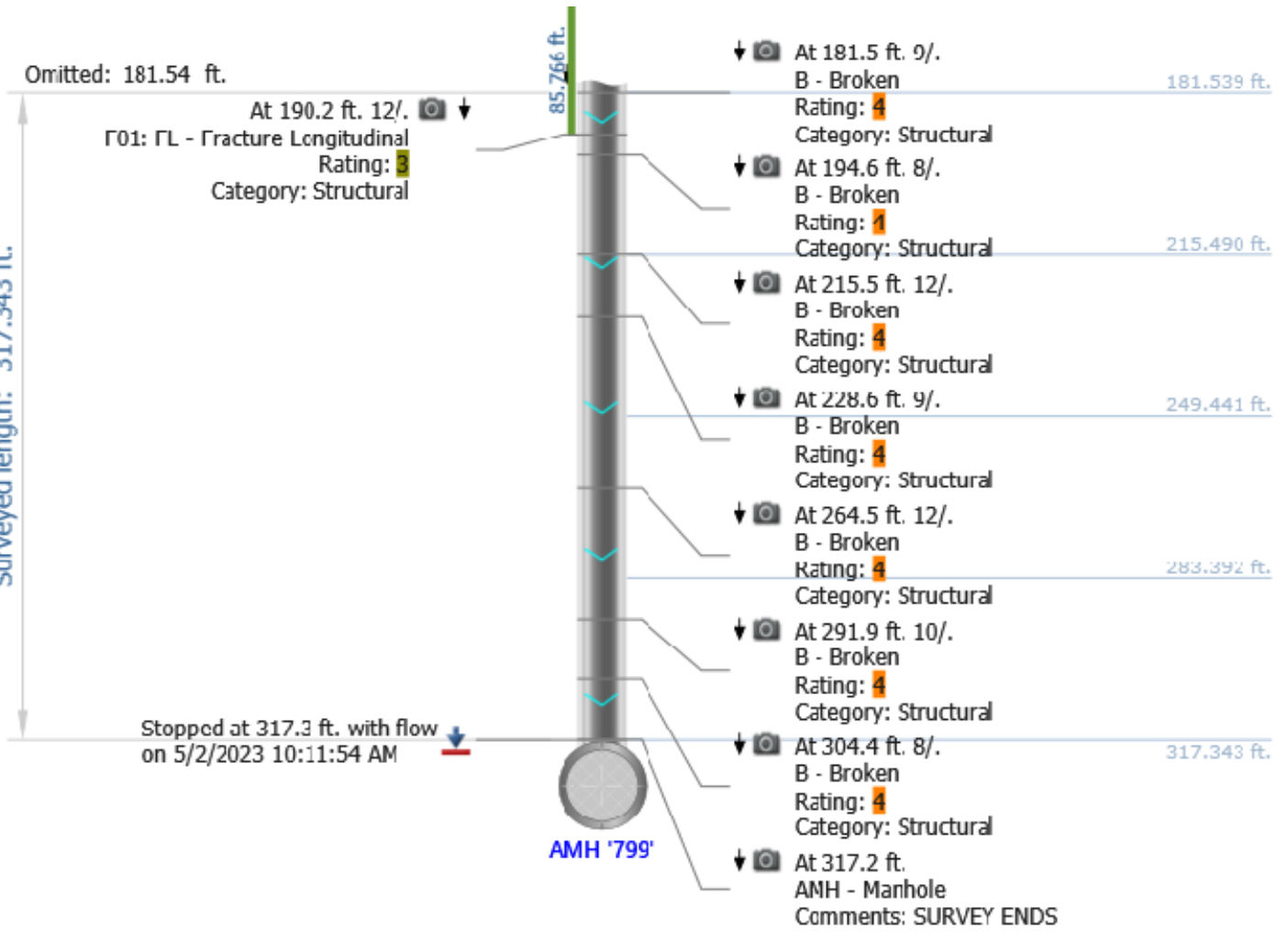
Last Modified: 04/09/2025 at 10:39AM EDT

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Mainline length: 317.343 ft.  
Surveyed length: 317.343 ft.



# NWMCC INSPECTION REPORT

## Inspection Photos

City: <b>SPRINGFIELD MA</b>	Street: <b>ABERDEEN EASEMENT</b>	Start date/time: <b>20230502 09:43</b>	Pipe segment ref.: <b>P2E53</b>
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Photo: **79A-799-20230502-094355-094500.JPG**

At: **5.004 ft. RPP - Point Repair Patch**  
**10/11**

Joint: **No PATCH**

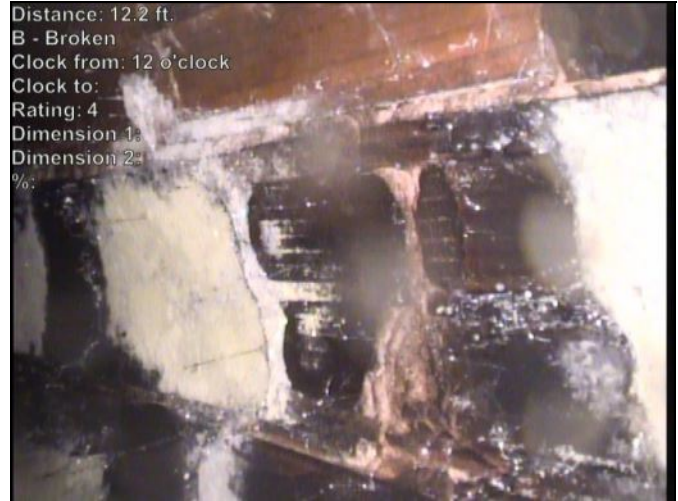


Photo: **79A-799-20230502-094355-094635.JPG**

At: **12.209 ft. B - Broken**  
**12/12**

Joint: **No**



Photo: **79A-799-20230502-094355-094720.JPG**

At: **21.216 ft. B - Broken**  
**11/11**

Joint: **No**



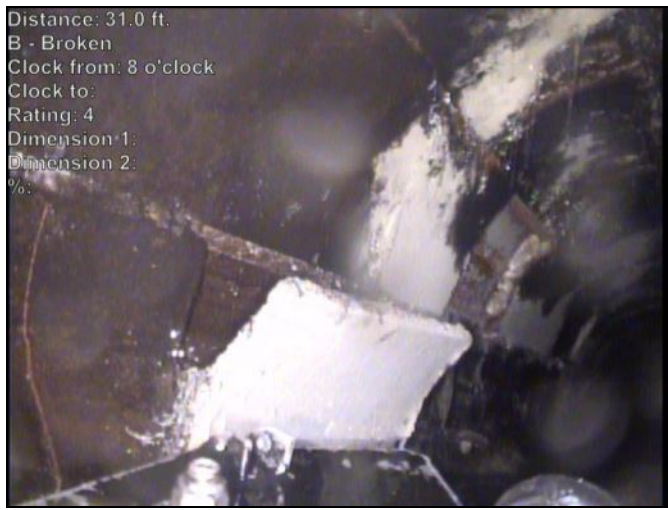
Photo: **79A-799-20230502-094355-094833.JPG**

At: **31.024 ft. B - Broken**  
**8/10**

Joint: **No**

Last Modified: 04/09/2025 at 10:39AM EDT





Distance: 31.0 ft.  
B - Broken  
Clock from: 8 o'clock  
Clock to:  
Rating: 4  
Dimension 1:  
Dimension 2:  
%:

Photo: 79A-799-20230502-094355-094806.JPG

At: 31.024 ft. B - Broken  
8/10

Joint: No



Distance: 39.3 ft.  
RPP - Point Repair Patch  
Clock from: 10 o'clock  
Clock to:  
Rating:  
Dimension 1:  
Dimension 2:  
%:

PATCH

Photo: 79A-799-20230502-094355-094908.JPG

At: 39.33 ft. 10/. RPP - Point Repair Patch

Joint: No PATCH



Distance: 42.2 ft.  
RPP - Point Repair Patch  
Clock from: 11 o'clock  
Clock to:  
Rating:  
Dimension 1:  
Dimension 2:  
%:

BRICK

Photo: 79A-799-20230502-094355-094945.JPG

At: 42.232 ft. RPP - Point Repair Patch  
11/.

Joint: No BRICK



Distance: 42.4 ft.  
B - Broken  
Clock from: 4 o'clock  
Clock to:  
Rating: 4  
Dimension 1:  
Dimension 2:  
%:

Photo: 79A-799-20230502-094355-095004.JPG

At: 42.432 ft. 4/. B - Broken

Joint: No

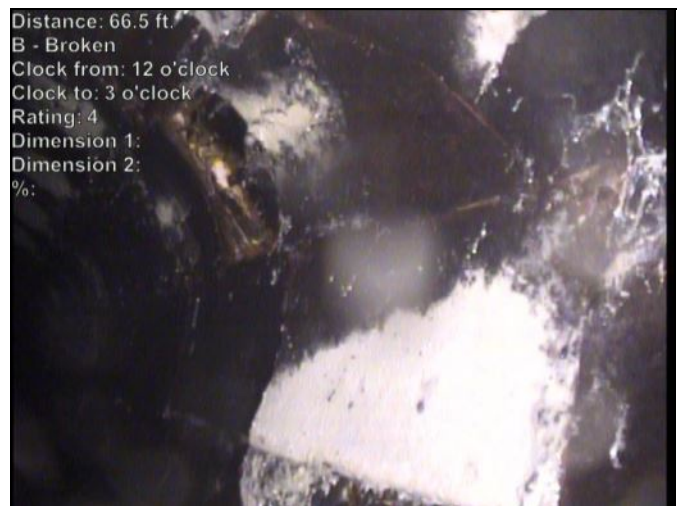


Distance: 53.7 ft.  
B - Broken  
Clock from: 11 o'clock  
Clock to:  
Rating: 4  
Dimension 1:  
Dimension 2:  
%:

Photo: 79A-799-20230502-094355-095044.JPG

At: 53.741 ft. B - Broken  
11/.

Joint: No



Distance: 66.5 ft.  
B - Broken  
Clock from: 12 o'clock  
Clock to: 3 o'clock  
Rating: 4  
Dimension 1:  
Dimension 2:  
%:

Photo: 79A-799-20230502-094355-095127.JPG

At: 66.451 ft. B - Broken  
12/3

Joint: No

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Photo: 79A-799-20230502-094355-095154.JPG

At: 73.756 ft. B - Broken  
12/.

Joint: No

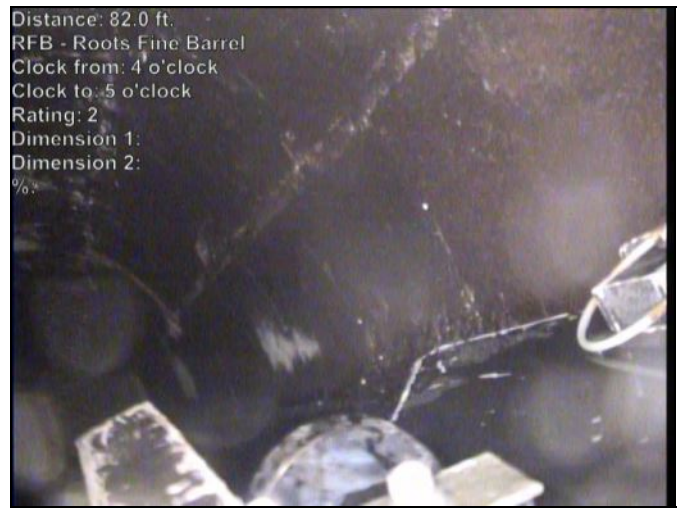


Photo: 79A-799-20230502-094355-095231.JPG

At: 81.963 ft. RFB - Roots Fine Barrel  
4/5

Joint: No

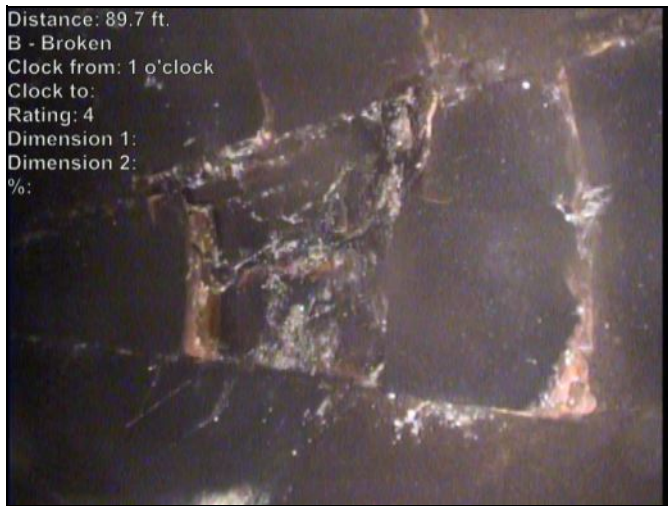


Photo: 79A-799-20230502-094355-095302.JPG

At: 89.669 ft. 1/. B - Broken

Joint: No



Photo: 79A-799-20230502-094355-095315.JPG

At: 91.37 ft. 4/. B - Broken

Joint: No



Photo: 79A-799-20230502-094355-095343.JPG

At: 104.48 ft. FL - Fracture Longitudinal  
12/.

Joint: No



Photo: 79A-799-20230502-094355-095440.JPG

At: 128.498 ft. B - Broken  
9/10

Joint: No

Last Modified: 04/09/2025 at 10:39AM EDT



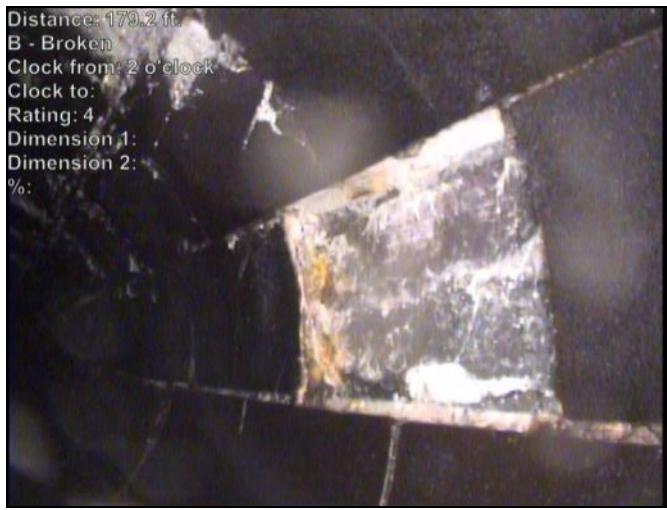


Photo: 79A-799-20230502-094355-095630.JPG

At: 179.237 ft. B - Broken  
2/.

Joint: No



Photo: 79A-799-20230502-094355-095708.JPG

At: 181.539 ft. B - Broken  
9/.

Joint: No



Photo: 79A-799-20230502-094355-095729.JPG

At: 190.246 ft. FL - Fracture Longitudinal  
12/.

Joint: No

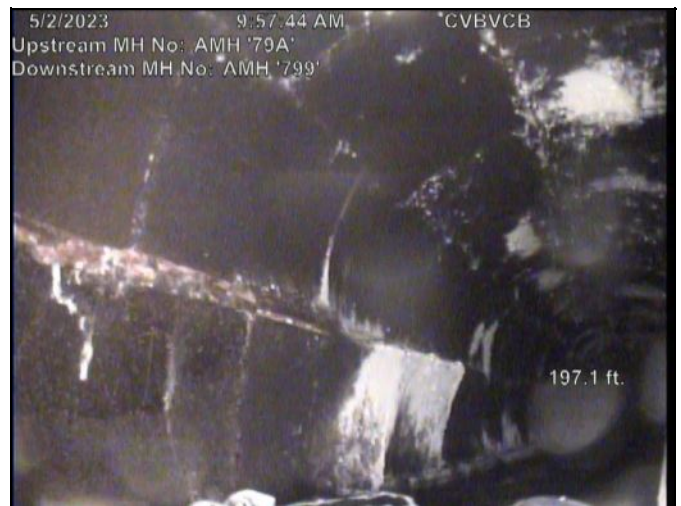


Photo: 79A-799-20230502-094355-095739.JPG

At: 194.649 ft. B - Broken  
8/.

Joint: No

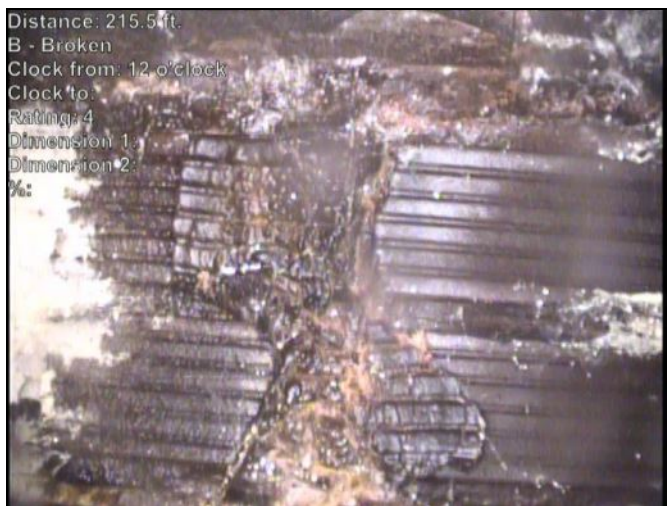


Photo: 79A-799-20230502-094355-095833.JPG

At: 215.465 ft. B - Broken  
12/.

Joint: No



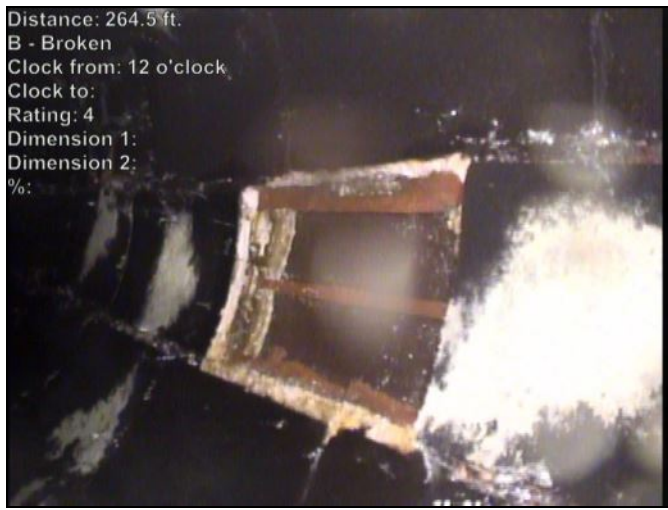
Photo: 79A-799-20230502-094355-095914.JPG

At: 228.575 ft. B - Broken  
9/.

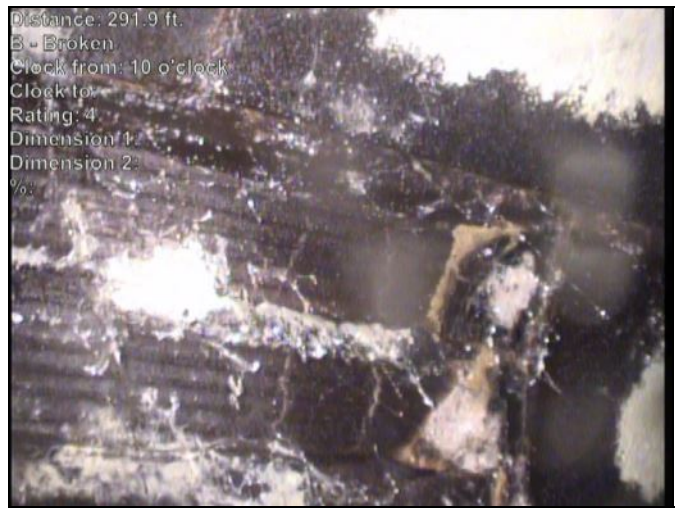
Joint: No

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Distance: 264.5 ft.  
B - Broken  
Clock from: 12 o'clock  
Clock to:  
Rating: 4  
Dimension 1:  
Dimension 2:  
%:  
Photo: 79A-799-20230502-094355-100027.JPG  
At: 264.503 ft. B - Broken  
12/.  
Joint: No



Distance: 291.9 ft.  
B - Broken  
Clock from: 10 o'clock  
Clock to:  
Rating: 4  
Dimension 1:  
Dimension 2:  
%:  
Photo: 79A-799-20230502-094355-100153.JPG  
At: 291.924 ft. B - Broken  
10/.  
Joint: No



Distance: 304.4 ft.  
B - Broken  
Clock from: 8 o'clock  
Clock to:  
Rating: 4  
Dimension 1:  
Dimension 2:  
%:  
Photo: 79A-799-20230502-094355-101037.JPG  
At: 304.433 ft. B - Broken  
8/.  
Joint: No



Distance: 317.2 ft.  
AMH - Manhole  
Clock from:  
Clock to:  
Rating:  
Dimension 1:  
Dimension 2:  
%:  
SURVEY ENDS  
Photo: 79A-799-20230502-094355-101124.JPG  
At: 317.243 ft. AMH - Manhole  
Joint: No SURVEY ENDS

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## NWMCC INSPECTION REPORT

### PACP Rating Description

<b><u>1:</u></b>	<p><b>Excellent Condition</b></p> <p><b>Minor Defects - Failure unlikely in the foreseeable future</b></p>
<b><u>2:</u></b>	<p><b>Good Condition</b></p> <p><b>Defects that have not begun to deteriorate - Pipe unlikely to fail for at least 20 years.</b></p>
<b><u>3:</u></b>	<p><b>Fair Condition</b></p> <p><b>Moderate defects that will continue to deteriorate - Pipe may fail in 10-20 years.</b></p>
<b><u>4:</u></b>	<p><b>Poor Condition</b></p> <p><b>Severe Defects that will become Grade 5 defects within the foreseeable future - Pipe will probably fail in 5-10 years.</b></p>
<b><u>5:</u></b>	<p><b>Immediate Attention</b></p> <p><b>Defects require immediate attention - Pipe has failed or will likely fail within the next 5 years or sooner.</b></p>

Last Modified: 04/09/2025 at 10:39AM EDT

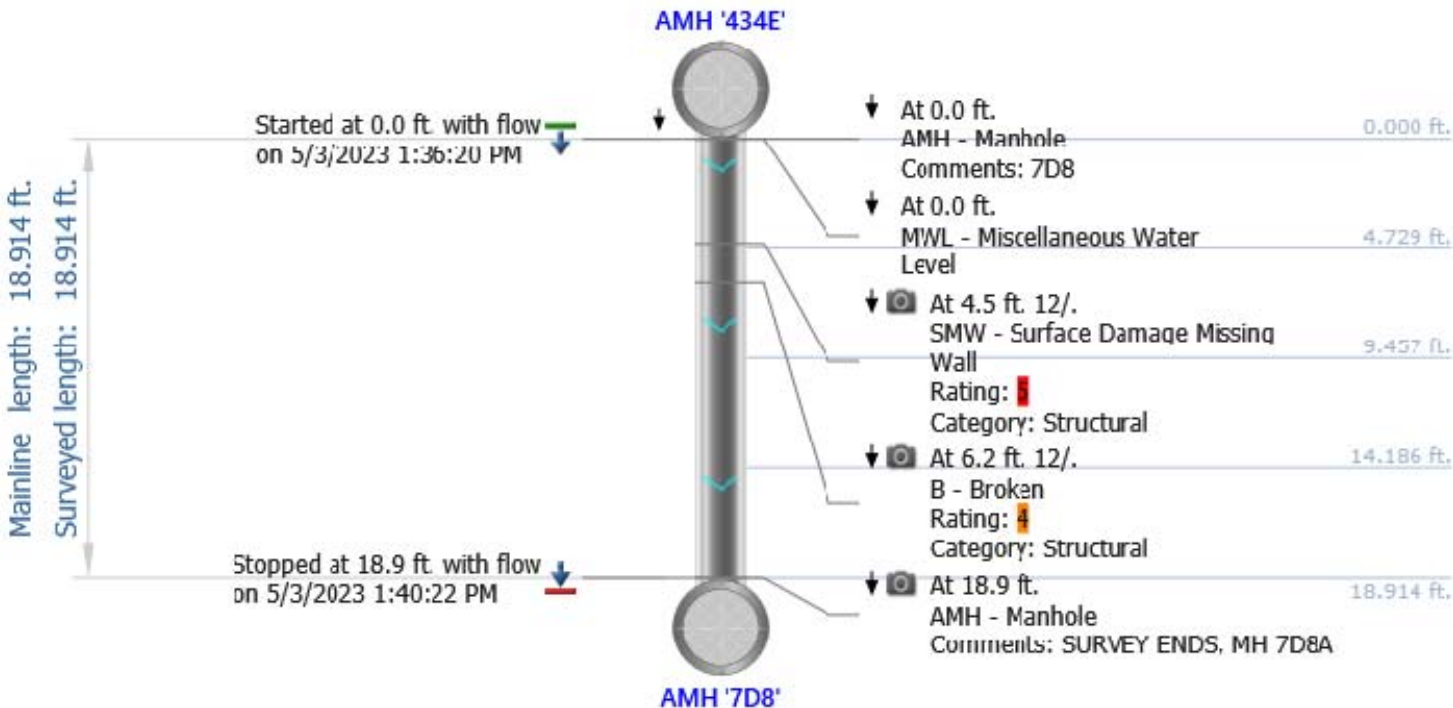
## NWMCC INSPECTION REPORT

Start date/time: <b>20230503 13:36</b>	Weather: <b>Dry Weather/Wet Ground</b>	Surveyed by: <b>B. DEGROATE</b>	Certificate number: <b>0218-070300747</b>	Pipe segment ref.: <b>P4880</b>	
Owner:	Customer:	Pre-cleaning: <b>No Pre-Cleaning</b>	Date cleaned:	Project name: <b>KLE005-30</b>	
City: <b>SPRINGFIELD MA</b>	Street: <b>ABERDEEN EASEMENT</b>	Location code:	Pipe use: <b>Sanitary Sewage Pipe</b>	Drainage area: _____	Flow control: _____
Upstream MH No: <b>434E</b>	Downstream MH No: <b>7D8</b>	Direction: <b>D</b>	Total length: <b>18.914 ft.</b>	Length surveyed: <b>18.914 ft.</b>	
Purpose:	Pipe joint length:	Height: <b>36 in.</b>	Material: <b>Clay Tile (not vitrified clay)</b>	LateralsCounter:	Additional info:

### Pipe Ratings

Grade	Structural:					O&M:					Overall:			Risk
	Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Pipe Rating	Pipe Rating Index	LoF	
1	0	0	9	5141	4.5	0	0	0	0000	0.0	9	4.5	5.1	
2	0	0				0	0							
3	0	0				0	0							
4	0	4				0	0							
5	0	5				0	0							

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# NWMCC INSPECTION REPORT

## Inspection Photos

City: <b>SPRINGFIELD MA</b>	Street: <b>ABERDEEN EASEMENT</b>	Start date/time: <b>20230503 13:36</b>	Pipe segment ref.: <b>P4880</b>
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Distance: 4.5 ft.  
SMW - Surface Damage Missing Wall  
Clock from: 12 o'clock  
Clock to:  
Rating: 5  
Dimension 1:  
Dimension 2:  
%:

Photo: **7D8-7C1-20230503-133620-133648.JPG**  
At: **4.503 ft. 12/. SMW - Surface Damage Missing Wall**  
Joint: **No**



Distance: 6.2 ft.  
B - Broken  
Clock from: 12 o'clock  
Clock to:  
Rating: 4  
Dimension 1:  
Dimension 2:  
%:

Photo: **7D8-7C1-20230503-133620-133708.JPG**  
At: **6.205 ft. 12/. B - Broken**  
Joint: **No**



Distance: 18.9 ft.  
AMH - Manhole  
Clock from:  
Clock to:  
Rating:  
Dimension 1:  
Dimension 2:  
%:  
SURVEY ENDS, MH 7D8A

Photo: **7D8-7C1-20230503-133620-133932.JPG**  
At: **18.914 ft. AMH - Manhole**  
Joint: **No SURVEY ENDS, MH 7D8A**

Last Modified: 04/09/2025 at 10:39AM EDT

## NWMCC INSPECTION REPORT

### PACP Rating Description

<b><u>1:</u></b>	<p><b>Excellent Condition</b></p> <p><b>Minor Defects - Failure unlikely in the foreseeable future</b></p>
<b><u>2:</u></b>	<p><b>Good Condition</b></p> <p><b>Defects that have not begun to deteriorate - Pipe unlikely to fail for at least 20 years.</b></p>
<b><u>3:</u></b>	<p><b>Fair Condition</b></p> <p><b>Moderate defects that will continue to deteriorate - Pipe may fail in 10-20 years.</b></p>
<b><u>4:</u></b>	<p><b>Poor Condition</b></p> <p><b>Severe Defects that will become Grade 5 defects within the foreseeable future - Pipe will probably fail in 5-10 years.</b></p>
<b><u>5:</u></b>	<p><b>Immediate Attention</b></p> <p><b>Defects require immediate attention - Pipe has failed or will likely fail within the next 5 years or sooner.</b></p>

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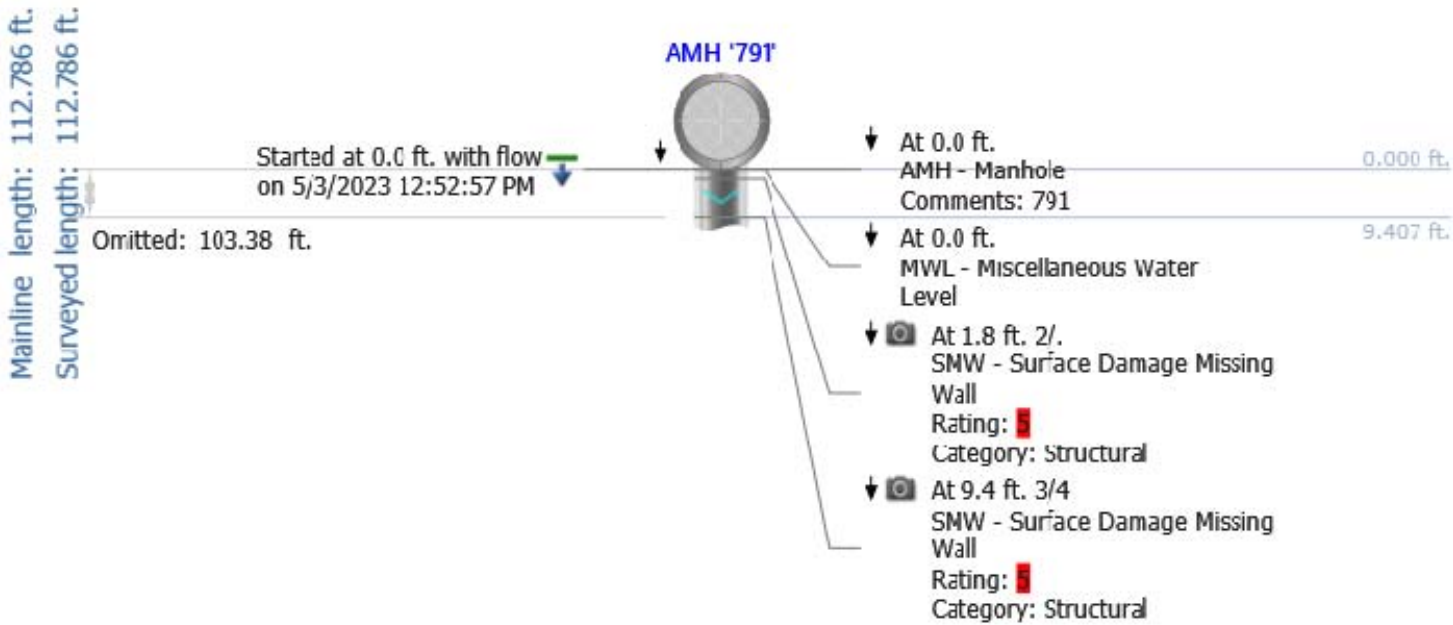
## NWMCC INSPECTION REPORT

Start date/time: <b>20230503 12:52</b>	Weather: <b>Dry Weather/Wet Ground</b>	Surveyed by: <b>B. DEGROATE</b>	Certificate number: <b>0218-070300747</b>	Pipe segment ref.: <b>P4761</b>	
Owner:	Customer:	Pre-cleaning: <b>No Pre-Cleaning</b>	Date cleaned:	Project name: <b>KLE005-30</b>	
City: <b>SPRINGFIELD MA</b>	Street: <b>ABERDEEN EASEMENT</b>	Location code:	Pipe use: <b>Sanitary Sewage Pipe</b>	Drainage area:	Flow control:
Upstream MH No: <b>791</b>	Downstream MH No: <b>J-8102</b>	Direction: <b>D</b>	Total length: <b>112.786 ft.</b>	Length surveyed: <b>112.786 ft.</b>	
Purpose:	Pipe joint length:	Height: <b>36 in.</b>	Material: <b>Clay Tile (not vitrified clay)</b>	LateralsCounter:	Additional info:

### Pipe Ratings

Grade	Structural:					O&M:					Overall:			Risk
	Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Pipe Rating	Pipe Rating Index	LoF	
1	0	0	81	5A44	4.8	0	1	5	4111	2.5	86	4.5	6.0	
2	0	0				0	0							
3	0	0				0	0							
4	0	16				0	4							
5	0	65				0	0							

Last Modified: 04/09/2025 at 10:39AM EDT






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Mainline length: 112.786 ft.  
Surveyed length: 112.786 ft.





















Omitted: 10.31 ft.

Omitted: 32.02 ft.

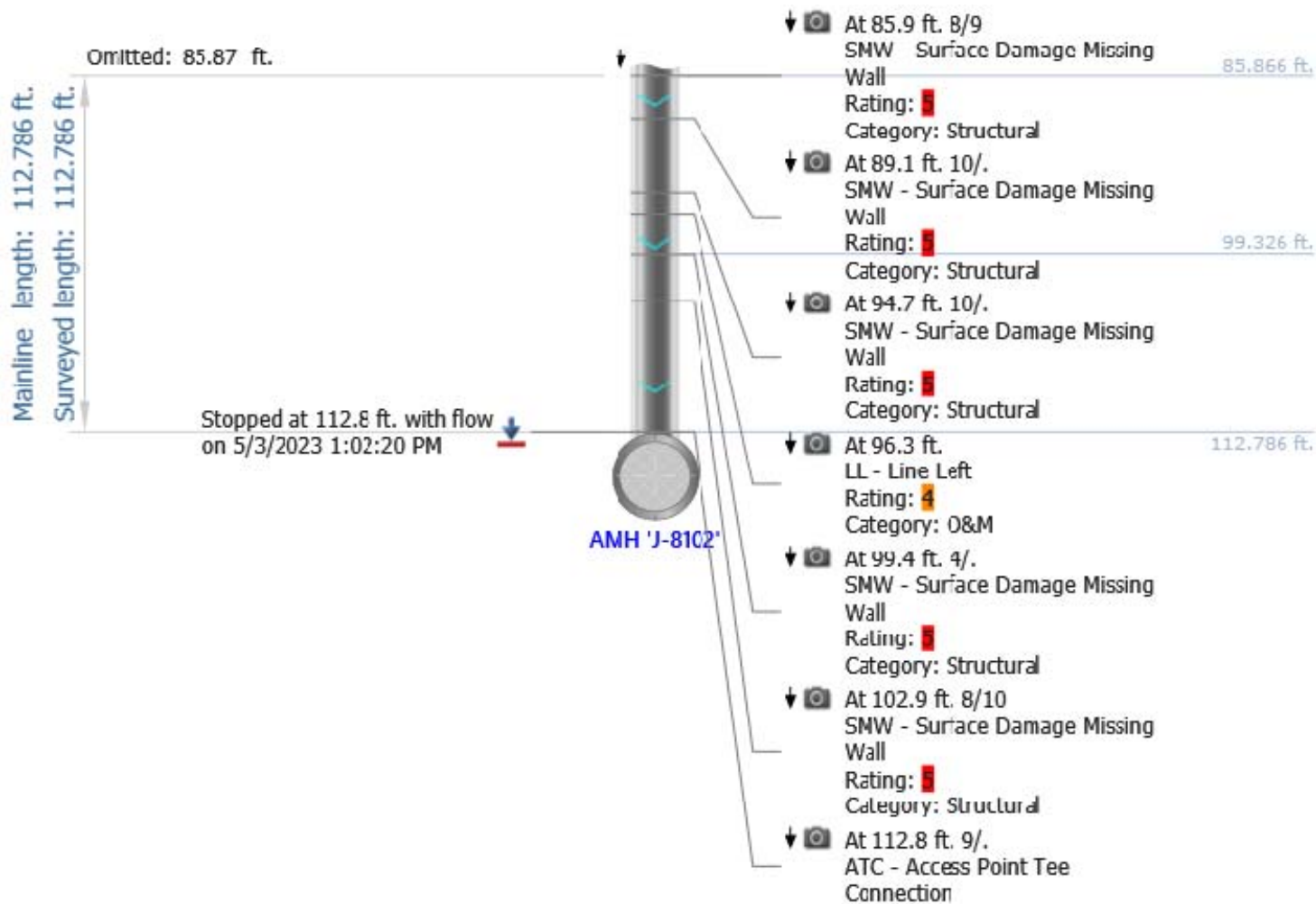
At 38.0 ft. 4/  ↓  
 S01: SMW - Surface Damage  
 Missing Wall  
 Rating:   
 Category: Structural

At 48.5 ft. 4/  ↓  
 F01: SMW - Surface Damage  
 Missing Wall  
 Rating:   
 Category: Structural

10.508 ft.

- ↓  At 10.3 ft. 10/11  
 B - Broken  
 Rating:   
 Category: Structural 10.308 ft.
- ↓  At 13.2 ft. 8/  
 RFJ - Roots Fine Joint  
 Rating:   
 Category: O&M 19.115 ft.
- ↓  At 16.2 ft. 2/  
 SMW - Surface Damage Missing  
 Wall  
 Rating:   
 Category: Structural 27.922 ft.
- ↓  At 19.3 ft. 4/  
 SMW - Surface Damage Missing  
 Wall  
 Rating:   
 Category: Structural 36.728 ft.
- ↓  At 25.4 ft. 4/  
 SMW - Surface Damage Missing  
 Wall  
 Rating:   
 Category: Structural 45.535 ft.
- ↓  At 29.0 ft. 8/  
 SMW - Surface Damage Missing  
 Wall  
 Rating:   
 Category: Structural 51.342 ft.
- ↓  At 35.1 ft. 2/  
 B - Broken  
 Rating:   
 Category: Structural 63.149 ft.
- ↓  At 38.2 ft. 9/  
 B - Broken  
 Rating:   
 Category: Structural 71.955 ft.
- ↓  At 43.2 ft. 2/  
 B - Broken  
 Rating:   
 Category: Structural 80.762 ft.
- ↓  At 49.1 ft.  
 MMC - Miscellaneous Material  
 Change  
 Comments: CONCRETE
- ↓  At 80.8 ft.  
 MMC - Miscellaneous Material  
 Change  
 Comments: CLAY TILE





# NWMCC INSPECTION REPORT

## Inspection Photos

City: <b>SPRINGFIELD MA</b>	Street: <b>ABERDEEN EASEMENT</b>	Start date/time: <b>20230503 12:52</b>	Pipe segment ref.: <b>P4761</b>
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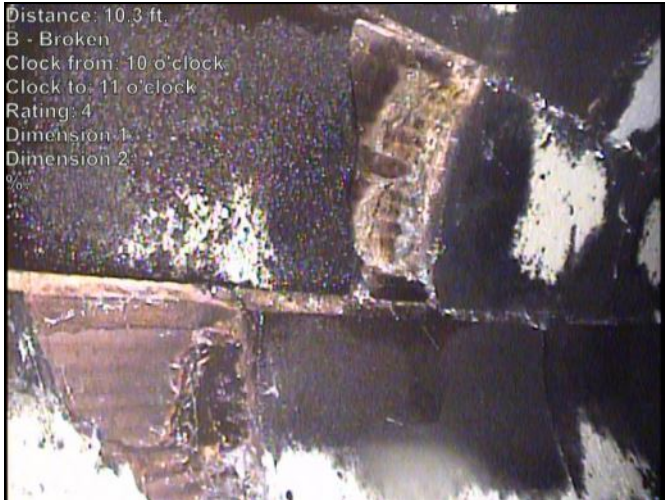
Distance: 1.8 ft.  
SMW - Surface Damage Missing Wall  
Clock from: 2 o'clock  
Clock to:  
Rating: 5  
Dimension 1:  
Dimension 2:  
%:

Photo: 791-J-8102-20230503-125257-125347.JPG  
At: 1.801 ft. 2/. SMW - Surface Damage Missing Wall  
Joint: No



Distance: 9.4 ft.  
SMW - Surface Damage Missing Wall  
Clock from: 3 o'clock  
Clock to: 4 o'clock  
Rating: 5  
Dimension 1:  
Dimension 2:  
%:

Photo: 791-J-8102-20230503-125257-125417.JPG  
At: 9.407 ft. 3/4 SMW - Surface Damage Missing Wall  
Joint: No



Distance: 10.3 ft.  
B - Broken  
Clock from: 10 o'clock  
Clock to: 11 o'clock  
Rating: 4  
Dimension 1:  
Dimension 2:  
%:

Photo: 791-J-8102-20230503-125257-125430.JPG  
At: 10.308 ft. B - Broken  
10/11  
Joint: No



Distance: 13.2 ft.  
RFJ - Roots Fine Joint  
Clock from: 8 o'clock  
Clock to:  
Rating: 1  
Dimension 1:  
Dimension 2:  
%:

Photo: 791-J-8102-20230503-125257-125451.JPG  
At: 13.21 ft. 8/. RFJ - Roots Fine Joint  
Joint: Yes

Last Modified: 04/09/2025 at 10:39AM EDT





Distance: 16.2 ft.  
SMW - Surface Damage Missing Wall  
Clock from: 2 o'clock  
Clock to:  
Rating: 5  
Dimension 1:  
Dimension 2:  
%:

Photo: 791-J-8102-20230503-125257-125507.JPG  
At: 16.212 ft. 2/. SMW - Surface Damage Missing Wall  
Joint: No



Distance: 19.3 ft.  
SMW - Surface Damage Missing Wall  
Clock from: 4 o'clock  
Clock to:  
Rating: 5  
Dimension 1:  
Dimension 2:  
%:

Photo: 791-J-8102-20230503-125257-125530.JPG  
At: 19.315 ft. 4/. SMW - Surface Damage Missing Wall  
Joint: No



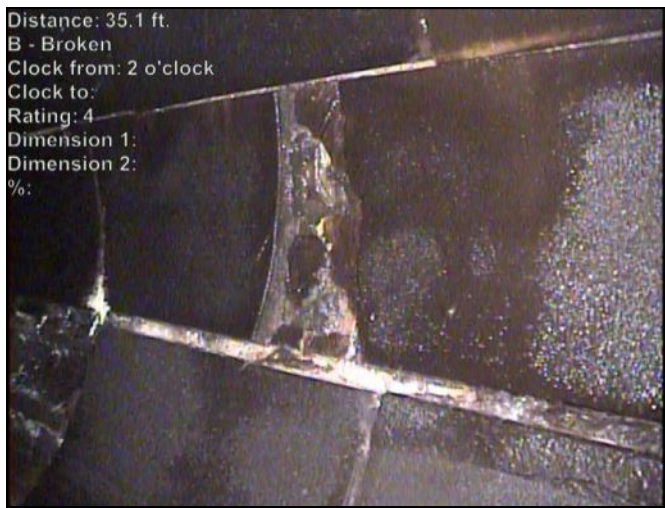
Distance: 25.4 ft.  
SMW - Surface Damage Missing Wall  
Clock from: 4 o'clock  
Clock to:  
Rating: 5  
Dimension 1:  
Dimension 2:  
%:

Photo: 791-J-8102-20230503-125257-125557.JPG  
At: 25.419 ft. 4/. SMW - Surface Damage Missing Wall  
Joint: No



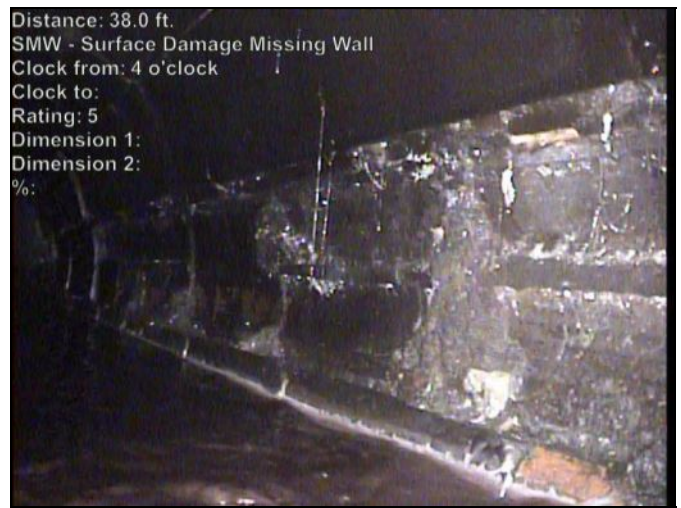
Distance: 29.0 ft.  
SMW - Surface Damage Missing Wall  
Clock from: 8 o'clock  
Clock to:  
Rating: 5  
Dimension 1:  
Dimension 2:  
%:

Photo: 791-J-8102-20230503-125257-125613.JPG  
At: 29.022 ft. 8/. SMW - Surface Damage Missing Wall  
Joint: No



Distance: 35.1 ft.  
B - Broken  
Clock from: 2 o'clock  
Clock to:  
Rating: 4  
Dimension 1:  
Dimension 2:  
%:

Photo: 791-J-8102-20230503-125257-125628.JPG  
At: 35.127 ft. 2/. B - Broken  
Joint: No

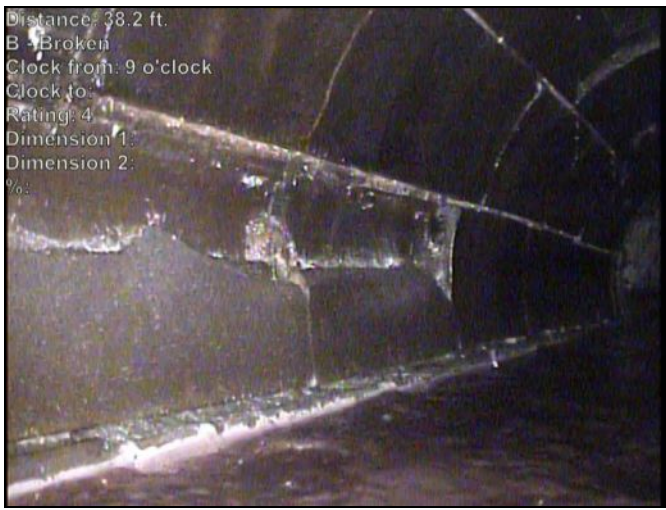


Distance: 38.0 ft.  
SMW - Surface Damage Missing Wall  
Clock from: 4 o'clock  
Clock to:  
Rating: 5  
Dimension 1:  
Dimension 2:  
%:

Photo: 791-J-8102-20230503-125257-125640.JPG  
At: 38.029 ft. 4/. SMW - Surface Damage Missing Wall  
Joint: No

Last Modified: 04/09/2025 at 10:39AM EDT



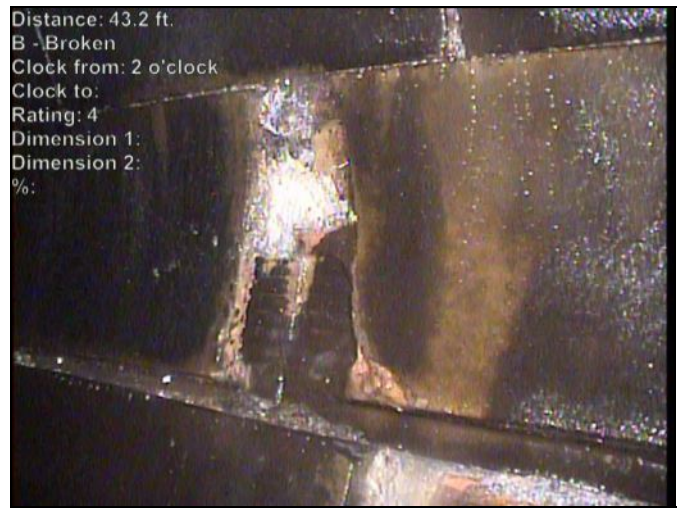


Distance: 38.2 ft.  
B - Broken  
Clock from: 9 o'clock  
Clock to:  
Rating: 4  
Dimension 1:  
Dimension 2:  
%:

Photo: 791-J-8102-20230503-125257-125652.JPG

At: 38.229 ft. 9/. B - Broken

Joint: No



Distance: 43.2 ft.  
B - Broken  
Clock from: 2 o'clock  
Clock to:  
Rating: 4  
Dimension 1:  
Dimension 2:  
%:

Photo: 791-J-8102-20230503-125257-125715.JPG

At: 43.233 ft. 2/. B - Broken

Joint: No



Distance: 48.5 ft.  
SMW - Surface Damage Missing Wall  
Clock from: 4 o'clock  
Clock to:  
Rating: 5  
Dimension 1:  
Dimension 2:  
%:

Photo: 791-J-8102-20230503-125257-125730.JPG

At: 48.537 ft. 4/. SMW - Surface Damage Missing Wall

Joint: No

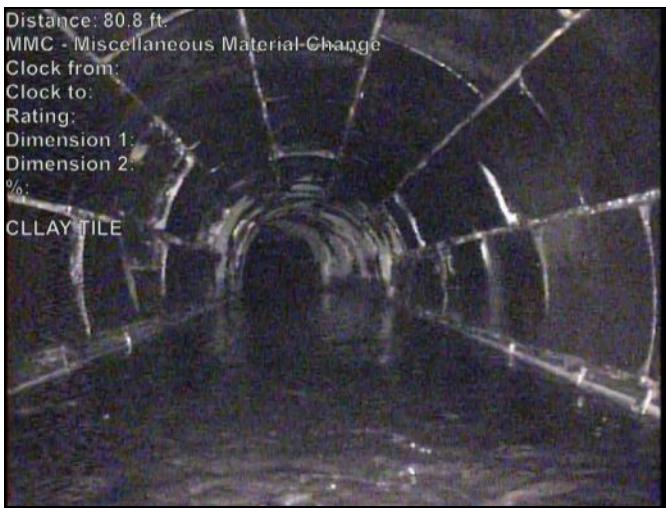


Distance: 49.1 ft.  
MMC - Miscellaneous Material Change  
Clock from:  
Clock to:  
Rating:  
Dimension 1:  
Dimension 2:  
%:

Photo: 791-J-8102-20230503-125257-125740.JPG

At: 49.138 ft. MMC - Miscellaneous Material Change

Joint: No CONCRETE



Distance: 80.8 ft.  
MMC - Miscellaneous Material Change  
Clock from:  
Clock to:  
Rating:  
Dimension 1:  
Dimension 2:  
%:

Photo: 791-J-8102-20230503-125257-125853.JPG

At: 80.762 ft. MMC - Miscellaneous Material Change

Joint: No CLLAY TILE



Distance: 85.9 ft.  
SMW - Surface Damage Missing Wall  
Clock from: 8 o'clock  
Clock to: 9 o'clock  
Rating: 5  
Dimension 1:  
Dimension 2:  
%:

Photo: 791-J-8102-20230503-125257-125913.JPG

At: 85.866 ft. SMW - Surface Damage Missing Wall

Joint: No 8/9





Distance: 89.1 ft.  
 SMW - Surface Damage Missing Wall  
 Clock from: 10 o'clock  
 Clock to:  
 Rating: 5  
 Dimension 1:  
 Dimension 2:  
 %:

Photo: 791-J-8102-20230503-125257-125929.JPG  
 At: 89.068 ft. SMW - Surface Damage Missing Wall  
 10/.  
 Joint: No



Distance: 94.7 ft.  
 SMW - Surface Damage Missing Wall  
 Clock from: 10 o'clock  
 Clock to:  
 Rating: 5  
 Dimension 1:  
 Dimension 2:  
 %:

Photo: 791-J-8102-20230503-125257-125949.JPG  
 At: 94.673 ft. SMW - Surface Damage Missing Wall  
 10/.  
 Joint: No



Distance: 96.3 ft.  
 LL - Line Left  
 Clock from:  
 Clock to:  
 Rating: 1  
 Dimension 1:  
 Dimension 2:  
 %: 25 %

Photo: 791-J-8102-20230503-125257-125958.JPG  
 At: 96.274 ft. LL - Line Left  
 Joint: No 25 %



Distance: 99.4 ft.  
 SMW - Surface Damage Missing Wall  
 Clock from: 4 o'clock  
 Clock to:  
 Rating: 5  
 Dimension 1:  
 Dimension 2:  
 %:

Photo: 791-J-8102-20230503-125257-130015.JPG  
 At: 99.376 ft. 4/. SMW - Surface Damage Missing Wall  
 Joint: No



Distance: 102.9 ft.  
 SMW - Surface Damage Missing Wall  
 Clock from: 8 o'clock  
 Clock to: 10 o'clock  
 Rating: 5  
 Dimension 1:  
 Dimension 2:  
 %:

Photo: 791-J-8102-20230503-125257-130032.JPG  
 At: 102.879 ft. SMW - Surface Damage Missing Wall  
 8/10  
 Joint: No



Distance: 112.8 ft.  
 ATC - Access Point Tee Connection  
 Clock from: 9 o'clock  
 Clock to:  
 Rating:  
 Dimension 1:  
 Dimension 2:  
 %:

Photo: 791-J-8102-20230503-125257-130158.JPG  
 At: 112.786 ft. ATC - Access Point Tee Connection  
 9/.  
 Joint: No

Last Modified: 04/09/2025 at 10:39AM EDT

## NWMCC INSPECTION REPORT

### PACP Rating Description

**1: Excellent Condition**

**Minor Defects - Failure unlikely in the foreseeable future**

**2: Good Condition**

**Defects that have not begun to deteriorate - Pipe unlikely to fail for at least 20 years.**

**3: Fair Condition**

**Moderate defects that will continue to deteriorate - Pipe may fail in 10-20 years.**

**4: Poor Condition**

**Severe Defects that will become Grade 5 defects within the foreseeable future - Pipe will probably fail in 5-10 years.**

**5: Immediate Attention**

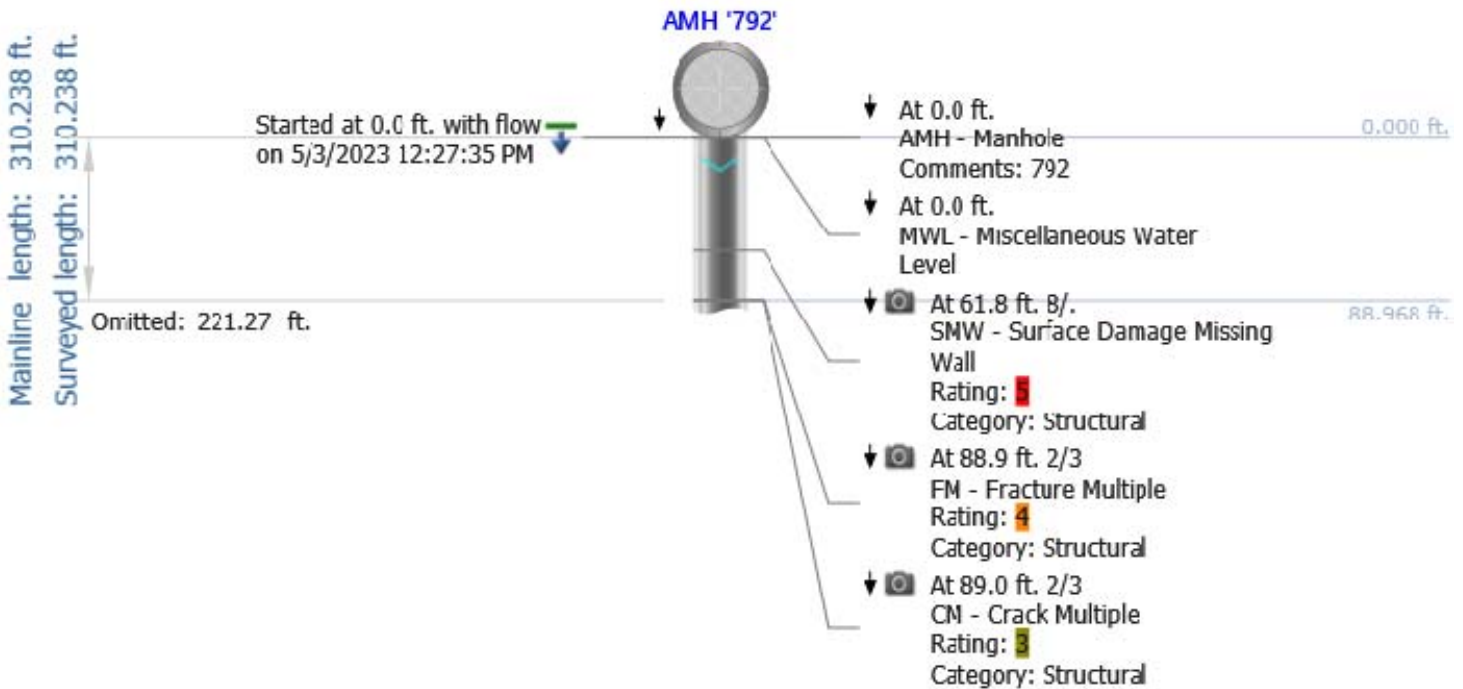
**Defects require immediate attention - Pipe has failed or will likely fail within the next 5 years or sooner.**

## NWMCC INSPECTION REPORT

Start date/time: <b>20230503 12:27</b>	Weather: <b>Dry Weather/Wet Ground</b>	Surveyed by: <b>B. DEGROATE</b>	Certificate number: <b>0218-070300747</b>	Pipe segment ref.: <b>P2F9F</b>	
Owner:	Customer:	Pre-cleaning: <b>No Pre-Cleaning</b>	Date cleaned:	Project name: <b>KLE005-30</b>	
City: <b>SPRINGFIELD MA</b>	Street: <b>ABERDEEN EASEMENT</b>	Location code:	Pipe use: <b>Sanitary Sewage Pipe</b>	Drainage area:	Flow control:
Upstream MH No: <b>792</b>	Downstream MH No: <b>791</b>	Direction: <b>D</b>	Total length: <b>310.238 ft.</b>	Length surveyed: <b>310.238 ft.</b>	
Purpose:	Pipe joint length:	Height: <b>36 in.</b>	Material: <b>Clay Tile (not vitrified clay)</b>	LateralsCounter:	Additional info:

### Pipe Ratings

Grade	Structural:					O&M:					Overall:			Risk
	Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Pipe Rating	Pipe Rating Index	LoF	
1	0	0	43	5147	3.6	0	0	7	3122	2.3	50	3.3	5.1	
2	0	4				0	4							
3	0	6				0	3							
4	0	28				0	0							
5	0	5				0	0							



Last Modified: 04/09/2025 at 10:39AM EDT



Omitted: 106.88 ft.

Mainline length: 310.238 ft.  
Surveyed length: 310.238 ft.

Omitted: 7.71 ft.

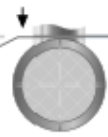
At 106.9 ft. 11/1	106.882 ft.
CM - Crack Multiple	
Rating: 3	
Category: Structural	
At 112.0 ft. 12/.	131.338 ft.
B - Broken	
Rating: 4	
Category: Structural	
At 131.7 ft. 2/.	153.793 ft.
B - Broken	
Rating: 4	
Category: Structural	
At 134.0 ft. 2/.	180.251 ft.
B - Broken	
Rating: 4	
Category: Structural	
At 148.3 ft. 12/.	204.707 ft.
CL - Crack Longitudinal	
Rating: 2	
Category: Structural	
At 162.1 ft. 4/.	229.163 ft.
RMJ - Roots Medium Joint	
Rating: 3	
Category: O&M	
At 194.0 ft. 8/.	253.620 ft.
DAR - Deposits Attached	
Ragging	
Rating: 2	
Category: O&M	
At 244.4 ft. 2/.	278.076 ft.
B - Broken	
Rating: 4	
Category: Structural	
At 277.5 ft. 8/.	302.532 ft.
DAR - Deposits Attached	
Ragging	
Rating: 2	
Category: O&M	
At 282.0 ft. 2/.	
B - Broken	
Rating: 4	
Category: Structural	
At 291.8 ft. 2/.	
B - Broken	
Rating: 4	
Category: Structural	
At 302.5 ft. 10/.	
CL - Crack Longitudinal	
Rating: 2	
Category: Structural	



Mainline length: 310.238 ft.  
Surveyed length: 310.238 ft.

Omitted: 310.04 ft.

Stopped at 310.2 ft. with flow  
on 5/3/2023 12:41:23 PM



AMH '791'



At 310.0 ft.  
AMH - Manhole  
Comments: SURVEY ENDS

310.037 ft.  
310.238 ft.

# NWMCC INSPECTION REPORT

## Inspection Photos

City: <b>SPRINGFIELD MA</b>	Street: <b>ABERDEEN EASEMENT</b>	Start date/time: <b>20230503 12:27</b>	Pipe segment ref.: <b>P2F9F</b>
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Photo: 792-791-20230503-122735-123022.JPG  
At: 61.847 ft. 8/. SMW - Surface Damage Missing Wall  
Joint: No

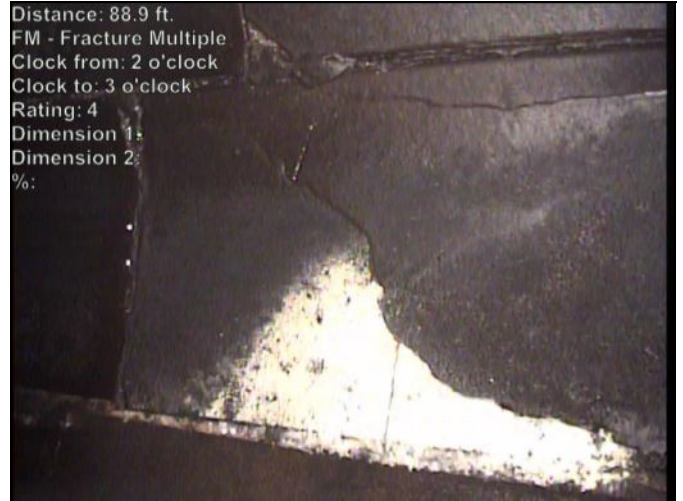


Photo: 792-791-20230503-122735-123127.JPG  
At: 88.868 ft. FM - Fracture Multiple  
2/3  
Joint: No



Photo: 792-791-20230503-122735-123141.JPG  
At: 88.968 ft. CM - Crack Multiple  
2/3  
Joint: No

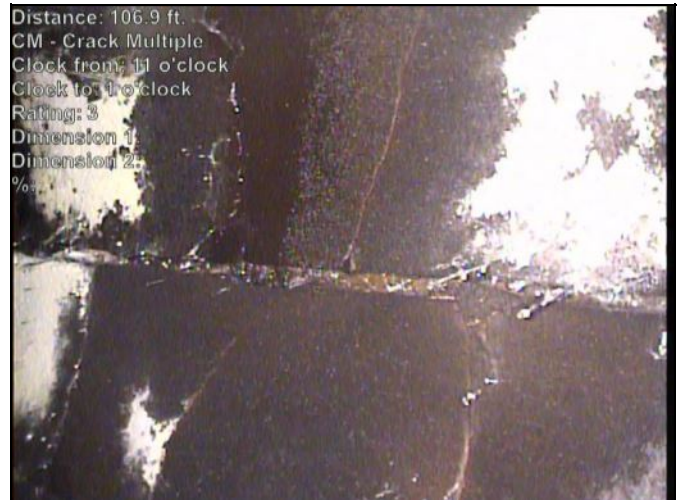
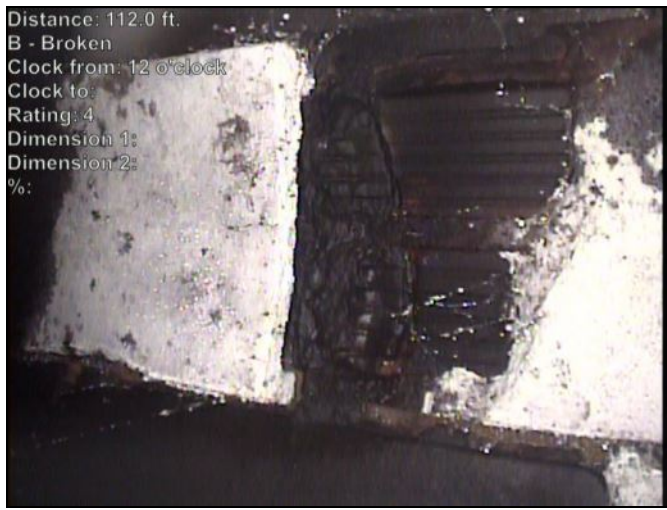


Photo: 792-791-20230503-122735-123231.JPG  
At: 106.882 ft. CM - Crack Multiple  
11/1  
Joint: No

Last Modified: 04/09/2025 at 10:39AM EDT





Distance: 112.0 ft.  
B - Broken  
Clock from: 12 o'clock  
Clock to:  
Rating: 4  
Dimension 1:  
Dimension 2:  
%:

Photo: 792-791-20230503-122735-123256.JPG

At: 111.986 ft. B - Broken  
12/.

Joint: No

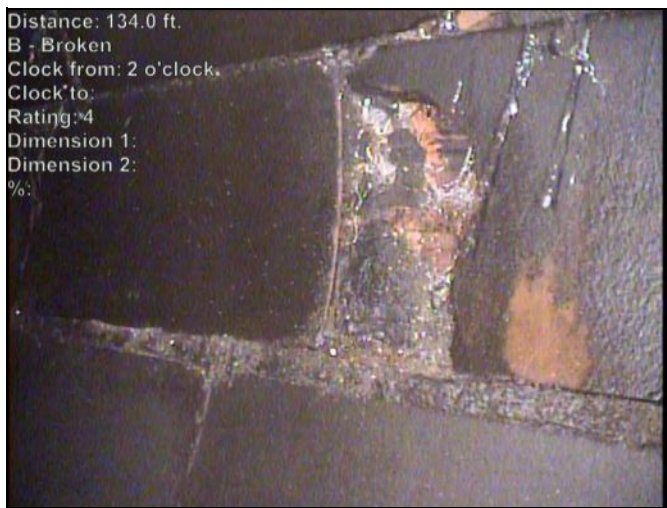


Distance: 131.7 ft.  
B - Broken  
Clock from: 2 o'clock  
Clock to:  
Rating: 4  
Dimension 1:  
Dimension 2:  
%:

Photo: 792-791-20230503-122735-123345.JPG

At: 131.701 ft. B - Broken  
2/.

Joint: No



Distance: 134.0 ft.  
B - Broken  
Clock from: 2 o'clock  
Clock to:  
Rating: 4  
Dimension 1:  
Dimension 2:  
%:

Photo: 792-791-20230503-122735-123357.JPG

At: 134.003 ft. B - Broken  
2/.

Joint: No



Distance: 148.3 ft.  
CL - Crack Longitudinal  
Clock from: 12 o'clock  
Clock to:  
Rating: 2  
Dimension 1:  
Dimension 2:  
%:

Photo: 792-791-20230503-122735-123436.JPG

At: 148.314 ft. CL - Crack Longitudinal  
12/.

Joint: No



Distance: 162.1 ft.  
RMJ - Roots Medium Joint  
Clock from: 4 o'clock  
Clock to:  
Rating: 3  
Dimension 1:  
Dimension 2:  
%: 5 %

Photo: 792-791-20230503-122735-123519.JPG

At: 162.124 ft. RMJ - Roots Medium Joint  
4/.

Joint: Yes 5 %



Distance: 194.0 ft.  
DAR - Deposits Attached Ragging  
Clock from: 8 o'clock  
Clock to:  
Rating: 2  
Dimension 1:  
Dimension 2:  
%: 5 %

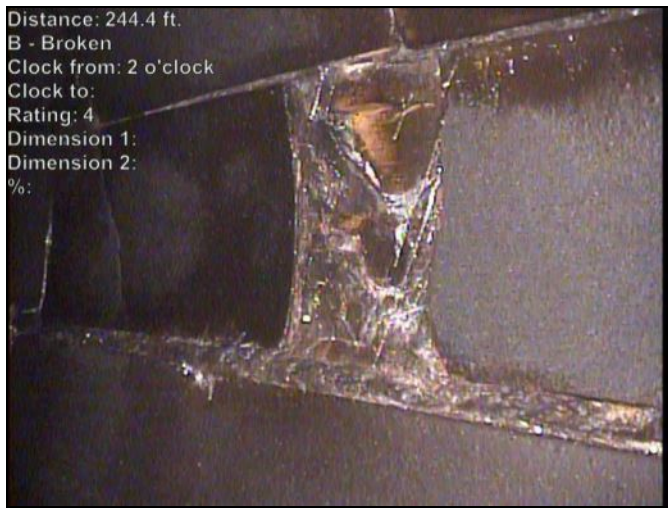
Photo: 792-791-20230503-122735-123638.JPG

At: 194.049 ft. DAR - Deposits Attached Ragging  
8/.

Joint: No 5 %

Last Modified: 04/09/2025 at 10:39AM EDT





Distance: 244.4 ft.  
 B - Broken  
 Clock from: 2 o'clock  
 Clock to:  
 Rating: 4  
 Dimension 1:  
 Dimension 2:  
 %:

Photo: 792-791-20230503-122735-123817.JPG

At: 244.387 ft. B - Broken  
 2/.

Joint: No



Distance: 277.5 ft.  
 DAR - Deposits Attached Ragging  
 Clock from: 8 o'clock  
 Clock to:  
 Rating: 2  
 Dimension 1:  
 Dimension 2:  
 %: 5%

Photo: 792-791-20230503-122735-123929.JPG

At: 277.513 ft. DAR - Deposits Attached Ragging  
 8/.

Joint: No 5%



Distance: 282.0 ft.  
 B - Broken  
 Clock from: 2 o'clock  
 Clock to:  
 Rating: 4  
 Dimension 1:  
 Dimension 2:  
 %:

Photo: 792-791-20230503-122735-123948.JPG

At: 282.016 ft. B - Broken  
 2/.

Joint: No



Distance: 291.8 ft.  
 B - Broken  
 Clock from: 2 o'clock  
 Clock to:  
 Rating: 4  
 Dimension 1:  
 Dimension 2:  
 %:

Photo: 792-791-20230503-122735-124014.JPG

At: 291.823 ft. B - Broken  
 2/.

Joint: No



Distance: 302.5 ft.  
 CL - Crack Longitudinal  
 Clock from: 10 o'clock  
 Clock to:  
 Rating: 2  
 Dimension 1:  
 Dimension 2:  
 %:

Photo: 792-791-20230503-122735-124043.JPG

At: 302.532 ft. CL - Crack Longitudinal  
 10/.

Joint: No



Distance: 310.0 ft.  
 AMH - Manhole  
 Clock from:  
 Clock to:  
 Rating:  
 Dimension 1:  
 Dimension 2:  
 %:

Photo: 792-791-20230503-122735-124106.JPG

At: 310.037 ft. AMH - Manhole  
 SURVEY ENDS

Joint: No SURVEY ENDS

Last Modified: 04/09/2025 at 10:39AM EDT

## NWMCC INSPECTION REPORT

### PACP Rating Description

<b><u>1:</u></b>	<p><b>Excellent Condition</b></p> <p><b>Minor Defects - Failure unlikely in the foreseeable future</b></p>
<b><u>2:</u></b>	<p><b>Good Condition</b></p> <p><b>Defects that have not begun to deteriorate - Pipe unlikely to fail for at least 20 years.</b></p>
<b><u>3:</u></b>	<p><b>Fair Condition</b></p> <p><b>Moderate defects that will continue to deteriorate - Pipe may fail in 10-20 years.</b></p>
<b><u>4:</u></b>	<p><b>Poor Condition</b></p> <p><b>Severe Defects that will become Grade 5 defects within the foreseeable future - Pipe will probably fail in 5-10 years.</b></p>
<b><u>5:</u></b>	<p><b>Immediate Attention</b></p> <p><b>Defects require immediate attention - Pipe has failed or will likely fail within the next 5 years or sooner.</b></p>

Last Modified: 04/09/2025 at 10:39AM EDT

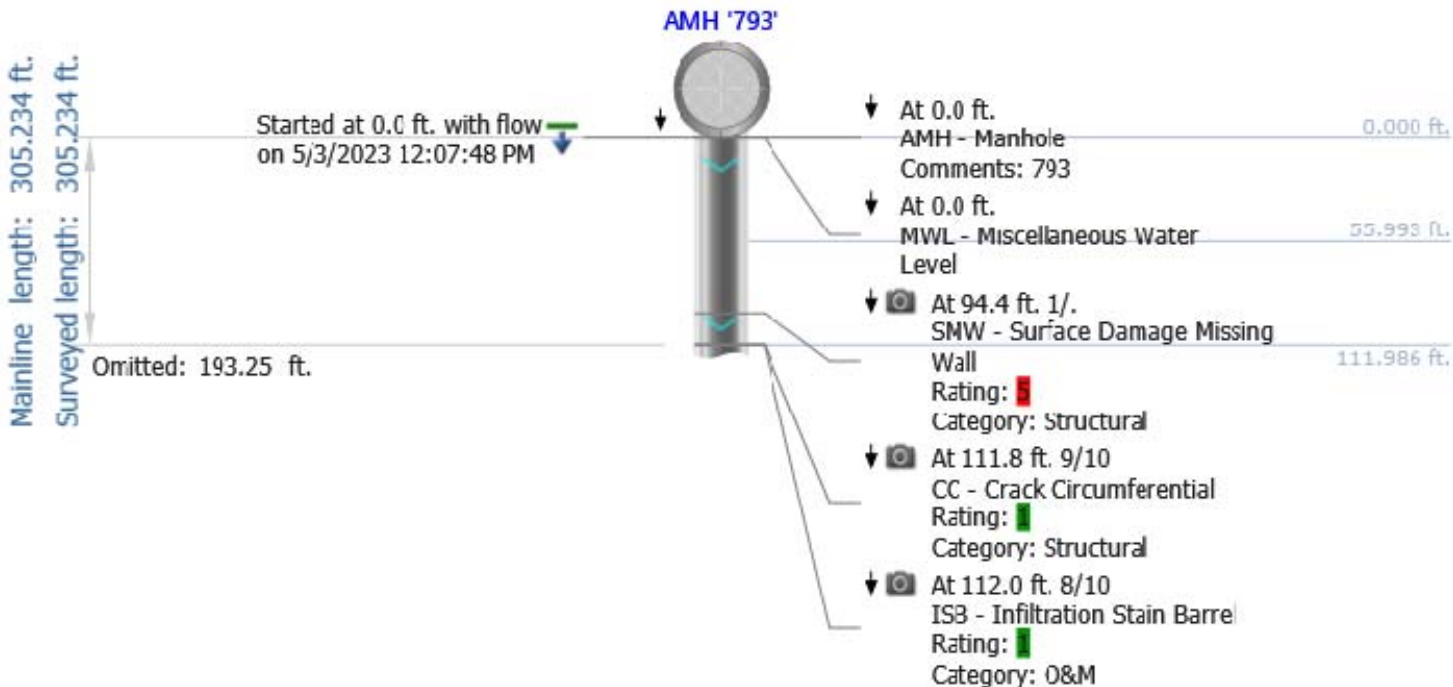
## NWMCC INSPECTION REPORT

Start date/time: <b>20230503 12:07</b>	Weather: <b>Dry Weather/Wet Ground</b>	Surveyed by: <b>B. DEGROATE</b>	Certificate number: <b>0218-070300747</b>	Pipe segment ref.: <b>P2F6D</b>	
Owner:	Customer:	Pre-cleaning: <b>No Pre-Cleaning</b>	Date cleaned:	Project name: <b>KLE005-30</b>	
City: <b>SPRINGFIELD MA</b>	Street: <b>ABERDEEN EASEMENT</b>	Location code:	Pipe use: <b>Sanitary Sewage Pipe</b>	Drainage area: _____	Flow control: _____
Upstream MH No: <b>793</b>	Downstream MH No: <b>792</b>	Direction: <b>D</b>	Total length: <b>305.234 ft.</b>	Length surveyed: <b>305.234 ft.</b>	
Purpose:	Pipe joint length:	Height: <b>36 in.</b>	Material: <b>Clay Tile (not vitrified clay)</b>	LateralsCounter:	Additional info:

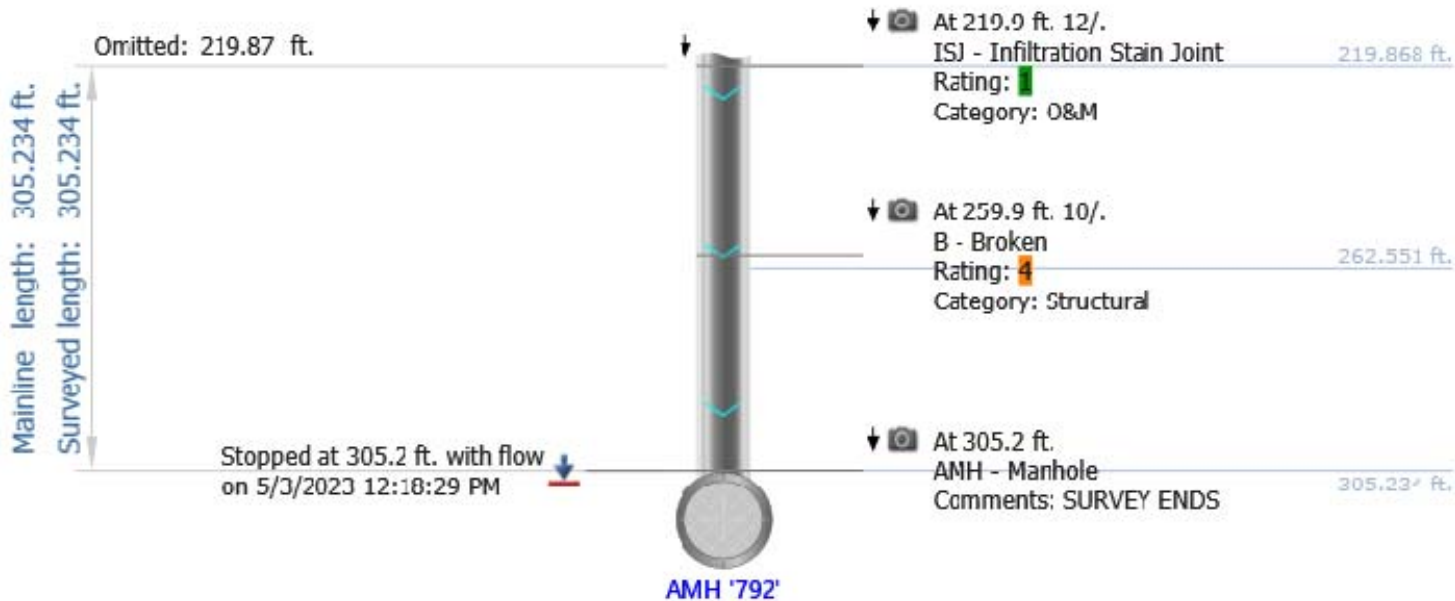
### Pipe Ratings

Grade	Structural:					O&M:					Overall:			Risk
	Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Pipe Rating	Pipe Rating Index	LoF	
1	0	1	10	5141	3.3	0	2	2	1200	1.0	12	2.4	5.1	
2	0	0				0								
3	0	0				0								
4	0	4				0								
5	0	5				0								

Last Modified: 04/09/2025 at 10:39AM EDT







Last Modified: 04/09/2025 at 10:39AM EDT

# NWMCC INSPECTION REPORT

## Inspection Photos

City: <b>SPRINGFIELD MA</b>	Street: <b>ABERDEEN EASEMENT</b>	Start date/time: <b>20230503 12:07</b>	Pipe segment ref.: <b>P2F6D</b>
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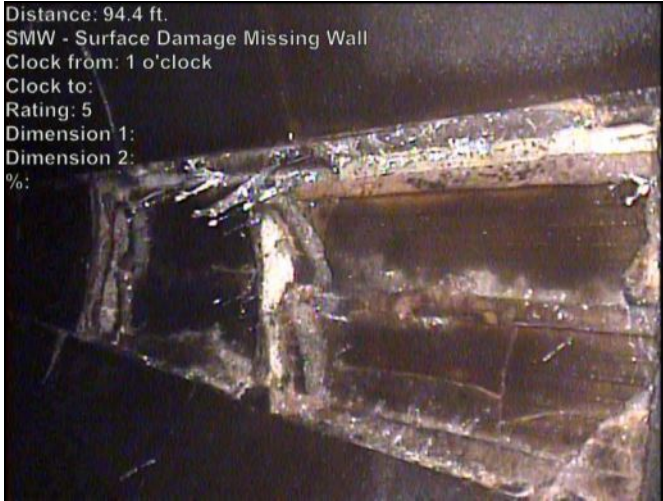


Photo: 793-792-20230503-120748-121043.JPG  
At: 94.372 ft. 1/. SMW - Surface Damage Missing Wall  
Joint: No



Photo: 793-792-20230503-120748-121131.JPG  
At: 111.786 ft. CC - Crack Circumferential  
9/10  
Joint: No

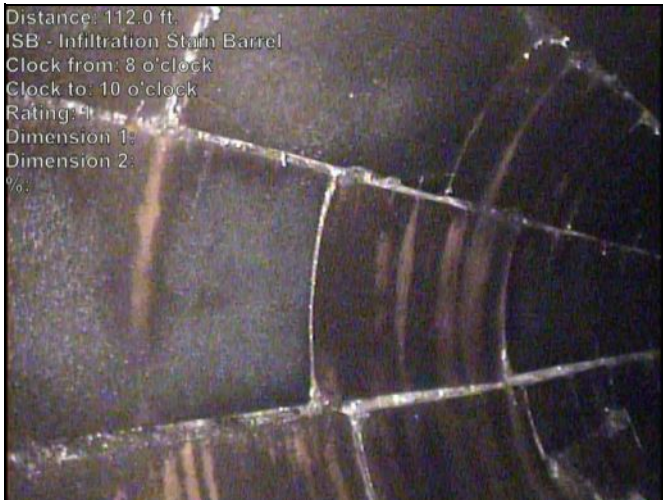


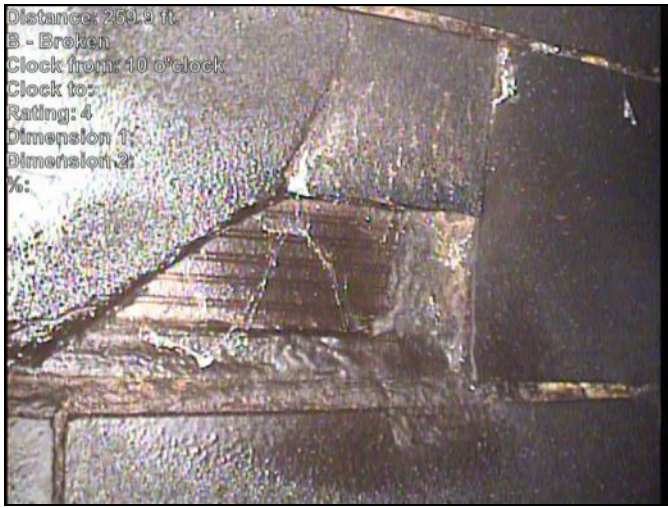
Photo: 793-792-20230503-120748-121145.JPG  
At: 111.986 ft. ISB - Infiltration Stain Barrel  
8/10  
Joint: No



Photo: 793-792-20230503-120748-121450.JPG  
At: 219.868 ft. ISJ - Infiltration Stain Joint  
12/.  
Joint: Yes

Last Modified: 04/09/2025 at 10:39AM EDT



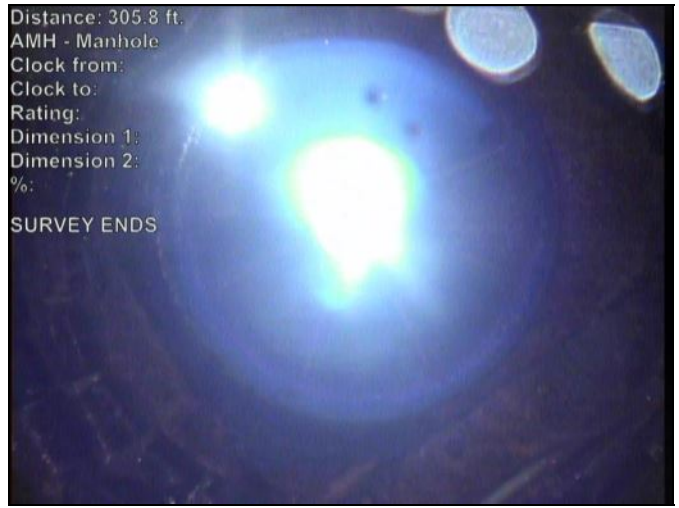


Distance: 259.9 ft.  
B - Broken  
Clock from: 10 o'clock  
Clock to:  
Rating: 4  
Dimension 1:  
Dimension 2:  
%:

Photo: 793-792-20230503-120748-121558.JPG

At: 259.899 ft. B - Broken  
10/.

Joint: No



Distance: 305.8 ft.  
AMH - Manhole  
Clock from:  
Clock to:  
Rating:  
Dimension 1:  
Dimension 2:  
%:

SURVEY ENDS

Photo: 793-792-20230503-120748-121741.JPG

At: 305.2 ft. AMH - Manhole  
Joint: No SURVEY ENDS

## NWMCC INSPECTION REPORT

### PACP Rating Description

<b><u>1:</u></b>	<p><b>Excellent Condition</b></p> <p><b>Minor Defects - Failure unlikely in the foreseeable future</b></p>
<b><u>2:</u></b>	<p><b>Good Condition</b></p> <p><b>Defects that have not begun to deteriorate - Pipe unlikely to fail for at least 20 years.</b></p>
<b><u>3:</u></b>	<p><b>Fair Condition</b></p> <p><b>Moderate defects that will continue to deteriorate - Pipe may fail in 10-20 years.</b></p>
<b><u>4:</u></b>	<p><b>Poor Condition</b></p> <p><b>Severe Defects that will become Grade 5 defects within the foreseeable future - Pipe will probably fail in 5-10 years.</b></p>
<b><u>5:</u></b>	<p><b>Immediate Attention</b></p> <p><b>Defects require immediate attention - Pipe has failed or will likely fail within the next 5 years or sooner.</b></p>

Last Modified: 04/09/2025 at 10:39AM EDT

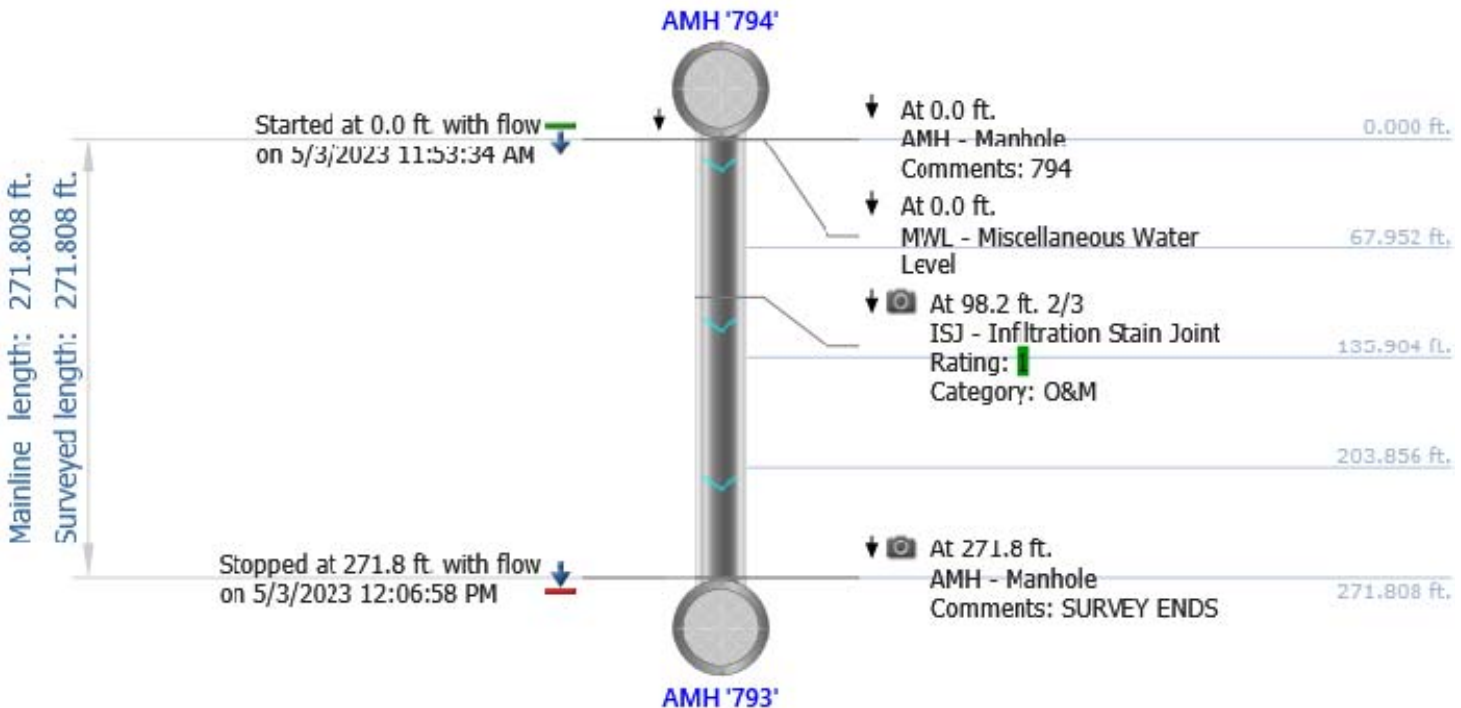
## NWMCC INSPECTION REPORT

Start date/time: <b>20230503 11:53</b>	Weather: <b>Dry Weather/Wet Ground</b>	Surveyed by: <b>B. DEGROATE</b>	Certificate number: <b>0218-070300747</b>	Pipe segment ref.: <b>P24ED</b>	
Owner:	Customer:	Pre-cleaning: <b>No Pre-Cleaning</b>	Date cleaned:	Project name: <b>KLE005-30</b>	
City: <b>SPRINGFIELD MA</b>	Street: <b>ABERDEEN EASEMENT</b>	Location code:	Pipe use: <b>Sanitary Sewage Pipe</b>	Drainage area:	Flow control:
Upstream MH No: <b>794</b>	Downstream MH No: <b>793</b>	Direction: <b>D</b>	Total length: <b>271.808 ft.</b>	Length surveyed: <b>271.808 ft.</b>	
Purpose:	Pipe joint length:	Height: <b>36 in.</b>	Material: <b>Clay Tile (not vitrified clay)</b>	LateralsCounter:	Additional info:

### Pipe Ratings

Grade	Structural:					O&M:					Overall:			Risk
	Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Pipe Rating	Pipe Rating Index	LoF	
1	0	0	0	0000	0.0	0	1	1	1100	1.0	1	1.0	1.1	
2	0	0				0								
3	0	0				0								
4	0	0				0								
5	0	0				0								

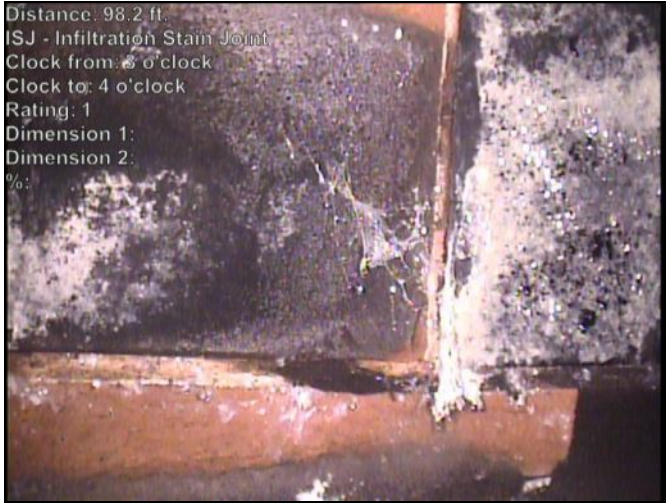
Last Modified: 04/09/2025 at 10:39AM EDT



# NWMCC INSPECTION REPORT

## Inspection Photos

City: <b>SPRINGFIELD MA</b>	Street: <b>ABERDEEN EASEMENT</b>	Start date/time: <b>20230503 11:53</b>	Pipe segment ref.: <b>P24ED</b>
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Distance: 98.2 ft.  
ISJ - Infiltration Stain Joint  
Clock from: 3 o'clock  
Clock to: 4 o'clock  
Rating: 1  
Dimension 1:  
Dimension 2:  
%:

Photo: 794-793-20230503-115334-115949.JPG  
At: 98.175 ft. ISJ - Infiltration Stain Joint  
2/3  
Joint: Yes



Distance: 271.8 ft.  
AMH - Manhole  
Clock from:  
Clock to:  
Rating:  
Dimension 1:  
Dimension 2:  
%:

SURVEY ENDS

Photo: 794-793-20230503-115334-120418.JPG  
At: 271.808 ft. AMH - Manhole  
Joint: No SURVEY ENDS

## NWMCC INSPECTION REPORT

### PACP Rating Description

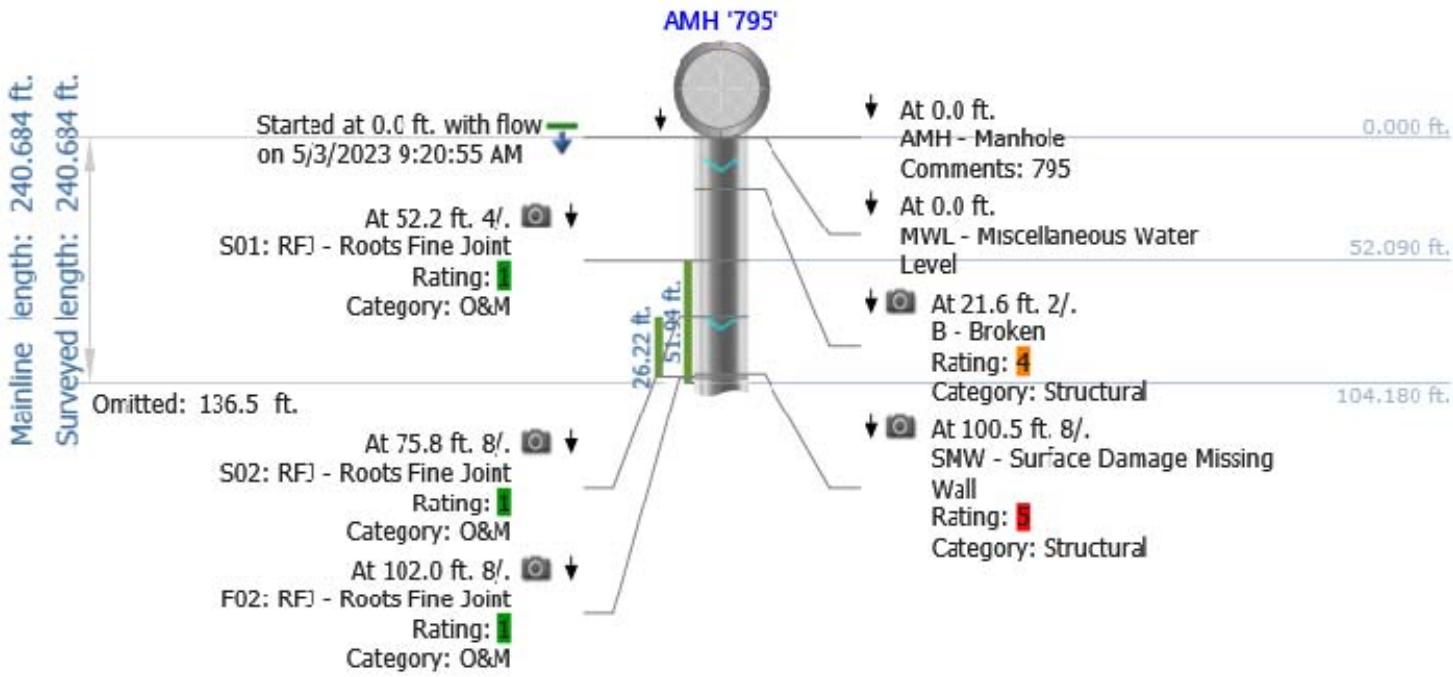
<b><u>1:</u></b>	<p><b>Excellent Condition</b></p> <p><b>Minor Defects - Failure unlikely in the foreseeable future</b></p>
<b><u>2:</u></b>	<p><b>Good Condition</b></p> <p><b>Defects that have not begun to deteriorate - Pipe unlikely to fail for at least 20 years.</b></p>
<b><u>3:</u></b>	<p><b>Fair Condition</b></p> <p><b>Moderate defects that will continue to deteriorate - Pipe may fail in 10-20 years.</b></p>
<b><u>4:</u></b>	<p><b>Poor Condition</b></p> <p><b>Severe Defects that will become Grade 5 defects within the foreseeable future - Pipe will probably fail in 5-10 years.</b></p>
<b><u>5:</u></b>	<p><b>Immediate Attention</b></p> <p><b>Defects require immediate attention - Pipe has failed or will likely fail within the next 5 years or sooner.</b></p>

## NWMCC INSPECTION REPORT

Start date/time: <b>20230503 09:20</b>	Weather: <b>Dry Weather/Wet Ground</b>	Surveyed by: <b>B. DEGROATE</b>	Certificate number: <b>0218-070300747</b>	Pipe segment ref.: <b>P2A96</b>	
Owner:	Customer:	Pre-cleaning: <b>No Pre-Cleaning</b>	Date cleaned:	Project name: <b>KLE005-30</b>	
City: <b>SPRINGFIELD MA</b>	Street: <b>ABERDEEN EASEMENT</b>	Location code:	Pipe use: <b>Sanitary Sewage Pipe</b>	Drainage area:	Flow control:
Upstream MH No: <b>795</b>	Downstream MH No: <b>794</b>	Direction: <b>D</b>	Total length: <b>240.684 ft.</b>	Length surveyed: <b>240.684 ft.</b>	
Purpose:	Pipe joint length:	Height: <b>36 in.</b>	Material: <b>Clay Tile (not vitrified clay)</b>	LateralsCounter:	Additional info:

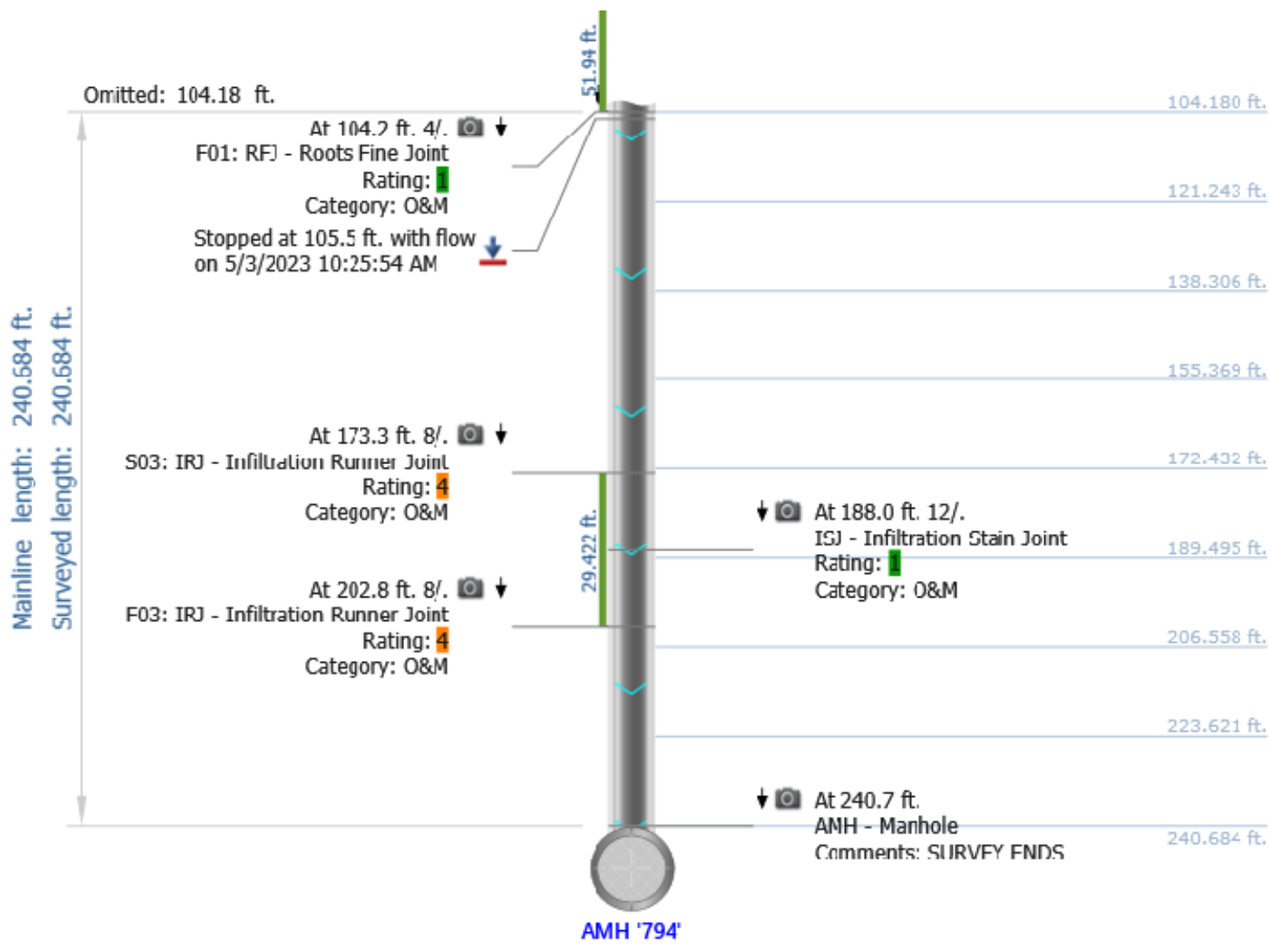
### Pipe Ratings

Grade	Structural:					O&M:					Overall:			Risk
	Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Pipe Rating	Pipe Rating Index	LoF	
1	0	0	9	5141	4.5	0	16	40	461B	1.8	49	2.0	5.1	
2	0	0				0	0							
3	0	0				0	0							
4	0	4				0	24							
5	0	5				0	0							



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# NWMCC INSPECTION REPORT

## Inspection Photos

City: <b>SPRINGFIELD MA</b>	Street: <b>ABERDEEN EASEMENT</b>	Start date/time: <b>20230503 09:20</b>	Pipe segment ref.: <b>P2A96</b>
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Photo: **795-794-20230503-092055-092244.JPG**  
At: **21.617 ft. 2/. B - Broken**  
Joint: **No**



Photo: **795-794-20230503-092055-092451.JPG**  
At: **52.24 ft. 4/. RFJ - Roots Fine Joint**  
Joint: **Yes**



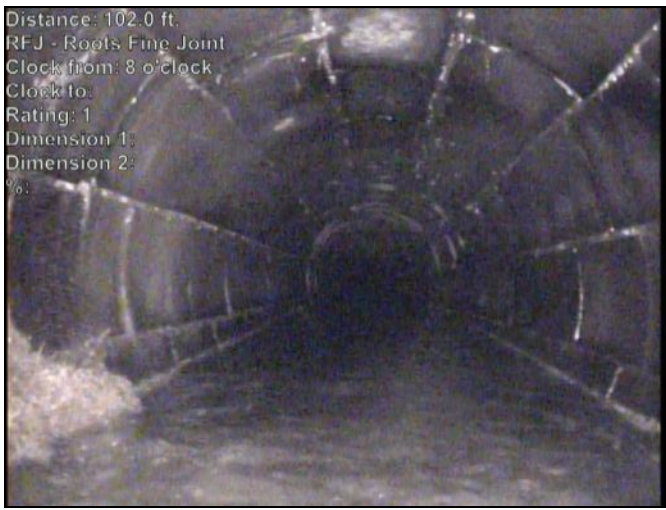
Photo: **795-794-20230503-092055-092638.JPG**  
At: **75.758 ft. 8/. RFJ - Roots Fine Joint**  
Joint: **Yes**



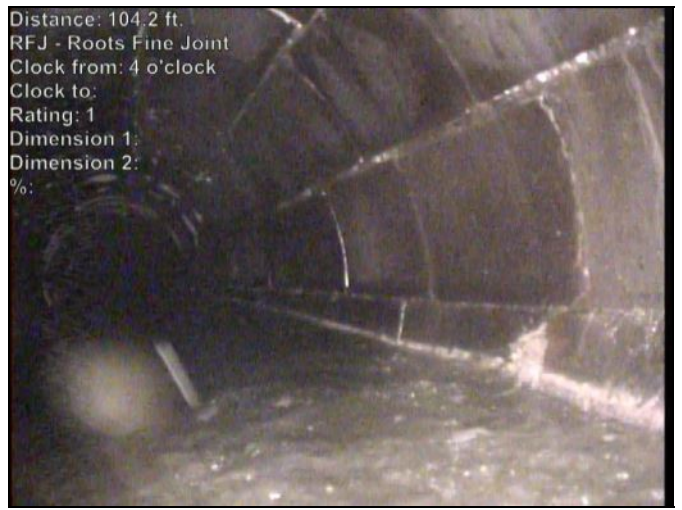
Photo: **795-794-20230503-092055-093810.JPG**  
At: **100.477 ft. SMW - Surface Damage Missing Wall 8/.**  
Joint: **No**

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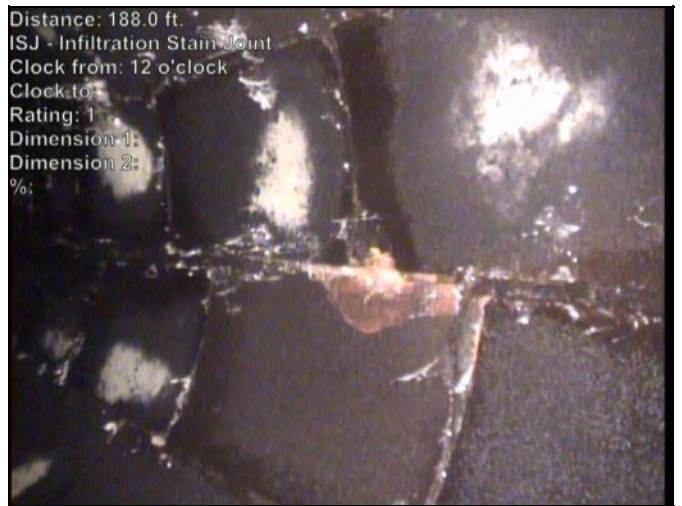
Distance: 102.0 ft.  
RFJ - Roots Fine Joint  
Clock from: 8 o'clock  
Clock to:  
Rating: 1  
Dimension 1:  
Dimension 2:  
%:  
Photo: 795-794-20230503-092055-102443.JPG  
At: 101.978 ft. RFJ - Roots Fine Joint  
8/.  
Joint: Yes



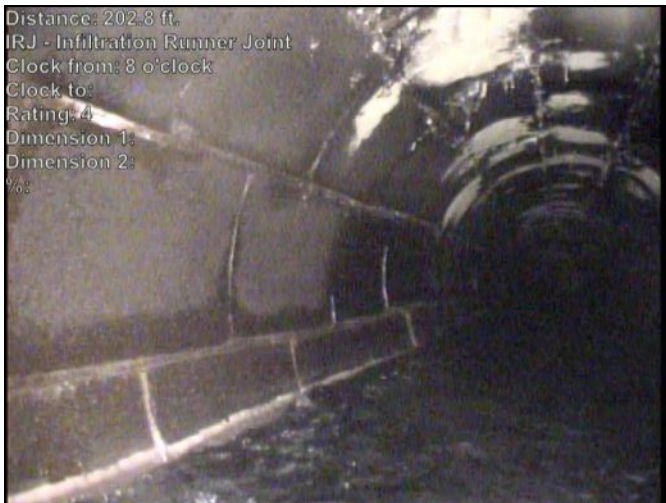
Distance: 104.2 ft.  
RFJ - Roots Fine Joint  
Clock from: 4 o'clock  
Clock to:  
Rating: 1  
Dimension 1:  
Dimension 2:  
%:  
Photo: 795-794-20230503-092055-102548.JPG  
At: 104.18 ft. 4/. RFJ - Roots Fine Joint  
Joint: Yes



Distance: 173.3 ft.  
IRJ - Infiltration Runner Joint  
Clock from: 8 o'clock  
Clock to:  
Rating: 4  
Dimension 1:  
Dimension 2:  
%:  
Photo: 795-794-20230503-092055-094551.JPG  
At: 173.333 ft. IRJ - Infiltration Runner Joint  
8/.  
Joint: Yes



Distance: 188.0 ft.  
ISJ - Infiltration Stain Joint  
Clock from: 12 o'clock  
Clock to:  
Rating: 1  
Dimension 1:  
Dimension 2:  
%:  
Photo: 795-794-20230503-092055-094150.JPG  
At: 188.044 ft. ISJ - Infiltration Stain Joint  
12/.  
Joint: Yes



Distance: 202.8 ft.  
IRJ - Infiltration Runner Joint  
Clock from: 8 o'clock  
Clock to:  
Rating: 4  
Dimension 1:  
Dimension 2:  
%:  
Photo: 795-794-20230503-092055-101747.JPG  
At: 202.755 ft. IRJ - Infiltration Runner Joint  
8/.  
Joint: Yes



Distance: 240.7 ft.  
AMH - Manhole  
Clock from:  
Clock to:  
Rating:  
Dimension 1:  
Dimension 2:  
%:  
SURVEY ENDS  
Photo: 795-794-20230503-092055-102021.JPG  
At: 240.684 ft. AMH - Manhole  
Joint: No SURVEY ENDS

Last Modified: 04/09/2025 at 10:39AM EDT

## NWMCC INSPECTION REPORT

### PACP Rating Description

**1: Excellent Condition**

**Minor Defects - Failure unlikely in the foreseeable future**

**2: Good Condition**

**Defects that have not begun to deteriorate - Pipe unlikely to fail for at least 20 years.**

**3: Fair Condition**

**Moderate defects that will continue to deteriorate - Pipe may fail in 10-20 years.**

**4: Poor Condition**

**Severe Defects that will become Grade 5 defects within the foreseeable future - Pipe will probably fail in 5-10 years.**

**5: Immediate Attention**

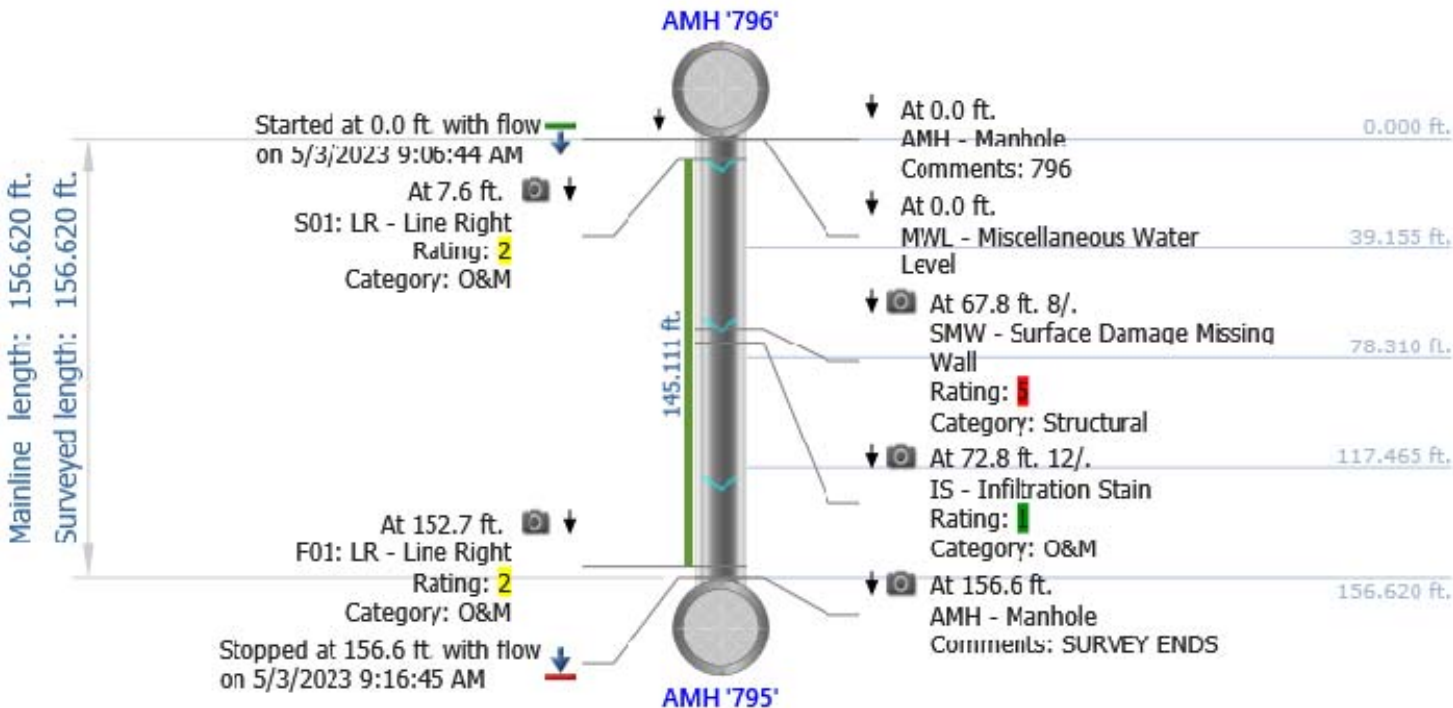
**Defects require immediate attention - Pipe has failed or will likely fail within the next 5 years or sooner.**

## NWMCC INSPECTION REPORT

Start date/time: <b>20230503 09:06</b>	Weather: <b>Dry Weather/Wet Ground</b>	Surveyed by: <b>B. DEGROATE</b>	Certificate number: <b>0218-070300747</b>	Pipe segment ref.: <b>P2F26</b>	
Owner:	Customer:	Pre-cleaning: <b>No Pre-Cleaning</b>	Date cleaned:	Project name: <b>KLE005-30</b>	
City: <b>SPRINGFIELD MA</b>	Street: <b>ABERDEEN EASEMENT</b>	Location code:	Pipe use: <b>Sanitary Sewage Pipe</b>	Drainage area:	Flow control:
Upstream MH No: <b>796</b>	Downstream MH No: <b>795</b>	Direction: <b>D</b>	Total length: <b>156.620 ft.</b>	Length surveyed: <b>156.620 ft.</b>	
Purpose:	Pipe joint length:	Height: <b>36 in.</b>	Material: <b>Clay Tile (not vitrified clay)</b>	LateralsCounter:	Additional info:

### Pipe Ratings

Grade	Structural:					O&M:					Overall:			Risk
	Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Pipe Rating	Pipe Rating Index	LoF	
1	0	0	5	5100	5.0	0	1	59	2D11	2.0	64	2.1	5.1	
2	0	0				0	58							
3	0	0				0	0							
4	0	0				0	0							
5	0	5				0	0							



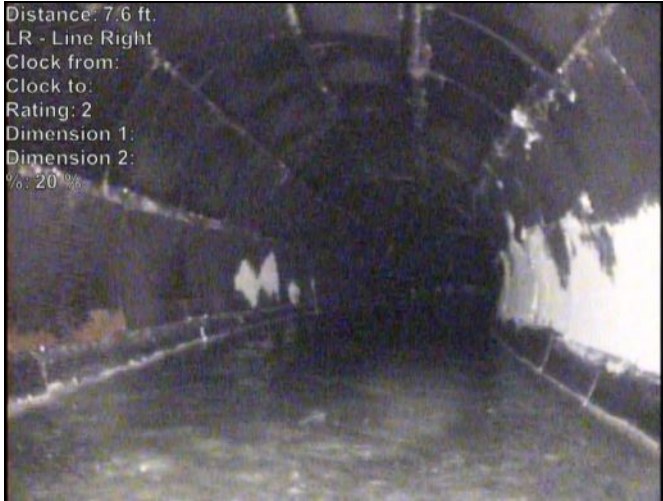
Last Modified: 04/09/2025 at 10:39AM EDT



# NWMCC INSPECTION REPORT

## Inspection Photos

City: <b>SPRINGFIELD MA</b>	Street: <b>ABERDEEN EASEMENT</b>	Start date/time: <b>20230503 09:06</b>	Pipe segment ref.: <b>P2F26</b>
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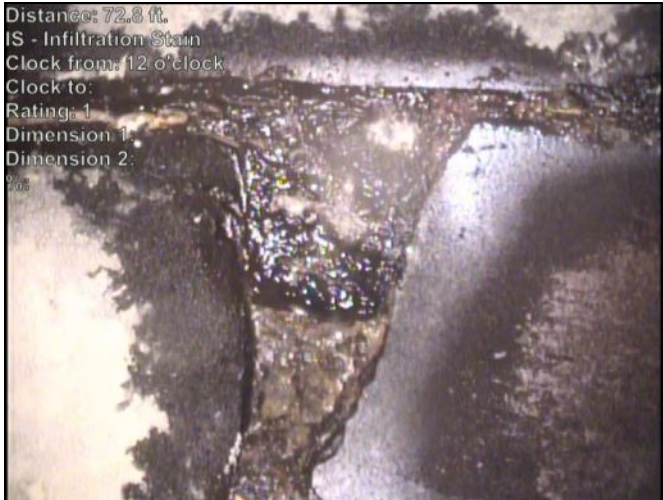
Distance: 7.6 ft.  
LR - Line Right  
Clock from:  
Clock to:  
Rating: 2  
Dimension 1:  
Dimension 2:  
%: 20 %

Photo: **796-795-20230503-090644-090737.JPG**  
At: **7.606 ft. LR - Line Right**  
Joint: **No 20 %**



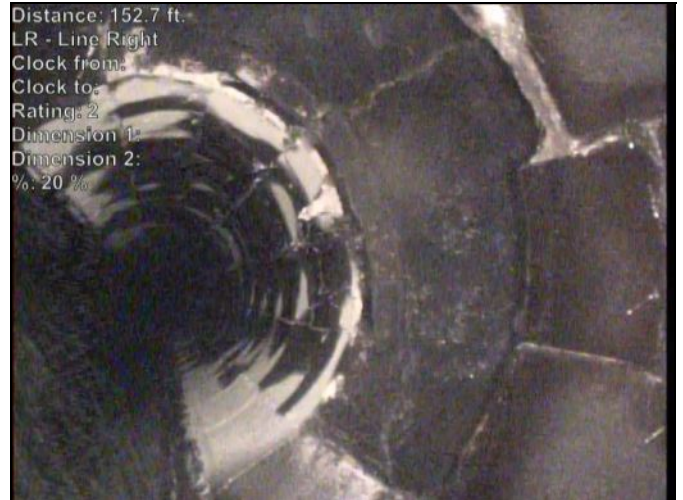
Distance: 67.8 ft.  
SMW - Surface Damage Missing Wall  
Clock from: 8 o'clock  
Clock to:  
Rating: 5  
Dimension 1:  
Dimension 2:  
%:

Photo: **796-795-20230503-090644-091234.JPG**  
At: **67.752 ft. 8/. SMW - Surface Damage Missing Wall**  
Joint: **No**



Distance: 72.8 ft.  
IS - Infiltration Stain  
Clock from: 12 o'clock  
Clock to:  
Rating: 1  
Dimension 1:  
Dimension 2:  
%:

Photo: **796-795-20230503-090644-091302.JPG**  
At: **72.756 ft. IS - Infiltration Stain 12/.**  
Joint: **No**



Distance: 152.7 ft.  
LR - Line Right  
Clock from:  
Clock to:  
Rating: 2  
Dimension 1:  
Dimension 2:  
%: 20 %

Photo: **796-795-20230503-090644-091608.JPG**  
At: **152.717 ft. LR - Line Right**  
Joint: **No 20 %**

Last Modified: 04/09/2025 at 10:39AM EDT



Photo: 796-795-20230503-090644-091623.JPG

At: 156.62 ft. AMH - Manhole

Joint: No SURVEY ENDS

## NWMCC INSPECTION REPORT

### PACP Rating Description

<b><u>1:</u></b>	<p><b>Excellent Condition</b></p> <p><b>Minor Defects - Failure unlikely in the foreseeable future</b></p>
<b><u>2:</u></b>	<p><b>Good Condition</b></p> <p><b>Defects that have not begun to deteriorate - Pipe unlikely to fail for at least 20 years.</b></p>
<b><u>3:</u></b>	<p><b>Fair Condition</b></p> <p><b>Moderate defects that will continue to deteriorate - Pipe may fail in 10-20 years.</b></p>
<b><u>4:</u></b>	<p><b>Poor Condition</b></p> <p><b>Severe Defects that will become Grade 5 defects within the foreseeable future - Pipe will probably fail in 5-10 years.</b></p>
<b><u>5:</u></b>	<p><b>Immediate Attention</b></p> <p><b>Defects require immediate attention - Pipe has failed or will likely fail within the next 5 years or sooner.</b></p>

Last Modified: 04/09/2025 at 10:39AM EDT

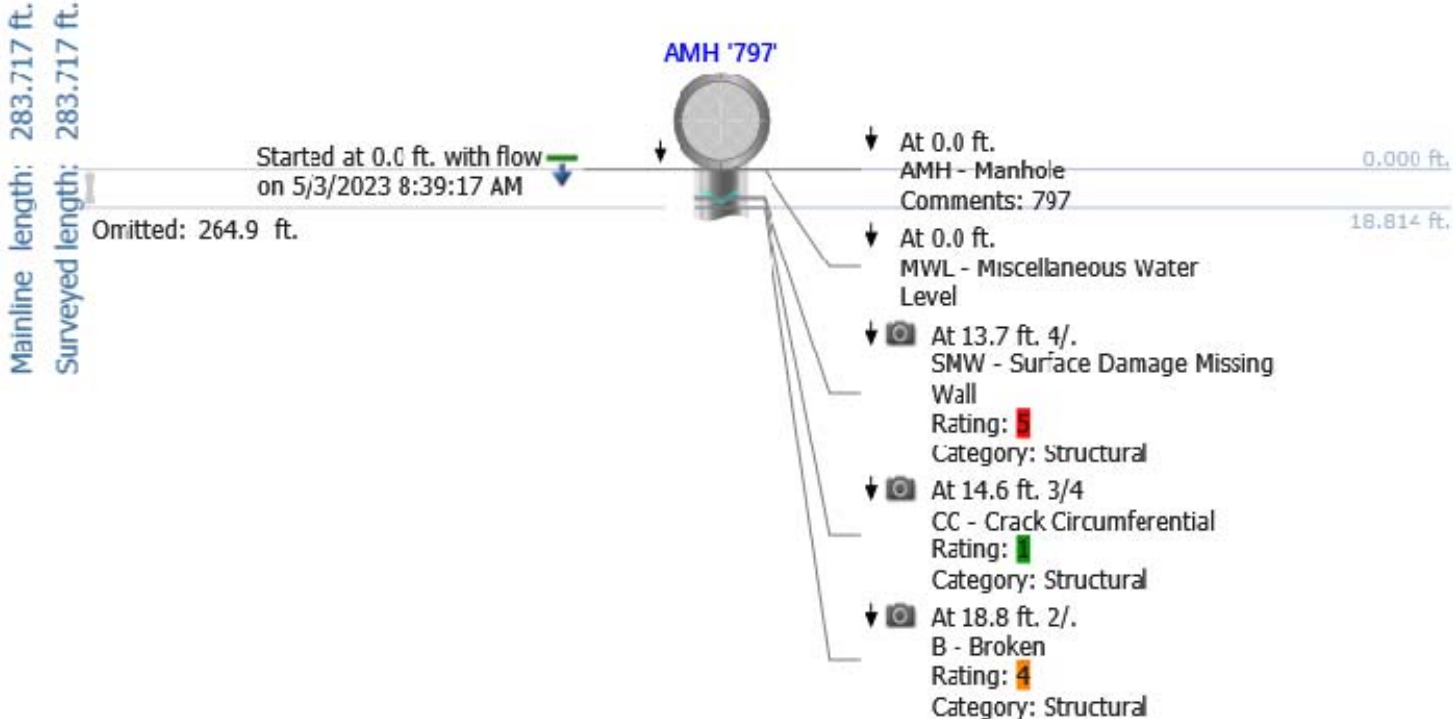
## NWMCC INSPECTION REPORT

Start date/time: <b>20230503 08:39</b>	Weather: <b>Dry Weather/Wet Ground</b>	Surveyed by: <b>B. DEGROATE</b>	Certificate number: <b>0218-070300747</b>	Pipe segment ref.: <b>P2EF3</b>	
Owner:	Customer:	Pre-cleaning: <b>No Pre-Cleaning</b>	Date cleaned:	Project name: <b>KLE005-30</b>	
City: <b>SPRINGFIELD MA</b>	Street: <b>ABERDEEN EASEMENT</b>	Location code:	Pipe use: <b>Sanitary Sewage Pipe</b>	Drainage area: _____	Flow control: _____
Upstream MH No: <b>797</b>	Downstream MH No: <b>796</b>	Direction: <b>D</b>	Total length: <b>283.717 ft.</b>	Length surveyed: <b>283.717 ft.</b>	
Purpose:	Pipe joint length:	Height: <b>36 in.</b>	Material: <b>Clay Tile (not vitrified clay)</b>	LateralsCounter:	Additional info:

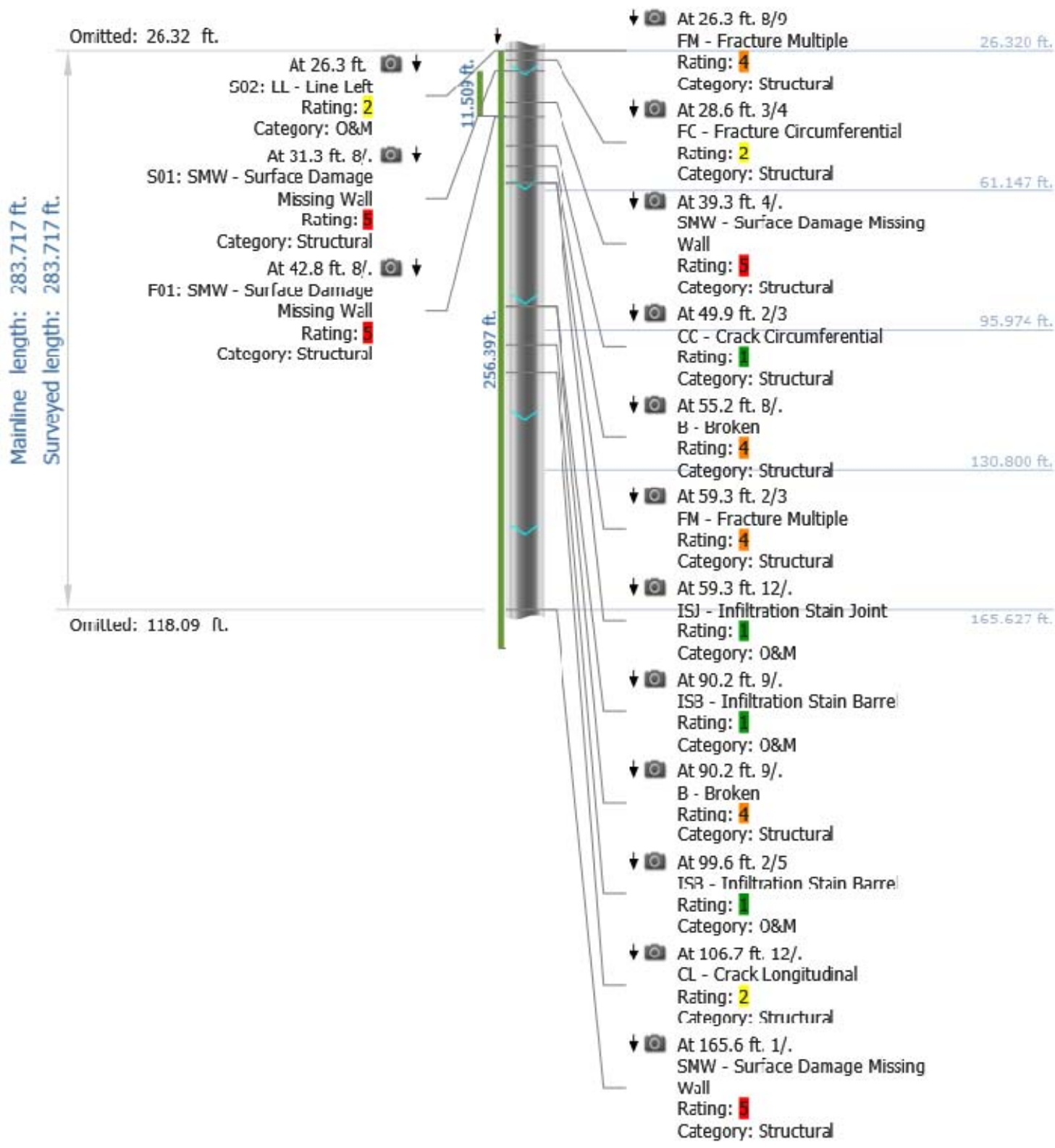
### Pipe Ratings

Grade	Structural:					O&M:					Overall:			Risk
	Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Pipe Rating	Pipe Rating Index	LoF	
1	0	3	80	5749	3.6	0	3	105	2113	1.9	185	2.4	5.7	
2	0	6				0	102							
3	0	0				0	0							
4	0	36				0	0							
5	0	35				0	0							

Last Modified: 04/09/2025 at 10:39AM EDT

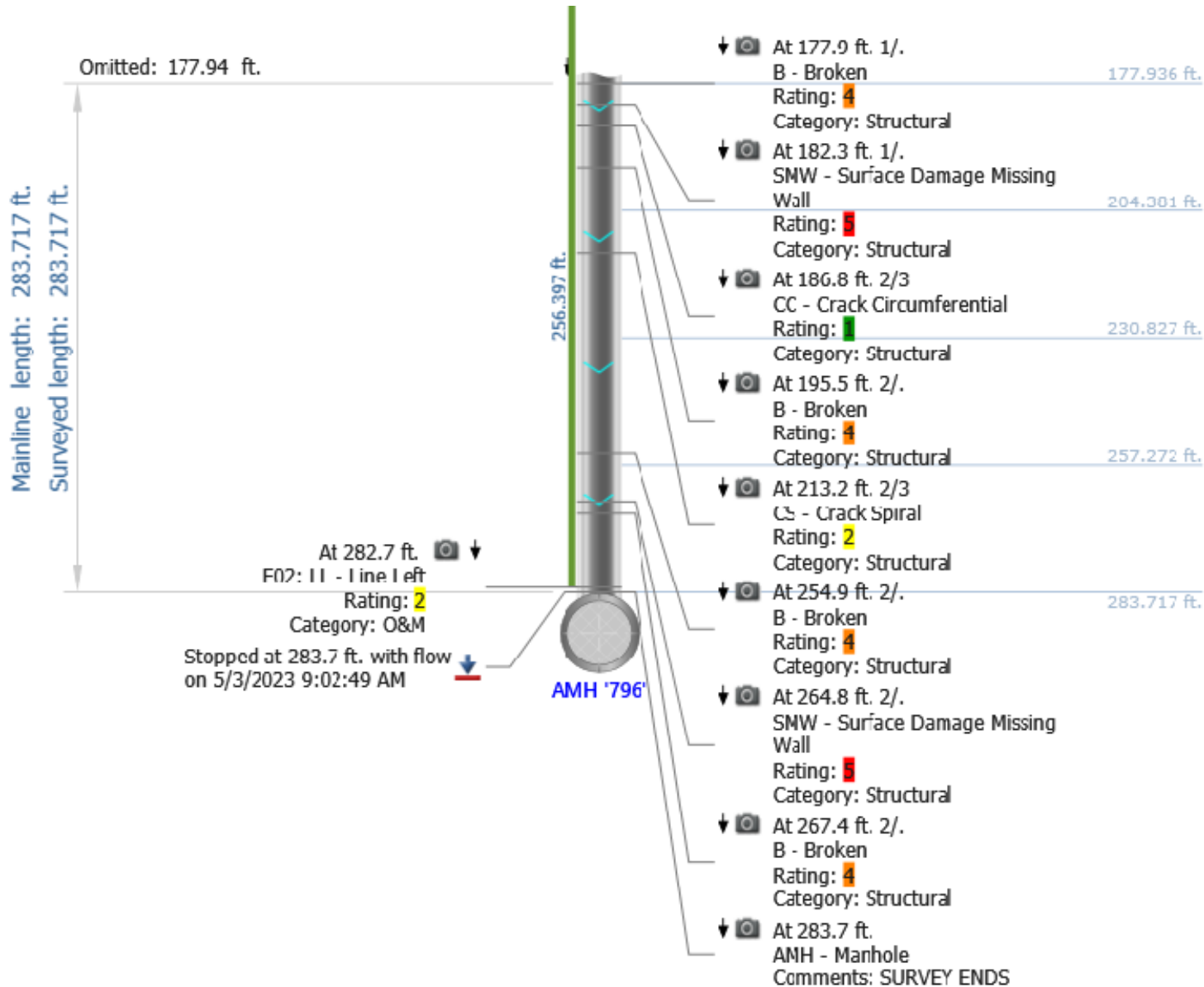


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# NWMCC INSPECTION REPORT

## Inspection Photos

City: <b>SPRINGFIELD MA</b>	Street: <b>ABERDEEN EASEMENT</b>	Start date/time: <b>20230503 08:39</b>	Pipe segment ref.: <b>P2EF3</b>
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Photo: 797-796-20230503-083917-084200.JPG  
At: 13.71 ft. 4/. SMW - Surface Damage Missing Wall  
Joint: No



Photo: 797-796-20230503-083917-084251.JPG  
At: 14.611 ft. CC - Crack Circumferential  
3/4  
Joint: No

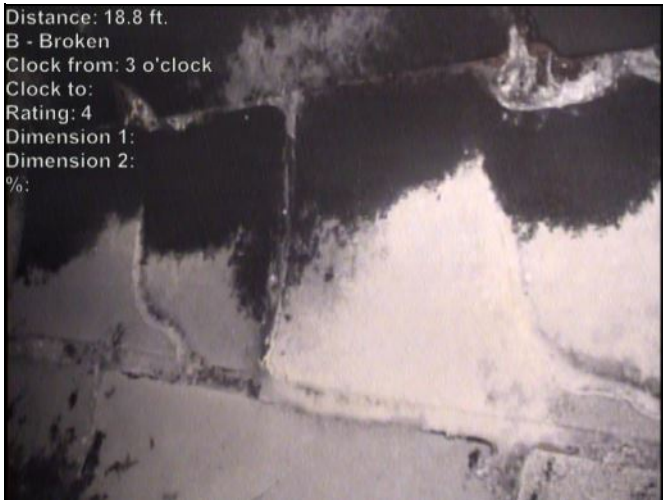


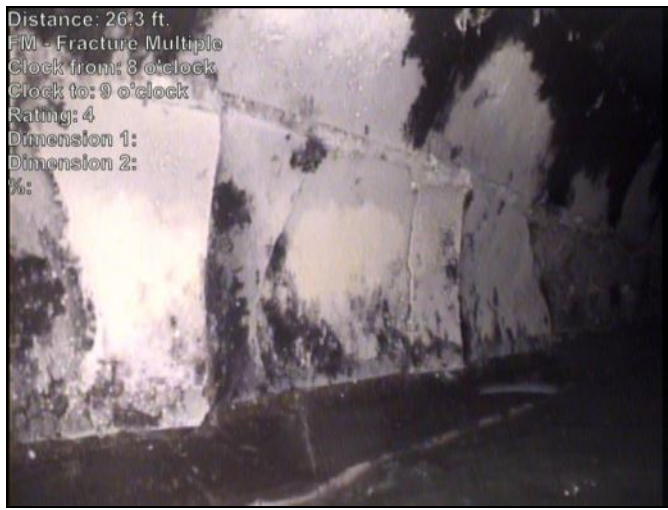
Photo: 797-796-20230503-083917-084332.JPG  
At: 18.814 ft. 2/. B - Broken  
Joint: No



Photo: 797-796-20230503-083917-084409.JPG  
At: 26.32 ft. LL - Line Left  
Joint: No 20 %

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Distance: 26.3 ft.  
FM - Fracture Multiple  
Clock from: 8 o'clock  
Clock to: 9 o'clock  
Rating: 4  
Dimension 1:  
Dimension 2:  
%:

Photo: 797-796-20230503-083917-084401.JPG  
At: 26.32 ft. 8/9 FM - Fracture Multiple  
Joint: No



Distance: 28.6 ft.  
FC - Fracture Circumferential  
Clock from: 3 o'clock  
Clock to: 4 o'clock  
Rating: 2  
Dimension 1:  
Dimension 2:  
%:

Photo: 797-796-20230503-083917-084429.JPG  
At: 28.622 ft. FC - Fracture Circumferential  
3/4  
Joint: No



Distance: 31.3 ft.  
SMW - Surface Damage Missing Wall  
Clock from: 8 o'clock  
Clock to:  
Rating: 5  
Dimension 1:  
Dimension 2:  
%:

Photo: 797-796-20230503-083917-084450.JPG  
At: 31.324 ft. 8/. SMW - Surface Damage Missing Wall  
Joint: No



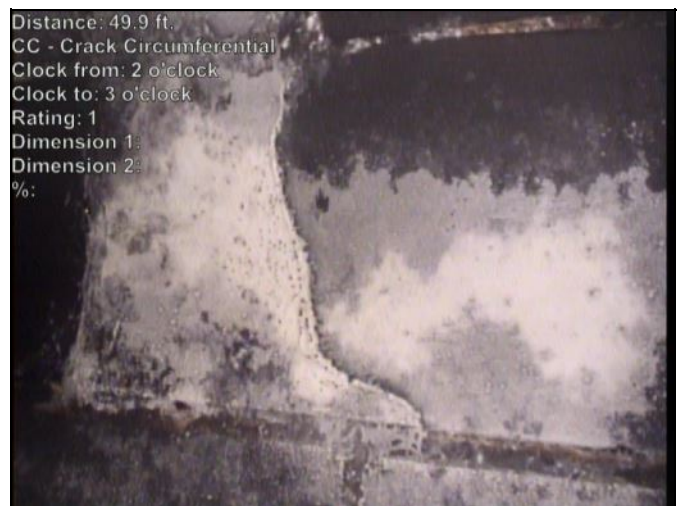
Distance: 39.3 ft.  
SMW - Surface Damage Missing Wall  
Clock from: 4 o'clock  
Clock to:  
Rating: 5  
Dimension 1:  
Dimension 2:  
%:

Photo: 797-796-20230503-083917-084514.JPG  
At: 39.33 ft. 4/. SMW - Surface Damage Missing Wall  
Joint: No



Distance: 42.8 ft.  
SMW - Surface Damage Missing Wall  
Clock from: 8 o'clock  
Clock to:  
Rating: 5  
Dimension 1:  
Dimension 2:  
%:

Photo: 797-796-20230503-083917-084530.JPG  
At: 42.833 ft. 8/. SMW - Surface Damage Missing Wall  
Joint: No

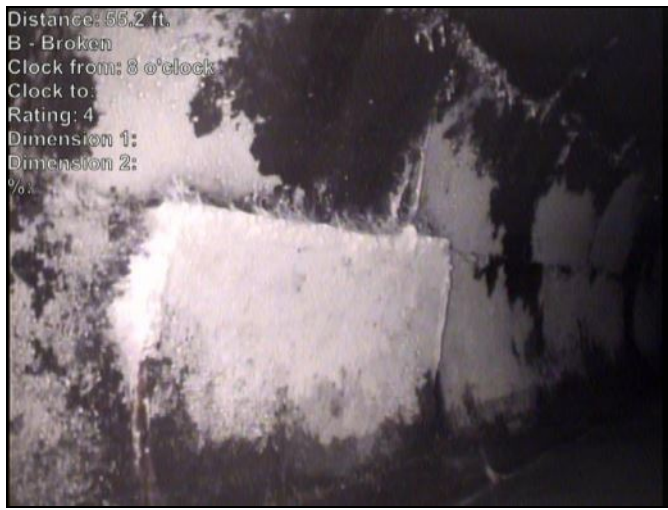


Distance: 49.9 ft.  
CC - Crack Circumferential  
Clock from: 2 o'clock  
Clock to: 3 o'clock  
Rating: 1  
Dimension 1:  
Dimension 2:  
%:

Photo: 797-796-20230503-083917-084550.JPG  
At: 49.938 ft. CC - Crack Circumferential  
2/3  
Joint: No

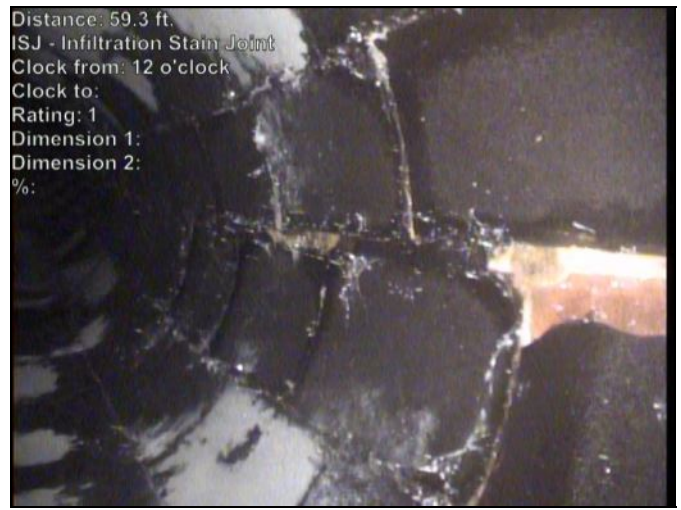
Last Modified: 04/09/2025 at 10:39AM EDT





Distance: 55.2 ft.  
B - Broken  
Clock from: 8 o'clock  
Clock to:  
Rating: 4  
Dimension 1:  
Dimension 2:  
%:

Photo: 797-796-20230503-083917-084614.JPG  
At: 55.242 ft. 8/. B - Broken  
Joint: No



Distance: 59.3 ft.  
ISJ - Infiltration Stain Joint  
Clock from: 12 o'clock  
Clock to:  
Rating: 1  
Dimension 1:  
Dimension 2:  
%:

Photo: 797-796-20230503-083917-084715.JPG  
At: 59.345 ft. ISJ - Infiltration Stain Joint  
12/.  
Joint: Yes



Distance: 59.3 ft.  
FM - Fracture Multiple  
Clock from: 2 o'clock  
Clock to: 3 o'clock  
Rating: 4  
Dimension 1:  
Dimension 2:  
%:

Photo: 797-796-20230503-083917-084644.JPG  
At: 59.345 ft. FM - Fracture Multiple  
2/3  
Joint: No



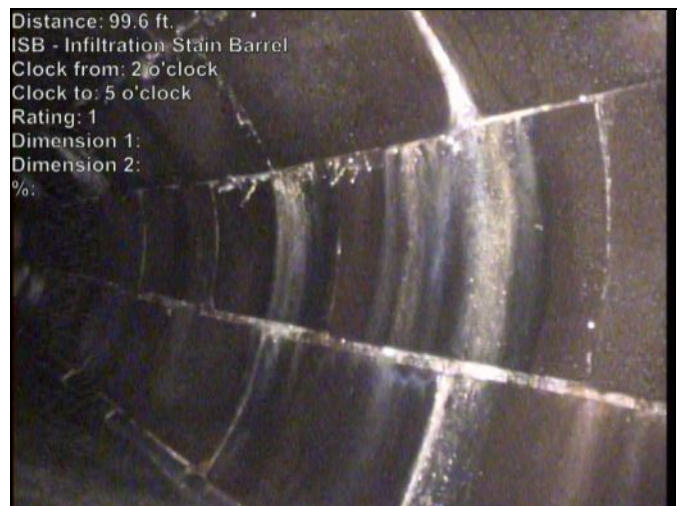
Distance: 90.2 ft.  
ISB - Infiltration Stain Barrel  
Clock from: 9 o'clock  
Clock to:  
Rating: 1  
Dimension 1:  
Dimension 2:  
%:

Photo: 797-796-20230503-083917-084916.JPG  
At: 90.169 ft. 9/. ISB - Infiltration Stain Barrel  
Joint: No



Distance: 90.2 ft.  
B - Broken  
Clock from: 9 o'clock  
Clock to:  
Rating: 4  
Dimension 1:  
Dimension 2:  
%:

Photo: 797-796-20230503-083917-084937.JPG  
At: 90.169 ft. 9/. B - Broken  
Joint: No



Distance: 99.6 ft.  
ISB - Infiltration Stain Barrel  
Clock from: 2 o'clock  
Clock to: 5 o'clock  
Rating: 1  
Dimension 1:  
Dimension 2:  
%:

Photo: 797-796-20230503-083917-085006.JPG  
At: 99.576 ft. ISB - Infiltration Stain Barrel  
2/5  
Joint: No

Last Modified: 04/09/2025 at 10:39AM EDT





Distance: 106.7 ft.  
CL - Crack Longitudinal  
Clock from: 12 o'clock  
Clock to:  
Rating: 2  
Dimension 1:  
Dimension 2:  
%:

Photo: 797-796-20230503-083917-085039.JPG

At: 106.682 ft. CL - Crack Longitudinal  
12/.

Joint: No

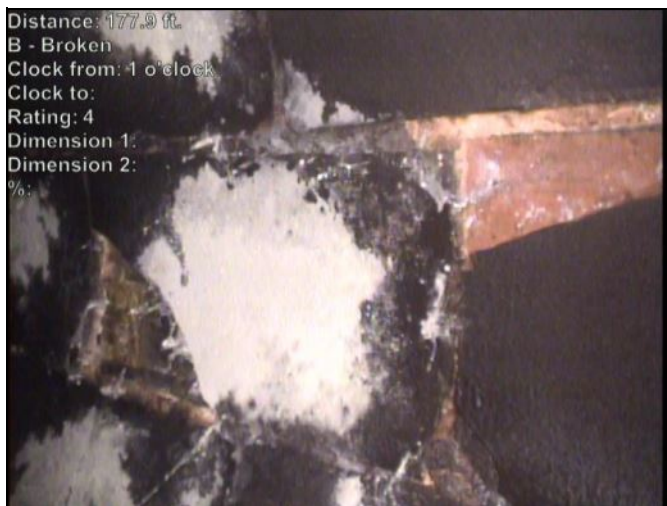


Distance: 165.6 ft.  
SMW - Surface Damage Missing Wall  
Clock from: 1 o'clock  
Clock to:  
Rating: 5  
Dimension 1:  
Dimension 2:  
%:

Photo: 797-796-20230503-083917-085244.JPG

At: 165.627 ft. SMW - Surface Damage Missing Wall  
1/.

Joint: No

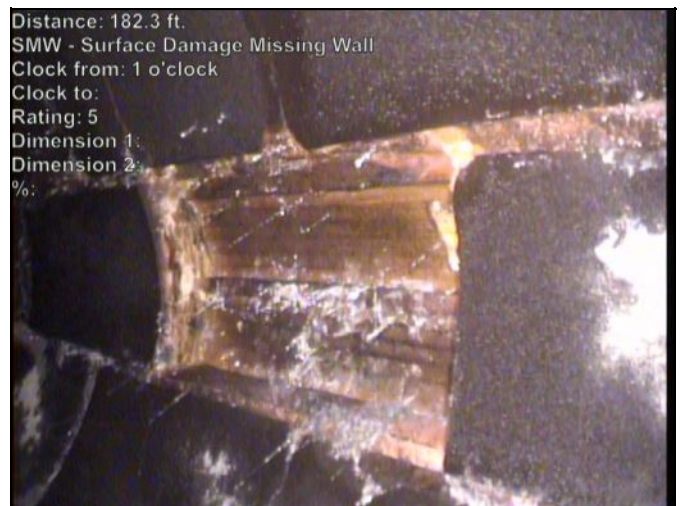


Distance: 177.9 ft.  
B - Broken  
Clock from: 1 o'clock  
Clock to:  
Rating: 4  
Dimension 1:  
Dimension 2:  
%:

Photo: 797-796-20230503-083917-085322.JPG

At: 177.936 ft. B - Broken  
1/.

Joint: No

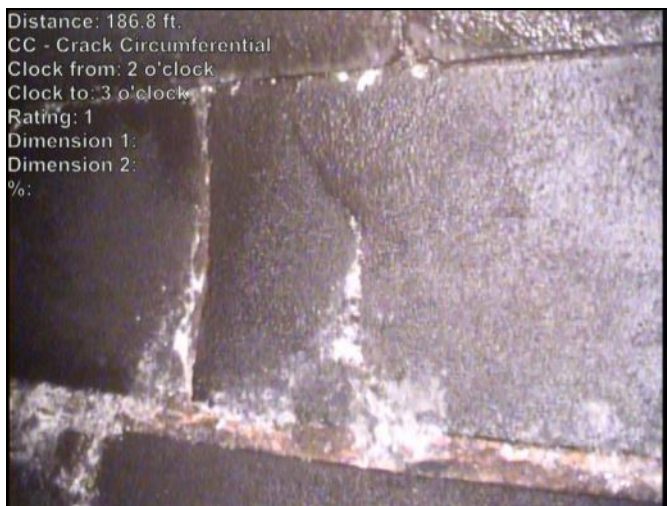


Distance: 182.3 ft.  
SMW - Surface Damage Missing Wall  
Clock from: 1 o'clock  
Clock to:  
Rating: 5  
Dimension 1:  
Dimension 2:  
%:

Photo: 797-796-20230503-083917-085354.JPG

At: 182.34 ft. 1/. SMW - Surface Damage Missing Wall

Joint: No



Distance: 186.8 ft.  
CC - Crack Circumferential  
Clock from: 2 o'clock  
Clock to: 3 o'clock  
Rating: 1  
Dimension 1:  
Dimension 2:  
%:

Photo: 797-796-20230503-083917-085418.JPG

At: 186.843 ft. CC - Crack Circumferential  
2/3

Joint: No



Distance: 195.4 ft.  
B - Broken  
Clock from: 2 o'clock  
Clock to:  
Rating: 4  
Dimension 1:  
Dimension 2:  
%:

Photo: 797-796-20230503-083917-085517.JPG

At: 195.45 ft. 2/. B - Broken

Joint: No

Last Modified: 04/09/2025 at 10:39AM EDT



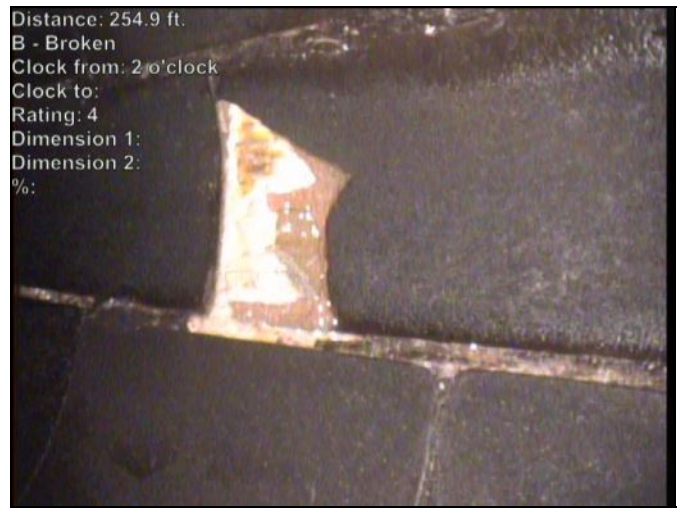


Distance: 213.2 ft.  
CS - Crack Spiral  
Clock from: 2 o'clock  
Clock to: 3 o'clock  
Rating: 2  
Dimension 1:  
Dimension 2:  
%:

Photo: 797-796-20230503-083917-085632.JPG

At: 213.163 ft. CS - Crack Spiral  
2/3

Joint: No



Distance: 254.9 ft.  
B - Broken  
Clock from: 2 o'clock  
Clock to:  
Rating: 4  
Dimension 1:  
Dimension 2:  
%:

Photo: 797-796-20230503-083917-085736.JPG

At: 254.895 ft. B - Broken  
2/.

Joint: No

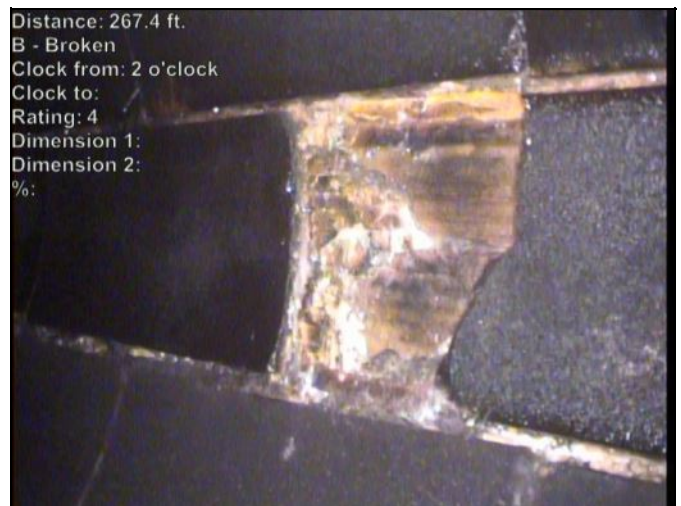


Distance: 264.8 ft.  
SMW - Surface Damage Missing Wall  
Clock from: 2 o'clock  
Clock to:  
Rating: 5  
Dimension 1:  
Dimension 2:  
%:

Photo: 797-796-20230503-083917-085802.JPG

At: 264.803 ft. SMW - Surface Damage Missing Wall  
2/.

Joint: No



Distance: 267.4 ft.  
B - Broken  
Clock from: 2 o'clock  
Clock to:  
Rating: 4  
Dimension 1:  
Dimension 2:  
%:

Photo: 797-796-20230503-083917-085819.JPG

At: 267.405 ft. B - Broken  
2/.

Joint: No



Distance: 282.7 ft.  
LL - Line Left  
Clock from:  
Clock to:  
Rating: 2  
Dimension 1:  
Dimension 2:  
%: 20 %

Photo: 797-796-20230503-083917-085909.JPG

At: 282.717 ft. LL - Line Left

Joint: No 20 %



Distance: 283.7 ft.  
AMH - Manhole  
Clock from:  
Clock to:  
Rating:  
Dimension 1:  
Dimension 2:  
%:

SURVEY ENDS

Photo: 797-796-20230503-083917-090220.JPG

At: 283.717 ft. AMH - Manhole

Joint: No SURVEY ENDS

Last Modified: 04/09/2025 at 10:39AM EDT

## NWMCC INSPECTION REPORT

### PACP Rating Description

<b><u>1:</u></b>	<p><b>Excellent Condition</b></p> <p><b>Minor Defects - Failure unlikely in the foreseeable future</b></p>
<b><u>2:</u></b>	<p><b>Good Condition</b></p> <p><b>Defects that have not begun to deteriorate - Pipe unlikely to fail for at least 20 years.</b></p>
<b><u>3:</u></b>	<p><b>Fair Condition</b></p> <p><b>Moderate defects that will continue to deteriorate - Pipe may fail in 10-20 years.</b></p>
<b><u>4:</u></b>	<p><b>Poor Condition</b></p> <p><b>Severe Defects that will become Grade 5 defects within the foreseeable future - Pipe will probably fail in 5-10 years.</b></p>
<b><u>5:</u></b>	<p><b>Immediate Attention</b></p> <p><b>Defects require immediate attention - Pipe has failed or will likely fail within the next 5 years or sooner.</b></p>

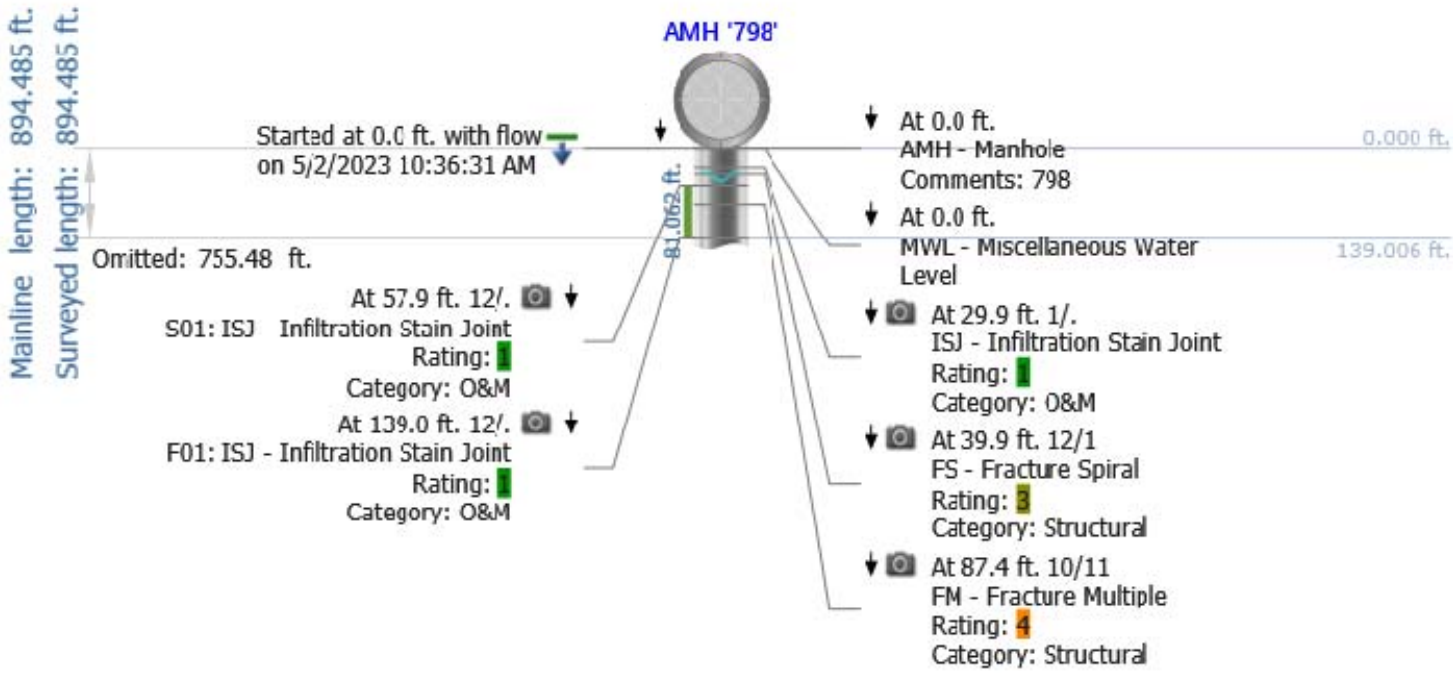
Last Modified: 04/09/2025 at 10:39AM EDT

## NWMCC INSPECTION REPORT

Start date/time: <b>20230502 10:36</b>	Weather: <b>Dry Weather/Wet Ground</b>	Surveyed by: <b>B. DEGROATE</b>	Certificate number: <b>0218-070300747</b>	Pipe segment ref.: <b>P2EC0</b>	
Owner:	Customer:	Pre-cleaning: <b>No Pre-Cleaning</b>	Date cleaned:	Project name: <b>KLE005-30</b>	
City: <b>SPRINGFIELD MA</b>	Street: <b>ABERDEEN EASEMENT</b>	Location code:	Pipe use: <b>Sanitary Sewage Pipe</b>	Drainage area:	Flow control:
Upstream MH No: <b>798</b>	Downstream MH No: <b>797</b>	Direction: <b>D</b>	Total length: <b>894.485 ft.</b>	Length surveyed: <b>894.485 ft.</b>	
Purpose:	Pipe joint length:	Height: <b>36 in.</b>	Material: <b>Clay Tile (not vitrified clay)</b>	LateralsCounter:	Additional info:

### Pipe Ratings

Grade	Structural:					O&M:					Overall:			
	Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Pipe Rating	Pipe Rating Index	LoF	Risk
1	0	0	7	4131	3.5	0	19	21	211B	1.1	28	1.3	4.1	
2	0	0				0	2							
3	0	3				0	0							
4	0	4				0	0							
5	0	0				0	0							



Last Modified: 04/09/2025 at 10:39AM EDT



Omitted: 148.11 ft.

Mainline length: 894.485 ft.  
Surveyed length: 894.485 ft.

Stopped at 894.5 ft. with flow  
on 5/2/2023 12:39:37 PM

AMH '79'

- At 118.1 ft. 12/  
ISJ - Infiltration Stain Joint 148.113 ft.  
Rating: █  
Category: O&M
- At 184.9 ft. 1/  
ISJ - Infiltration Stain Joint 241.410 ft.  
Rating: █  
Category: O&M
- At 194.6 ft.  
LR - Line Right 334.706 ft.  
Rating: 2  
Category: O&M
- At 201.1 ft.  
MGO - Miscellaneous General Observation  
Comments: GETTING STUCK AROUND BEND 428.003 ft.
- At 204.0 ft.  
MSA - Miscellaneous Survey Abandoned  
Category: O&M  
Comments: UNABLE TO FLOAT AROUND BEND 521.299 ft.
- 614.596 ft.
- 707.892 ft.
- 801.189 ft.
- 894.485 ft.

# NWMCC INSPECTION REPORT

## Inspection Photos

City: <b>SPRINGFIELD MA</b>	Street: <b>ABERDEEN EASEMENT</b>	Start date/time: <b>20230502 10:36</b>	Pipe segment ref.: <b>P2EC0</b>
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Photo: 798-797-20230502-103631-103835.JPG  
At: 29.923 ft. 1/. ISJ - Infiltration Stain Joint  
Joint: Yes



Photo: 798-797-20230502-103631-104032.JPG  
At: 39.931 ft. FS - Fracture Spiral  
12/1  
Joint: No



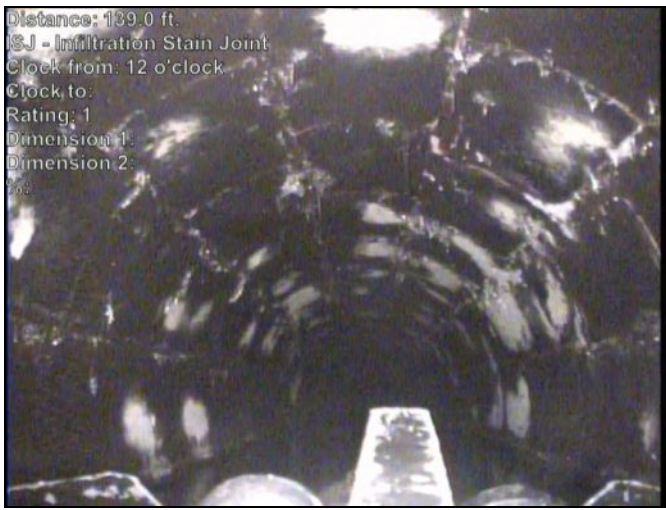
Photo: 798-797-20230502-103631-104309.JPG  
At: 57.944 ft. ISJ - Infiltration Stain Joint  
12/.  
Joint: Yes



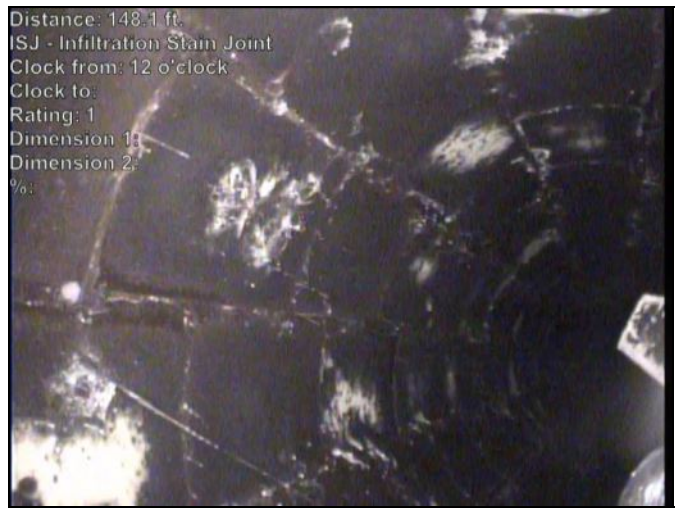
Photo: 798-797-20230502-103631-104706.JPG  
At: 87.367 ft. FM - Fracture Multiple  
10/11  
Joint: No

Last Modified: 04/09/2025 at 10:39AM EDT





Distance: 139.0 ft.  
ISJ - Infiltration Stain Joint  
Clock from: 12 o'clock  
Clock to:  
Rating: 1  
Dimension 1:  
Dimension 2:  
%:  
Photo: 798-797-20230502-103631-105203.JPG  
At: 139.006 ft. ISJ - Infiltration Stain Joint  
12/.  
Joint: Yes



Distance: 148.1 ft.  
ISJ - Infiltration Stain Joint  
Clock from: 12 o'clock  
Clock to:  
Rating: 1  
Dimension 1:  
Dimension 2:  
%:  
Photo: 798-797-20230502-103631-105319.JPG  
At: 148.113 ft. ISJ - Infiltration Stain Joint  
12/.  
Joint: Yes



5/2/2023 11:20:54 AM CVBVGB  
Upstream MH No: AMH '798'  
Downstream MH No: AMH '797'  
185.9 ft.  
Photo: 798-797-20230502-103631-112049.JPG  
At: 184.942 ft. ISJ - Infiltration Stain Joint  
1/.  
Joint: Yes



5/2/2023 11:21:35 AM CVBVGB  
Upstream MH No: AMH '798'  
Downstream MH No: AMH '797'  
196.8 ft.  
Photo: 798-797-20230502-103631-112128.JPG  
At: 194.649 ft. LR - Line Right  
Joint: No 20 %



Distance: 201.1 ft.  
MGO - Miscellaneous General Observation  
Clock from:  
Clock to:  
Rating:  
Dimension 1:  
Dimension 2:  
%:  
GETTING STUCK AROUND BEND  
Photo: 798-797-20230502-103631-114256.JPG  
At: 201.054 ft. MGO - Miscellaneous General Observation  
Joint: No GETTING STUCK AROUND BEND



Distance: 204.0 ft.  
MSA - Miscellaneous Survey Abandoned  
Clock from:  
Clock to:  
Rating:  
Dimension 1:  
Dimension 2:  
%:  
UNABLE TO FLOAT AROUND BEND  
Photo: 798-797-20230502-103631-123735.JPG  
At: 203.956 ft. MSA - Miscellaneous Survey Abandoned  
Joint: No UNABLE TO FLOAT AROUND BEND

Last Modified: 04/09/2025 at 10:39AM EDT

## NWMCC INSPECTION REPORT

### PACP Rating Description

<b><u>1:</u></b>	<p><b>Excellent Condition</b></p> <p><b>Minor Defects - Failure unlikely in the foreseeable future</b></p>
<b><u>2:</u></b>	<p><b>Good Condition</b></p> <p><b>Defects that have not begun to deteriorate - Pipe unlikely to fail for at least 20 years.</b></p>
<b><u>3:</u></b>	<p><b>Fair Condition</b></p> <p><b>Moderate defects that will continue to deteriorate - Pipe may fail in 10-20 years.</b></p>
<b><u>4:</u></b>	<p><b>Poor Condition</b></p> <p><b>Severe Defects that will become Grade 5 defects within the foreseeable future - Pipe will probably fail in 5-10 years.</b></p>
<b><u>5:</u></b>	<p><b>Immediate Attention</b></p> <p><b>Defects require immediate attention - Pipe has failed or will likely fail within the next 5 years or sooner.</b></p>

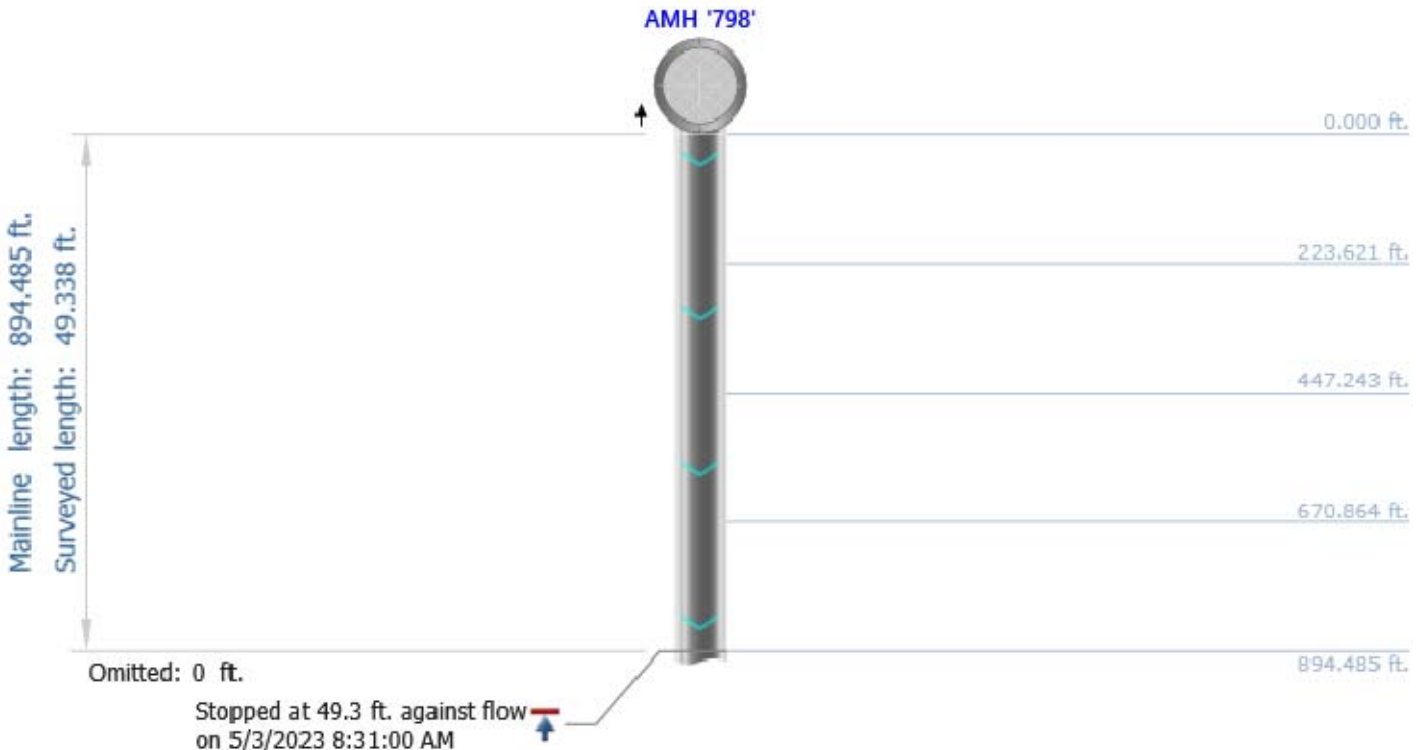
Last Modified: 04/09/2025 at 10:39AM EDT

## NWMCC INSPECTION REPORT

Start date/time: <b>20230503 08:13</b>	Weather: <b>Dry Weather/Wet Ground</b>	Surveyed by: <b>B. DEGROATE</b>	Certificate number: <b>0218-070300747</b>	Pipe segment ref.: <b>P2EC0</b>	
Owner:	Customer:	Pre-cleaning: <b>No Pre-Cleaning</b>	Date cleaned:	Project name: <b>KLE005-30</b>	
City: <b>SPRINGFIELD MA</b>	Street: <b>ABERDEEN EASEMENT</b>	Location code:	Pipe use: <b>Sanitary Sewage Pipe</b>	Drainage area:	Flow control:
Upstream MH No: <b>798</b>	Downstream MH No: <b>797</b>	Direction: <b>U</b>	Total length: <b>894.485 ft.</b>	Length surveyed: <b>49.338 ft.</b>	
Purpose:	Pipe joint length:	Height: <b>36 in.</b>	Material: <b>Clay Tile (not vitrified clay)</b>	LateralsCounter:	Additional info: <b>REVERSAL</b>

### Pipe Ratings

Grade	Structural:					O&M:					Overall:			Risk
	Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Pipe Rating	Pipe Rating Index	LoF	
1	0	0	4	4100	4.0	0	2	4	2112	1.3	8	2.0	4.1	
2	0	0				0	2							
3	0	0				0	0							
4	0	4				0	0							
5	0	0				0	0							



Last Modified: 04/09/2025 at 10:39AM EDT

Mainline length: 894.485 ft.  
Surveyed length: 49.338 ft.

Omitted: 845.15 ft.

Started at 0.0 ft. against flow  
on 5/3/2023 8:13:07 AM

AMH '797

- ↑ At 49.3 ft.  
MSA - Miscellaneous Survey  
Abandoned  
Category: O&M  
Comments: REVERSAL COMPLETED
- ↑ At 38.7 ft. 1/.  
B - Broken  
Rating: ■  
Category: Structural
- ↑ At 33.3 ft. 11/1  
ISB - Infiltration Stain Barrel  
Rating: ■  
Category: O&M
- ↑ At 21.9 ft. 12/1  
ISB - Infiltration Stain Barrel  
Rating: ■  
Category: O&M
- ↑ At 12.2 ft.  
LL - Line Left  
Rating: 2  
Category: O&M
- ↑ At 0.1 ft.  
MWL - Miscellaneous Water  
Level
- ↑ At 0.0 ft.  
AMH - Manhole  
Comments: 797

845.147 ft.

894.485 ft.



# NWMCC INSPECTION REPORT

## Inspection Photos

City: <b>SPRINGFIELD MA</b>	Street: <b>ABERDEEN EASEMENT</b>	Start date/time: <b>20230503 08:13</b>	Pipe segment ref.: <b>P2EC0</b>
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Photo: 798-797-20230503-081307-082744.JPG  
At: 12.209 ft. LL - Line Left  
Joint: No 20 %



Photo: 798-797-20230503-081307-082847.JPG  
At: 21.917 ft. ISB - Infiltration Stain Barrel  
12/1  
Joint: No



Photo: 798-797-20230503-081307-082924.JPG  
At: 33.326 ft. ISB - Infiltration Stain Barrel  
11/1  
Joint: No



Photo: 798-797-20230503-081307-082951.JPG  
At: 38.73 ft. 1/. B - Broken  
Joint: No

Last Modified: 04/09/2025 at 10:39AM EDT

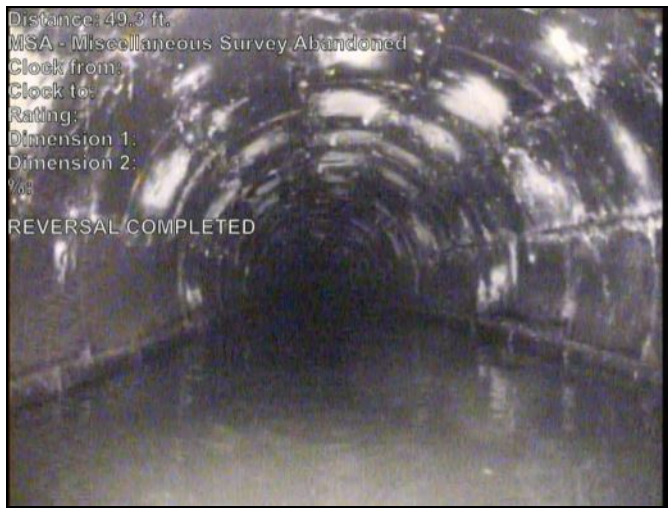


Photo: 798-797-20230503-081307-083039.JPG

At: 49.338 ft. MSA - Miscellaneous Survey Abandoned

Joint: No REVERSAL COMPLETED



## NWMCC INSPECTION REPORT

### PACP Rating Description

<b><u>1:</u></b>	<p><b>Excellent Condition</b></p> <p><b>Minor Defects - Failure unlikely in the foreseeable future</b></p>
<b><u>2:</u></b>	<p><b>Good Condition</b></p> <p><b>Defects that have not begun to deteriorate - Pipe unlikely to fail for at least 20 years.</b></p>
<b><u>3:</u></b>	<p><b>Fair Condition</b></p> <p><b>Moderate defects that will continue to deteriorate - Pipe may fail in 10-20 years.</b></p>
<b><u>4:</u></b>	<p><b>Poor Condition</b></p> <p><b>Severe Defects that will become Grade 5 defects within the foreseeable future - Pipe will probably fail in 5-10 years.</b></p>
<b><u>5:</u></b>	<p><b>Immediate Attention</b></p> <p><b>Defects require immediate attention - Pipe has failed or will likely fail within the next 5 years or sooner.</b></p>

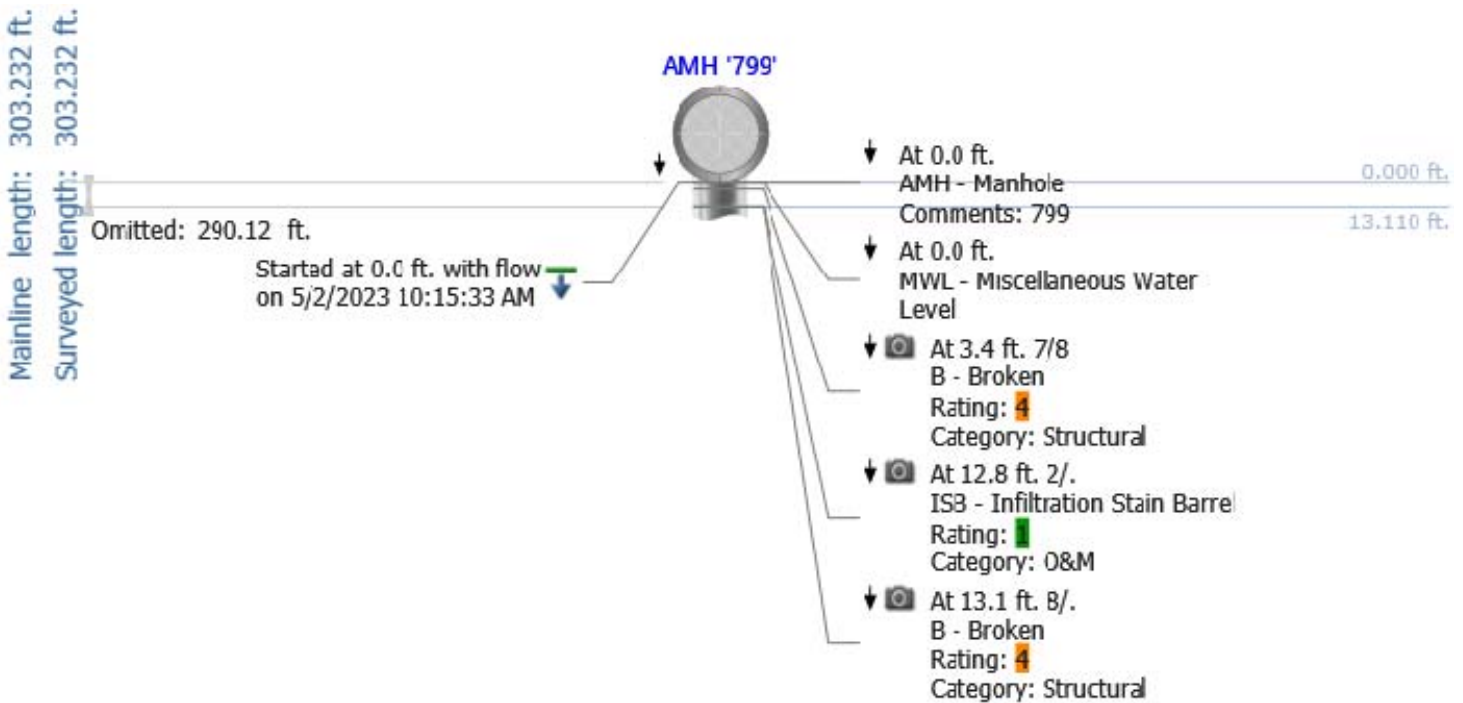
Last Modified: 04/09/2025 at 10:39AM EDT

## NWMCC INSPECTION REPORT

Start date/time: <b>20230502 10:15</b>	Weather: <b>Dry Weather/Wet Ground</b>	Surveyed by: <b>B. DEGROATE</b>	Certificate number: <b>0218-070300747</b>	Pipe segment ref.: <b>P2E8B</b>	
Owner:	Customer:	Pre-cleaning: <b>No Pre-Cleaning</b>	Date cleaned:	Project name: <b>KLE005-30</b>	
City: <b>SPRINGFIELD MA</b>	Street: <b>ABERDEEN EASEMENT</b>	Location code:	Pipe use: <b>Sanitary Sewage Pipe</b>	Drainage area:	Flow control:
Upstream MH No: <b>799</b>	Downstream MH No: <b>798</b>	Direction: <b>D</b>	Total length: <b>303.232 ft.</b>	Length surveyed: <b>303.232 ft.</b>	
Purpose:	Pipe joint length:	Height: <b>36 in.</b>	Material: <b>Clay Tile (not vitrified clay)</b>	LateralsCounter:	Additional info:

### Pipe Ratings

Grade	Structural:					O&M:					Overall:			Risk
	Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Pipe Rating	Pipe Rating Index	LoF	
1	0	0	24	4600	4.0	0	1	1	1100	1.0	25	3.6	4.6	
2	0	0				0	0							
3	0	0				0	0							
4	0	24				0	0							
5	0	0				0	0							



Last Modified: 04/09/2025 at 10:39AM EDT

Mainline length: 303.232 ft.  
Surveyed length: 303.232 ft.

Omitted: 35.03 ft.



# NWMCC INSPECTION REPORT

## Inspection Photos

City: <b>SPRINGFIELD MA</b>	Street: <b>ABERDEEN EASEMENT</b>	Start date/time: <b>20230502 10:15</b>	Pipe segment ref.: <b>P2E8B</b>
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Photo: **799-798-20230502-101533-101625.JPG**  
At: **3.403 ft. 7/8 B - Broken**  
Joint: **No**



Photo: **799-798-20230502-101533-101713.JPG**  
At: **12.81 ft. 2/. ISB - Infiltration Stain Barrel**  
Joint: **No**



Photo: **799-798-20230502-101533-101734.JPG**  
At: **13.11 ft. 8/. B - Broken**  
Joint: **No**

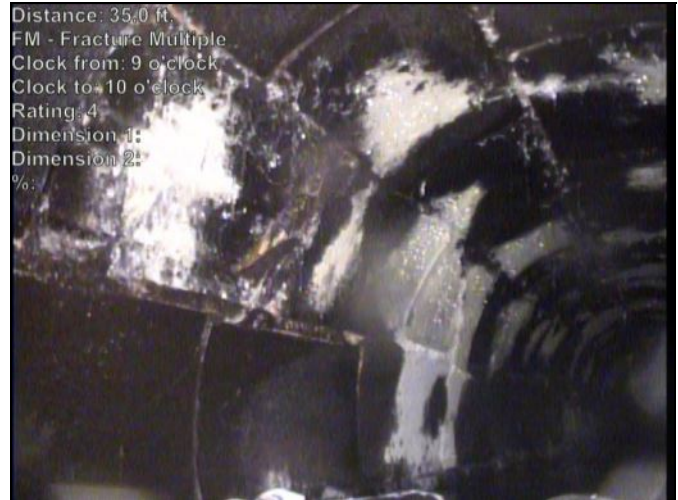
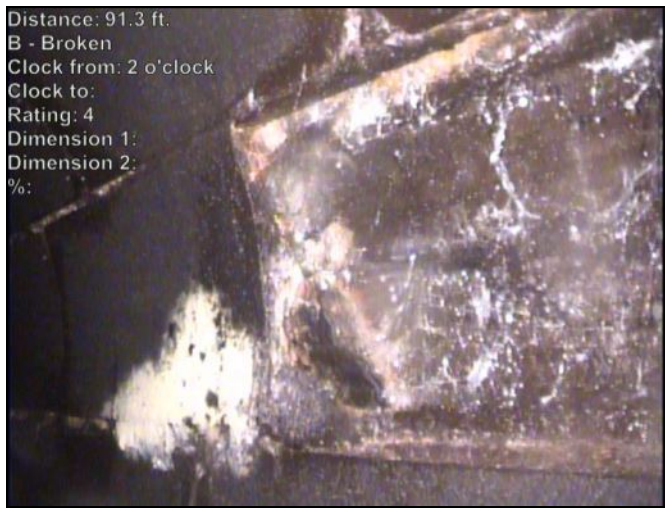


Photo: **799-798-20230502-101533-101815.JPG**  
At: **35.027 ft. FM - Fracture Multiple 9/10**  
Joint: **No**

Last Modified: 04/09/2025 at 10:39AM EDT





Distance: 91.3 ft.  
B - Broken  
Clock from: 2 o'clock  
Clock to:  
Rating: 4  
Dimension 1:  
Dimension 2:  
%:

Photo: 799-798-20230502-101533-101957.JPG

At: 91.27 ft. 2/. B - Broken

Joint: No



Distance: 173.0 ft.  
B - Broken  
Clock from: 8 o'clock  
Clock to:  
Rating: 4  
Dimension 1:  
Dimension 2:  
%:

Photo: 799-798-20230502-101533-102256.JPG

At: 173.033 ft. B - Broken

8/.

Joint: No



Distance: 298.8 ft.  
B - Broken  
Clock from: 7 o'clock  
Clock to:  
Rating: 4  
Dimension 1:  
Dimension 2:  
%:

Photo: 799-798-20230502-101533-102858.JPG

At: 298.829 ft. B - Broken

7/.

Joint: No



Distance: 303.2 ft.  
AMH - Manhole  
Clock from:  
Clock to:  
Rating:  
Dimension 1:  
Dimension 2:  
%:

Photo: 799-798-20230502-101533-102932.JPG

At: 303.232 ft. AMH - Manhole

Joint: No SURVEY ENDS

Last Modified: 04/09/2025 at 10:39AM EDT

## NWMCC INSPECTION REPORT

### PACP Rating Description

<b><u>1:</u></b>	<p><b>Excellent Condition</b></p> <p><b>Minor Defects - Failure unlikely in the foreseeable future</b></p>
<b><u>2:</u></b>	<p><b>Good Condition</b></p> <p><b>Defects that have not begun to deteriorate - Pipe unlikely to fail for at least 20 years.</b></p>
<b><u>3:</u></b>	<p><b>Fair Condition</b></p> <p><b>Moderate defects that will continue to deteriorate - Pipe may fail in 10-20 years.</b></p>
<b><u>4:</u></b>	<p><b>Poor Condition</b></p> <p><b>Severe Defects that will become Grade 5 defects within the foreseeable future - Pipe will probably fail in 5-10 years.</b></p>
<b><u>5:</u></b>	<p><b>Immediate Attention</b></p> <p><b>Defects require immediate attention - Pipe has failed or will likely fail within the next 5 years or sooner.</b></p>

Last Modified: 04/09/2025 at 10:39AM EDT

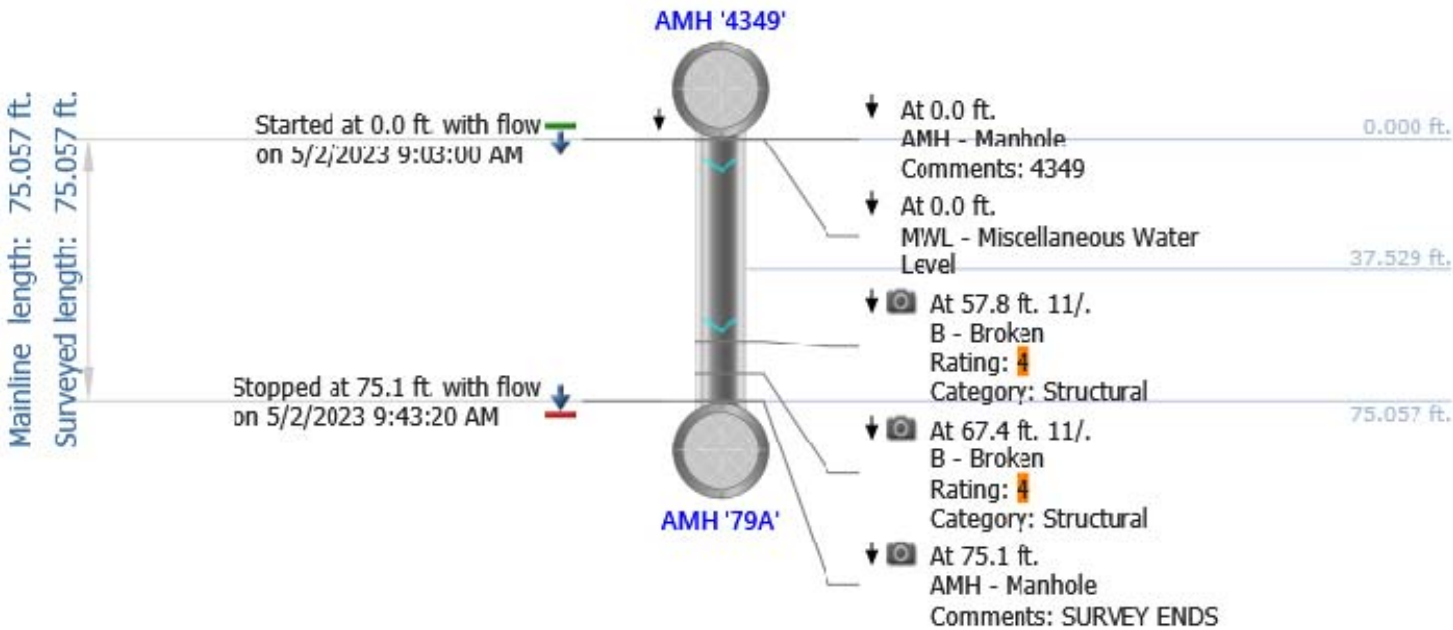
## NWMCC INSPECTION REPORT

Start date/time: <b>20230502 09:03</b>	Weather: <b>Dry Weather/Wet Ground</b>	Surveyed by: <b>B. DEGROATE</b>	Certificate number: <b>0218-070300747</b>	Pipe segment ref.: <b>P4874</b>	
Owner:	Customer:	Pre-cleaning: <b>No Pre-Cleaning</b>	Date cleaned:	Project name: <b>KLE005-30</b>	
City: <b>SPRINGFIELD MA</b>	Street: <b>ABERDEEN EASEMENT</b>	Location code:	Pipe use: <b>Sanitary Sewage Pipe</b>	Drainage area:	Flow control:
Upstream MH No: <b>4349</b>	Downstream MH No: <b>79A</b>	Direction: <b>D</b>	Total length: <b>75.057 ft.</b>	Length surveyed: <b>75.057 ft.</b>	
Purpose:	Pipe joint length:	Height: <b>36 in.</b>	Material: <b>Clay Tile (not vitrified clay)</b>	LateralsCounter:	Additional info:

### Pipe Ratings

Grade	Structural:					O&M:					Overall:			Risk
	Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Pipe Rating	Pipe Rating Index	LoF	
1	0	0	8	4200	4.0	0	0	0	0000	0.0	8	4.0	4.2	
2	0	0				0	0							
3	0	0				0	0							
4	0	8				0	0							
5	0	0				0	0							

Last Modified: 04/09/2025 at 10:39AM EDT



# NWMCC INSPECTION REPORT

## Inspection Photos

City: <b>SPRINGFIELD MA</b>	Street: <b>ABERDEEN EASEMENT</b>	Start date/time: <b>20230502 09:03</b>	Pipe segment ref.: <b>P4874</b>
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Photo: 4349-79A-20230502-090300-094050.JPG

At: 57.844 ft. B - Broken  
11/.

Joint: No



Photo: 4349-79A-20230502-090300-094141.JPG

At: 67.352 ft. B - Broken  
11/.

Joint: No



Photo: 4349-79A-20230502-090300-094254.JPG

At: 75.057 ft. AMH - Manhole

Joint: No SURVEY ENDS

Last Modified: 04/09/2025 at 10:39AM EDT



## NWMCC INSPECTION REPORT

### PACP Rating Description

<b><u>1:</u></b>	<p><b>Excellent Condition</b></p> <p><b>Minor Defects - Failure unlikely in the foreseeable future</b></p>
<b><u>2:</u></b>	<p><b>Good Condition</b></p> <p><b>Defects that have not begun to deteriorate - Pipe unlikely to fail for at least 20 years.</b></p>
<b><u>3:</u></b>	<p><b>Fair Condition</b></p> <p><b>Moderate defects that will continue to deteriorate - Pipe may fail in 10-20 years.</b></p>
<b><u>4:</u></b>	<p><b>Poor Condition</b></p> <p><b>Severe Defects that will become Grade 5 defects within the foreseeable future - Pipe will probably fail in 5-10 years.</b></p>
<b><u>5:</u></b>	<p><b>Immediate Attention</b></p> <p><b>Defects require immediate attention - Pipe has failed or will likely fail within the next 5 years or sooner.</b></p>

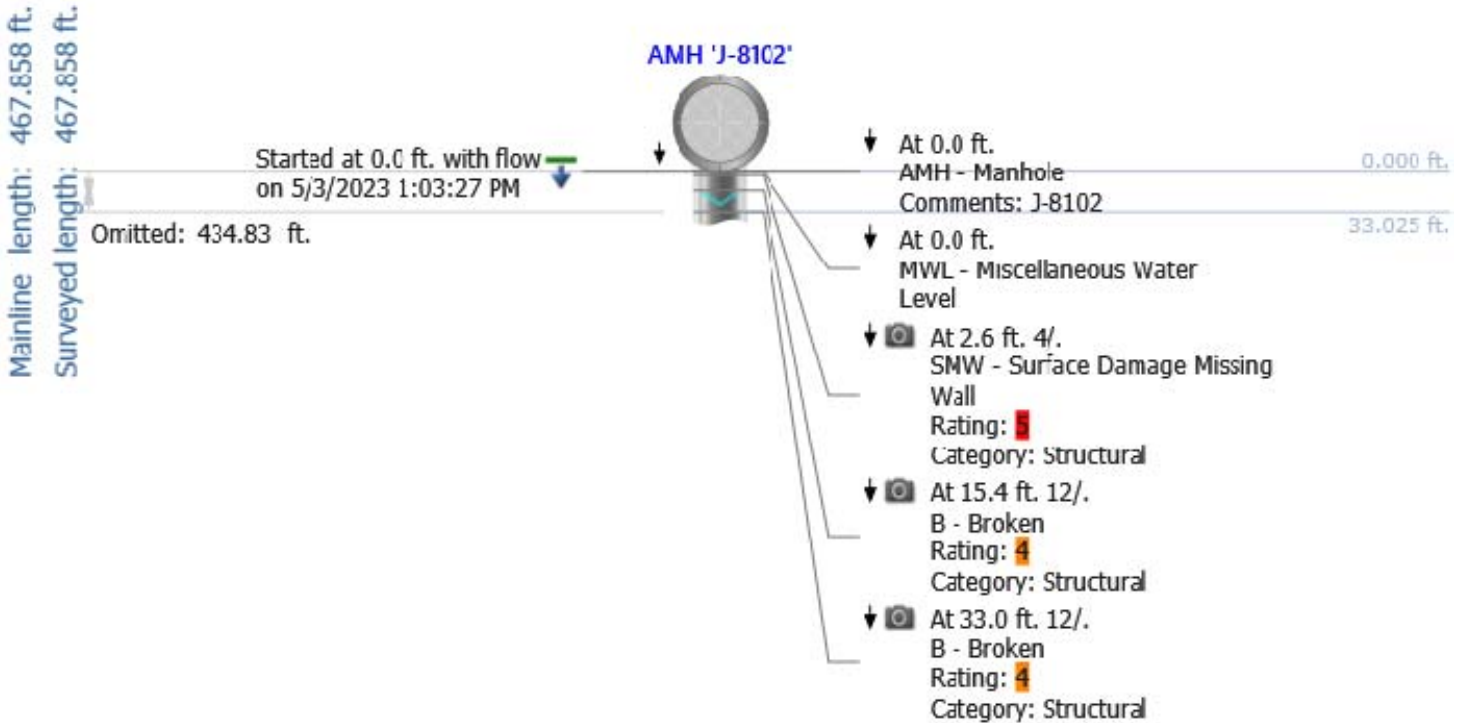
## NWMCC INSPECTION REPORT

Start date/time: <b>20230503 13:03</b>	Weather: <b>Dry Weather/Wet Ground</b>	Surveyed by: <b>B. DEGROATE</b>	Certificate number: <b>0218-070300747</b>	Pipe segment ref.: <b>P4762</b>	
Owner:	Customer:	Pre-cleaning: <b>No Pre-Cleaning</b>	Date cleaned:	Project name: <b>KLE005-30</b>	
City: <b>SPRINGFIELD MA</b>	Street: <b>ABERDEEN EASEMENT</b>	Location code:	Pipe use: <b>Sanitary Sewage Pipe</b>	Drainage area:	Flow control:
Upstream MH No: <b>J-8102</b>	Downstream MH No: <b>434E</b>	Direction: <b>D</b>	Total length: <b>467.858 ft.</b>	Length surveyed: <b>467.858 ft.</b>	
Purpose:	Pipe joint length:	Height: <b>36 in.</b>	Material: <b>Clay Tile (not vitrified clay)</b>	LateralsCounter:	Additional info:

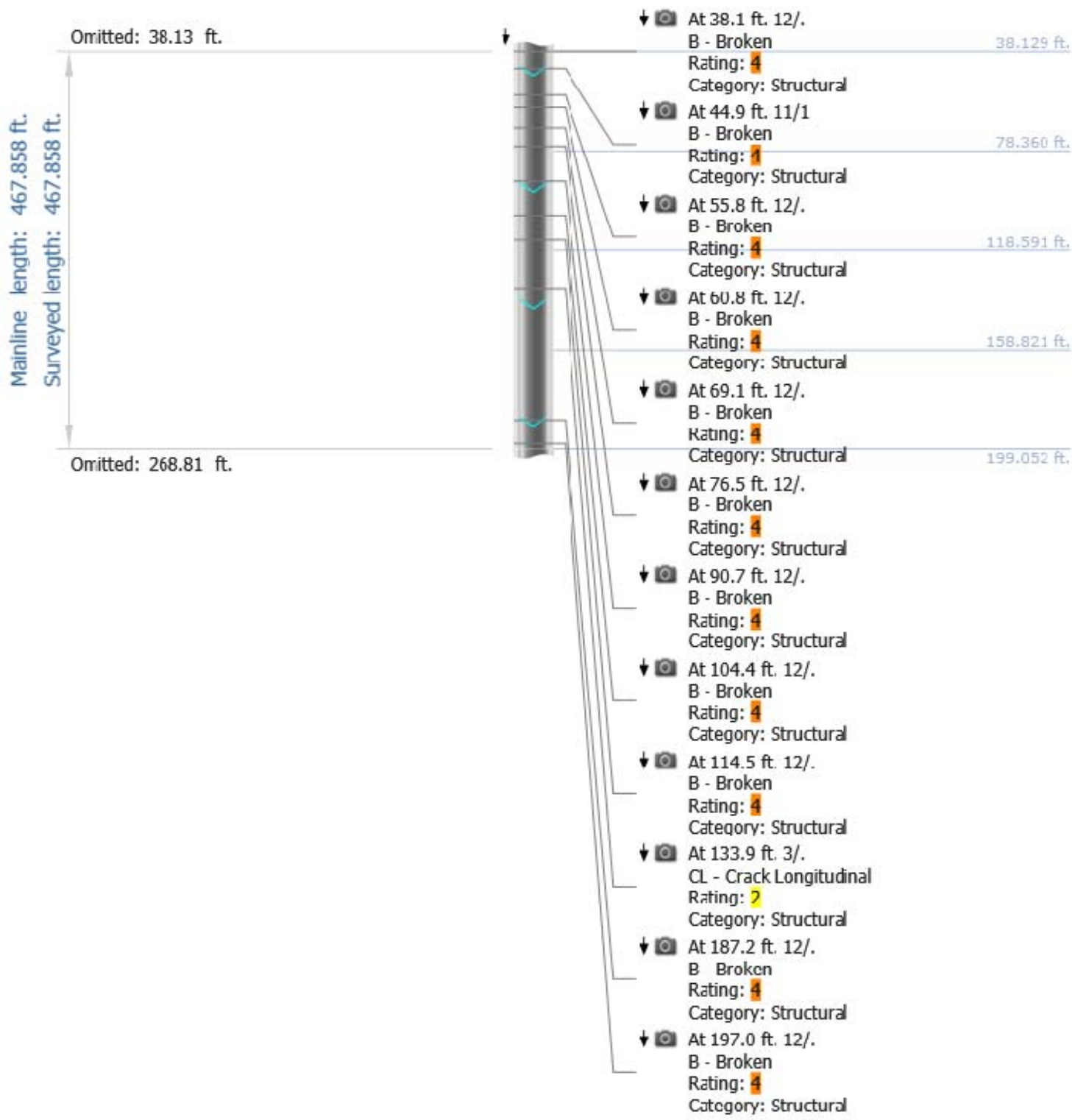
### Pipe Ratings

Grade	Structural:					O&M:					Overall:			Risk
	Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Defects	Segment Grade	Pipe Rating	Quick Rating	Pipe Rating Index	Pipe Rating	Pipe Rating Index	LoF	
1	0	0	97	514C	3.9	0	1	3	2111	1.5	100	3.7	5.1	
2	0	4				0	2							
3	0	0				0	0							
4	0	88				0	0							
5	0	5				0	0							

Last Modified: 04/09/2025 at 10:39AM EDT



Last Modified: 04/09/2025 at 10:39AM EDT



Omitted: 199.05 ft.

Mainline length: 467.858 ft.  
Surveyed length: 467.858 ft.

Stopped at 467.9 ft. with flow  
on 5/3/2023 1:34:30 PM

AMH '4345'

- At 199.1 ft. 12/.  
B - Broken  
Rating: 4  
Category: Structural  
199.052 ft.
- At 234.0 ft. 3/.  
CL - Crack Longitudinal  
Rating: 2  
Category: Structural  
232.653 ft.
- At 238.4 ft. 11/1  
B - Broken  
Rating: 4  
Category: Structural  
266.254 ft.
- At 245.6 ft. 12/.  
B - Broken  
Rating: 4  
Category: Structural  
299.854 ft.
- At 282.2 ft. 12/.  
B - Broken  
Rating: 4  
Category: Structural  
333.455 ft.
- At 303.6 ft. 12/.  
B - Broken  
Rating: 4  
Category: Structural  
367.056 ft.
- At 309.1 ft. 12/.  
B - Broken  
Rating: 4  
Category: Structural  
400.657 ft.
- At 365.0 ft. 12/.  
B - Broken  
Rating: 4  
Category: Structural  
434.257 ft.
- At 375.7 ft. 5/7  
OBZ - Obstruction Other  
Rating: 2  
Category: O&M  
Comments: UNDERWATER  
467.858 ft.
- At 459.9 ft. 8/9  
B - Broken  
Rating: 4  
Category: Structural
- At 465.3 ft. 12/.  
B - Broken  
Rating: 4  
Category: Structural
- At 467.0 ft. 9/.  
RFJ - Roots Fine Joint  
Rating: 1  
Category: O&M
- At 467.9 ft.  
AMH - Manhole  
Comments: SURVEY ENDS



# NWMCC INSPECTION REPORT

## Inspection Photos

City: <b>SPRINGFIELD MA</b>	Street: <b>ABERDEEN EASEMENT</b>	Start date/time: <b>20230503 13:03</b>	Pipe segment ref.: <b>P4762</b>
--------------------------------	-------------------------------------	---	------------------------------------



Photo: **J-8102-7D8-20230503-130327-130415.JPG**  
At: **2.602 ft. 4/. SMW - Surface Damage Missing Wall**  
Joint: **No**



Photo: **J-8102-7D8-20230503-130327-130507.JPG**  
At: **15.412 ft. B - Broken 12/.**  
Joint: **No**

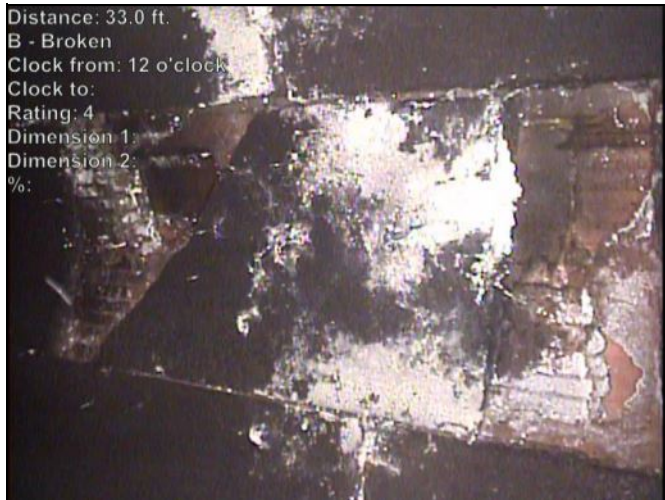


Photo: **J-8102-7D8-20230503-130327-130605.JPG**  
At: **33.025 ft. B - Broken 12/.**  
Joint: **No**

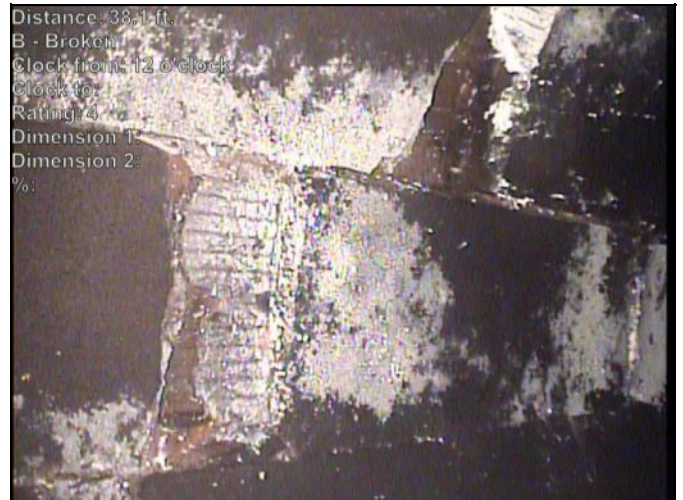


Photo: **J-8102-7D8-20230503-130327-130630.JPG**  
At: **38.129 ft. B - Broken 12/.**  
Joint: **No**

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Photo: J-8102-7D8-20230503-130327-130704.JPG

At: 44.934 ft. B - Broken  
11/1

Joint: No

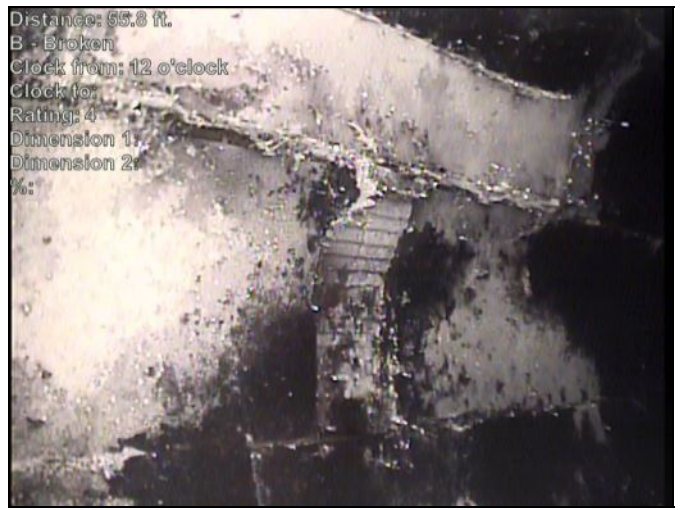


Photo: J-8102-7D8-20230503-130327-130747.JPG

At: 55.843 ft. B - Broken  
12/.

Joint: No

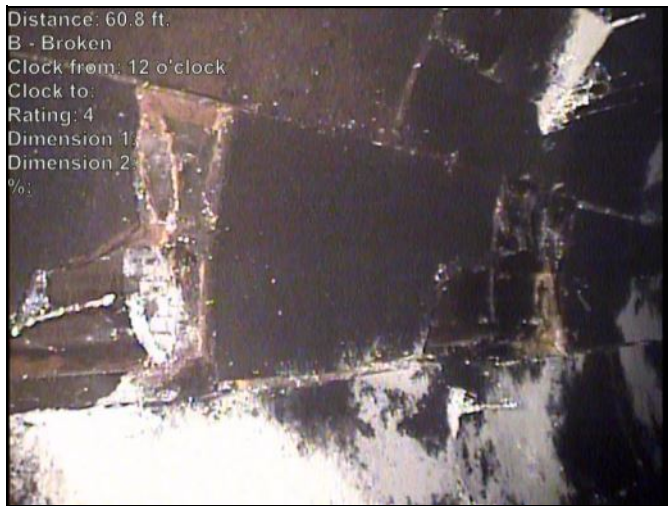


Photo: J-8102-7D8-20230503-130327-130804.JPG

At: 60.847 ft. B - Broken  
12/.

Joint: No

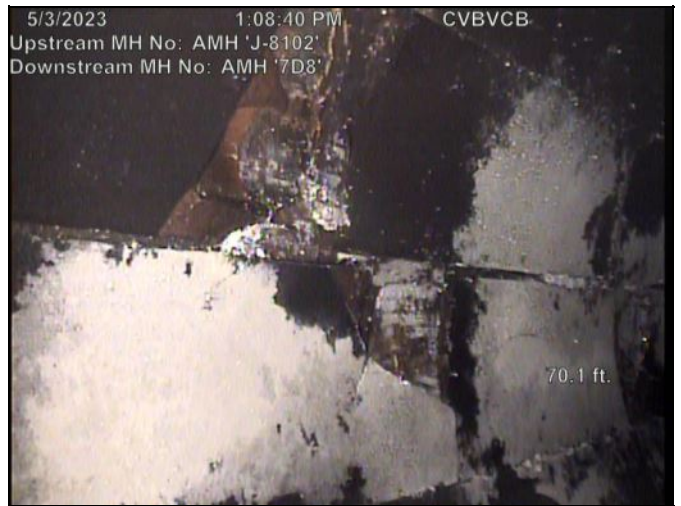


Photo: J-8102-7D8-20230503-130327-130835.JPG

At: 69.053 ft. B - Broken  
12/.

Joint: No

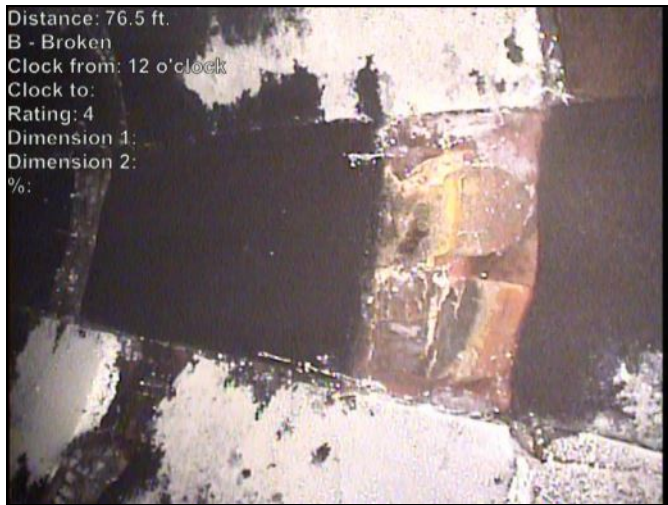


Photo: J-8102-7D8-20230503-130327-130900.JPG

At: 76.459 ft. B - Broken  
12/.

Joint: No

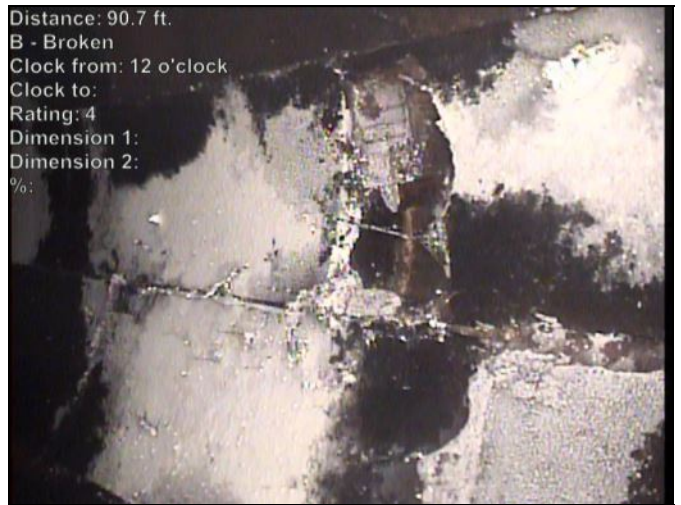


Photo: J-8102-7D8-20230503-130327-130935.JPG

At: 90.669 ft. B - Broken  
12/.

Joint: No

Last Modified: 04/09/2025 at 10:39AM EDT





Photo: J-8102-7D8-20230503-130327-131019.JPG

At: 104.38 ft. B - Broken  
12/.

Joint: No

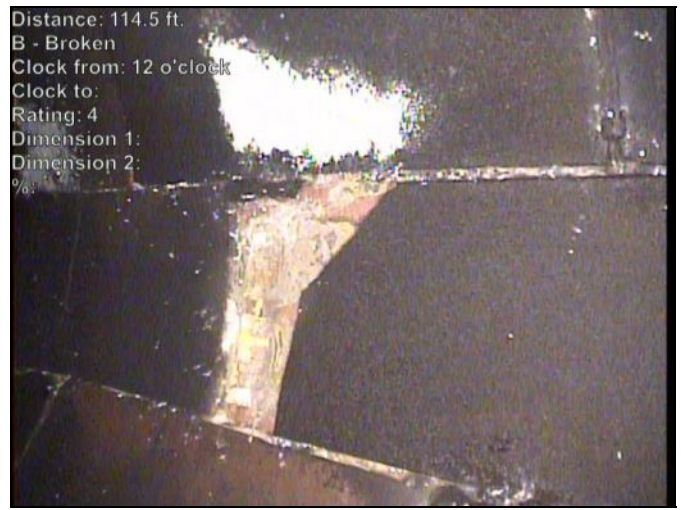


Photo: J-8102-7D8-20230503-130327-131044.JPG

At: 114.488 ft. B - Broken  
12/.

Joint: No

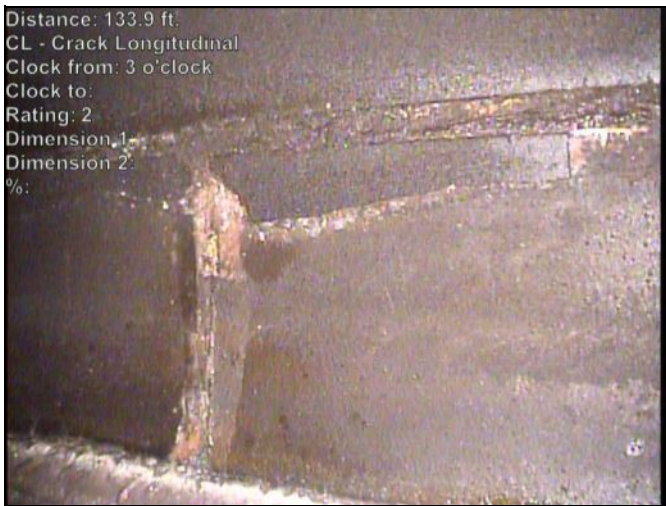


Photo: J-8102-7D8-20230503-130327-131129.JPG

At: 133.903 ft. CL - Crack Longitudinal  
3/.

Joint: No

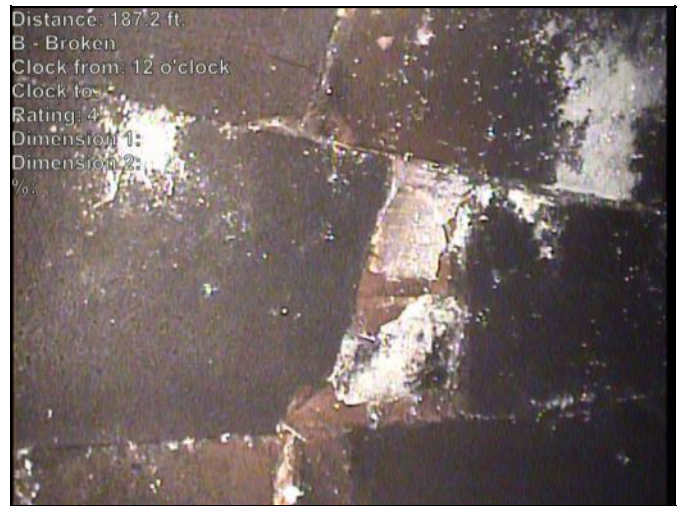


Photo: J-8102-7D8-20230503-130327-131308.JPG

At: 187.243 ft. B - Broken  
12/.

Joint: No



Photo: J-8102-7D8-20230503-130327-131336.JPG

At: 196.951 ft. B - Broken  
12/.

Joint: No

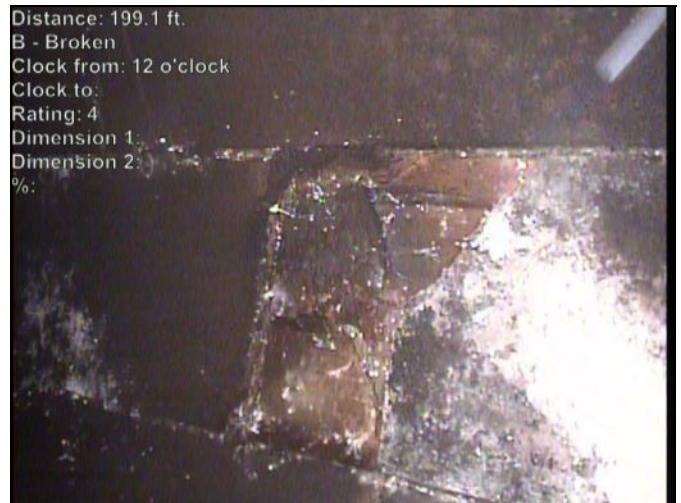


Photo: J-8102-7D8-20230503-130327-131351.JPG

At: 199.052 ft. B - Broken  
12/.

Joint: No

Last Modified: 04/09/2025 at 10:39AM EDT





Distance: 234.0 ft.  
CL - Crack Longitudinal  
Clock from: 3 o'clock  
Clock to:  
Rating: 2  
Dimension 1:  
Dimension 2:  
%:

Photo: J-8102-7D8-20230503-130327-131458.JPG

At: 233.979 ft. CL - Crack Longitudinal  
3/.

Joint: No



Distance: 238.4 ft.  
B - Broken  
Clock from: 11 o'clock  
Clock to: 1 o'clock  
Rating: 4  
Dimension 1:  
Dimension 2:  
%:

Photo: J-8102-7D8-20230503-130327-131519.JPG

At: 238.383 ft. B - Broken  
11/1

Joint: No

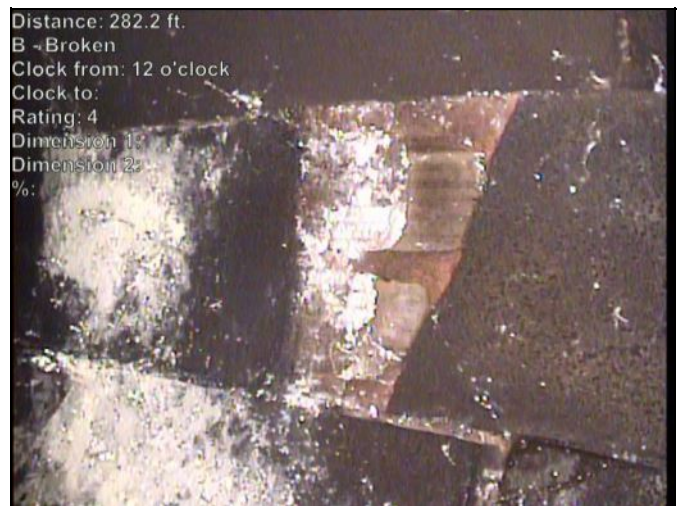


Distance: 245.6 ft.  
B - Broken  
Clock from: 12 o'clock  
Clock to:  
Rating: 4  
Dimension 1:  
Dimension 2:  
%:

Photo: J-8102-7D8-20230503-130327-131539.JPG

At: 245.588 ft. B - Broken  
12/.

Joint: No

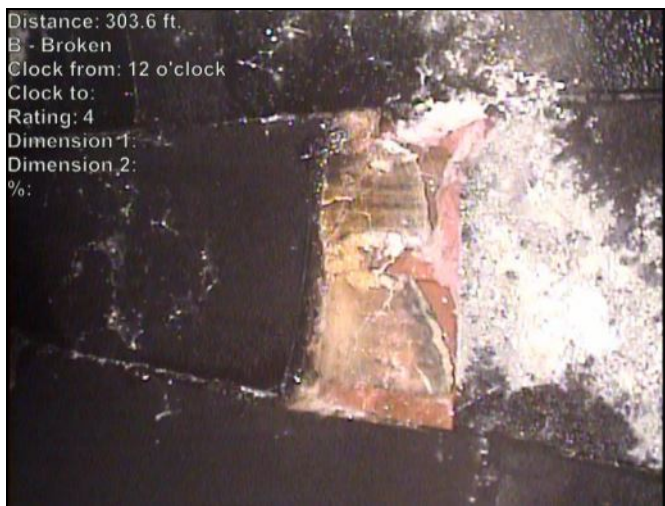


Distance: 282.2 ft.  
B - Broken  
Clock from: 12 o'clock  
Clock to:  
Rating: 4  
Dimension 1:  
Dimension 2:  
%:

Photo: J-8102-7D8-20230503-130327-131657.JPG

At: 282.216 ft. B - Broken  
12/.

Joint: No

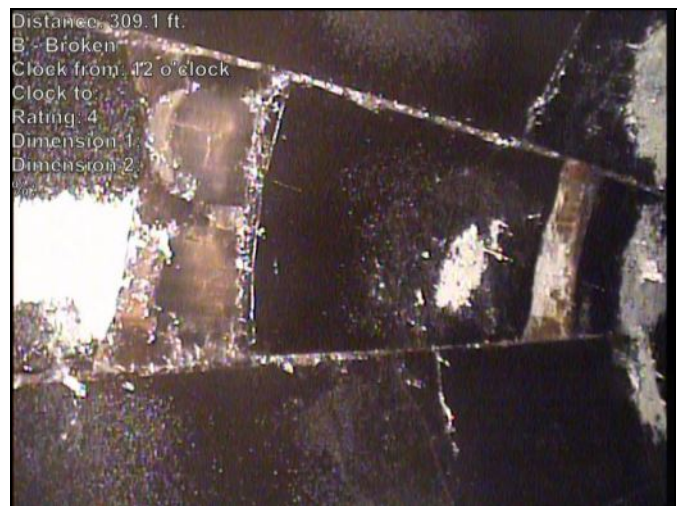


Distance: 303.6 ft.  
B - Broken  
Clock from: 12 o'clock  
Clock to:  
Rating: 4  
Dimension 1:  
Dimension 2:  
%:

Photo: J-8102-7D8-20230503-130327-131814.JPG

At: 303.633 ft. B - Broken  
12/.

Joint: No



Distance: 309.1 ft.  
B - Broken  
Clock from: 12 o'clock  
Clock to:  
Rating: 4  
Dimension 1:  
Dimension 2:  
%:

Photo: J-8102-7D8-20230503-130327-131835.JPG

At: 309.137 ft. B - Broken  
12/.

Joint: No

Last Modified: 04/09/2025 at 10:39AM EDT



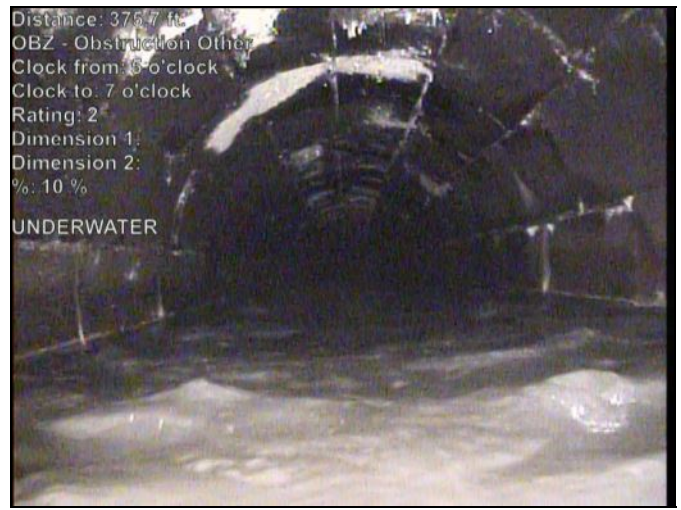


Distance: 365.0 ft.  
B - Broken  
Clock from: 12 o'clock  
Clock to:  
Rating: 4  
Dimension 1:  
Dimension 2:  
%:

Photo: J-8102-7D8-20230503-130327-132100.JPG

At: 364.98 ft. B - Broken  
12/.

Joint: No



Distance: 375.7 ft.  
OBZ - Obstruction Other  
Clock from: 6 o'clock  
Clock to: 7 o'clock  
Rating: 2  
Dimension 1:  
Dimension 2:  
%: 10 %

Photo: J-8102-7D8-20230503-130327-132218.JPG

At: 375.688 ft. OBZ - Obstruction Other  
5/7

Joint: No 10 % UNDERWATER

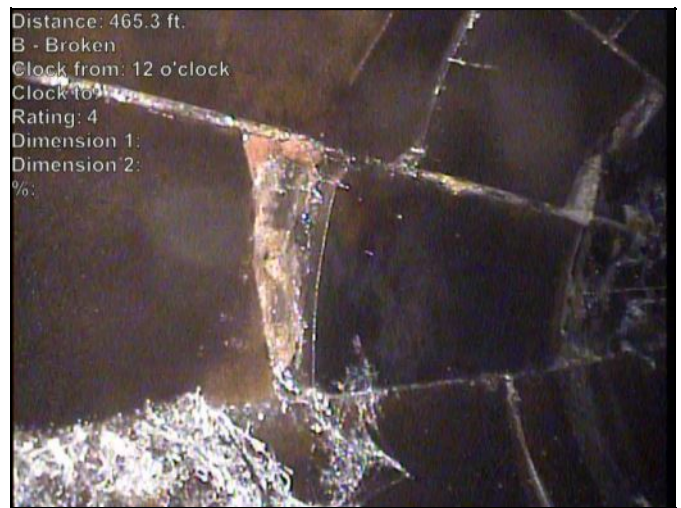


Distance: 459.9 ft.  
B - Broken  
Clock from: 8 o'clock  
Clock to: 9 o'clock  
Rating: 4  
Dimension 1:  
Dimension 2:  
%:

Photo: J-8102-7D8-20230503-130327-133203.JPG

At: 459.852 ft. B - Broken  
8/9

Joint: No



Distance: 465.3 ft.  
B - Broken  
Clock from: 12 o'clock  
Clock to:  
Rating: 4  
Dimension 1:  
Dimension 2:  
%:

Photo: J-8102-7D8-20230503-130327-133253.JPG

At: 465.256 ft. B - Broken  
12/.

Joint: No



Distance: 467.0 ft.  
RFJ - Roots Fine Joint  
Clock from: 9 o'clock  
Clock to:  
Rating: 1  
Dimension 1:  
Dimension 2:  
%:

Photo: J-8102-7D8-20230503-130327-133317.JPG

At: 466.958 ft. RFJ - Roots Fine Joint  
9/.

Joint: Yes



Distance: 467.9 ft.  
AMH - Manhole  
Clock from:  
Clock to:  
Rating:  
Dimension 1:  
Dimension 2:  
%:

Photo: J-8102-7D8-20230503-130327-133415.JPG

At: 467.858 ft. AMH - Manhole  
SURVEY ENDS

Joint: No SURVEY ENDS

Last Modified: 04/09/2025 at 10:39AM EDT



## Manhole Inspections

Last Modified: 04/09/2025 at 10:39AM EDT





# Manhole Inspection Field Form

Manhole ID	Comments	Photo
7D8	Inside manhole	
7D8	Area around manhole	

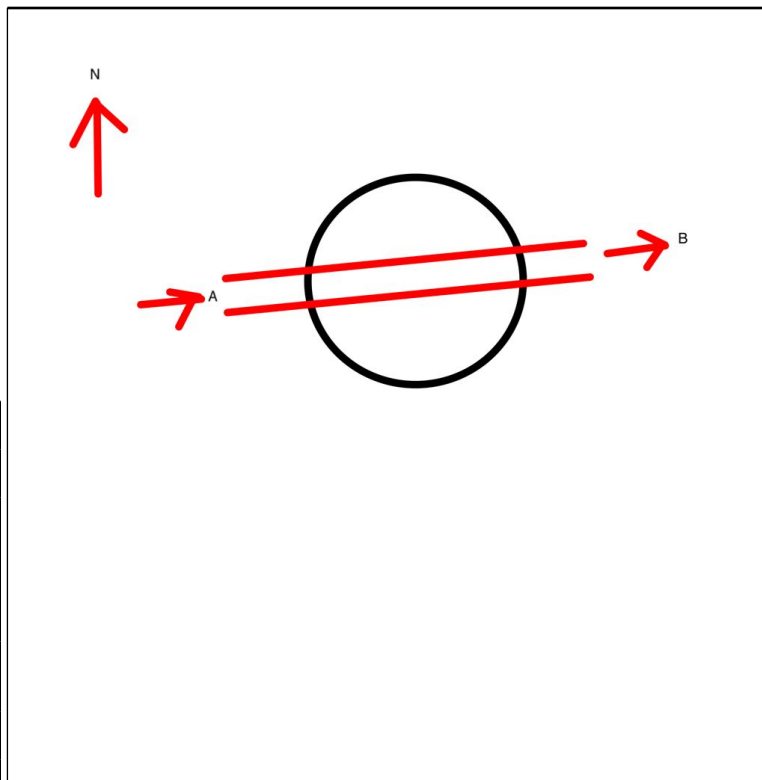
Last Modified: 04/09/2025 at 10:39AM EDT

# Manhole Inspection Field Form



**Manhole ID:** 7D9  
**Inspector:** RLW  
**Date:** 05/30/2017  
**Weather:** cloudy **Temp:** 57  
**Street:** Wilbraham Road  
**Inspection Type:** Surface Inspection  
**Inspection Performed?:** Y  
**Manhole Marker?** N/A **GPS Taken:** Yes

## Schematic:



## Manhole

**Manhole Function:**  Sanitary  Combined  
 Stormdrain  Common  
**Cover Size:**  24"  30"  Other  
**Manhole Size:**  4'  5'  Other 3 ft.  
**Depth from rim:** 3.2 ft.  
**Depth to Wet Ring from rim:** None\_observed  
**Drop:**  Yes  No  
**Manhole Material:** precast concrete  
**Location of Manhole:** roadside  
**Flow Condition:** no flow  
**General Notes:**  
 NO BREAK IN PIPE THROUGH MANHOLE. TOP OF PIPE IN CENTER OF MANHOLE AT INVERT OF 3'.

## Area Around Manhole

**Paved:** \_\_\_\_\_  
**Unpaved:** satisfactory

## Pipes

	Pipe Asset ID	Pipe Size (in)	Material	Shape	Invert Depth from Rim (ft.)	Flow Depth from Invert (in.)	Debris Depth from Invert (in.)	Condition of Pipe
B	P3243	4	CIPP	Circular	2.3	NOT KNOWN	NOT KNOWN	Not Known
A	P3244	8	Asbestos Cement	Circular	2.3	NOT KNOWN	NOT KNOWN	Not Known

## Defect Observations

Position	Depth From Rim	Component	Category	Code	Condition Grade	Observation
to			operation and maintenance	DSZ	2	Deposits - Settled - Other

Last Modified: 04/09/2025 at 10:39AM EDT

# Manhole Inspection Field Form



Manhole ID	Comments	Photo
7D9	DOWNSTREAM TO THE RIGHT	
7D9	LOOKING DOWNSTREAM	

Last Modified: 04/09/2025 at 10:39AM EDT

# Manhole Inspection Field Form



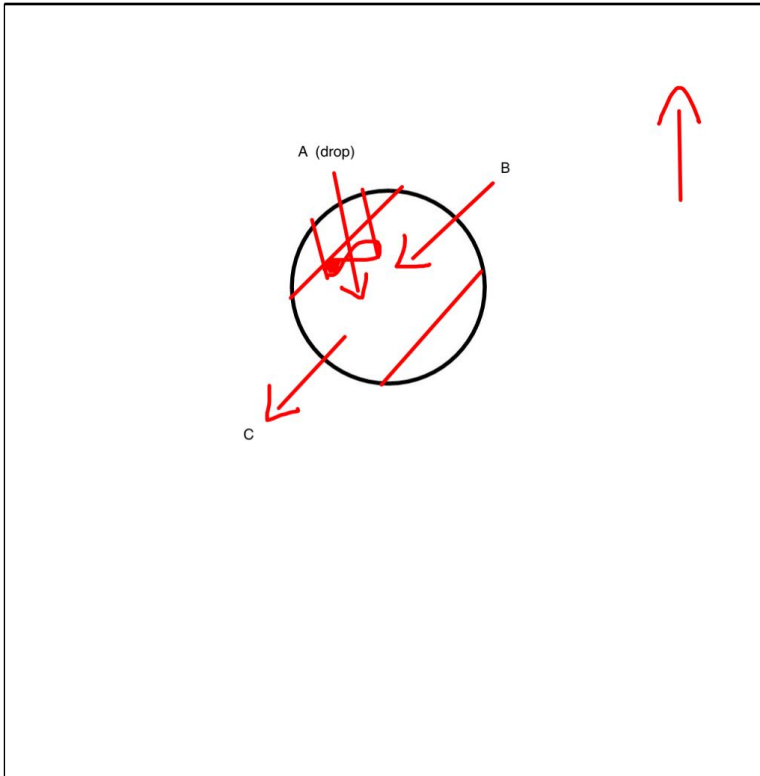
**Manhole ID:** 79A  
**Inspector:** CJD  
**Date:** 03/08/2016  
**Weather:** cloudy **Temp:** 50  
**Street:** North Branch Mill River Sewer

**Inspection Type:**  Surface Inspection  Entry  
**GPS Taken?:**  Yes  No  Previously  
**Manhole Marker?** no

## Manhole

**Manhole Function:**  Sanitary  Combined  
 Stormdrain  Common  
**Cover Size:**  24"  30"  Other  
**Manhole Size:**  4'  5'  Other  
**Depth from rim:** 6.4 ft.  
**Depth to Wet Ring from rim:** \_\_\_\_\_ ft.  
**Drop:**  Yes  No  
**Manhole Material:** brick  
**Location of Manhole:** easement  
**Flow Condition:** steady  
**General Notes:**

## Schematic:



## Area Around Manhole

**Paved:** \_\_\_\_\_  
**Unpaved:** satisfactory

Last Modified: 04/09/2025 at 10:39AM EDT

## Pipes

	Pipe Asset ID	Pipe Size (in)	Material	Shape	Invert Depth from Rim (ft.)	Flow Depth from Invert (in.)	Debris Depth from Invert (in.)	Condition of Pipe
A	P2D99	10	Vitrified Clay Pipe	Circular	4.5	2	0	Fair
B	P4874	36	Clay Tile (not vitrified clay)	Circular	6.4	12	0	Fair
	P2E53	36	Vitrified Clay Pipe	Circular	6.4	12	0	Fair



# Manhole Inspection Field Form

Manhole ID	Comments	Photo
79A	Inside manhole	
79A	Area around manhole	

Last Modified: 04/09/2025 at 10:39AM EDT



# Manhole Inspection Field Form

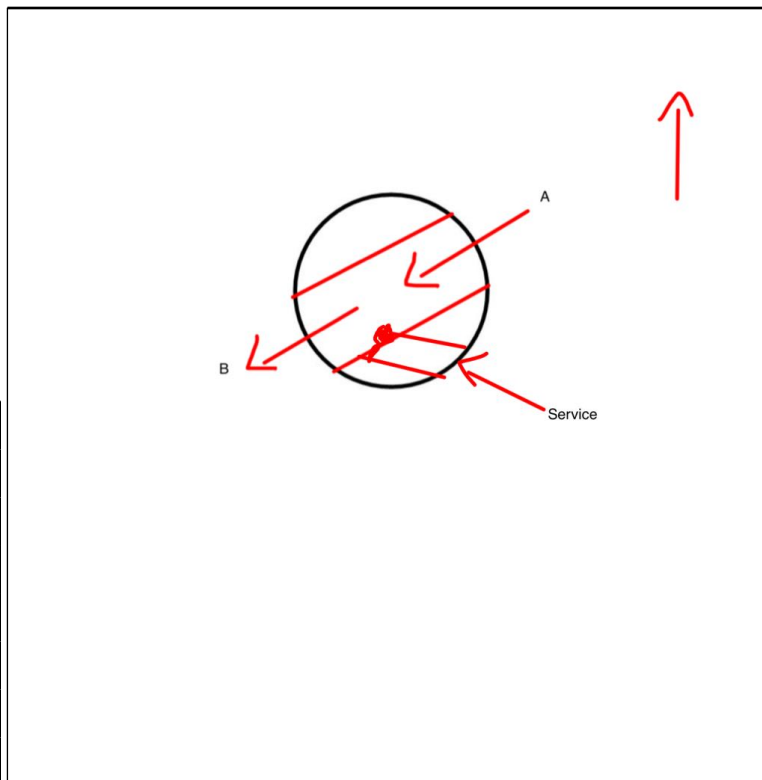


**Manhole ID:** 791  
**Inspector:** CJD  
**Date:** 03/08/2016  
**Weather:** sunny **Temp:** 45  
**Street:** North Branch Mill River Sewer  
**Inspection Type:**  Surface Inspection  Entry  
**GPS Taken?:**  Yes  No  Previously  
**Manhole Marker?** na

## Manhole

**Manhole Function:**  Sanitary  Combined  
 Stormdrain  Common  
**Cover Size:**  24"  30"  Other  
**Manhole Size:**  4'  5'  Other  
**Depth from rim:** 4.9 ft.  
**Depth to Wet Ring from rim:** \_\_\_\_\_ ft.  
**Drop:**  Yes  No  
**Manhole Material:** brick  
**Location of Manhole:** easement  
**Flow Condition:** steady  
**General Notes:**

## Schematic:



## Area Around Manhole

**Paved:** \_\_\_\_\_  
**Unpaved:** satisfactory

## Pipes

	Pipe Asset ID	Pipe Size (in)	Material	Shape	Invert Depth from Rim (ft.)	Flow Depth from Invert (in.)	Debris Depth from Invert (in.)	Condition of Pipe
A	P2F9F	36	Clay Tile (not vitrified clay)	Circular	4.9	12	0	Fair
B	P4761	36	Clay Tile (not vitrified clay)	Circular	4.9	12	0	Fair

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# Manhole Inspection Field Form



Manhole ID	Comments	Photo
791	Inside manhole	
791	Area around manhole	

Last Modified: 04/09/2025 at 10:39AM EDT

# Manhole Inspection Field Form



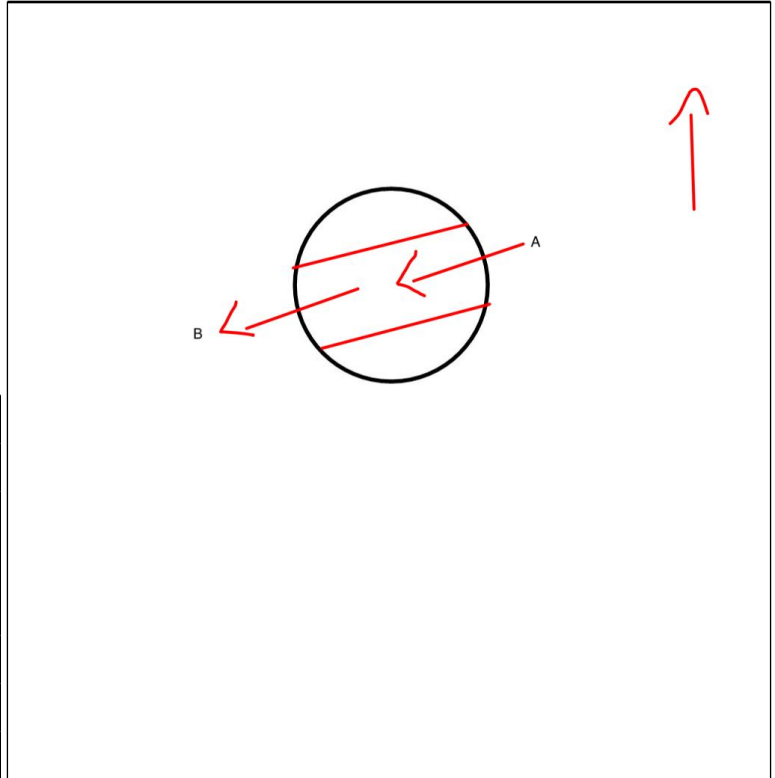
**Manhole ID:** 792  
**Inspector:** CJD  
**Date:** 03/08/2016  
**Weather:** sunny **Temp:** 50  
**Street:** North Branch Mill River Sewer

**Inspection Type:**  Surface Inspection  Entry  
**GPS Taken?:**  Yes  No  Previously  
**Manhole Marker?** na

## Manhole

**Manhole Function:**  Sanitary  Combined  
 Stormdrain  Common  
**Cover Size:**  24"  30"  Other  
**Manhole Size:**  4'  5'  Other  
**Depth from rim:** 5.8 ft.  
**Depth to Wet Ring from rim:** \_\_\_\_\_ ft.  
**Drop:**  Yes  No  
**Manhole Material:** brick  
**Location of Manhole:** easement  
**Flow Condition:** steady  
**General Notes:**

## Schematic:



## Area Around Manhole

**Paved:** cracked  
**Unpaved:** \_\_\_\_\_

Last Modified: 04/09/2025 at 10:39AM EDT

## Pipes

	Pipe Asset ID	Pipe Size (in)	Material	Shape	Invert Depth from Rim (ft.)	Flow Depth from Invert (in.)	Debris Depth from Invert (in.)	Condition of Pipe
A	P2F6D	36	Clay Tile (not vitrified clay)	Circular	5.8	12	0	Fair
B	P2F9F	36	Clay Tile (not vitrified clay)	Circular	5.8	12	0	Fair

# Manhole Inspection Field Form

Manhole ID	Comments	Photo
792	Inside manhole	
792	Area around manhole	

Last Modified: 04/09/2025 at 10:39AM EDT



# Manhole Inspection Field Form



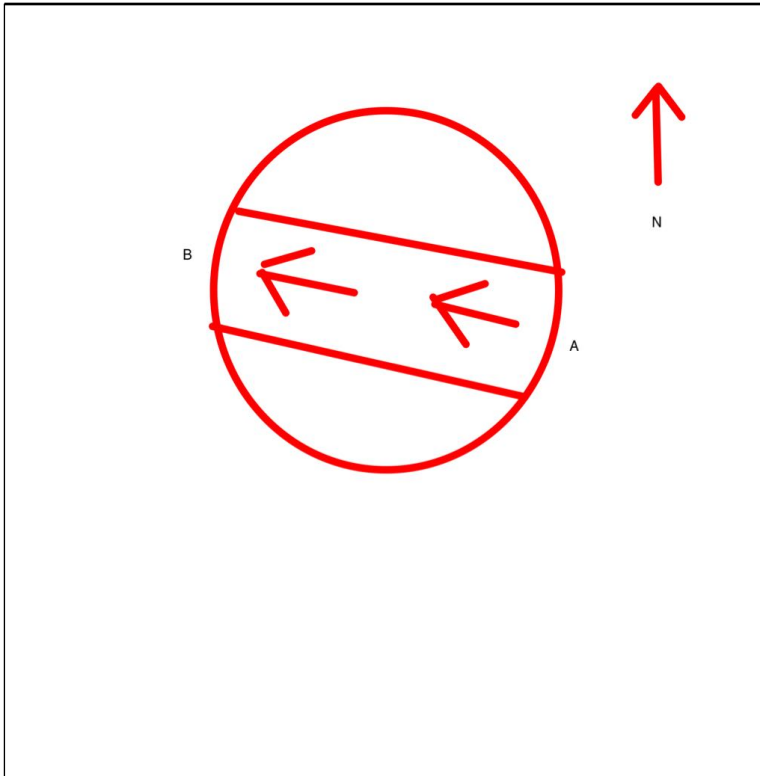
**Manhole ID:** 793  
**Inspector:** CJD  
**Date:** 03/08/2016  
**Weather:** sunny      **Temp:** 63  
**Street:** North Branch Mill River Sewer

**Inspection Type:**     Surface Inspection     Entry  
**GPS Taken?:**     Yes     No     Previously  
**Manhole Marker?**    no

## Manhole

**Manhole Function:**     Sanitary     Combined  
     Stormdrain     Common  
**Cover Size:**     24"     30"     Other  
**Manhole Size:**     4'     5'     Other  
**Depth from rim:** 7.2 ft.  
**Depth to Wet Ring from rim:** \_\_\_\_\_ ft.  
**Drop:**     Yes     No  
**Manhole Material:** brick  
**Location of Manhole:** easement  
**Flow Condition:**    steady  
**General Notes:**  
Segment block clay tile

## Schematic:



## Area Around Manhole

**Paved:** \_\_\_\_\_  
**Unpaved:**    satisfactory

Last Modified: 04/09/2025 at 10:39AM EDT

## Pipes

	Pipe Asset ID	Pipe Size (in)	Material	Shape	Invert Depth from Rim (ft.)	Flow Depth from Invert (in.)	Debris Depth from Invert (in.)	Condition of Pipe
A	P24ED	36	Clay Tile (not vitrified clay)	Circular	7.2	12	0	Fair
B	P2F6D	36	Clay Tile (not vitrified clay)	Circular	7.2	12	0	Fair

# Manhole Inspection Field Form

Manhole ID	Comments	Photo
793	Downstream on right	
793	Surrounding Area	

Last Modified: 04/09/2025 at 10:39AM EDT

# Manhole Inspection Field Form



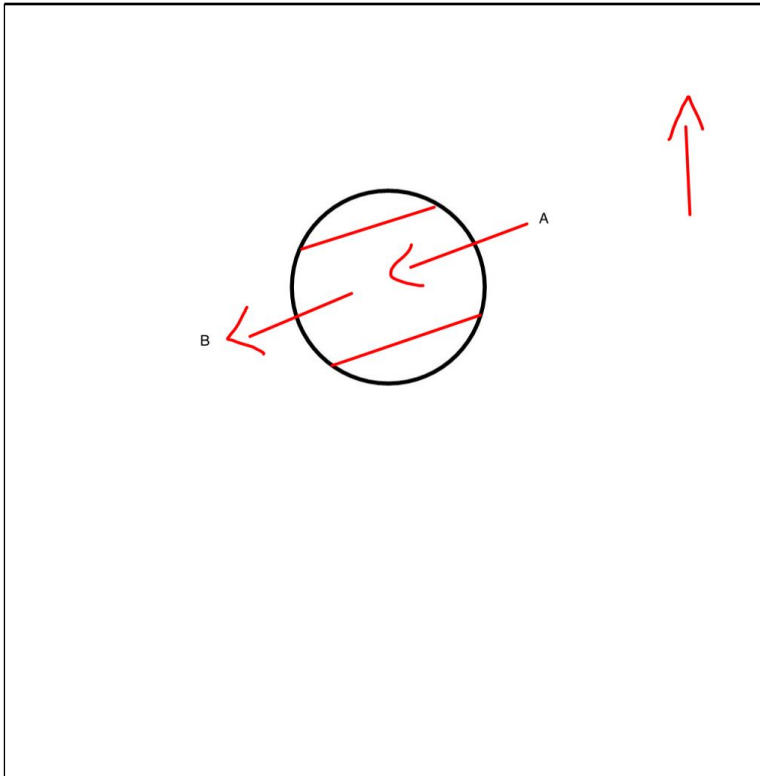
**Manhole ID:** 794  
**Inspector:** CJD  
**Date:** 03/08/2016  
**Weather:** sunny **Temp:** 50  
**Street:** North Branch Mill River Sewer

**Inspection Type:**  Surface Inspection  Entry  
**GPS Taken?:**  Yes  No  Previously  
**Manhole Marker?** no

## Manhole

**Manhole Function:**  Sanitary  Combined  
 Stormdrain  Common  
**Cover Size:**  24"  30"  Other  
**Manhole Size:**  4'  5'  Other  
**Depth from rim:** 9.1 ft.  
**Depth to Wet Ring from rim:** \_\_\_\_\_ ft.  
**Drop:**  Yes  No  
**Manhole Material:** brick  
**Location of Manhole:** easement  
**Flow Condition:** steady  
**General Notes:**

## Schematic:



## Area Around Manhole

**Paved:** \_\_\_\_\_  
**Unpaved:** satisfactory

Last Modified: 04/09/2025 at 10:39AM EDT

## Pipes

	Pipe Asset ID	Pipe Size (in)	Material	Shape	Invert Depth from Rim (ft.)	Flow Depth from Invert (in.)	Debris Depth from Invert (in.)	Condition of Pipe
A	P2A96	36	Clay Tile (not vitrified clay)	Circular	9.1	12	0	Fair
	P24ED	36	Clay Tile (not vitrified clay)	Circular	9.1	12	0	Fair



# Manhole Inspection Field Form



Manhole ID	Comments	Photo
794	Inside manhole	
794	Area around manhole	

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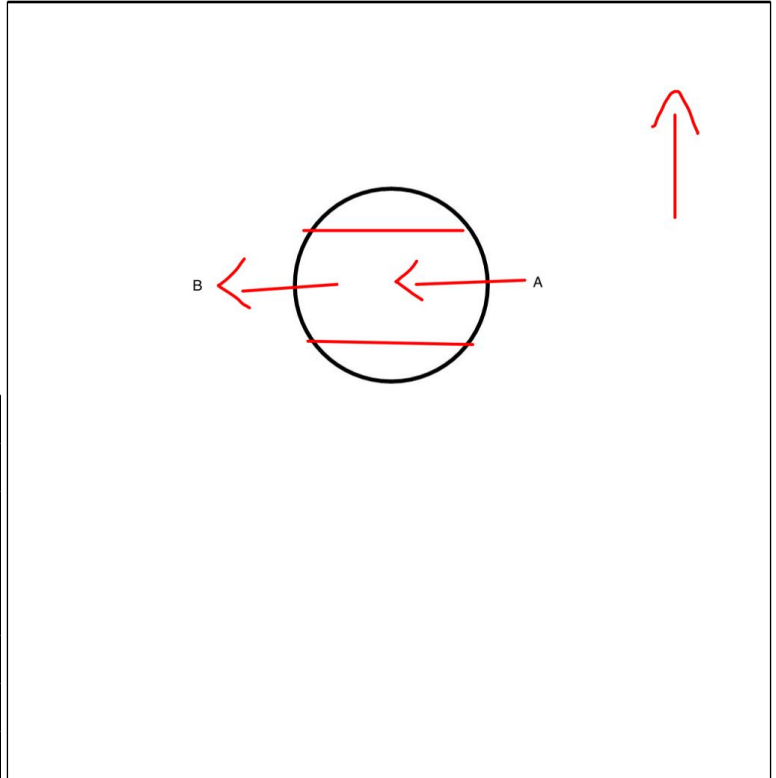


# Manhole Inspection Field Form



**Manhole ID:** 795  
**Inspector:** CJD  
**Date:** 03/08/2016  
**Weather:** sunny **Temp:** 50  
**Street:** North Branch Mill River Sewer  
**Inspection Type:**  Surface Inspection  Entry  
**GPS Taken?:**  Yes  No  Previously  
**Manhole Marker?** no

**Schematic:**



**Manhole**

**Manhole Function:**  Sanitary  Combined  
 Stormdrain  Common  
**Cover Size:**  24"  30"  Other  
**Manhole Size:**  4'  5'  Other  
**Depth from rim:** 6.7 ft.  
**Depth to Wet Ring from rim:** \_\_\_\_\_ ft.  
**Drop:**  Yes  No  
**Manhole Material:** brick  
**Location of Manhole:** easement  
**Flow Condition:** steady  
**General Notes:**

**Area Around Manhole**

**Paved:** \_\_\_\_\_  
**Unpaved:** satisfactory

Last Modified: 04/09/2025 at 10:39AM EDT

**Pipes**

	Pipe Asset ID	Pipe Size (in)	Material	Shape	Invert Depth from Rim (ft.)	Flow Depth from Invert (in.)	Debris Depth from Invert (in.)	Condition of Pipe
A	P2F26	36	Clay Tile (not vitrified clay)	Circular	6.7	12	0	Fair
B	P2A96	36	Clay Tile (not vitrified clay)	Circular	6.7	12	0	Fair

# Manhole Inspection Field Form

Manhole ID	Comments	Photo
795	Inside manhole	
795	Area around manhole	

Last Modified: 04/09/2025 at 10:39AM EDT

# Manhole Inspection Field Form



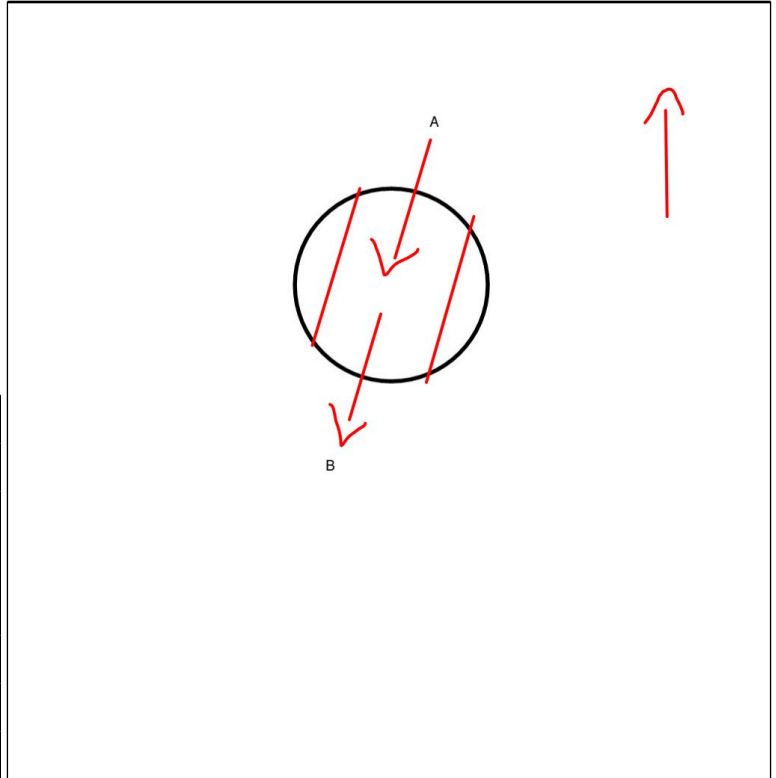
**Manhole ID:** 796  
**Inspector:** CJD  
**Date:** 03/08/2016  
**Weather:** partly cloudy      **Temp:** 50  
**Street:** North Branch Mill River Sewer

**Inspection Type:**     Surface Inspection     Entry  
**GPS Taken?:**     Yes     No     Previously  
**Manhole Marker?**    no

## Manhole

**Manhole Function:**     Sanitary     Combined  
     Stormdrain     Common  
**Cover Size:**     24"     30"     Other  
**Manhole Size:**     4'     5'     Other  
**Depth from rim:** 5.2 ft.  
**Depth to Wet Ring from rim:** \_\_\_\_\_ ft.  
**Drop:**     Yes     No  
**Manhole Material:** brick  
**Location of Manhole:** easement  
**Flow Condition:**    steady  
**General Notes:**

## Schematic:



## Area Around Manhole

**Paved:** \_\_\_\_\_  
**Unpaved:**    satisfactory

## Pipes

	Pipe Asset ID	Pipe Size (in)	Material	Shape	Invert Depth from Rim (ft.)	Flow Depth from Invert (in.)	Debris Depth from Invert (in.)	Condition of Pipe
A	P2EF3	36	Clay Tile (not vitrified clay)	Circular	5.1	12	0	Fair
B	P2F26	36	Clay Tile (not vitrified clay)	Circular	5.2	12	0	Fair

Last Modified: 04/09/2025 at 10:39AM EDT



# Manhole Inspection Field Form

Manhole ID	Comments	Photo
796	Inside manhole	
796	Area around manhole	

Last Modified: 04/09/2025 at 10:39AM EDT

# Manhole Inspection Field Form



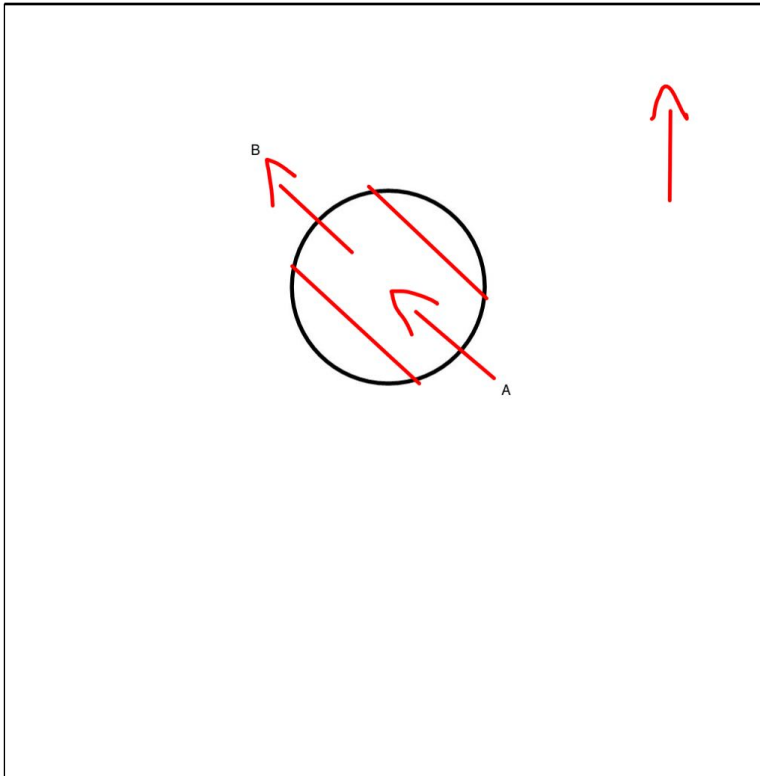
**Manhole ID:** 797  
**Inspector:** CJD  
**Date:** 03/08/2016  
**Weather:** partly cloudy      **Temp:** 50  
**Street:** North Branch Mill River Sewer

**Inspection Type:**     Surface Inspection     Entry  
**GPS Taken?:**     Yes     No     Previously  
**Manhole Marker?**    no

## Manhole

**Manhole Function:**     Sanitary     Combined  
     Stormdrain     Common  
**Cover Size:**     24"     30"     Other  
**Manhole Size:**     4'     5'     Other  
**Depth from rim:** 14.1 ft.  
**Depth to Wet Ring from rim:** \_\_\_\_\_ ft.  
**Drop:**     Yes     No  
**Manhole Material:** brick  
**Location of Manhole:** easement  
**Flow Condition:** steady  
**General Notes:** \_\_\_\_\_

## Schematic:



## Area Around Manhole

**Paved:** \_\_\_\_\_  
**Unpaved:** satisfactory

Last Modified: 04/09/2025 at 10:39AM EDT

## Pipes

	Pipe Asset ID	Pipe Size (in)	Material	Shape	Invert Depth from Rim (ft.)	Flow Depth from Invert (in.)	Debris Depth from Invert (in.)	Condition of Pipe
A	P2EC0	36	Clay Tile (not vitrified clay)	Circular	14.1	12	0	Fair
A	P2EF3	36	Clay Tile (not vitrified clay)	Circular	14.1	12	0	Fair



# Manhole Inspection Field Form

Manhole ID	Comments	Photo
797	Inside manhole	
797	Area around manhole	

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# Manhole Inspection Field Form



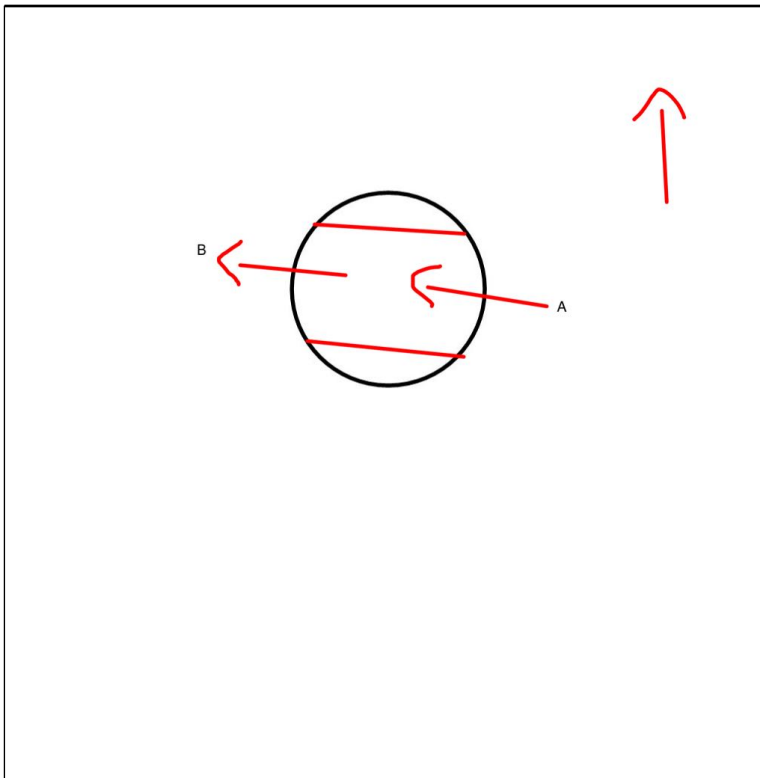
**Manhole ID:** 798  
**Inspector:** CJD  
**Date:** 03/08/2016  
**Weather:** sunny **Temp:** 55  
**Street:** North Branch Mill River Sewer

**Inspection Type:**  Surface Inspection  Entry  
**GPS Taken?:**  Yes  No  Previously  
**Manhole Marker?** no

## Manhole

**Manhole Function:**  Sanitary  Combined  
 Stormdrain  Common  
**Cover Size:**  24"  30"  Other  
**Manhole Size:**  4'  5'  Other  
**Depth from rim:** 6 ft.  
**Depth to Wet Ring from rim:** \_\_\_\_\_ ft.  
**Drop:**  Yes  No  
**Manhole Material:** brick  
**Location of Manhole:** easement  
**Flow Condition:** steady  
**General Notes:** \_\_\_\_\_

## Schematic:



## Area Around Manhole

**Paved:** \_\_\_\_\_  
**Unpaved:** satisfactory

Last Modified: 04/09/2025 at 10:39AM EDT

## Pipes

	Pipe Asset ID	Pipe Size (in)	Material	Shape	Invert Depth from Rim (ft.)	Flow Depth from Invert (in.)	Debris Depth from Invert (in.)	Condition of Pipe
A	P2E8B	36	Clay Tile (not vitrified clay)	Circular	6.00	12	0	Fair
B	P2EC0	36	Clay Tile (not vitrified clay)	Circular	6.00	12	0	Fair



# Manhole Inspection Field Form



Manhole ID	Comments	Photo
798	Inside manhole	
798	Area around manhole	

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# Manhole Inspection Field Form



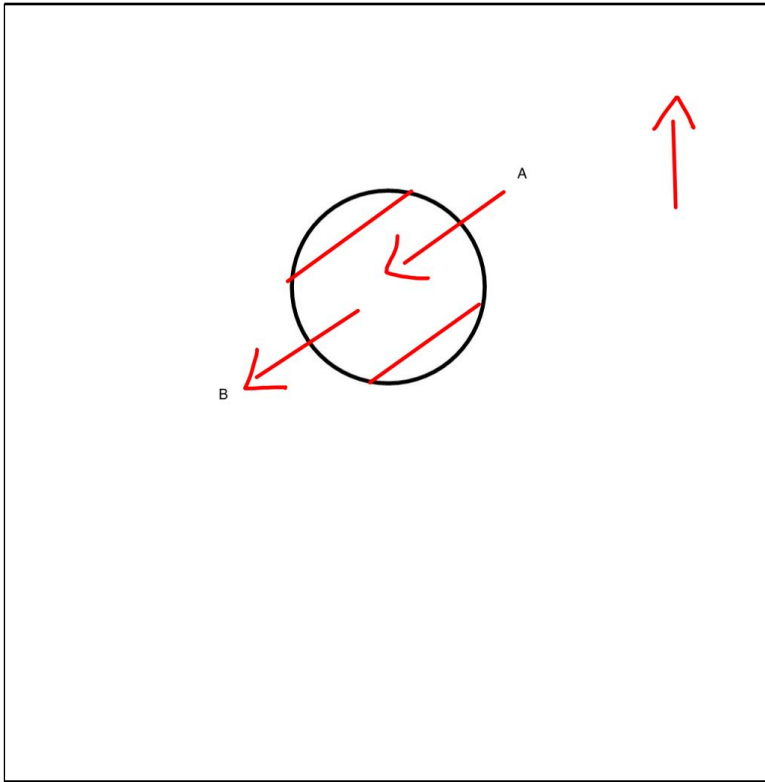
**Manhole ID:** 799  
**Inspector:** CJD  
**Date:** 03/08/2016  
**Weather:** partly cloudy      **Temp:** 49  
**Street:** North Branch Mill River Sewer

**Inspection Type:**     Surface Inspection     Entry  
**GPS Taken?:**     Yes     No     Previously  
**Manhole Marker?**    no

## Manhole

**Manhole Function:**     Sanitary     Combined  
     Stormdrain     Common  
**Cover Size:**     24"     30"     Other  
**Manhole Size:**     4'     5'     Other  
**Depth from rim:** 7.8 ft.  
**Depth to Wet Ring from rim:** \_\_\_\_\_ ft.  
**Drop:**     Yes     No  
**Manhole Material:** brick  
**Location of Manhole:** easement  
**Flow Condition:**    steady  
**General Notes:**

## Schematic:



## Area Around Manhole

**Paved:** \_\_\_\_\_  
**Unpaved:**            satisfactory

Last Modified: 04/09/2025 at 10:39AM EDT

## Pipes

	Pipe Asset ID	Pipe Size (in)	Material	Shape	Invert Depth from Rim (ft.)	Flow Depth from Invert (in.)	Debris Depth from Invert (in.)	Condition of Pipe
A	P2E53	36	Clay Tile (not vitrified clay)	Circular	7.8	12	0	Fair
B	P2E8B	36	Clay Tile (not vitrified clay)	Circular	7.8	12	0	Fair

# Manhole Inspection Field Form

Manhole ID	Comments	Photo
799	Inside manhole	
799	Area around manhole	

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# Manhole Inspection Field Form



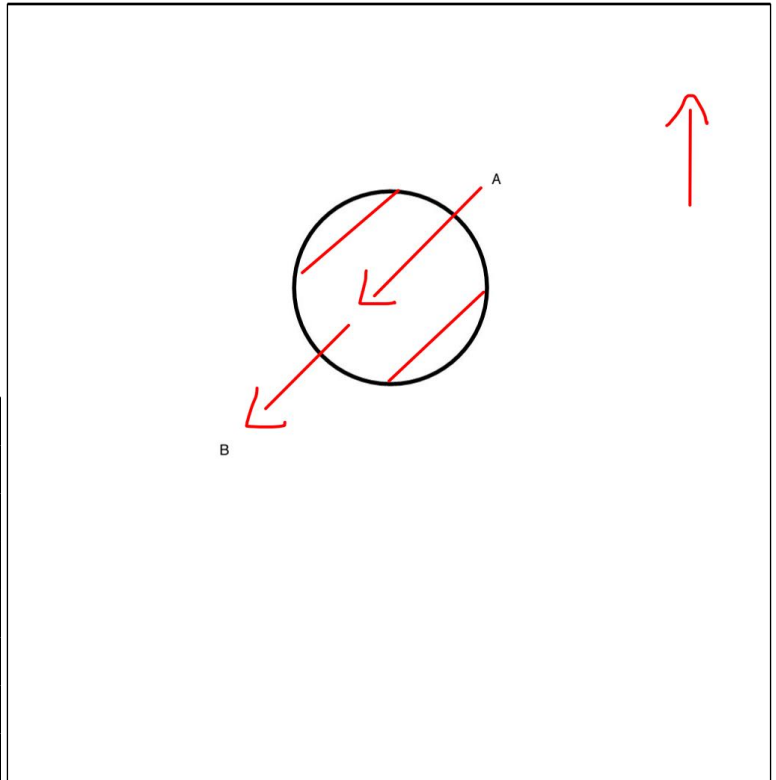
**Manhole ID:** 4349  
**Inspector:** CJD  
**Date:** 03/08/2016  
**Weather:** partly cloudy      **Temp:** 50  
**Street:** North Branch Mill River

**Inspection Type:**     Surface Inspection     Entry  
**GPS Taken?:**     Yes     No     Previously  
**Manhole Marker?**    no

## Manhole

**Manhole Function:**     Sanitary     Combined  
     Stormdrain     Common  
**Cover Size:**     24"     30"     Other  
**Manhole Size:**     4'     5'     Other  
**Depth from rim:** 7.1 ft.  
**Depth to Wet Ring from rim:** \_\_\_\_\_ ft.  
**Drop:**     Yes     No  
**Manhole Material:** brick  
**Location of Manhole:** easement  
**Flow Condition:**    steady  
**General Notes:**

## Schematic:



## Area Around Manhole

**Paved:** \_\_\_\_\_  
**Unpaved:**            satisfactory

## Pipes

	Pipe Asset ID	Pipe Size (in)	Material	Shape	Invert Depth from Rim (ft.)	Flow Depth from Invert (in.)	Debris Depth from Invert (in.)	Condition of Pipe
A	P2E21	36	Clay Tile (not vitrified clay)	Circular	7	12	0	Fair
B	P4874	36	Clay Tile (not vitrified clay)	Circular	7.1	12	0	Fair

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# Manhole Inspection Field Form



Manhole ID	Comments	Photo
4349	Inside manhole	
4349	Area around manhole	

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## SWSC MATERIAL SPECIFICATIONS

# **SPRINGFIELD WATER AND SEWER COMMISSION**



## **MATERIAL SPECIFICATIONS**

**Version 4 – November 1, 2020**

William E. Leonard, Commissioner  
Vanessa Otero, Commissioner  
Daniel Rodriguez, Commissioner



# Springfield Water and Sewer Commission

## Material Specifications

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## Material Specifications

### CHAPTER 1 REVISIONS

1. Version 1 of these Material Specifications was written April 1, 2008.
2. Revisions of these Material Specifications as of June 18, 2008
3. Version 2 of these Material Specifications was written as an Interim version as of October 20, 2017. A final version will be written in 2018
4. Version 3 of these Material Specifications was written after review of the Interim Version 2 and was Finalized July 1, 2020.
5. Version 4 of these Material Specifications was written after review of the Finalized Version 3 and was Finalized November 1, 2020.



# Springfield Water and Sewer Commission

## Material Specifications

### CHAPTER 2 GENERAL PROVISIONS

#### 2.1.1 Reference to Specifications

These specifications may be referred to as the Commission's Specifications.

#### 2.1.2 Severability

The provisions of these Specifications are severable. If any provision of these Specifications or any specific application to any person or circumstance is held invalid, such invalidity shall not affect other provisions or applications which can be given effect in the absence of the invalid provision or application.

#### 2.1.3 Applicable Regulations

Every user of the public water system, private water mains, public sewer system, or private sewer mains shall be subject to regulations of the Commission, as they apply, and to any charges, rates, fees and assessments which are or may be established by the Commission. Any user of the public water system, private water mains, public sewer system, or private sewer mains shall also be subject to applicable Local, State, and Federal regulations.

#### 2.1.4 Reference Standards

Where reference is made to one of the below standards, the revision in effect at the time of bid opening shall apply.

1. American Concrete Institute (ACI)
2. American Iron and Steel Institute (AISI)
3. American National Standards Institute (ANSI)
4. American Society of Testing and Materials (ASTM)
5. American Water Works Association (AWWA)
6. American Welding Society (AWS)
7. Ductile iron Pipe Research Association (DIPRA)
8. Manufacturing Standardization Society of the Valve and Fittings (MSS)
9. National Fire Protection Association (NFTA)
10. NSF International (NSF)



# Springfield Water and Sewer Commission

## Material Specifications

### CHAPTER 3 WATER MAINS AND APPURTANANCES,

#### Section 3.1 WATER PIPE – DUCTILE IRON

##### 3.1.1 General

1. Ductile Iron Pipe provided to the Springfield Water and Sewer Commission (Commission) or installer shall be manufactured, tested, inspected and delivered in full compliance with this Material Specification.
2. Ductile Iron Pipe shall be designed and manufactured in accordance with the most current ANSI A21.50/AWWA C-150 and ANSI A21.51/AWWA C-151, the latest revision and all addenda thereto.
3. Ductile Iron Pipe shall be NSF 61 certified.
4. The product(s) shall have all parts cast and assembled in North America or meet the requirements with the American Iron & Steel (AIS), as follows;
  - (a) North America shall mean the United States, Canada, and Mexico,
  - (b) Cast shall mean molten metals poured into a mold to create Casting(s) for a finished product,
  - (c) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and
  - (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or
  - (e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.
5. Inspection:
  - (a) All finished product(s) furnished shall be subject to inspection by the Commission at the place of manufacture and shall be subject to inspection after delivery to the Commission.
  - (b) Cost of re-inspection of materials or fabricated finished product(s) caused by the non-compliance of the manufacturer with the provisions of the specifications, shall be paid for by the manufacturer, and shall be deductible from the price paid for the finished product.





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## Material Specifications

### 3.1.2 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.
2. The manufacturer/vendor shall furnish three (3) sets of 24-inch by 36-inch certified shop drawings for all products to be used. All finished product(s) shall be provided in accordance to these drawings. The drawings shall show the following:
  - (a) Cross sectional drawings of the finished product(s) showing overall dimensions,
  - (b) Material specifications for each component of the finished product(s),
  - (c) Coating applied to each component of the finished product(s), if applicable,
  - (d) Weight of each component and total weight for each finished product(s), and
  - (e) Country of origin for each component.
3. If applicable and/or in addition, the manufacturer/vendor shall furnish three (3) sets of coating specification(s) of each component that has a coating applied identifying type of coating, color of coating, manufacturer of coating, part number of the coating, and a sample on a 3-inch by 5-inch chip.
4. Certification of where product(s) is made:
  - (a) If the product(s) is made in North America the manufacturer shall furnish a letter certifying the product is made in North America and signed by the Owner or President of the Company.
  - (b) If the product(s) meet the requirements of AIS the manufacturer shall furnish a letter certifying the product meets all the requirements of the AIS, an explanation, in the letter, of how the products meets the AIS requirements, and signed by the Owner or President of the Company.
5. The manufacturer/vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the product(s) and all materials in its construction exactly conform to the applicable requirements of these Material Specifications and the applicable AWWA Standard(s).
6. The manufacturer/vendor shall furnish a certified statement that all finished product(s) of the same make and model bid, regardless of the year of manufactured, shall have interchangeable component parts and that the parts availability and delivery shall remain firm for ten (10) years.



# Springfield Water and Sewer Commission

## Material Specifications

7. The manufacturer/vendor shall furnish a warranty for the product(s) that states that the product(s) shall be free from all defects in material and workmanship under normal use of the product for a minimum ten (10) year time period from time of delivery. The manufacturer shall replace and/or repair defective parts or the product(s) for a minimum ten (10) year time period from time of delivery.
8. The manufacturer/vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:
  - (a) Name of Municipality/Utility
  - (b) Total amount of product bid on and amount delivered
  - (c) Date the bid was accepted and date the product was delivered
  - (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product
9. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification “Approved”, “Approved as Noted”, or “Rejected-Resubmit” and return to the manufacturer and/or vendor.
  - (a) Approved means the contractor can supply the material as shown on the drawing(s).
  - (b) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.
  - (c) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

### 3.1.3 Ductile Iron Push-on Joint Water Pipe

1. Cement Lining
  - (a) All pipe shall be double cement lined with an approved mortar lining and sealed with an approved asphaltic material seal coat in accordance with ANSI A21.4/AWWA C-104 of the latest revision.
  - (b) Provisions of AWWA C-104, Section 4.11 relating to characteristics of asphaltic seal coat as to deleterious effect upon the quality, color, taste or odor imparted to potable water shall be strictly observed.



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## Material Specifications

### 2. Exterior Coating

- (a) All pipe shall have a base layer of arc-applied, 99.99% pure zinc coating, having a mass of 200g/m<sup>2</sup> and shall comply with all applicable parts of ISO 8179 for zinc coatings.
- (b) All pipe shall have a finish layer of shop-applied bituminous paint in accordance with AWWA C-151 latest the revision and shall comply with all applicable parts of ISO 8179 for zinc coatings.

### 3. Length

The maximum length shall be twenty (20) feet.

### 4. Joints

- (a) Pipe to have push-on type joints conforming to ANSI A21.11/AWWA C-111.
- (b) Standard Styrene Butadiene Rubber (SBR) gasket shall be provided complete with lubricant. For special conditions that require gaskets other than the standard SBR gasket see the Material Specification for Special Gaskets.
- (c) Gaskets and lubricant shall be standard for the pipe used and approved by Springfield Water and Sewer Commission. Rubber gaskets and lubricant for the joints shall be shipped in bags.
- (d) The Springfield Water and Sewer Commission may require, under certain terrain conditions that restrained joints be used. The method of restraining may either, be of an locking gasket type joint, interlocking type joint, or mechanical joint restraint, as specified in Section 3.16 of these Specifications and as required by the Springfield Water and Sewer Commission.

### 5. Roundness

- (a) Pipe to be field cut shall be gauged full length, a mechanical joint gland shall fit over the full length of a gauged pipe.
- (b) 10% of each pipe size of each delivery shall be gauged the full length and clearly marked as gauged pipe.

### 6. Wedges

Three (3) serrated bronze wedges shall be provided for each length of pipe ordered.

### 7. Markings



# Springfield Water and Sewer Commission

## Material Specifications

- (a) The pressure rating, metal thickness class, net weight of pipe without lining, length of pipe, date of manufacture and the name of the manufacturer shall be clearly marked on each length of pipe.
- (b) Pipe to be field cut and gauged full length shall be specially marked with green ends or other marking approved by the Commission.
- (c) Pipe markings shall include the word “Zinc” in the pipe markings or label required by AWWA C-151 and/or other markings as deemed appropriate by the manufacturer.

### 8. Pipe Class

- (a) All pipe delivered shall be a minimum Thickness Class 52, unless otherwise approved by the Commission’s E&TS.
- (b) The Metal Thickness and Pressure Class of Ductile Iron Pipe Table below is being provided as a reference. The rated water working pressure based on AWWA C-151 standard laying condition: Type #2. Metal Thickness Class shall be as shown in following table:

Size	Thickness Class	Metal Thickness	Pressure Class	Metal Thickness
4	52	0.29	350	0.25
6	52	0.31	350	0.25
8	52	0.33	350	0.25
10	52	0.35	350	0.26
12	52	0.37	350	0.28
16	52	0.4	350	0.34
20	52	0.42	300	0.36
24	52	0.44	300	0.4
30	52	0.47	250	0.42
36	52	0.53	200	0.42
42	52	0.59	200	0.47
48	52	0.65	200	0.52
54	52	0.73	200	0.58

Note: all dimensions are in inches

### 9. Inspection

The Commission reserves the right to retain an outside inspection laboratory to inspect pipe at manufacturer's foundry, inspection costs to be paid by the Commission.



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## Material Specifications

### 3.1.4 Delivery(s)

1. Delivery shall be specified in terms of number of days from receipt of order.
2. Delivery shall be made by truck to locations designated in the Commission's service area in which include Ludlow, Springfield, Agawam, Westfield, Granville, and Blandford, all in Massachusetts.
3. When applicable, the low bidder shall notify the Commission of the quantity comprising a minimum truckload.
4. When applicable, the Commission reserves the right to mix product size to reach a full truckload.
5. The manufacturer/vendor and/or shipper must use care in preparing the product(s) for shipment and in handling during shipment and delivery, to insure that the product(s) are delivered without damage. Particular attention must be directed at protecting the product(s) from damage. Damaged product(s) will not be accepted and returned to manufacturer/vendor at the manufacturer/vendor's cost.
6. The manufacturer/vendor, on request, shall provide the Commission or Installer with an affidavit for each and every delivery of an order, stating that the product(s) and all materials in its construction exactly conform to the applicable requirements of these Material Specifications and the applicable AWWA Standard(s).

### 3.1.5 Flanged Ductile Iron Pipe

1. Flanged Ductile Iron-Pipe shall, as a minimum, shall meet all specifications in of Paragraphs 3.1.1, 3.1.2, 3.1.3, and 3.1.4 except the joints and gaskets shall be as follows:
2. Flanged Ductile Iron Pipe and Fittings provided to the Commission or installer shall be manufactured, tested, inspected and delivered in full compliance with this Specification.
3. Flanged Pipe shall be bid without accessories (gaskets and bolts).
  - Accessories shall be as specified in Section 3.16 of these Material Specifications.
4. Flanged Ductile Iron-Pipe, as a minimum, shall conform to the most current ANSI A21.15/AWWA C-115 and all addenda thereto.
5. All Flanged Pipe delivered shall be a minimum Thickness Class 53, unless otherwise approved by the Commission's E&TS.

3.22

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# Springfield Water and Sewer Commission

## Material Specifications

6. Flanged Ductile Iron-Pipe shall have the bolt circle and bolt holes conform to dimensions and drilling of ANSI B16.1, Class 125 or ANSI A21.15/AWWA C-115.
7. All flanges installed on ductile iron pipe for mechanical applications shall be constructed of ASTM A536, Grade 65-45-12 ductile iron. Gray cast iron flanges shall not be allowed.
8. Flanges shall be rated for a working pressure of not less than 250-PSI.
9. Class 125 drilled flanges shall be flat-faced and have the following properties:
  - (a) Tensile Strength 70,000-psi
  - (b) Yield Stress 50,000-psi.
  - (c) Percent Elongation 5.0
  - (d) Max. Working Pressure Pipe 3-in to 18-in dia.: 350-psi
  - (e) Max. Working Pressure Pipe 24-in to 64-in dia.: 250-ps

### 3.1.6 Pipe Manufactures Makes and Models Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. U. S. Pipe and Foundry Co. – Tyton Joint,
2. American Ductile Iron Pipe Co. – Fastite Joint,
3. Atlantic States Pipe (McWayne, Inc.) – Tyton up to 24-inch and Fastite greater than 24-inch (gaskets are not interchangeable with US Pipe or American Pipe),
4. or the Approved equal product of another manufacture provided the product(s) are manufactured as per these Material Specifications.



# Springfield Water and Sewer Commission

## Material Specifications

### Section 3.2 Special Gaskets

1. Gaskets to be used when Volatile Organic Compounds (VOC), such as hydrocarbons, acids, vegetable oils, and petroleum products are present, shall be as follows:
  - (a) Gaskets shall be VITON® - VITON® is the registered trade name for the fluoroelastomer (FKM) manufactured by DuPont. However, it is commonly used as the generic term for all FKM elastomers.
  - (b) FKM gaskets shall be resistant to hydrocarbons, acids, vegetable oils, and petroleum products.
  - (c) FKM gaskets shall provide permeation resistance to low molecular weight petroleum products and/or other VOC contaminants.



# Springfield Water and Sewer Commission

## Material Specifications

### Section 3.3 INSULATED PIPE AND INSULATION SYSTEMS

#### 3.3.1 Pre-Insulated Ductile Iron Pipe

1. All Push-on Joint Insulated ductile iron water pipe as a minimum, shall meet all specifications in of Paragraphs 3.1.1, 3.1.2, 3.1.4, 3.1.4 and the following additional requirements.
2. The insulating system shall consist of 2-inch rigid foam insulation in a waterproof protective outer jacket or protective outer jacket, both to be applied at the factory.
3. Insulation shall consist of 2-inches of rigid polyurethane foam in accordance with the following:
4. The density shall be 2.2 to 3.0 lbs/ft<sup>3</sup> (35 to 48 kg/m<sup>3</sup>) in accordance with ASTM D1622,
5. The water absorption shall be 4% by volume in accordance with ASTM D2842,
6. The closed cell content shall be 90% minimum in accordance with ASTM D2856,
7. The system compressive strength shall be 60 to 80 lbs/in<sup>2</sup> (414 to 552 kPa) in accordance with modified ASTM D1621,
8. The thermal conductivity shall have a K value of 0.14 to 0.17 Btu-in/hr-ft<sup>2</sup>-°F (0.020 to 0.026 W/m-°C), and
9. The service range shall be -49° F to 185° F (-45° C to 85° C).
10. The water proof protective outer jacket shall for below grade installations shall be UV inhibited polyethylene and in accordance with the following, unless otherwise approved by the Commission's E&TS:
11. The sealant shall be butyl rubber and resin,
12. The minimum service temperature shall be -49° F (-45° C),
13. The minimum installation temperature shall be -30° F (-34° C),
14. The minimum thickness shall be 50 mils (1.27mm), and
15. The tensile strength shall be 38 lbs/inch-wide (6.8 kg/cm-wide) in accordance with ASTM D1000).





# Springfield Water and Sewer Commission

## Material Specifications

16. The protective outer jacket shall for above grade installations shall be galvanized steel lock seam (Spiwrap® is the registered trade name) and in accordance with the following, unless otherwise approved by the Commission's E&TS:
17. The protective outer jacket shall be factory installed, and
18. The wall thickness shall be 18-gauge, 0.051-inch (1.3mm) thick.
19. Bell and spigot joints shall be sealed using a single turn of 6-inch (150mm) wide butyl mastic tape or heat shrink wrap/closure seal.
20. Insulation kits for the mechanical joints shall be supplied and shall be pre-fabricated urethane half shells with fully bonded polymer protective coating on all exterior surfaces, including the ends and pre-rolled, form fitting, outer cover metal sheet of the same material and gauge as the pipe jacket. Kits shall be supplied silicone caulking for the seams, stainless steel attachment strips, clips, and heat shrink sleeves to seal between pipe and kits.
21. The pipe shall be insulated as shown on the drawings.

### 3.3.2 Insulated Pipe Manufactures Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. Urecon Pre-Insulated Pipe,
2. Perma Pipe,
3. Tricon,
4. or the Approved equal product of another manufacture provided the product(s) are manufactured as per these Material Specifications.



# Springfield Water and Sewer Commission

## Material Specifications

### Section 3.4 Field Applied Insulation Systems

#### 3.4.1 General

1. Field Applied Insulation Systems provided to the Springfield Water and Sewer Commission (Commission) or installer shall be manufactured, tested, inspected and delivered in full compliance with this Material Specification.
2. ***Insert Product Name*** shall be designed and manufactured in accordance with the most current ANSI \_\_\_\_/AWWA C-\_\_ and ANSI A\_\_\_\_/AWWA C-\_\_, the latest revision and all addenda thereto.
3. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;
  - (d) North America shall mean the United States, Canada, and Mexico,
  - (e) Cast shall mean molten metals poured into a mold to create Casting(s) for a finished product,
  - (f) Incidental parts may be purchased/obtained from other countries to provide a finished product, in accordance with these Material Specifications, and
  - (g) Assembled shall mean castings and sourced parts are put together to build a finished product, or
  - (h) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.
4. Inspection:
  - (a) All finished product(s) furnished shall be subject to inspection by the Commission at the place of manufacture and shall be subject to inspection after delivery to the Commission.
  - (b) Cost of re-inspection of product(s) or fabricated finished product(s) caused by the non-compliance of the manufacturer with the provisions of these Material Specifications or applicable standard, shall be paid for by the manufacturer, and shall be deductible from the price paid for the finished product(s).
5. All fasteners, excluding joint accessories, shall be made of Grade 304 stainless steel. Bolts shall meet ASTM A193 grade B8, latest revision. Nuts shall be in accordance with ASTM A194 grade 8, latest revision. Bolts and nuts shall be Unified National Coarse (UNC) rolled thread and heavy-duty hex nuts. Bolts



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installed into castings shall be provided with one (1) Grade 304 stainless steel flat washer and nuts and bolts shall be provided with two (2) Grade 304 stainless steel flat washers so that the epoxy coating is not damaged. At a minimum, nuts shall be coated with fluorocarbon, epoxy, zinc, or other anti-corrosion coating to help prevent galling.

6. To prevent galling; all stainless steel bolts shall be coated on the outside of all threads and the stainless steel nuts or castings on the inside of all threads at the factory, with an anti-seizing material such as provided by Henkel Technologies, Rocky Hill, Connecticut - product name: Loctite Nickel Anti-Seize Lubricant; Chesterton Technical Products, Stoneham, Massachusetts – product name: Chesterton 772 Premium Nickel Anti-Seize Compound; Permatex Inc. Hartford, Connecticut – product name: Permatex Nickel Anti-Seize Lubricant or equal product of another manufacturer and as specified in Section 3.18 of these Specifications.
7. Field Applied Insulation Systems for less than 4-feet of cover, above grade, or across bridge span(s) is typically a four part system that includes the insulation sections, an insulation jacket, the seals, and/or bands.
8. Insulation jackets for above grade installations shall be aluminum, unless otherwise specified by the Commission.
9. Insulation jackets for below grade installations shall be a self-adhesive composite rubber modified asphalt with cross laminated polyethylene, known as cold insulation wrap (CI Wrap), unless otherwise specified by the Commission.
10. The above shall be supplied as follows, unless otherwise approved by the Commission's E&TS:

### 3.4.2 Insulation Sections

1. The insulating sections for above grade and below grade installations shall consist of 2-inch rigid foam insulation in a waterproof protective outer jacket or protective outer jacket, both to be applied at the factory.
2. Insulation shall consist of 2-inches of rigid polyurethane foam in accordance with the following:
  - (a) The density shall be a minimum of 1.9 lbs/ft<sup>3</sup> in accordance with ASTM D1622,
  - (b) The water absorption shall be less than 1% by volume in accordance with ASTM C272,



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- (c) The closed cell content shall be 90% minimum in accordance with ASTM D6226,
  - (d) The system compressive strength shall be 25 to 30 lbs/in<sup>2</sup> in accordance with modified ASTM D1621,
  - (e) The thermal conductivity shall have a K value of 0.14 to 0.17 Btu-in/hr-ft<sup>2</sup>-°F in accordance with ASTM C518, and
  - (f) The service range shall be -49° F to 185° F.
3. The insulation sections shall be fabricated in half-section of 3-foot lengths. The half-sections shall fit tightly over the pipe to be insulated, except for the joint locations and the fittings where an oversized cover is made to allow for any bell joint or hardware.

### 3.4.3 Jacketing for Above Grade Installations

- 1. Insulation jackets for above grade installations shall be 0.020-inch thick aluminum with an internal moisture barrier. The aluminum shall be from alloys 3105 or 3003.
- 2. The internal moisture barrier shall be 3-mil polyethylene heat laminated to the inside of the metal jacket sections.
- 3. The aluminum jackets shall be delivered in half sections and in \_\_-inch lengths.

### 3.4.4 Straps Above Grade Installations

- 1. Straps for above grade installations shall be soft annealed, 3/4-inch wide, 0.020-thick, 304 stainless steel.

### 3.4.5 Jacketing for Below Grade Installations

- 1. Insulation jackets for below grade installations shall be a self-adhesive composite rubber modified asphalt with cross laminated polyethylene, known as cold insulation wrap (CI Wrap).
- 2. The CI Wrap shall be 50-mil thick.
- 3. The aluminum jackets shall be delivered in standard roll sizes of 4-inch by 75-foot for the seams, fittings, and repairs and 36-inch by 75-foot for the insulation sections.

### 3.4.6 Field Applied Insulation Manufactures Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the



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component(s) shall result in the product no longer being approved and removed from this list.

1. ITW Insulation Systems,
2. Foster Products,
3. Tricon Piping Systems, or
4. Equal provided the product(s) are manufactured as per these specifications.



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### Section 3.5 POLYETHYLENE ENCASUREMENT

#### 3.5.1 General

1. Polyethylene Encasement (PE) provided to the Springfield Water and Sewer Commission (Commission) or installer shall be manufactured, tested, inspected and delivered in full compliance with this Specification.
2. PE as a minimum shall conform to the most current American Water Works Association Standard C-105 and all addenda thereto.
3. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;
  - (a) North America shall mean the United States, Canada, and Mexico,
  - (b) Produced shall mean molten polyethylene(s) formed into a sheet to create a finished product,
  - (c) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and
  - (d) Manufactured shall mean sheets and sourced parts are put together to build a finished product, or
  - (e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.
4. Inspection:
  - (a) All finished product(s) furnished shall be subject to inspection by the Commission at the place of manufacture and shall be subject to inspection after delivery to the Commission.
  - (b) Cost of re-inspection of materials or fabricated finished product(s) caused by the non-compliance of the manufacturer with the provisions of the specifications, shall be paid for by the manufacturer, and shall be deductible from the price paid for the finished product(s).
5. Delivery shall be made by truck in minimum truckload quantity to locations designated in the Commission's service area in and near Springfield, Massachusetts. The low bidder shall notify the Commission of the quantity comprising a minimum truckload.



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6. The manufacturer/vendor/shipper must use care in preparing finished product(s) for shipment and in handling during shipment and delivery, to insure that the finished(s) are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged finished products and/or protective coatings will not be accepted.

### 3.5.2 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.
2. The manufacturer and/or vendor shall furnish three (3) sets of 24-inch by 36-inch certified shop drawings for all materials to be used. All components shall be provided in accordance to these drawings. The drawings shall show the following:
  - (a) Cross sectional drawings of the gate valve showing overall dimensions,
  - (b) Material specifications for each component,
  - (c) Coating applied to each component, if applicable,
  - (d) Weight of each component and total weight, and
  - (e) Country of origin for each component.
3. The manufacturer and/or vendor shall furnish three (3) sets of specification(s) of each component that has the product applied identifying component surface preparation, primer (if applicable), type of component(s), color of component(s), manufacturer of component(s), part number of the component(s), and a sample on a 3-inch by 5-inch chip, if applicable.
4. The manufacturer and/or vendor shall furnish a letter certifying the product meets all the requirements of the AISAIS, an explanation, in the letter, of how the products meets the AISAIS requirements, and signed by the Owner or President of the Company.
5. The manufacturer and/or vendor shall furnish one (1) complete catalogue or manual for parts, repair, and maintenance.
6. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the finished product(s) and all materials in its construction exactly conform to the applicable requirements of these specifications and the applicable AWWA Standards.
7. The manufacturer and/or vendor shall furnish a certified statement that all gate valves of the same make and model bid, regardless of the year of manufactured,



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shall have interchangeable component parts and that the parts availability and delivery shall remain firm for ten (10) years.

8. The manufacturer and/or vendor shall furnish a warranty for the gate valves that states that the gate valves shall be free from all defects in material and workmanship under normal use of the product for a minimum ten (10) year time period from time of delivery. The manufacturer shall replace and/or repair defective parts or the whole gate valve for a minimum ten (10) year time period from time of delivery.
9. The manufacturer and/or vendor shall furnish certified results of a proof of design test performed at an independent testing laboratory. Testing shall include a shell test and seat test to demonstrate the valve body and seat will hold pressure as required.
10. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:
  - (a) Name of Municipality/Utility
  - (b) Total amount of product bid on and amount delivered
  - (c) Date the bid was accepted and date the product was delivered
  - (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product
11. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification “Approved”, “Approved as Noted”, or “Rejected-Resubmit” and return to the manufacturer and/or vendor.
  - (a) Approved means the contractor can supply the material as shown on the drawing(s).
  - (a) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.
  - (b) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

### 3.5.3 Polyethylene Encasement

1. Polyethylene Encasement shall be V-Bio Polyethylene Encasement in full compliance with this Material Specification.





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2. V-Bio Polyethylene Encasement (PE) shall consist of three layers of co-extruded linear low density polyethylene (LLDPE), fused into a single thickness of not less than eight mils in accordance with ANSI/AWWA C105/A21.5, ASTM D4976, and the following.
3. The inside surface of the V-Bio PE wrap to be in contact with the pipe exterior shall be infused with a blend of antimicrobial compound to mitigate microbiologically influenced corrosion and a volatile corrosion inhibitor to control galvanic corrosion.
4. V-Bio PE shall be provided in tubes for water mains, bends, offsets, reducers, and other pipe shaped appurtenances, unless otherwise approved by the Commission.
5. V-BioPE shall be provided in sheets for valves, tees, crosses, and other odd shaped appurtenances, unless otherwise approved by the Commission.
6. Physical properties of finished PE film shall be:
  - (a) Tensile strength 3,600 psi \*
  - (b) Elongation 800 percent \*
  - (c) Dielectric strength 800 V/mil thickness minimum
  - (d) Impact Resistance 600 g minimum
  - (e) Propagation Tear Resistance 2,550 grams force minimum \*

\*Minimum in machine and transverse direction
7. V-Bio PE tubing and sheets shall be provided with a bright white exterior and a bright yellow interior and shall be clearly marked every two feet along its length with the following information in one-inch high letters:
  - (a) Manufacturer's name or trademark
  - (b) Year of Manufacture
  - (c) ANSI/AWWA C105/A21.5
  - (d) Minimum film thickness and material type
  - (e) Applicable range of nominal pipe diameter size(s)
  - (f) Warning – Corrosion Protection – Repair any damage



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8. Tubes and sheets shall be provided in the following minimum sizes for the appropriate pipe sizes, unless otherwise approved by the Commission:

Polyethylene Tube and Sheet Sizes for Ductile Iron Pipe															
Pipe Diameter in inches	4	6	8	10	12	16	20	24	30	36	42	48	54	60	64
Flat Tube in inches	14	16	20	24	27	34	41	54	67	81	81	95	108	108	121
Sheet in inches	28	32	40	48	54	68	82	108	134	162	162	190	216	216	242
Rolls of 100-foot tape per 1000-feet	3	3	3	4	4	6	7	8	10	15	15	17	20	20	21

9. V-Bio PE tubing shall be supplied in the following minimum lengths, unless otherwise approved by the Commission:
- (a) Up to 16-inch diameter pipe – 300-feet long
  - (b) 24-inch to 30-inch diameter pipe – 220-feet long
  - (c) 30-inch to 64-inch diameter pipe – 110-feet long
10. V-Bio PE tubing shall be provided with perforations every 22-feet, unless otherwise approved by the Commission.

### 3.5.4 Adhesive Tape for Polyethylene Encasement

1. Adhesive tape shall be a minimum of 2-inches wide.
2. Adhesive tape shall be an anticorrosion material made of PE or polyvinyl chloride (PVC) that is 10-mil thick. Duct tape is not allowed.
3. PE or PVC adhesive tape shall have heat a laminated adhesive layer of butyl glue.
4. PE or PVC adhesive tape shall be supplied in the approximate quantities defined in the chart above.



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### 3.5.5 Polyethylene Encasement Manufactures Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. REPCOR Inc.,
2. T. Christy Enterprises, Inc. (Christy's),
3. Trumbull Industries, or
4. Equal provided the product(s) are manufactured as per these specifications.



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### Section 3.6 GATE VALVES

#### 3.6.1 General

1. Gate Valves provided to the Springfield Water and Sewer Commission (Commission) or installer shall be manufactured, tested, inspected and delivered in full compliance with this Specification.
2. Gate Valves as a minimum shall conform to the most current American Water Works Association Standard C-509 (full wall) or C-515 (reduced wall) and all addenda thereto.
3. Gate Valve bodies shall be of high strength ductile iron ASTM A-536 grade 65-45-12.
4. Gate Valves maximum working pressure shall be 250-PSI static pressure.
  - (a) Gate Valves shall be shell tested at 500-PSI minimum with the gate in the open position.
  - (b) Gate Valves shall be seat tested at 250-PSI minimum with the gate in the closed position on each side of the seat.
5. Gate Valves shall be bid without accessories (glands, gland gaskets and bolts).
  - Accessories shall be as specified in Section 3.16 of these Material Specifications.
6. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;
  - (a) North America shall mean the United States, Canada, and Mexico,
  - (b) Cast shall mean molten metal(s) poured into a mold to create Casting(s) for a finished product,
  - (c) Incidental parts may be purchased/obtained from other countries to provide a finished product , in accordance with these Material Specifications, and
  - (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or
  - (e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.



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7. Inspection:
  - (a) All finished product(s) furnished shall be subject to inspection by the Commission at the place of manufacture and shall be subject to inspection after delivery to the Commission.
  - (b) Cost of re-inspection of materials or fabricated finished product(s) caused by the non-compliance of the manufacturer with the provisions of the specifications, shall be paid for by the manufacturer, and shall be deductible from the price paid for the finished product(s).
8. Delivery shall be made by truck in minimum truckload quantity to locations designated in the Commission's service area in and near Springfield, Massachusetts. The low bidder shall notify the Commission of the quantity comprising a minimum truckload.
9. The manufacturer/vendor/shipper must use care in preparing finished product(s) for shipment and in handling during shipment and delivery, to insure that the finished(s) are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged finished products and/or protective coatings will not be accepted.
10. Valves shall be bid without accessories (glands, gland gaskets and bolts).
11. Accessories shall be as specified in Section 3.16 of these Material Specifications.

### 3.6.2 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.
2. The manufacturer and/or vendor shall furnish three (3) sets of 24-inch by 36-inch certified shop drawings for all materials to be used. All components shall be provided in accordance to these drawings. The drawings shall show the following:
  - (a) Cross sectional drawings of the gate valve showing overall dimensions,
  - (b) Material specifications for each component,
  - (c) Coating applied to each component, if applicable,
  - (d) Weight of each component and total weight, and
  - (e) Country of origin for each component.



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3. The manufacturer and/or vendor shall furnish three (3) sets of coating specification(s) of each component that has a coating applied identifying component surface preparation, primer (if applicable), type of coating(s), color of coating(s), manufacturer of coating(s), part number of the coating(s), and a sample on a 3-inch by 5-inch chip.
4. The manufacturer and/or vendor shall furnish a letter certifying the product meets all the requirements of the AISAIS, an explanation, in the letter, of how the products meets the AISAIS requirements, and signed by the Owner or President of the Company.
5. The manufacturer and/or vendor shall furnish one (1) complete catalogue or manual for parts, repair, and maintenance.
6. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the finished product(s) and all materials in its construction exactly conform to the applicable requirements of these specifications and the applicable AWWA Standards.
7. The manufacturer and/or vendor shall furnish a certified statement that all gate valves of the same make and model bid, regardless of the year of manufactured, shall have interchangeable component parts and that the parts availability and delivery shall remain firm for ten (10) years.
8. The manufacturer and/or vendor shall furnish a warranty for the gate valves that states that the gate valves shall be free from all defects in material and workmanship under normal use of the product for a minimum ten (10) year time period from time of delivery. The manufacturer shall replace and/or repair defective parts or the whole gate valve for a minimum ten (10) year time period from time of delivery.
9. The manufacturer and/or vendor shall furnish certified results of a proof of design test performed at an independent testing laboratory. Testing shall include a shell test and seat test to demonstrate the valve body and seat will hold pressure as required.
10. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:
  - (a) Name of Municipality/Utility
  - (b) Total amount of product bid on and amount delivered
  - (c) Date the bid was accepted and date the product was delivered



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- (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product
11. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification “Approved”, “Approved as Noted”, or “Rejected-Resubmit” and return to the manufacturer and/or vendor.
- (a) Approved means the contractor can supply the material as shown on the drawing(s).
- (b) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.
- (c) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

### 3.6.3 Class 250B - Resilient Seated 4” - 16” Gate Valves and Tapping Valves

1. The valve body and bonnet shall be coated on all exterior and interior surfaces with fusion bonded epoxy conforming to the requirements of AWWA C-550 (most current revision) for Protective Epoxy Interior Coatings for Valves and Hydrants.
2. The valve body markings shall include the manufacturers name or mark, pressure rating, material (D.I.), and year of manufacture and be cast into the body.
3. Valves ordered under this specification will be within the following size schedules 4-inch, 6-inch, 8-inch, 10-inch, 12-inch, and 16-inch.
4. Valves to be provided with a minimum of two (2) O-ring stem seals.
5. Valves shall be of the non-rising stem (NRS) design.
6. Valves shall be wrench-nut operated with a 2-inch square-operating nut made of ductile iron and **right hand** to open.
7. Valves ordered under this Specification shall be provided with valve ends selected from the following:
  - (a) Mechanical joint both ends
    - Mechanical joint bell dimensions shall conform to ANSI A21.11/AWWA C-111.
  - (b) Flanged both ends



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- The end flanges of flanged valves shall conform to dimensions and drilling of ANSI B16.1, Class 125 or ANSI A21.10/AWWA C-110.

### (c) Mechanical joint X flanged

- Mechanical joint bell dimensions shall conform to ANSI A21.11/AWWA C-111.
- The end flanges of flanged valves shall conform to dimensions and drilling of ANSI B16.1, Class 125 or ANSI A21.10/AWWA C-110.

### (d) Mechanical joint X tapping valve flange

- Mechanical joint bell dimensions shall conform to ANSI A21.11/AWWA C-111.
- Tapping valve flanges that form the joint with the tapping sleeve shall conform to the dimensions MSS SP-60 in sizes 4" through 12". The connecting MJ bell of the tapping valve mating with the tapping machine must be parallel and concentric with the opposite flange and concentric with the waterway to provide proper alignment for the tapping operation. This flange shall conform to the dimensions of MSS SP-113. Tapping valves provided must be manufactured to be used with the Mueller CL-12 Drilling Machine with the following shell cutter diameters 3 ½", 5 ½", 7 ½", 9 ½", and 11 ½".

8. The resilient-seat wedge shall be constructed of cast iron or ductile iron and fully encapsulated in a rubber compound for water service, constructed of STYRENE BUTADIENE RUBBER (SBR) rubber, and must meet or exceed ASTM D-2000 3 BA 715. No bare metal shall be left exposed. Wedge rubber shall be molded in place and banded tightly to the cast iron or ductile iron core and shall not be mechanically attached with screws, rivets, or similar fasteners. The wedge shall be symmetrical and seat equally well with flow in either direction.
9. The resilient-seat shall be made of an elastomer compound that complies with Section 4.2.2.7 of AWWA Standard C-515, (most current revision).
10. All fasteners, excluding joint accessories, shall be made of Grade 304 stainless steel. Bolts shall meet ASTM A193 grade B8, latest revision. Nuts shall be in accordance with ASTM A194 grade 8, latest revision. Bolts and nuts shall be Unified National Coarse (UNC) rolled thread and heavy-duty hex nuts. Bolts installed into castings shall be provided with one (1) Grade 304 stainless steel flat washer and nuts and bolts shall be provided with two (2) Grade 304 stainless steel flat washers so that the epoxy coating is not damaged. At a minimum, nuts shall be coated with fluorocarbon, epoxy, zinc, or other anti-corrosion coating to help prevent galling.





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11. To prevent galling; all stainless steel bolts shall be coated on the outside of all threads and the stainless steel nuts or castings on the inside of all threads at the factory, with an anti-seizing material such as provided by Henkel Technologies, Rocky Hill, Connecticut - product name: Loctite Nickel Anti-Seize Lubricant; Chesterton Technical Products, Stoneham, Massachusetts – product name: Chesterton 772 Premium Nickel Anti-Seize Compound; Permatex Inc. Hartford, Connecticut – product name: Permatex Nickel Anti-Seize Lubricant or equal product of another manufacturer and as specified in Section 3.18 of these Specifications.
12. Valve stems and stem nuts shall be made of a copper alloy or stainless steel and the minimum yield strength shall be 40,000-PSI.

### 3.6.4 Class 250B - Outside-Screw-And-Yoke (OS & Y) Rising Stem

1. In addition to Paragraphs 3.6.1, 3.6.2, and 3.6.3 OS&Y valves shall meet the following requirements:
2. Valves ordered under this specification will be within the following size schedules: 3-inch, 4-inch, 6-inch, 8-inch, 10-inch and 12-inch.
3. OS&Y gate valves shall be **LEFT HAND TO OPEN**.
4. Valves shall be of the outside screw-and-yoke (OS&Y) rising stem design. Design shall be such that the stuffing box can be packed when the valve is in the fully open position and under pressure.
5. OS&Y valves shall be operated by hand wheels sized in accordance with Table 5, C-509. Hand wheel shall be of the spoke-type only. An arrow showing the direction to turn the hand wheel to open the valve, with the word “OPEN” in ½” or larger letters in a break in the arrow shaft shall be cast on the rim of the hand wheel so as to be readily readable.
6. Valves ordered under this Specification shall be provided with flange valve ends on both ends. The end flanges of flanged valves shall conform to dimension and drilling in accordance with ANSI B16.1, Class 125 or ANSI A21.10/AWWA C-110.
7. All fasteners, excluding joint accessories, shall be made of Grade 304 stainless steel. Bolts shall meet ASTM A193 grade B8, latest revision. Nuts shall be in accordance with ASTM A194 grade 8, latest revision. Bolts and nuts shall be Unified National Coarse (UNC) rolled thread and heavy-duty hex nuts. Bolts installed into castings shall be provided with one (1) Grade 304 stainless steel flat washer and nuts and bolts shall be provided with two (2) Grade 304 stainless steel flat washers so that the epoxy coating is not damaged. At a minimum, nuts shall



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be coated with fluorocarbon, epoxy, zinc, or other anti-corrosion coating to help prevent galling.

8. To prevent galling; all stainless steel bolts shall be coated on the outside of all threads and the stainless steel nuts or castings on the inside of all threads at the factory, with an anti-seizing material such as provided by Henkel Technologies, Rocky Hill, Connecticut - product name: Loctite Nickel Anti-Seize Lubricant; Chesterton Technical Products, Stoneham, Massachusetts – product name: Chesterton 772 Premium Nickel Anti-Seize Compound; Permatex Inc. Hartford, Connecticut – product name: Permatex Nickel Anti-Seize Lubricant or equal product of another manufacturer and as specified in Section 3.18 of these Specifications.
9. Valves shall be bid without accessories (companion flanges, glands, gland gaskets and bolts).
10. Accessories shall be as specified in Section 3.16 of these Material Specifications.
11. Valve stems and stem nuts shall be made of a copper alloy or stainless steel and the minimum yield strength shall be 40,000-PSI.
12. Any conflict between this paragraph and the other specified paragraphs concerning OS&Y valves then this paragraph shall govern.

### 3.6.5 Class 250B - 4” - 16” Valves Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. American Flow Control – Series 2500 (reduced wall),
2. Clow – Model 2638 (reduced wall) or 2640 (full wall),
3. J & S – Series 6600, 6700 (OS&Y), and 6900 (all full wall),
4. Kennedy – Series 7000 (reduced wall) or full wall special order,
5. M & H – Series 7000 (reduced wall) or 7500 (full wall),
6. Mueller – Model 2361 (reduced wall) or 2362 (full wall),
7. US Pipe – Model USP0 (reduced wall) USP1 (full wall),
8. East Jordan Iron Works – Model Flowmaster, or



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9. Equal provided the products are manufactured as per these specifications.



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### Section 3.7 BUTTERFLY VALVES

#### 3.7.1 General

1. Butterfly Valves (BV) provided to the Springfield Water and Sewer Commission (Commission) or installer shall be manufactured, tested, inspected and delivered in full compliance with this Specification.
2. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;
  - (a) North America shall mean the United States, Canada, and Mexico,
  - (b) Cast shall mean molten metal(s) poured into a mold to create Casting(s) for a finished product,
  - (c) Incidental parts may be purchased/obtained from other countries to provide a finished product , in accordance with these Material Specifications, and
  - (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or
  - (e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.
3. Inspection:
  - (a) All finished product(s) furnished shall be subject to inspection by the Commission at the place of manufacture and shall be subject to inspection after delivery to the Commission.
  - (b) Cost of re-inspection of materials or fabricated finished product(s) caused by the non-compliance of the manufacturer with the provisions of the specifications, shall be paid for by the manufacturer, and shall be deductible from the price paid for the finished product(s).
4. Delivery shall be made by truck in minimum truckload quantity to locations designated in the Commission's service area in and near Springfield, Massachusetts. The low bidder shall notify the Commission of the quantity comprising a minimum truckload.
5. The manufacturer/vendor/shipper must use care in preparing finished product(s) for shipment and in handling during shipment and delivery, to insure that the finished(s) are delivered without damage. Particular attention must be directed at



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protecting the protective coating from damage. Damaged finished products and/or protective coatings will not be accepted.

### 3.7.2 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.
2. The manufacturer and/or vendor shall furnish three (3) sets of 24-inch by 36-inch certified shop drawings for all materials to be used. All components shall be provided in accordance to these drawings. The drawings shall show the following:
  - (a) Cross sectional drawings of the gate valve showing overall dimensions,
  - (b) Material specifications for each component,
  - (c) Coating applied to each component, if applicable,
  - (d) Weight of each component and total weight, and
  - (e) Country of origin for each component.
3. The manufacturer and/or vendor shall furnish three (3) sets of coating specification(s) of each component that has a coating applied identifying component surface preparation, primer (if applicable), type of coating(s), color of coating(s), manufacturer of coating(s), part number of the coating(s), and a sample on a 3-inch by 5-inch chip.
4. The manufacturer and/or vendor shall furnish a letter certifying the product meets all the requirements of the AISAS, an explanation, in the letter, of how the products meets the AISAS requirements, and signed by the Owner or President of the Company.
5. The manufacturer and/or vendor shall furnish one (1) complete catalogue or manual for parts, repair, and maintenance.
6. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the finished product(s) and all materials in its construction exactly conform to the applicable requirements of these specifications and the applicable AWWA Standards.
7. The manufacturer and/or vendor shall furnish a certified statement that all butterfly valves of the same make and model bid, regardless of the year of manufactured, shall have interchangeable component parts and that the parts availability and delivery shall remain firm for ten (10) years.



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8. The manufacturer and/or vendor shall furnish a warranty for the butterfly valves that states that the butterfly valves shall be free from all defects in material and workmanship under normal use of the product for a minimum ten (10) year time period from time of delivery. The manufacturer shall replace and/or repair defective parts or the whole butterfly valve for a minimum ten (10) year time period from time of delivery.
9. The manufacturer and/or vendor shall furnish certified results of a proof of design test performed at an independent testing laboratory. Testing shall include a shell test and seat test to demonstrate the valve body and seat will hold pressure as required.
10. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:
  - (a) Name of Municipality/Utility
  - (b) Total amount of product bid on and amount delivered
  - (c) Date the bid was accepted and date the product was delivered
  - (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product
11. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification “Approved”, “Approved as Noted”, or “Rejected-Resubmit” and return to the manufacturer and/or vendor.
  - (a) Approved means the contractor can supply the material as shown on the drawing(s).
  - (b) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.
  - (c) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

### 3.7.3 Class 250B - Butterfly Valves

1. All Butterfly Valves (BV) as a minimum shall conform to the most current American Water Works Association Standard C-504 and all addenda thereto.
2. All BV bodies shall be of high strength ductile iron ASTM A-536 grade 65-45-12.
3. All BV maximum working pressure shall be 250-PSI static pressure.

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4. Required shop testing, in accordance with AWWA C504:
  - (a) Each Class 250B valve shall be shop tested and certified for leakage with the disc in the horizontal plane.
    - BV shall be shell tested at 500-PSI minimum with the disc in the open position.
    - BV shall be seat tested at 250-PSI minimum with the gate in the closed position on each side of the seat.
  - (b) After each BV is completely assembled, including the actuator, it shall be operated several times in the factory to ensure it is in working condition.
5. All BV shall be bid without accessories (glands, gland gaskets and bolts).
  - Accessories shall be as specified in Section 3.16 of these Material Specifications.
6. All BV shall be rubber-seated, tight closing against stainless steel. BV shall be designed for direct bury service.
7. All BV body ends shall be mechanical joint conforming to ANSI A21.11/AWWA C-111, unless otherwise specified.
8. All BV shall be provided with manual actuators. All manual actuators shall be provided with a 2-inch square operating nut made of ductile iron. Manual valve actuators shall be capable of holding the disc in any position without creeping or fluttering. Manual actuators shall be serviceable without removal from the valve. A shaft seal shall be incorporated between the manual actuator and the valve.
9. All BV actuators shall be equipped with adjustable mechanical stop limiting devices to prevent over travel of the valve disc in the open and closed positions. Flow stops in the valve flow stream will not be allowed.
10. All BV manual actuators shall be of the traveling nut design rated for 450 foot-pounds of input torque against the open and closed stops. Such actuators shall be totally enclosed for buried service in a gearbox. Gears must operate in a lubricant and be totally sealed to prevent entry of dirt or liquids into the actuator.
11. Unless otherwise specified, all BV shall be right hand to open (clockwise). The operating nut shall be painted red.
12. All BV shall have an epoxy coating on the interior, exterior, and the vane. The coating shall meet all requirements of AWWA C-550 of latest revision. All bodies and vanes shall be factory coated prior to assembly and testing. All ferrous surfaces of the valve body, waterway, and vane shall receive an epoxy coating with a



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minimum dry film thickness of 8-mils. All exterior surfaces shall be coated with an epoxy with a minimum of 6-mils dry film thickness. Fusion Bonded is acceptable.

13. All BV seats shall be of synthetic Nitrile (Buna-N) compound, unless otherwise specified.
14. All BV seats shall be recessed into the body and held in place with epoxy injection or attached to the disk with type 304, 316, or ASTM A564 stainless steel hardware to restrain the seats from any movement at the maximum rated flow in either direction. When the seat is attached to the disc the bolts shall pass through the seat, retainer, and disc.
15. All BV shafts shall be turned, ground, and polished and shall be constructed of Type 630/17-4 PH/ASTM A584 stainless steel and shall be sized per AWWA Standard for Rubber-seated Butterfly Valves C-504, latest revision.
16. All BV disc shall be secured to the shafts with pins. These pins shall be of the same material as the shaft and pass completely through the disc and shaft. Pins shall be tightly secured with lock-washers and nuts to ensure line vibrations cannot loosen the connection.
17. Shaft seals shall be of the chevron or O-ring type.
18. Valve bearings shall be sleeve type, corrosion resistant, and self-lubricating. Bearing load shall not exceed 20-percent of the compressible strength of the bearing or shaft materials, and shall be secured in the trunion by a machined edge. Ferrous bearings in the flow stream shall not be allowed.
19. All fasteners, excluding joint accessories, shall be made of Grade 304 stainless steel. Bolts shall meet ASTM A193 grade B8, latest revision. Nuts shall be in accordance with ASTM A194 grade 8, latest revision. Bolts and nuts shall be Unified National Coarse (UNC) rolled thread and heavy-duty hex nuts. Bolts installed into castings shall be provided with one (1) Grade 304 stainless steel flat washer and nuts and bolts shall be provided with two (2) Grade 304 stainless steel flat washers so that the epoxy coating is not damaged. At a minimum, nuts shall be coated with fluorocarbon, epoxy, zinc, or other anti-corrosion coating to help prevent galling.
20. To prevent galling; all stainless steel bolts shall be coated on the outside of all threads and the stainless steel nuts or castings on the inside of all threads at the factory, with an anti-seizing material such as provided by Henkel Technologies, Rocky Hill, Connecticut - product name: Loctite Nickel Anti-Seize Lubricant; Chesterton Technical Products, Stoneham, Massachusetts – product name: Chesterton 772 Premium Nickel Anti-Seize Compound; Permatex Inc. Hartford,





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Connecticut – product name: Permatex Nickel Anti-Seize Lubricant or equal product of another manufacturer and as specified in Section 3.18 of these Specifications.

### 3.7.4 Butterfly Valves Makes and Models Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. Clow – Series 4500, Style 1450-CL250,
2. DeZurik, BAW-CL250,
3. Henry Pratt Company, Model Groundhog HP-250,
4. Kennedy – Series 4500, Style 1450-CL250,
5. M & H – Series 4500, Style 1450-CL250,
6. Mueller – Model Lineseal XP,
7. Val-Matic, Series 2000-CL250, or
8. Equal provided the products are manufactured as per these specifications.



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### Section 3.8 CHECK VALVES

#### 3.8.1 General

1. Check Valves provided to the Springfield Water and Sewer Commission (Commission) or installer shall be manufactured, tested, inspected and delivered in full compliance with this Specification.
2. Check Valves as a minimum shall conform to the most current American Water Works Association Standard C-508 and all addenda thereto.
3. Working pressure 250 PSI. Test pressure 500 PSI.
4. Check Valves shall be bid without accessories (glands, gland gaskets and bolts).
  - Accessories shall be as specified in Section 3.16 of these Material Specifications.
5. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;
  - (a) North America shall mean the United States, Canada, and Mexico,
  - (b) Cast shall mean molten metal(s) poured into a mold to create Casting(s) for a finished product,
  - (c) Incidental parts may be purchased/obtained from other countries to provide a finished product , in accordance with these Material Specifications, and
  - (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or
  - (e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.
6. Inspection:
  - (a) All finished product(s) furnished shall be subject to inspection by the Commission at the place of manufacture and shall be subject to inspection after delivery to the Commission.
  - (b) Cost of re-inspection of materials or fabricated finished product(s) caused by the non-compliance of the manufacturer with the provisions of the specifications, shall be paid for by the manufacturer, and shall be deductible from the price paid for the finished product(s).



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7. Delivery shall be made by truck in minimum truckload quantity to locations designated in the Commission's service area in and near Springfield, Massachusetts. The low bidder shall notify the Commission of the quantity comprising a minimum truckload.
8. The manufacturer/vendor/shipper must use care in preparing finished product(s) for shipment and in handling during shipment and delivery, to insure that the finished(s) are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged finished(s) will not be accepted.
9. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the finished product(s) and all materials in its construction exactly conform to the applicable requirements of these specifications and the applicable AWWA Standards.

### 3.8.2 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.
2. The manufacturer and/or vendor shall furnish three (3) sets of 24-inch by 36-inch certified shop drawings for all materials to be used. All components shall be provided in accordance to these drawings. The drawings shall show the following:
  - (a) Cross sectional drawings of the check valve showing overall dimensions,
  - (b) Material specifications for each component,
  - (c) Coating applied to each component, if applicable,
  - (d) Weight of each component and total weight, and
  - (e) Country of origin for each component.
3. The manufacturer shall furnish three (3) sets of coating specification(s) of each component that has a coating applied identifying component surface preparation, primer (if applicable), type of coating(s), color of coating(s), manufacturer of coating(s), part number of the coating(s), and a sample on a 3-inch by 5-inch chip.
4. The manufacturer shall furnish a letter certifying the product meets all the requirements of the AIS, an explanation, in the letter, of how the products meets the AIS requirements, and signed by the Owner or President of the Company.
5. The manufacturer shall furnish one (1) complete catalogue or manual for parts, repair, and maintenance.



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6. The manufacturer shall furnish a certified statement that all check valves of the same make and model bid, regardless of the year of manufactured, shall have interchangeable component parts and that the parts availability and delivery shall remain firm for ten (10) years.
7. The manufacturer shall furnish a warranty for the check valves that states that the check valves shall be free from all defects in material and workmanship under normal use of the product for a minimum ten (10) year time period from time of delivery. The manufacturer shall replace and/or repair defective parts or the whole check valve for a minimum ten (10) year time period from time of delivery.
8. The manufacturer shall furnish certified results of a proof of design test performed at an independent testing laboratory. Testing shall include a million-cycle continuous test to demonstrate the durability of the flexible connection.
9. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:
  - (a) Name of Municipality/Utility
  - (b) Total amount of product bid on and amount delivered
  - (c) Date the bid was accepted and date the product was delivered
  - (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product
10. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification “Approved”, “Approved as Noted”, or “Rejected-Resubmit” and return to the manufacturer and/or vendor.
  - (a) Approved means the contractor can supply the material as shown on the drawing(s).
  - (b) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.
  - (c) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

### 3.8.3 Check Valves

1. Check Valves body and cover shall be of high strength ductile iron ASTM A-536 grade 65-45-12.



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2. Check Valves working pressure shall be 250-PSI static pressure. Check valves provided under this specification shall be shell tested at 500-PSI minimum with the flapper in the open position. Check valves provided under this specification shall seal drop tight at pressures greater than 5-PSI minimum.
3. Check valve flow area when fully open shall be not less than the area of the circle of the diameter of the nominal pipe size.
4. The check valve body and cover shall be coated on all exterior and interior surfaces with fusion bonded epoxy conforming to the requirements of AWWA C-550 (most current revision) for Protective Epoxy Interior Coatings for Valves and Hydrants.
5. The check valve body markings shall include the manufacturers name or mark, pressure rating, material (D.I.), and year of manufacture and be cast into the body.
6. Check valves ordered under this specification will be within the following size schedules 4-inch, 6-inch, 8-inch, 10-inch, and 12-inch.
7. Check valves ordered under this Specification shall be provided with flanged ends conform to dimensions and drilling of ANSI B16.1, Class 125 or ANSI A21.10/AWWA C-110.
8. The check valve disc shall be constructed of ductile iron or alloy steel and fully encapsulated in a rubber compound for water service, molded, not split and glued, constructed of styrene butadiene rubber (SBR) or Nitrile (Buna-N) compounds, and must meet or exceed ASTM D-2000 3 BA 715 and ANSI A21.11/AWWA C-111, latest revision. No bare metal shall be left exposed. Disc-rubber shall be molded in place and banded tightly to the ductile iron or steel core and shall not be mechanically attached with screws, rivets, or similar fasteners.
9. Check valve disc travel shall not be more than 35-degrees for full open position.
10. Bronze seat rings are not allowed. Disc shall be the only moveable part. No o-rings or other bearings are allows.
11. All fasteners, excluding joint accessories, shall be made of Grade 304 stainless steel. Bolts shall meet ASTM A193 grade B8, latest revision. Nuts shall be in accordance with ASTM A194 grade 8, latest revision. Bolts and nuts shall be Unified National Coarse (UNC) rolled thread and heavy-duty hex nuts. Bolts installed into castings shall be provided with one (1) Grade 304 stainless steel flat washer and nuts and bolts shall be provided with two (2) Grade 304 stainless steel flat washers so that the epoxy coating is not damaged. At a minimum, nuts shall be coated with fluorocarbon, epoxy, zinc, or other anti-corrosion coating to help prevent galling.



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12. To prevent galling; all stainless steel bolts shall be coated on the outside of all threads and the stainless steel nuts or castings on the inside of all threads at the factory, with an anti-seizing material such as provided by Henkel Technologies, Rocky Hill, Connecticut - product name: Loctite Nickel Anti-Seize Lubricant; Chesterton Technical Products, Stoneham, Massachusetts – product name: Chesterton 772 Premium Nickel Anti-Seize Compound; Permatex Inc. Hartford, Connecticut – product name: Permatex Nickel Anti-Seize Lubricant or equal product of another manufacturer and as specified in Section 3.18 of these Specifications.
13. Valves shall be bid without accessories (glands, gland gaskets and bolts).
14. Accessories shall be as specified in Section 3.16 of these Material Specifications.

### 3.8.4 Check Valves Makes and Models Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. American Flow Control: Series 2100 - RSCV1,
2. Val-matic: Series 500A – VMC502A,
3. Henry Pratt Company: RD-Series Flex-0205,
4. Milliken Valve Company; Series 850 – Figure 851, or
5. Equal provided the products are manufactured as per these specifications.



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### Section 3.9 AIR VALVE ASSEMBLIES AND AIR CORPORATIONS

#### 3.9.1 General

1. Air Valve Assemblies and Air Corporations provided to the Commission or installer shall be manufactured, tested, inspected and delivered in full compliance with this Specification.
2. Brass components of the Air Valve Assemblies may be made from copper alloy No. 83600, in accordance with ASTM B30, ASTM B62, or ASTM B584 and AWWA C-800 latest version containing 85% copper, 5% tin, 5% lead, and 5% zinc (brass 85-5-5-5).
3. Copper tube components of the Air Valve Assemblies shall be type "L", manufactured in America.
4. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;
  - (a) North America shall mean the United States, Canada, and Mexico,
  - (b) Cast shall mean molten metal(s) poured into a mold to create Casting(s) for a finished product,
  - (c) Incidental parts may be purchased/obtained from other countries to provide a finished product , in accordance with these Material Specifications, and
  - (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or
  - (e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.
5. Inspection:
  - (a) All finished product(s) furnished shall be subject to inspection by the Commission at the place of manufacture and shall be subject to inspection after delivery to the Commission.
  - (b) Cost of re-inspection of materials or fabricated finished product(s) caused by the non-compliance of the manufacturer with the provisions of the specifications, shall be paid for by the manufacturer, and shall be deductible from the price paid for the finished product(s).



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6. Delivery shall be made by truck in minimum truckload quantity to locations designated in the Commission's service area in and near Springfield, Massachusetts. The low bidder shall notify the Commission of the quantity comprising a minimum truckload.
7. The manufacturer/vendor/shipper must use care in preparing finished product(s) for shipment and in handling during shipment and delivery, to insure that the finished product(s) are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged finished product(s) will not be accepted.
8. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the finished product(s) and all materials in its construction exactly conform to the applicable requirements of these specifications and the applicable AWWA Standards.

### 3.9.2 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.
2. The manufacturer and/or vendor shall furnish three (3) sets of 24-inch by 36-inch certified shop drawings for all materials to be used. All components shall be provided in accordance to these drawings. The drawings shall show the following:
  - (a) Cross sectional drawings of the corporation and curb stop showing overall dimensions,
  - (b) Material specifications for each component,
  - (c) Coating applied to each component, if applicable,
  - (d) Weight of each component and total weight, and
  - (e) Country of origin for each component.
3. The manufacturer shall furnish three (3) sets of coating specification(s) of each component that has a coating applied identifying component surface preparation, primer (if applicable), type of coating(s), color of coating(s), manufacturer of coating(s), part number of the coating(s), and a sample on a 3-inch by 5-inch chip.
4. The manufacturer shall furnish a letter certifying the product meets all the requirements of the AIS, an explanation, in the letter, of how the products meets the AIS requirements, and signed by the Owner or President of the Company.





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5. The manufacturer shall furnish one (1) complete catalogue or manual for parts, repair, and maintenance.
6. The manufacturer shall furnish a certified statement that all products shall have interchangeable component parts and that the parts availability and delivery shall remain firm for ten (10) years.
7. The manufacturer shall furnish a warranty for the product that states that the products shall be free from all defects in material and workmanship under normal use of the product for a minimum ten (10) year time period from time of delivery. The manufacturer shall replace and/or repair defective parts or the whole check valve for a minimum ten (10) year time period from time of delivery.
8. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:
  - (a) Name of Municipality/Utility
  - (b) Total amount of product bid on and amount delivered
  - (c) Date the bid was accepted and date the product was delivered
  - (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product
9. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification “Approved”, “Approved as Noted”, or “Rejected-Resubmit” and return to the manufacturer and/or vendor.
  - (a) Approved means the contractor can supply the material as shown on the drawing(s).
  - (b) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.
  - (c) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

### 3.9.3 Standard Air Valve Assembly

1. One-inch or Two-inch corporations: may be brass 85-5-5-5, tapered inlet ball corporation with One-inch or Two-inch CC thread on the inlet side and One-inch or Two-inch female IP thread on the outlet side. One is required for each assembly.



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2. Corporations may rotate 360 degrees in either direction or rotate  $\frac{1}{4}$  turn only and **OPEN LEFT**, counter-clockwise.
3. One-inch or Two-inch 90-degree elbows: may be brass 85-5-5-5, female on both ends with One-inch or Two-inch IP thread. Three are required for each assembly.
4. One-inch or Two-inch Ball Valve Curb Stop and Waste: may be brass 85-5-5-5, ball valve type with One-inch or Two-inch female IP thread on both ends. A tee head A stop & waste hole shall be provided. One is required for each assembly.
5. Curb Stops shall rotate  $\frac{1}{4}$  turn only and **OPEN LEFT**, counter-clockwise.
6. One-inch and/or Two-inch Nip: may be brass 85-5-5-5, male on both ends with One-inch or Two-inch IP thread. Minimum length shall be six-inches and maximum length shall be twelve-inches, unless otherwise approved by the Commission. Three are required for each assembly.
7. One-inch or Two-inch Riser pipe: may be brass 85-5-5-5, male on both ends with One-inch or Two-inch IP thread. The length shall be from the last 90-degree elbow to four-to-six-inches below finished roadway. One is required for each assembly.
8. One-inch or Two-inch cap: may be brass 85-5-5-5, One-inch or Two-inch female IP thread. One is required for each assembly.

### 3.9.4 One-Piece Air Valve Assembly

1. The One-Piece Air Valve shall be of a type equal to Wedge Manufacturing, L.L.C., catalog numbers 10060 for 1-inch and 20060 for 2-inch, or an approved equal.
2. One-inch or two-inch corporations: may be brass 85-5-5-5, tapered inlet ball corporation with One-inch or Two-inch CC thread on the inlet side and One-inch or Two-inch male IP thread on the outlet side. One is required for each assembly.
3. Corporations may rotate 360 degrees in either direction or rotate  $\frac{1}{4}$  turn only and **OPEN LEFT**, counter-clockwise.
4. One-Piece Air Valves shall be provided with a lower operating lever made of cast or stamped brass that is secured to the brass ball valve with a marine type brass cotter pin.
5. One-Piece Air Valves shall be provided with a brass ball valve with female iron pipe threads at both ends. The ball valves shall be drilled on the riser side for drainage.



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6. One-Piece Air Valves shall be provided with an adapter at both ends made of copper. The adapters shall have male threads on one end and plain on the other for crimp fitting.
7. One-Piece Air Valves shall be provided with a copper riser pipe. The Riser pipe shall be crimp fit to the copper adapters at both ends.
8. One-Piece Air Valves shall be provided with a tee handle made of cast brass. The tee handle shall be secured to the operating rod with stainless steel roll pin.
9. One-Piece Air Valves shall be provided with an operating rod made of 3/8-inch diameter brass CDA 360, ASTM B-16.
10. One-Piece Air Valves shall be provided with a split ring connector that shall secure the operating rod to the riser. The fasteners shall be stainless steel.
11. One-Piece Air Valves shall be provided with a lower mechanism that connects the operating rod to the lower operating lever. The lower mechanism shall be secured to the operating rod with a stainless steel roll pin. The lower mechanism shall be secured to the lower operating lever with a 3/8-inch X 1/2-inch stainless steel bolt with a Nylock safety nut.

### 3.9.5 Air Corporations

1. Air corporations shall be one-inch.
2. Tapered inlet ball type corporations, may be brass 85-5-5-5, shall be with one-inch CC thread on the inlet side, and one-inch male IP thread on the outlet side.
3. Corporations may rotate 360 degrees in either direction or rotate 1/4 turn only and **OPEN LEFT**, counter-clockwise.
4. Air corporations shall be provided with a 1-inch female IP threaded brass cap, unless otherwise approved by the Commission.

### 3.9.6 Air Valve Assembly Makes and Models Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.



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1. Tapered inlet ball type corporations with one-inch or two-inch CC thread on the inlet side and one-inch or two-inch female IP thread on the outlet side

	<u>1-inch</u>	<u>2-inch</u>
(a) Ford:	FB1600-4	FB1600-7
(b) Red Hed:	Not Available (NA)	RHB43875
(c) Mueller:	B-20045 (state size)	B-20045 (state size)
(d) McDonald:		
(e) Cambridge:		

2. Ball Valve Curb with Stop and Waste and with One-inch or Two-inch female IP thread on both ends

	<u>1-inch</u>	<u>2-inch</u>
(a) Ford:	B11-444SW	B11-777SW
(b) Red Hed:	RHB22202	RHB22205
(c) Mueller:	B-20283 (state size)	
(d) McDonald:		
(e) Cambridge:		

### 3.9.7 Air Corporation Makes and Models Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. Tapered inlet ball type corporations with one-inch CC thread on the inlet side and one-inch male IP thread on the outlet side

(a) Ford:	FB800-4
(b) Red Hed:	RH43842
(c) Mueller:	B-2996 (state size)
(d) McDonald:	



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(e) Cambridge:

3.62



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### Section 3.10 VALVE BOXES

#### 3.10.1 General

1. Valve Boxes provided to the Commission or installer shall be telescopic in design, Cast Iron, heavy pattern, adjustable type top section, bottom section, and cover and manufactured, tested, inspected and delivered in full compliance with this Specification.
2. The valve boxes shall be certified to meet American Association of State Highway and Transportation Officials (AASHTO) M 105 Class 35B strength of materials requirements.
3. Valve boxes shall be strong, durable, even grained cast iron, smooth, free from scale, lumps, blisters, sand holes and defects of any kind.
  - (a) An HS20 load rating is required.
  - (b) Cast iron shall conform to American Society of Testing and Materials (ASTM) A48, Class 35B.
  - (c) Valve boxes covers and seats shall be machined to a true surface so that the cover does not rock in the frame no matter the position of the cover.
4. The Commission may require valve boxes be subjected to proof load testing as follows:
  - (a) Testing shall be in accordance with the National Institute of Standards Technology (NIST) standards – Proof Load Testing (PLT).
  - (b) The PLT shall show no detrimental deformation or cracks when a proof load of 25,000-pounds is concentrated on an 9-inch by 9-inch area at the center of the cover for a 1-minute period of time.
  - (c) Permanent deformation shall not exceed 1/8-inch.
  - (d) All testing shall be at the supplier’s expense.
5. Valve boxes top sections, bottom sections, covers, and enlarged bases shall be provided with individual permanent markings that are easily discernable and show the following:
  - (a) Name of the producing foundry and country of manufacture preceded by the words “Made in”, such as “Made in USA”
  - (b) AASHTO designation or ASTM designation number



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- (c) Class by a number followed by a letter indicating the minimum tensile strength and size of test bar,
  - (d) Heat identification and cast date (MM/DD/YY),
  - (e) The above markings are required, but the Commission will allow some variation in how the above markings are provided on the finished product. The design and location of the markings must meet and be subject to the approval of the Commission's aesthetic judgment.
6. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;
- (a) North America shall mean the United States, Canada, and Mexico,
  - (b) Cast shall mean molten metals poured into a mold to create Casting(s) for a finished product,
  - (c) Incidental parts may be purchased/obtained from other countries to provide a finished product , in accordance with these Material Specifications, and
  - (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or
  - (e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement govern.
7. All valve boxes tops, bottoms, and covers shall be coated with an approved petroleum asphaltic seal coat.
8. The manufacturer/vendor/shipper must use care in preparing valves boxes for shipment and in handling during shipment and delivery, to insure that the product(s) are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged product(s) will not be accepted.
9. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the product(s) and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AWWA Standards.

### 3.10.2 Submittals

- 1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.



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2. The manufacturer and/or vendor shall furnish three (3) sets of 24-inch by 36-inch certified shop drawings for all materials to be used. All components shall be provided in accordance to these drawings. The drawings shall show the following:
  - (a) Cross sectional drawings of the product(s) showing overall dimensions,
  - (b) Material specifications for each component,
  - (c) Coating applied to each component, if applicable,
  - (d) Weight of each component and total weight, and
  - (e) Country of origin for each component.
3. The manufacturer shall furnish three (3) sets of coating specification(s) of each component that has a coating applied identifying component surface preparation, primer (if applicable), type of coating(s), color of coating(s), manufacturer of coating(s), part number of the coating(s), and a sample on a 3-inch by 5-inch chip.
4. The manufacturer shall furnish a letter certifying the product(s) meet all the requirements of the AIS, an explanation, in the letter, of how the product(s) meets the AIS requirements, and signed by the Owner or President of the Company.
5. The manufacturer shall furnish one (1) complete catalogue or manual for parts, repair, and maintenance.
6. The manufacturer shall furnish a certified statement that all product(s) of the same make and model bid, regardless of the year of manufactured, shall have interchangeable component parts and that the parts availability and delivery shall remain firm for ten (10) years.
7. The manufacturer shall furnish a warranty for the product(s) that states that the product(s) shall be free from all defects in material and workmanship under normal use of the product for a minimum one (1) year time period from time of delivery. The manufacturer shall replace and/or repair defective parts or the whole product(s) for a minimum one (1) year time period from time of delivery.
8. The manufacturer shall furnish a certified statement that the required tests on the various materials and on the completed product(s) have been made, and the results of all tests conform to the requirements of the American Association of State Highway and Transportation Officials (AASHTO) M 105 Class 35B strength of materials requirements, American Society of Testing and Materials (ASTM) A48, Class 35B, and as the Commission may require the National Institute of Standards Technology (NIST) standards – Proof Load Testing.





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9. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:
  - (a) Name of Municipality/Utility
  - (b) Total amount of product bid on and amount delivered
  - (c) Date the bid was accepted and date the product was delivered
  - (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product
10. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification “Approved”, “Approved as Noted”, or “Rejected-Resubmit” and return to the manufacturer and/or vendor.
  - (a) Approved means the contractor can supply the material as shown on the drawing(s).
  - (b) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.
  - (c) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

### 3.10.3 Two Piece Valve Boxes

1. In addition to the General Section above the following shall be provided:
2. The total weight of the valve box assembly (top, cover and bottom sections) shall be 105 pounds minimum.
3. Valve boxes shall be of lengths adapted to five-feet of pipe cover or more and have a minimum of six-inches of overlap in the most extended position
4. The top section shall have:
  - (a) A top flange to increase the stability of the box to remain at the present height
  - (b) A smooth cast seat to accept the lid and insure a non-rocking installation.
  - (c) The top section shall be 24-inches to 27-inches long and weigh a minimum of 40-pounds.
5. The bottom section shall have:



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- (a) A belled base and have an inside diameter of 5- $\frac{1}{4}$ "
- (b) The belled base shall enclose the valve, the valve stuffing box / seal plate, and operating nut.
- (c) A bottom flange of sufficient bearing area to prevent settling.
- (d) The bottom section shall be 36-inches to 40-inches long and weigh a minimum of 45-pounds.

### 3.10.4 Three Piece Valve Boxes

1. In addition to the General Section above the following shall be provided:
2. The total weight of the valve box assembly (top, cover, bottom, and base sections) shall be 145 pounds minimum.
3. Valve boxes shall be of lengths adapted to five-feet of pipe cover or more and have a minimum of six-inches of overlap in the most extended position
4. The top section shall have:
  - (a) A top flange to increase the stability of the box to remain at the present height.
  - (b) A smooth cast seat to accept the lid and insure a non-rocking installation.
5. The bottom section shall have:
  - (a) A belled base and have an inside diameter of 5- $\frac{1}{4}$ ".
  - (b) A bottom flange of sufficient bearing that will fit onto a number six base.
6. The number six base section shall have:
  - (a) At the top opening a minimum inside diameter of 5- $\frac{1}{4}$ ".
  - (b) The belled base shall enclose the air valve assembly and allow the lever to operate freely.
  - (c) A bottom flange of sufficient bearing area to prevent settling.

### 3.10.5 Valve Box Cover

1. In addition to the General Section above the following shall be provided:
2. The valve box cover shall have:



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- (a) A 7-5/16-inch diameter with a 2-inch thick lid and a 1-1/2-inch deep skirt. The overall height shall be 3-1/2-inches.
- (b) The valve box cover shall weigh no less than 13 pounds
- (c) The valve box cover shall have the word “Water” cast in the top.
- (d) The valve box cover shall be designed to remain seated when subjected to mobile traffic conditions.
- (e) The valve box cover shall be close fitting and substantially dirt tight and flush with the top of the box rim.

### 3.10.6 Valve Box Riser(s)

1. In addition to the General Section above the following shall be provided:
2. The valve box riser(s) shall be either fixed or slide type.
3. Valve box riser(s) shall be provided the following lengths:
  - (a) 1-inches – fixed
  - (b) 1-1/2- inches – fixed
  - (c) 2- inches – fixed
  - (d) 3-inches – fixed
  - (e) 4-inches – fixed
  - (f) 6-inches – slide
  - (g) 10-inches to 12inches – slide
  - (h) 13-inches to 18-inches - slide
4. A top flange to increase the stability of the box to remain at the present height.
5. A smooth cast seat to accept a standard valve box cover and insure a non-rocking installation.
6. The lower portion of valve box extension shall be, at most, 5-3/4-inch in diameter in order to fit inside the top section of an existing gate box.



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### 3.10.7 Valve Boxes Manufacturers and Models Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. Bibby Ste-Croix

- (a) Valve box complete: V683 (5664S)
- (b) Top section only: V747
- (c) Bottom section only: 7354
- (d) Cover: V878
- (e) 1-inch fixed riser: V829
- (f) 1-1/2-inches fixed riser: V830
- (g) 2-inch fixed riser: V831
- (h) 3-inch fixed riser: V832
- (i) 4-inch fixed riser: V833
- (j) 6-inch slide riser: V856
- (k) 10-inch to 14-inch slide riser: V858
- (l) 15-inch to 24-inch slide riser: V862
- (m)#6 enlarged base: 7341,

2. Bingham and Taylor –

- (a) Valve box complete: 5664-S (Fig. 4908)
- (b) Top section only: 56-S
- (c) Bottom section only: 64-S
- (d) Cover: 4905-L1.5
- (e) 1-inch fixed riser: 6016-B and specify raise desired



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- (f) 1-1/2-inches fixed riser: 6016-B and specify raise desired
  - (g) 2-inch fixed riser; 6016-B and specify raise desired
  - (h) 3-inch fixed riser: 6016-B and specify raise desired
  - (i) 4-inch fixed riser: 6016-B and specify raise desired
  - (j) 6-inch slide riser: NA (use item k)
  - (k) 10-inch to 14-inch slide riser: 6020 and specify raise desired (10-1/2-inches)
  - (l) 15-inch to 24-inch slide riser: 6020 and specify raise desired (15-inches)
  - (m)#6 enlarged base: 4909-A,
3. East Jordan Iron Works –
- (a) Valve box complete: 85553960 (664-A)
  - (b) Top section only: \_\_\_\_\_
  - (c) Bottom section only: \_\_\_\_\_
  - (d) Cover: 6800 (2-inch skirt)
  - (e) 1-inch fixed riser: 8500010
  - (f) 1-1/2-inches fixed riser: 850002015
  - (g) 2-inch fixed riser; 8500020
  - (h) 3-inch fixed riser: 8500030
  - (i) 4-inch fixed riser: 8500040
  - (j) 6-inch slide riser: NA (use item l)
  - (k) 10-inch to 14-inch slide riser: NA (use item l)
  - (l) 15-inch to 24-inch slide riser: 855558009 (#69) (16-1/2-inches)
  - (m)(#6) enlarged base: 85605006, or
4. Equal provided the products are manufactured as per these specifications.



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### Section 3.11 HYDRANTS – DRY BARREL

#### 3.11.1 Public Hydrants

#### 3.11.2 General

1. Hydrants provided to the Springfield Water and Sewer Commission (Commission) or installer shall be manufactured, tested, inspected and delivered in full compliance with this Specification.
2. Hydrants as a minimum shall conform to the most current American Water Works Association Standard C-502 and all addenda thereto.
3. Working pressure 250 PSI. Test pressure 500 PSI.
4. Hydrant shall open RIGHT (clockwise).
5. The direction to open shall be cast with an indicating arrow and “OPEN” into the operating nut and weather shield or into the bonnet and shall be clearly visible when viewed from the top.
6. Hydrants shall be for 5-feet-0-inch, 5-feet-6-inch, 6-feet-0-inch, and 6-feet-6-inch bury. The standard depth of bury is 6-feet-0-inch, unless otherwise specified by the Commission (See delivery requirements, below). Depth of bury shall be painted on the lower barrel section of the hydrant.
7. Hydrant shall be of the full compression design, opening against and closing with the water pressure.
8. All internal parts shall be designed for rapid and simple removal employing a compact lightweight wrench that will withdraw all working parts from the base of the hydrant as a unit.
  - The design and construction of the hydrant shall be such that a Commission maintenance and repair crew can fully disassemble the hydrant from the frangible coupling in no more than one (1) hour.
9. Hydrants shall be bid without accessories (glands, gland gaskets and bolts).
  - Accessories shall be as specified in Section 3.16 of these Material Specifications.
10. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;
  - (a) North America shall mean the United States, Canada, and Mexico,



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- (b) Cast shall mean molten metals poured into a mold to create Casting(s) for a finished product,
- (c) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and
- (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or
- (e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.

### 11. Inspection:

- (a) All finished product(s) furnished shall be subject to inspection by the Commission at the place of manufacture and shall be subject to inspection after delivery to the Commission.
- (b) Cost of re-inspection of materials or fabricated finished product(s) caused by the non-compliance of the manufacturer with the provisions of the specifications, shall be paid for by the manufacturer, and shall be deductible from the price paid for the hydrants.

12. Delivery shall be made by truck in minimum truckload quantity to locations designated in the Commission's service area in and near Springfield, Massachusetts. The low bidder shall notify the Commission of the quantity comprising a minimum truckload. The Commission reserves the right to mix depth of buries to reach a full truckload.

13. The manufacturer/vendor/shipper must use care in preparing finished product(s) for shipment and in handling during shipment and delivery, to insure that the finished(s) are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged finished(s) will not be accepted.

14. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the finished product(s) and all materials in its construction exactly conform to the applicable requirements of these specifications and the applicable AWWA Standards.

### 3.11.3 Submittals

- 1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.



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2. The manufacturer and/or vendor shall furnish three (3) sets of 24-inch by 36-inch certified shop drawings for all materials to be used. All components shall be provided in accordance to these drawings. The drawings shall show the following:
  - (a) Cross sectional drawings of the hydrant showing overall dimensions,
  - (b) Material specifications for each component,
  - (c) Coating applied to each component, if applicable,
  - (d) Weight of each component and total weight for each bury depth, and
  - (e) Country of origin for each component.
3. The manufacturer shall furnish three (3) sets of coating specification(s) of each component that has a coating applied identifying component surface preparation, primer (if applicable), type of coating(s), color of coating(s), manufacturer of coating(s), part number of the coating(s), and a sample on a 3-inch by 5-inch chip.
4. The manufacturer shall furnish a letter certifying the product meets all the requirements of the AIS, an explanation, in the letter, of how the products meets the AIS requirements, and signed by the Owner or President of the Company.
5. The manufacturer shall furnish one (1) complete catalogue or manual for parts, repair, and maintenance.
6. The manufacturer shall furnish a certified statement that all hydrants of the same make and model bid, regardless of the year of manufactured, shall have interchangeable component parts and that the parts availability and delivery shall remain firm for ten (10) years.
7. The manufacturer shall furnish a warranty for the hydrants that states that the hydrants shall be free from all defects in material and workmanship under normal use of the product for a minimum ten (10) year time period from time of delivery. The manufacturer shall replace and/or repair defective parts or the whole hydrant for a minimum ten (10) year time period from time of delivery. The manufacturer shall repaint, recoat hydrants, or replace hydrant or hydrant parts that exhibit coating failure, such as rusting, chipping, flaking, under normal condition and from handling during delivery for a minimum three (3) year time period from time of delivery. Coating failures caused by Installer will not be a cause of coating failure.
8. The manufacturer shall furnish a certified statement that the required tests on the various materials and on the completed hydrant have been made, and the results of all tests conform to the requirements of the American Water Works Association





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Standard Specification C-502. The records of the tests shall be furnished for the individual parts with respect to physical and chemical properties.

9. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:
  - (a) Name of Municipality/Utility
  - (b) Total amount of product bid on and amount delivered
  - (c) Date the bid was accepted and date the product was delivered
  - (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product
10. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification “Approved”, “Approved as Noted”, or “Rejected-Resubmit” and return to the manufacturer and/or vendor.
  - (a) Approved means the contractor can supply the material as shown on the drawing(s).
  - (b) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.
  - (c) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

### 3.11.4 Bonnet

1. The bonnet shall be one piece and made of high strength cast iron ASTM A-126 Class B or of high strength ductile iron ASTM A-536 grade 65-45-12.
2. The bonnet shall be free draining.
3. The bonnet shall be designed to make tampering difficult and provide a convenient means for lubricating.

### 3.11.5 Barrel Sections

1. The barrel sections shall be one piece and made of high strength cast iron ASTM A-126 Class B or of high strength ductile iron ASTM A-536 grade 65-45-12.
2. The lower barrel shall be provided with a bury line painted or embossed onto it.



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3. The upper and lower barrel joint shall be no less than 2-inches above the bury line.
4. The upper barrel nozzles shall be “three (3) way” and as follows:
  - (a) The upper barrel shall be equipped with (2) two each 2-1/2-inch hose nozzles, 180 degrees apart.
  - (b) The upper barrel be equipped with one (1) each 4-1/2-inch pumper nozzle on the same plane and in between the 2-1/2-inch hose nozzles.
  - (c) The location of the center line of the upper barrel nozzles shall be at least 16-inches above the bury line so that a 15-inch wrench can freely turn 360-degrees without hitting the ground.
5. Changes in shape or size of the barrel sections shall be curved. The junction of the hose and pumper outlets shall be rounded.
6. The upper and lower barrel joint shall be connected with a traffic safety flange.
  - (a) The traffic safety flange shall be designed so that in the event of accident, damage, or breaking of the hydrant above or near the ground line the main valve will remain closed.
  - (b) The traffic safety flange shall be of the split flange, split coupling type, or lock ring designed to permit 360-degree rotary movement of the upper barrel without shutting down service or removing the flange bolt
  - (c) The traffic safety flange may be high strength cast iron ASTM A-126 Class B or of high strength ductile iron ASTM A-536 grade 65-45-12 or other approved material designed so that in the event of accident, damage, or breaking of the hydrant above or near the ground line the main valve will remain closed.
  - (d) Break-away bolts, break-away barrel, lugs or individual metal keeper devices are not acceptable.
7. Hydrants shall be provided with permanent markings cast or stamped, mechanical or adhesive attachment shall not be acceptable, that are easily discernable (at least 1/2-inch to 1-inch tall) after the hydrant is installed (characters in parentheses are examples of permanent markings) that include the following:
  - (a) Identity of manufacturer by name, initials, insignia, or abbreviations commonly in use,
  - (b) Size of main valve opening (5-1/4”),
  - (c) Material the barrels are made of (DI or CI),



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- (d) Year of manufacture (2010),
- (e) Pressure rating (250 PSI), and
- (f) Underwriters Laboratory Listed (UL).

### 3.11.6 Outlet Nozzles

1. Hydrant outlet nozzles shall be bronze and fastened into the nozzle section of the upper barrel by a mechanical means.
  - (a) Screwed in outlet nozzles shall be provided with a lock pin/screw to prevent the outlet nozzle from backing out, or;
  - (b) Recessed lug & groove outlet nozzles shall be provided with a threaded retainer or lock pin/screw to prevent outlet nozzle from backing out.
  - (c) Hydrant outlet nozzles shall not have any movement when locked into place.
  - (d) Caulking the outlet nozzle into the upper barrel shall not be allowed.
2. Hydrant outlet nozzles shall have National Fire Protection Association (NFPA) Number 194 National (American) Standard Fire Hose Coupling Screw Threads.

### 3.11.7 Outlet Nozzle Caps

1. Outlet nozzle caps shall be made of high strength Cast Iron ASTM 126A Class B
2. Outlet nozzle caps shall have National Fire Protection Association (NFPA) Number 194 National (American) Standard Fire Hose Coupling Screw Threads.
3. Nozzle caps shall be provided with 1-1/8" (point to flat) pentagon and shall be not less than 1" high.
4. All nozzle caps shall be provided with a metal slip ring attached to the nozzle cap and metal chains connected to the slip ring and hydrant barrel. The chain (slip) ring and chains shall allow the nozzle caps to rotate freely.
  - (a) The chain (slip) ring shall not be less than 1/4-inch diameter steel.
  - (b) The chain shall be non-kink double/twisted loop steel and shall not be less than 3/16-inch diameter. Each link shall be approximately 1-1/2-inches long. Each chain shall have at least eleven (11) links.
  - (c) The slip ring and chain shall be rust proof coated or plated or stainless steel.



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### 3.11.8 Operating Mechanism

1. Operating nut shall be made of high strength ductile iron ASTM A-536 grade 65-45-12 or bronze
  - (a) 1-1/8" (point to flat) pentagon and shall be not less than 1" high.
  - (b) Operating nut may function as both an operating nut and weather-shield.
  - (c) The operating mechanism may be sealed with a rubber weather-shield or O-ring seal.
2. The design and construction of the hydrant operating mechanism of the hydrant shall be such that one (1) person shall be able to open and close the hydrant under a maximum operating pressure of 250-PSI with a 15-inch wrench.
3. The design and construction of the hydrant operating mechanism located at the top of the hydrant shall be such that no part of the operating threads will be in contact with water in the upper barrel (standpipe) when the hydrant is in service.
  - (a) The working threaded parts of the operating mechanism shall not have any steel or iron parts against steel or iron parts. The threaded portion of the operating stem or the stem nut (or sleeve) shall be made of bronze or stainless steel.
  - (b) Details and materials for the dry-top construction shall be subject to the approval of the Commission.
4. Hydrant operating mechanism assembly shall be housed in a compact housing with an integral lubrication chamber.
  - (a) Two (2) O-rings shall be provided to seal the lubrication chamber from water in the hydrant barrel from entering the lubricating chamber under pressure.
  - (b) An additional O-ring shall be used in the hold down nut to prevent dirt, condensation or atmospheric contamination entering the lubrication chamber from outside.
  - (c) The moving surface against which these two "O"-rings bear upon to create the seal must be of bronze or stainless steel.
5. A travel stop nut or similar device may, but is not required, be used to limit main valve travel and to prevent putting main stem into over compression.
6. The upper operating assembly shall be compatible with the "Custodian" vandal proof device as manufactured by Hydra-Shield Manufacturing, Inc. The



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"Custodian" device must be able to be installed without further machining or modification to the hydrant.

7. The upper and lower operating rods may be made of cold roll steel (CRS), hot rolled steel (HRS), stainless steel (SS), or other material approved by the Commission. The lower operating rod shall not protrude past the lower barrel
8. The operating rods shall be connected with frangible coupling designed so that in the event of accident, damage, or breaking of the hydrant above or near the ground line the main valve will remain closed.
  - (a) The frangible coupling shall be held in place to the operating rods with at least one (1) stainless steel pin or bolt in each rod.
  - (b) Details and materials for the frangible connections shall be subject to the approval of the Commission.

### 3.11.9 Main Valve Assembly

1. Hydrant valve opening 5-1/4" minimum as sized by seat ring internal opening.
2. The hydrant main valve may be either three (3) piece design or one (1) piece design, as follows:
3. Three (3) piece design includes a top plate, main valve, and bottom plate:
  - (a) The valve top plate may be high strength ductile iron ASTM A-536 grade 65-45-12, high strength Cast Iron ASTM 126A Class B, bronze, or other material approved by the Commission.
  - (b) The valve bottom plate may be high strength ductile iron ASTM A-536 grade 65-45-12, high strength Cast Iron ASTM 126A Class B, bronze, or other material approved by the Commission.
  - (c) The valve bottom plate shall be fully epoxy coated by a fusion or thermal bonding in accordance with AWWA C-550. Bronze or stainless steel valve bottom plates do not require epoxy coating.
  - (d) The main valve may be high strength ductile iron ASTM A-536 grade 65-45-12, high strength Cast Iron ASTM 126A Class B, bronze, or other material approved by the Commission fully encapsulated in a rubber compound for water service, molded, not split and glued, constructed of styrene butadiene rubber (SBR) or Nitrile (Buna-N) compounds, and must meet or exceed ASTM D-2000 3 BA 715 and ANSI A21.11/AWWA C-111, latest revision. No bare metal shall be left exposed.



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4. One (1) piece design is a single piece:
  - (a) The main valve may be high strength ductile iron ASTM A-536 grade 65-45-12, high strength Cast Iron ASTM 126A Class B, steel, or other material approved by the Commission.
  - (b) The main valve shall be fully encapsulated in a rubber compound for water service, molded, not split and glued, constructed of ethylene propylene diene Monomer (EPDM) rubber in accordance with [ASTM](#) standard D-1418, styrene butadiene rubber (SBR) or Nitrile (Buna-N) compounds in accordance with ASTM D-2000 3 BA 715 and ANSI A21.11/AWWA C-111, latest revision. No bare metal shall be left exposed.
5. The main valve assembly shall have a bronze sub-seat and a bronze seat ring.
6. The mechanically installed sub-seat of the hydrant shall be constructed of bronze, and be an integral part of the bottom shoe/elbow.
  - The sub-seat shall be mechanically installed with threads, lock rings, or other Commission approved method.
7. The seat ring shall also be of bronze and shall be a working component of the main valve assembly.
8. Seal between seating and sub-seat shall consist of "o" rings located in machined grooves, above and below the drainage channel.
9. There shall be a minimum of two (2) drain ports one hundred and eighty-degrees apart. The drain ports shall be provided in the bottom barrel, bottom shoe/elbow, or between the bottom barrel and bottom shoe/elbow.
10. All "O" rings shall seal against bronze.

### 3.11.10 Bottom Shoe/Elbow

1. The bottom shoe/elbow shall be made of high strength ductile iron ASTM A-536 grade 65-45-12.
2. The bottom shoe/elbow shall be provided with flat cast bottom to set the hydrant on.
3. The bottom shoe/elbow shall be provided with 6-inch mechanical joint connection in accordance with ANSI/AWWA C111/A21.11.



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## Material Specifications

### 3.11.11 Coatings

1. Coatings require proper surface preparation in order for the coating systems to adhere to the component being coated. At a minimum the components shall be mechanically blast cleaned and/or immersed in a chemical cleaner or heat cleaned in a furnace in order to insure a properly prepared surface that is clean and clear of any grease, oil, dirt, etc., in accordance with AWWA C502 and C-550, latest versions.
2. The bonnet shall be fully epoxy coated by a fusion or thermal bonding, a polyester powder coat, or an epoxy wet or electrodesposition coat primer with a polyurethane top coat paint system in accordance with AWWA C502 and C-550, latest versions, and shall be applied to the interior (excluding lubricating chamber) and exterior of the bonnet.
  - (a) The color shall be a gloss aluminum/silver in accordance with Federal Standard 595 Paint Specification FS 17178.
  - (b) All threads and/or functional openings and surfaces shall be protected prior to coating and the barrel delivered without coating on the threads and/or functional openings and surfaces.
3. The upper barrel shall be fully epoxy coated by a fusion or thermal bonding, a polyester powder coat, or an epoxy wet or an electrodesposition coat primer with a polyurethane top coat paint system in accordance with AWWA C502 and C-550, latest versions, and shall be applied to the interior and exterior of the upper barrel.
  - (a) The color shall be gloss blue angels yellow in accordance with Federal Standard 595 Paint Specification FS 13655 or RGB Hex Code FDD31D.
  - (b) All threads and/or functional openings and surfaces shall be protected prior to coating and the barrel delivered without coating on the threads and/or functional openings and surfaces.
4. The lower barrel may be covered with two (2) coats of asphaltic tar coatings, the first being allowed to dry before the second is applied or may be fully epoxy coated by a fusion or thermal bonding or coated in accordance with AWWA C-502 and C-550, latest version, and shall be applied to the interior and exterior of the lower barrel.
5. The nozzle caps shall be fully epoxy coated by a fusion or thermal bonding, a polyester powder coat, or a epoxy wet or electrodesposition coat primer with a polyurethane top coat paint system in accordance with AWWA C502 and C-550, latest versions, and shall be applied to the interior and exterior of the nozzle caps.



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- (a) The color shall be a gloss aluminum/silver in accordance with Federal Standard 595 Paint Specification FS 17178.
  - (b) All threads and/or functional openings and surfaces shall be protected prior to coating and the barrel delivered without coating on the threads and/or functional openings and surfaces.
6. The bottom shoe/elbow shall be fully epoxy coated by a fusion or thermal bonding in accordance with AWWA C-502 and C-550 and shall be applied to the interior and exterior of the bottom shoe/elbow.

### 3.11.12 Manuals, Spare Parts, Tools, Touch-up Paint, Training, Repairs

1. The requirements of this section are for Commission Price Agreements and are not for Commission Approved Contractors or Commission Capital Projects, unless specifically asked for in the project.
2. The manufacturer shall provide four (4) 24-inches by 36-inches (vertical) cut sheets showing all the hydrant components, component material, and component part numbers with the first delivery. The vertical cut sheets shall be laminated.
3. The manufacturer shall provide six (6) complete sets catalogue or manual for parts, repair and maintenance with the first delivery.
4. The manufacturer shall provide at no additional cost four (4) complete sets of assembly/disassembly tools with the first delivery of hydrants.
5. The manufacturer shall provide two (2) quarts of touch-paint or coating that is compatible with the factory applied coating with the first delivery.
6. The manufacturer shall provide training to Commission construction and maintenance staff every two (2) years. Training shall be by a factory trained representative at the Commission's Customer Service Office at 71 Colton Street, Springfield Massachusetts during normal business hours. The first training shall be provided within 30-days of the first delivery unless otherwise scheduled by the Commission.
7. The manufacturer and/or vendor shall provide the Commission with contact information for a factory trained representative who shall be responsible to respond to complaints from the Commission about defects in material, coatings, and workmanship under normal use of the product within ten (10) working days.





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## Material Specifications

### 3.11.13 Miscellaneous

1. All fasteners, excluding joint accessories, installed below the ground line shall be made of Grade 304 stainless steel. Bolts shall meet ASTM A193 grade B8, latest revision. Nuts shall be in accordance with ASTM A194 grade 8, latest revision. Bolts and nuts shall be Unified National Coarse (UNC) rolled thread and heavy-duty hex nuts. Bolts installed into castings shall be provided with one (1) Grade 304 stainless steel flat washer and nuts and bolts shall be provided with two (2) Grade 304 stainless steel flat washers so that the epoxy coating is not damaged. At a minimum, nuts shall be coated with fluorocarbon, epoxy, zinc, or other anti-corrosion coating to help prevent galling.
2. All fasteners installed above the ground line shall be made of medium carbon steel and supplied with a rust proof coating. Bolts shall be of medium carbon steel, per ASTM A193, grade B7. Nuts shall be heavy hex nuts made of medium carbon steel, ASTM A194, grade 2H. All bolts and nuts shall be Unified National Coarse (UNC) rolled thread. Bolts installed into castings shall be provided with one (1) medium carbon steel flat washer and nuts and bolts shall be provided with two (2) medium carbon steel flat washers so that the epoxy coating is not damaged. All the medium carbon steel bolts, nuts, and washers installed above the ground line shall be rust proof coated or plated. Nuts and/or bolts shall be provided with two (2) Grade B steel flat washers so that the epoxy coating is not damaged.
3. To prevent galling; all stainless steel bolts shall be coated on the outside of all threads and the stainless steel nuts or castings on the inside of all threads at the factory, with an anti-seizing material such as provided by Henkel Technologies, Rocky Hill, Connecticut - product name: Loctite Nickel Anti-Seize Lubricant; Chesterton Technical Products, Stoneham, Massachusetts – product name: Chesterton 772 Premium Nickel Anti-Seize Compound; Permatex Inc. Hartford, Connecticut – product name: Permatex Nickel Anti-Seize Lubricant or equal product of another manufacturer and as specified in Section 3.18 of these Specifications.
4. The exterior design of the bonnet and upper barrel shall be of the “traditional design” and must meet and be subject to the approval of the Commission’s aesthetic judgment.



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## Material Specifications

### 3.11.14 Hydrant Makes and Models Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. American Flow Control – B-84-B-5,
2. AVK – 2780,
3. Clow – Medallion – F2545,
4. Kennedy - Guardian – K81,
5. M & H – 6129,
6. Mueller – Super Centurion,
7. U.S. Pipe - Metropolitan 250 – Model M-94,
8. East Jordan Iron Works – Watermaster 5CD250, or
9. Equal provided the Hydrants are manufactured as per these specifications.



# Springfield Water and Sewer Commission

## Material Specifications

### 3.11.15 Private Hydrants installed after a Back Flow Prevention Device

1. In addition to the Material Specifications for Public Hydrants Section 3.11.1 Private Hydrants installed after a back flow prevention device shall meet the following requirements:
2. Private Hydrants installed after a Back Flow Prevention Device shall be “two (2) way” and as follows:
  - (a) The upper barrel shall be equipped with (2) two each 2-1/2-inch hose nozzles, no greater than 180 degrees apart.
  - (b) The location of the center line of the upper barrel nozzles shall be at least 16-inches above the bury line so that a 15-inch wrench can freely turn 360-degrees without hitting the ground.
3. The upper barrel shall be fully epoxy coated by a fusion or thermal bonding, a polyester powder coat, or an epoxy wet or electro-disposition coat primer with a polyurethane top coat paint system in accordance with AWWA C502 and C-550, latest versions, and shall be applied to the interior and exterior of the upper barrel.
  - (a) The color shall be gloss red in accordance with Federal Standard 595 Paint Specification FS 11105 or RGB Hex Code B51F11.
  - (b) All threads and/or functional openings and surfaces shall be protected prior to coating and the barrel delivered without coating on the threads and/or functional openings and surfaces.
4. The rest of the components shall be coated as required in Section 3.11.11 of these Material Specifications.



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## Material Specifications

### 3.11.16 Private Hydrants installed before a Back Flow Prevention Device

1. In addition to the Material Specifications for Public Hydrants Section 3.11.1 Private Hydrants installed before a back flow prevention device shall meet the following requirements:
2. The upper barrel shall be fully epoxy coated by a fusion or thermal bonding, a polyester powder coat, or an epoxy wet or electro-disposition coat primer with a polyurethane top coat paint system in accordance with AWWA C502 and C-550, latest versions, and shall be applied to the interior and exterior of the upper barrel.
  - (a) The color shall be gloss red in accordance with Federal Standard 595 Paint Specification FS 11105 or RGB Hex Code B51F11.
  - (b) All threads and/or functional openings and surfaces shall be protected prior to coating and the barrel delivered without coating on the threads and/or functional openings and surfaces.
3. The rest of the components shall be coated as required in Section 3.11.11 of these Material Specifications.



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## Material Specifications

### 3.11.17 Vandal Proof Device for Operating Fire Hydrants

1. Vandal Proof Device for Operating Fire Hydrants provided to the Commission or Installer shall be manufactured, tested, inspected and delivered in full compliance with this Specification.
2. Device Description
  - (a) A vandal proof device (Trade Name “Custodian”) to prevent unauthorized use of fire hydrants. The device shall readily attach to the existing fire hydrant housing or opening mechanism. Materials shall be strong enough to withstand acts of vandalism and weather extremes and still provide smooth fire hydrant operation. The device shall be unique in that only a special magnetic wrench can open or close the fire hydrant.
  - (b) The vandal proof device shall be made to be installed on any hydrant in the Springfield Water and Sewer Commission’s Service Area..
  - (c) The vandal proof device shall be made to order, for specific makes and models of hydrants.

3. Device Construction

An inner barrel constructed of high tensile manganese bronze shall be designed to fit over the existing fire hydrant operating nuts. An outer housing constructed of stainless steel shall be installed over the inner barrel so as to swivel freely until a special key wrench is used. Attachment of the outer housing shall be a special snap ring groove designed to withstand repeated blows by a sledge hammer without shearing.

4. Device Mating Collar

A mating collar shall be installed between the outer housing fire hydrant top for a weather seal and to prevent removal of the swivel housing by pry bars or other tools available to vandals. The mating collar shall extend up the sides of the swivel housing and to a height sufficient to provide added protection of the hydrant operating nut and to withstand repeated blows by sledge without failing.

5. Device Operating Wrench

A special magnetic operating wrench shall be constructed of an aluminum-magnesium alloy with handles extending from both sides for easy operation. The wrench shall incorporate a unique permanent magnet which will engage an activator located inside the outer housing. The magnet’s inductive magnet can engage the activator. Performance must not be affected by local environment



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temperature ranges or weather conditions. The special key wrench shall be the only means of opening or closing the hydrant. As an added convenience, the opposite side of the wrench shall contain a conventional 1-1/8" pentagon recess that will work on standard hydrant nuts.

6. The manufacturer/vendor/shipper must use care in preparing the vandal proof device for shipment and in handling during shipment and delivery, to insure that the vandal proof devices are delivered without damage. Damaged vandal proof devices will not be accepted.
7. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the vandal proof device and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AWWA Standards.
8. References

The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

- (a) Name of Municipality/Utility
- (b) Total amount of product bid on and amount delivered
- (c) Date the bid was accepted and date the product was delivered
- (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product



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### 3.11.18 Diffusers for Fire Hydrants

1. Fire Hydrant Diffusers shall be provided to the Commission or Installer shall be manufactured, tested, inspected and delivered in full compliance with this Specification.
2. Fire Hydrant Diffusers shall be for use with chemically treated (4 ppm or less chlorine/chloramine) potable water.
3. Fire Hydrant Diffusers shall be provided with 2-1/2-inch NPT Coupling that accepts any 2-1/2" NPT Male Iron Pipe Adapter.
4. Fire Hydrant Diffusers shall be 18-inches in length x 8-inches x 8-inches at the discharge
5. Fire Hydrant Diffusers shall weight 33-pounds.
6. Fire Hydrant Diffusers shall be used with 81% Sodium Sulfitite tablets
7. Fire Hydrant Diffusers shall have an eleven (11) Tablet Capacity and use approximately one (1) Tablet per 2,500-gallons.
8. Fire Hydrant Diffusers shall be as currently manufactured by Pollardwater – Model LPD-250, or equal provided the Fire Hydrant Diffusers are manufactured as per these specifications.
9. The manufacturer/vendor/shipper must use care in preparing the above product for shipment and in handling during shipment and delivery, to insure that the products are delivered without damage. Damaged vandal proof devices will not be accepted.
10. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above product and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AWWA Standards.

#### 11. References

The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

- (a) Name of Municipality/Utility
- (b) Total amount of product bid on and amount delivered
- (c) Date the bid was accepted and date the product was delivered



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- (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product.

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### 3.11.19 Private Yard Hydrant

1. Private Yard Hydrants provided to the Springfield Water and Sewer Commission (Commission) or installer shall be manufactured, tested, inspected and delivered in full compliance with this Specification.
2. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;
  - (a) North America shall mean the United States, Canada, and Mexico,
  - (b) Cast shall mean molten metals poured into a mold to create Casting(s) for a finished product,
  - (c) Formed shall mean metals rolled or pressed or machined to create a finished product,
  - (d) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and
  - (e) Assembled shall mean castings and sourced parts are put together to build a finished product, or
  - (f) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.
3. Inspection:
  - (a) All finished product(s) furnished shall be subject to inspection by the Commission at the place of manufacture and shall be subject to inspection after delivery to the Commission.
  - (b) Cost of re-inspection of materials or fabricated finished product(s) caused by the non-compliance of the manufacturer with the provisions of the specifications, shall be paid for by the manufacturer, and shall be deductible from the price paid for the finished products.
4. Delivery shall be made by truck in minimum truckload quantity to locations designated in the Commission's service area in and near Springfield, Massachusetts. The low bidder shall notify the Commission of the quantity comprising a minimum truckload. The Commission reserves the right to mix depth of buries to reach a full truckload.
5. The manufacturer/vendor/shipper must use care in preparing finished product(s) for shipment and in handling during shipment and delivery, to insure that the



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finished(s) are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged finished(s) will not be accepted.

6. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the finished product(s) and all materials in its construction exactly conform to the applicable requirements of these specifications and the applicable AWWA Standards.
7. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.
8. The manufacturer and/or vendor shall furnish three (3) sets of 8-1/2-inch by 11-inch certified shop drawings for all materials to be used. All components shall be provided in accordance to these drawings. The drawings shall show the following:
  - (a) Cross sectional drawings of the fittings showing overall dimensions,
  - (b) Material specifications for each component,
  - (c) Coating applied to each component, if applicable,
  - (d) Rated working pressure and hydrostatic test pressure of each finished product(s), and
  - (e) Country of origin for each component.
9. The manufacturer at the Commission's request shall furnish three (3) sets of coating specification(s) of each component that has a coating applied identifying component surface preparation, primer (if applicable), type of coating(s), color of coating(s), manufacturer of coating(s), part number of the coating(s), and a sample on a 3-inch by 5-inch chip.
10. The manufacturer shall furnish a letter certifying the product meets all the requirements of the AIS, an explanation, in the letter, of how the products meets the AIS requirements, and signed by the Owner or President of the Company.
11. The manufacturer shall furnish a warranty for the finished Fittings that states that the Fittings shall be free from all defects in material and workmanship and from handling during delivery under normal use of the product for a minimum one (1) year time period from time of delivery. The manufacturer shall replace and/or repair defective parts or the whole coupling for a minimum one (1) year time period from time of delivery. Coating failures caused by Installer will not be a cause of coating failure



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12. The manufacturer shall furnish a certified statement that the required tests on the various materials and on the completed Fittings have been made, and the results of all tests conform to the requirements of the appropriate ANSI/AWWA standard.
13. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:
  - (a) Name of Municipality/Utility
  - (b) Total amount of product bid on and amount delivered
  - (c) Date the bid was accepted and date the product was delivered
  - (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product
14. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification “Approved”, “Approved as Noted”, or “Rejected-Resubmit” and return to the manufacturer and/or vendor.
  - (a) Approved means the contractor can supply the material as shown on the drawing(s).
  - (b) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.
  - (c) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.
15. Private Yard Hydrants shall be non-freezing type and provided so as to be self-draining and a depth of bury of 5-feet 6-inches minimum.
16. Private Yard Hydrants will be furnished with a 2" female iron pipe (FIP) inlet and a 2-1/2" national standard thread (NST) outlet.
17. Private Yard Hydrants shall have a non-turning operating rod and shall open to the left.
18. Private Yard Hydrants shall be painted red.
19. All working parts of Private Yard Hydrants shall be bronze to bronze design and be serviceable from above grade with no digging.
20. The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for



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interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

- (a) Kupferle – #80WD, or
- (b) Equal provided the products are manufactured as per these specifications.



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## Material Specifications

### Section 3.12 FITTINGS

#### 3.12.1 General

1. Fittings provided to the Springfield Water and Sewer Commission (Commission) or its Installers shall be manufactured, tested, inspected and delivered in full compliance with this Specification.
2. Fittings shall be cast from of high strength ductile iron conforming to ASTM A-536 grade 70-50-05. The minimum tensile strength shall be 70,000-PSI, the minimum yield strength shall be 50,000-PSI, and the minimum elongation shall be 5%.
3. Fittings shall be NSF 61 certified.
4. Working Pressure:
  - (a) 4-inch though 24-inch shall be rated at 350-PSI. Test pressure shall be three (3) times the rated working pressure (1050-PSI).
  - (b) 30-inch though 48-inch shall be rated at 250-PSI. Test pressure shall be three (3) times the rated working pressure (750-PSI).
  - (c) 54-inch though 64-inch shall be rated at 150-PSI. Test pressure shall be three (3) times the rated working pressure (450-PSI).
5. Joints of Fittings:
  - (a) Fittings shall be restrained mechanical joint conforming to ANSI A21.11/AWWA C-111 and as specified in Section 3.16 of these Material Specifications, unless otherwise specified by the Springfield Water and Sewer Commission (Commission).
  - (b) Ductile Iron fittings with restrained mechanical joint, flange, plain end, or combination thereof may be allowed in accordance with appropriate ANSI/AWWA standard and as specified by Commission.
  - (c) The bolt holes shall be equal spaced and straddle the pipe center line.
  - (d) Push-on (Tyton), type joints are not acceptable.
6. Ductile Iron Fittings shall be interior lined and exterior coated as follows:
  - (a) All Fittings shall be lined with an double cement mortar lining and sealed (over the mortar lining) and with an approved asphaltic material seal coat in accordance with ANSI A21.4/AWWA C-104 of the latest revision.



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- (b) Provisions of ANSI A21.4/AWWA C-104, Section 4.11 relating to characteristics of asphaltic seal coat as to deleterious effect upon the quality, color, taste or odor imparted to potable water shall be strictly observed.
  - (c) The exterior coating all Fittings shall have a base layer of arc-applied, 99.99% pure zinc coating, having a mass of 200g/m<sup>2</sup> and shall comply with all applicable parts of ISO 8179 for zinc coatings.
  - (d) All Fittings shall have a finish layer of shop-applied bituminous paint in accordance with AWWA C-151 latest the revision and shall comply with all applicable parts of ISO 8179 for zinc coatings
7. Markings
- (a) Fittings shall be marked with the weight.
  - (b) Fittings shall have distinctly cast upon them the pressure rating, the manufacturer's identification, nominal diameter of the openings, and the number of degree or fraction of the circle on all bends.
8. All tests shall be made in accordance with the methods prescribed by the appropriate ANSI/AWWA standards.
9. All fasteners, excluding joint accessories, shall be made of Grade 304 stainless steel. Bolts shall meet ASTM A193 grade B8, latest revision. Nuts shall be in accordance with ASTM A194 grade 8, latest revision. Bolts and nuts shall be Unified National Coarse (UNC) rolled thread and heavy-duty hex nuts. Bolts installed into castings shall be provided with one (1) Grade 304 stainless steel flat washer and nuts and bolts shall be provided with two (2) Grade 304 stainless steel flat washers so that the epoxy coating is not damaged. At a minimum, nuts shall be coated with fluorocarbon, epoxy, zinc, or other anti-corrosion coating to help prevent galling.
10. To prevent galling; all stainless steel bolts shall be coated on the outside of all threads and the stainless steel nuts or castings on the inside of all threads at the factory, with an anti-seizing material such as provided by Henkel Technologies, Rocky Hill, Connecticut - product name: Loctite Nickel Anti-Seize Lubricant; Chesterton Technical Products, Stoneham, Massachusetts – product name: Chesterton 772 Premium Nickel Anti-Seize Compound; Permatex Inc. Hartford, Connecticut – product name: Permatex Nickel Anti-Seize Lubricant or equal product of another manufacturer and as specified in Section 3.18 of these Specifications.
11. Fittings shall be bid without accessories (glands, gland gaskets and bolts).



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12. Accessories shall be as specified in Section 3.16 of these Material Specifications.
13. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;
  - (c) North America shall mean the United States, Canada, and Mexico,
  - (d) Cast shall mean molten metals poured into a mold to create Casting(s) for a finished product,
  - (e) Formed shall mean metals rolled or pressed or machined to create a finished product,
  - (f) Incidental parts may be purchased/obtained from other countries to provide a finished product , in accordance with these Material Specifications, and
  - (g) Assembled shall mean castings and sourced parts are put together to build a finished product, or
  - (h) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.
14. Inspection:
  - (i) All finished product(s) furnished shall be subject to inspection by the Commission at the place of manufacture and shall be subject to inspection after delivery to the Commission.
  - (j) Cost of re-inspection of materials or fabricated finished product(s) caused by the non-compliance of the manufacturer with the provisions of the specifications, shall be paid for by the manufacturer, and shall be deductible from the price paid for the finished products.
15. Delivery shall be made by truck in minimum truckload quantity to locations designated in the Commission's service area in and near Springfield, Massachusetts. The low bidder shall notify the Commission of the quantity comprising a minimum truckload. The Commission reserves the right to mix depth of buries to reach a full truckload.
16. The manufacturer/vendor/shipper must use care in preparing finished product(s) for shipment and in handling during shipment and delivery, to insure that the finished(s) are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged finished(s) will not be accepted.



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17. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the finished product(s) and all materials in its construction exactly conform to the applicable requirements of these specifications and the applicable AWWA Standards.

### 3.12.2 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.
2. The manufacturer and/or vendor shall furnish three (3) sets of 8-1/2-inch by 11-inch certified shop drawings for all materials to be used. All components shall be provided in accordance to these drawings. The drawings shall show the following:
  - (a) Cross sectional drawings of the fittings showing overall dimensions,
  - (b) Material specifications for each component,
  - (c) Coating applied to each component, if applicable,
  - (d) Rated working pressure and hydrostatic test pressure of each finished product(s), and
  - (e) Country of origin for each component.
3. The manufacturer at the Commission's request shall furnish three (3) sets of coating specification(s) of each component that has a coating applied identifying component surface preparation, primer (if applicable), type of coating(s), color of coating(s), manufacturer of coating(s), part number of the coating(s), and a sample on a 3-inch by 5-inch chip.
4. The manufacturer shall furnish a letter certifying the product meets all the requirements of the AIS, an explanation, in the letter, of how the products meets the AIS requirements, and signed by the Owner or President of the Company.
5. The manufacturer shall furnish a warranty for the finished Fittings that states that the Fittings shall be free from all defects in material and workmanship and from handling during delivery under normal use of the product for a minimum one (1) year time period from time of delivery. The manufacturer shall replace and/or repair defective parts or the whole coupling for a minimum one (1) year time period from time of delivery. Coating failures caused by Installer will not be a cause of coating failure
6. The manufacturer shall furnish a certified statement that the required tests on the various materials and on the completed Fittings have been made, and the results of all tests conform to the requirements of the appropriate ANSI/AWWA standard.





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7. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:
  - (f) Name of Municipality/Utility
  - (g) Total amount of product bid on and amount delivered
  - (h) Date the bid was accepted and date the product was delivered
  - (i) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product
8. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification “Approved”, “Approved as Noted”, or “Rejected-Resubmit” and return to the manufacturer and/or vendor.
  - (j) Approved means the contractor can supply the material as shown on the drawing(s).
  - (k) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.
  - (l) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

### 3.12.3 Ductile Iron Fittings - Compact (or Short) Body

1. Ductile Iron Fittings – Compact (or Short) Body provided to the Commission or its Contractors shall be manufactured, tested, inspected and delivered in full compliance with this Specification.
2. Ductile Iron Fittings – Compact (or Short) Body, as a minimum, meet all specifications as in Paragraphs 3.12.1, 3.12.2, and the following:
3. Ductile Iron Fittings Compact (or Short) Body shall at a minimum conform to ANSI 21.53/AWWA C-153 (most current revision).



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### 3.12.4 Ductile Iron Fittings – Standard (or Long) Body

1. Ductile Iron Fittings – Standard (or Long) Body provided to the Springfield Water and Sewer Commission (Commission) or its Contractors shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.
2. Ductile Iron Fittings – Standard (or Long ) Body, as a minimum, meet all specifications as in in Paragraphs 3.12.1, 3.12.2, and the following:
3. Ductile Iron Fittings - Standard (or Long) Body shall at a minimum conform to ANSI 21.10/AWWA C-110 (most current revision).

Last Modified: 04/09/2025 at 10:39AM EDT



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### 3.12.5 Hydrant Anchoring Tees

1. Hydrant Anchoring Tees provided to the Commission or Installer shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.
2. Hydrant Anchoring Tees, as a minimum, meet all specifications as in in Paragraphs 3.12.1, 3.12.2, and the following:
3. Hydrant Anchoring Tees shall conform to ANSI A21/AWWA C-110 (most current revision).
4. Hydrant Anchoring Tees shall be restrained mechanical joint conforming to ANSI A21.11/AWWA C-111 and as specified in Section 3.16 of these Material Specifications, unless otherwise specified and the branch shall have a plain end with an integral gland and rotating mechanical joint gland and mechanical joint restraints to provide a restrained connection.



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### 3.12.6 Solid Sleeve

1. Solid Sleeves provided to the Springfield Water and Sewer Commission (Commission) or its Contractors shall be manufactured, tested, inspected and delivered in full compliance with this Specification.
2. Solid Sleeves, as a minimum, meet all specifications as in in Paragraphs 3.12.1, 3.12.2, and the following:
3. Solid Sleeves shall conform to ANSI A21/AWWA C-110 (most current revision).
4. Solid Sleeves shall be restrained mechanical joint conforming to ANSI A21.11/AWWA C-111 and as specified in Section 3.16 of these Material Specifications, unless otherwise specified.
5. Solid sleeves, at a minimum, shall be provided with a ¾” NPT test port with a lead free brass lug with standard square head. Proper use of this feature assures positive seal before putting the water main back in service.

### 3.12.7 Split Repair sleeve

1. Split Repair Sleeves provided to the Springfield Water and Sewer Commission (Commission) or its Contractors shall be manufactured, tested, inspected and delivered in full compliance with this Specification.
2. Split Repair Sleeves, as a minimum, meet all specifications as in in Paragraphs 3.12.1, 3.12.2, and the following:
3. Split Repair Sleeves shall conform to ANSI A21/AWWA C-110 (most current revision).
4. Split Repair sleeves for ductile iron shall be restrained mechanical joint conforming to ANSI A21.11/AWWA C-111 and as specified in Section 3.16 of these Material Specifications, unless otherwise specified.
5. Split Repair sleeves for cast iron shall be mechanical joint conforming to ANSI A21.11/AWWA C-111 and as specified in Section 3.16 of these Material Specifications, unless otherwise specified. When specified for cast iron pipe restraining glands are not required.
6. Split Repair sleeves, at a minimum, shall be provided with a ¾” NPT test port with a lead free brass lug with standard square head. Proper use of this feature assures positive seal before putting the water main back in service.
7. Split Repair sleeves shall be provided with split gland and body components.



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8. Split Repair sleeve side rubber gaskets shall be rectangular to cross-section and shall fit into grooved channels in the casting. These gaskets shall extend the entire length of the sleeve. Gaskets shall be made of Nitrile (Buna-N).
9. Split Repair sleeve shall be AB-CD pattern to permit use of plain rubber and duck-tipped gaskets for various O.D. piping sizes.

### 3.12.8 Fitting Makes and Models Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. Ductile Iron Fittings – Compact and Standard Body
  - (a) American Cast Iron Pipe Co. – all fittings,
  - (b) Atlantic States Pipe (McWayne, Inc.) – all fittings,
  - (c) Griffon Pipe Products, Inc. – all fittings,
  - (d) Tyler Union – all fittings,
  - (e) U. S. Pipe and Foundry Co. – all fittings, or the equal product of another manufacturer.
2. Ductile Iron Fittings – Hydrant Anchoring Tees
  - (a) American Cast Iron Pipe Co.,
  - (b) Atlantic States Pipe (McWayne, Inc.),
  - (c) Griffon Pipe Products, Inc.,
  - (d) Tyler Union,
  - (e) U. S. Pipe and Foundry Co., or the equal product of another manufacturer.
3. Ductile Iron Fittings – Solid Sleeves
  - (a) American Cast Iron Pipe Co.,
  - (b) Atlantic States Pipe (McWayne, Inc.),
  - (c) Griffon Pipe Products, Inc.,



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- (d) Tyler Union,
  - (e) U. S. Pipe and Foundry Co., or the equal product of another manufacturer.
4. Ductile Iron Fittings – Split Repair Sleeves
- (a) American Cast Iron Pipe Co. – model 2800,
  - (b) Atlantic States Pipe (McWayne, Inc.),
  - (c) Griffon Pipe Products, Inc.,
  - (d) Mueller Co. – models H-785 and H-786
  - (e) Tyler Union - ,
  - (f) U. S. Pipe and Foundry Co., or the equal product of another manufacturer.



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### Section 3.13 COUPLINGS

#### 3.13.1 General

1. Couplings provided to the Springfield Water and Sewer Commission or its Contractors shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.
2. Couplings as a minimum shall conform to the most current American Water Works Association Standard C-219 and all addenda thereto.
3. Working pressure shall be rated at 200-PSI. Test pressure shall be 1.5 times the rated working pressure (375-PSI).
4. Couplings shall be provided with gaskets constructed of Styrene butadiene rubber (SBR) or Nitrile (Buna-N) compounds for water service, molded, not split and glued, and must meet or exceed ASTM D-2000 3 BA 715 and ANSI A21.11/AWWA C-111, latest revision.
5. The exterior coating all couplings shall be fusion-bonded epoxy coating in accordance with ANSI A21.16 / AWWA C116 of the latest revision and shall be applied to the interior and exterior of the fitting.
6. All fasteners, excluding joint accessories, shall be made of Grade 304 stainless steel. Bolts shall be in accordance with ASTM A193 grade B8, latest revision. Nuts shall be in accordance with ASTM A194 grade 8, latest revision. Bolts and nuts shall be Unified National Coarse (UNC) rolled thread and heavy-duty hex nuts. Bolts installed into castings shall be provided with one (1) Grade 304 stainless steel flat washer and nuts and bolts shall be provided with two (2) Grade 304 stainless steel flat washers so that the epoxy coating is not damaged. At a minimum, nuts shall be coated with fluorocarbon, epoxy, zinc, or other anti-corrosion coating to help prevent galling.
7. At the Commission's discretion, track-head or tee-head bolts made of high strength, low alloy, corrosion resistant, Cor-Ten steel may be substituted. A request for the substitution must be submitted in writing to E&TS. Track head bolts made of high strength, low alloy, corrosion resistant, Cor-Ten steel shall be in accordance AWWA C-111, ASTM A242, and/or ASTM A588 latest revisions. Nuts shall be in accordance with ASTM A194 grade 2H or ASTM A563 grade A latest revision. Bolts and nuts shall be Unified National Coarse (UNC) rolled thread and heavy-duty hex nuts. Bolts installed into castings shall be provided with one (1) medium carbon steel flat washer and nuts and bolts shall be provided with two (2) medium carbon steel flat washers so that the epoxy coating is not damaged. All the non-stainless steel bolts, nuts, and washers shall be rust proof coated or plated.



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8. To prevent galling; all stainless steel bolts shall be coated on the outside of all threads and the stainless steel nuts or castings on the inside of all threads at the factory, with an anti-seizing material such as provided by Henkel Technologies, Rocky Hill, Connecticut - product name: Loctite Nickel Anti-Seize Lubricant; Chesterton Technical Products, Stoneham, Massachusetts – product name: Chesterton 772 Premium Nickel Anti-Seize Compound; Permatex Inc. Hartford, Connecticut – product name: Permatex Nickel Anti-Seize Lubricant or equal product of another manufacturer and as specified in Section 3.18 of these Specifications.
9. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;
  - (a) North America shall mean the United States, Canada, and Mexico,
  - (b) Cast shall mean molten metals poured into a mold to create Casting(s) for a finished product,
  - (c) Formed shall mean metals rolled or pressed or machined to create a finished product,
  - (d) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and
  - (e) Assembled shall mean castings and sourced parts are put together to build a finished product, or
  - (f) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.
10. Inspection:
  - (a) All finished product(s) furnished shall be subject to inspection by the Commission at the place of manufacture and shall be subject to inspection after delivery to the Commission.
  - (b) Cost of re-inspection of materials or fabricated finished product(s) caused by the non-compliance of the manufacturer with the provisions of the specifications, shall be paid for by the manufacturer, and shall be deductible from the price paid for the finished products.
11. Delivery shall be made by truck in minimum truckload quantity to locations designated in the Commission’s service area in and near Springfield, Massachusetts. The low bidder shall notify the Commission of the quantity





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comprising a minimum truckload. The Commission reserves the right to mix depth of buries to reach a full truckload.

12. The manufacturer/vendor/shipper must use care in preparing finished product(s) for shipment and in handling during shipment and delivery, to insure that the finished(s) are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged finished(s) will not be accepted.
13. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the finished product(s) and all materials in its construction exactly conform to the applicable requirements of these specifications and the applicable AWWA Standards.

### 3.13.2 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.
2. The manufacturer and/or vendor shall furnish three (3) sets of 8-1/2-inch by 11-inch certified shop drawings for all materials to be used. All components shall be provided in accordance to these drawings. The drawings shall show the following:
  - (a) Cross sectional drawings of the hydrant showing overall dimensions,
  - (b) Material specifications for each component,
  - (c) Coating applied to each component, if applicable,
  - (d) Country of origin for each component.
3. The manufacturer at the Commission's request shall furnish three (3) sets of coating specification(s) of each component that has a coating applied identifying component surface preparation, primer (if applicable), type of coating(s), color of coating(s), manufacturer of coating(s), part number of the coating(s), and a sample on a 3-inch by 5-inch chip.
4. The manufacturer shall furnish a letter certifying the product meets all the requirements of the AIS, an explanation, in the letter, of how the products meets the AIS requirements, and signed by the Owner or President of the Company.
5. The manufacturer shall furnish a warranty for the finished couplings that states that the couplings shall be free from all defects in material and workmanship and from handling during delivery under normal use of the product for a minimum one (1) year time period from time of delivery. The manufacturer shall replace and/or repair defective parts or the whole coupling for a minimum one (1) year time period

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from time of delivery. Coating failures caused by Installer will not be a cause of coating failure

6. The manufacturer shall furnish a certified statement that the required tests on the various materials and on the completed couplings have been made, and the results of all tests conform to the requirements of the American Water Works Association Standard Specification C-219.
7. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:
  - (a) Name of Municipality/Utility
  - (b) Total amount of product bid on and amount delivered
  - (c) Date the bid was accepted and date the product was delivered
  - (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product
8. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification “Approved”, “Approved as Noted”, or “Rejected-Resubmit” and return to the manufacturer and/or vendor.
  - (a) Approved means the contractor can supply the material as shown on the drawing(s).
  - (b) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.
  - (c) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

### 3.13.3 Standard Range Couplings 4” – 24”

1. Standard Range Couplings 4” – 24” shall, as a minimum, meet all specifications as in Paragraphs 3.13.1, 3.13.2, and the following:
2. Standard Range Couplings 4” – 24” shall have both center and end rings made of high strength ductile iron ASTM A-536 grade 65-45-12, latest revision.
3. Standard Range Couplings 4” – 24” shall have the center rings, end rings, and gaskets clearly labeled to show the diameter range it will cover.



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### 3.13.4 Wide Range Couplings 4” – 24”

1. Wide Range Couplings 4” – 24” shall, as a minimum, shall meet all specifications as in Paragraphs 3.13.1, 3.13.2, and the following:
2. Wide Range Couplings 4” – 24” shall have both center and end rings made of high strength ductile iron ASTM A-536 grade 65-45-12, latest revision.
3. Wide Range Couplings 4” – 24” shall have the center rings, end rings, and gaskets clearly labeled to show the diameter range it will cover.

### 3.13.5 Wide Range Two Bolt Couplings up to 12-inch

1. Wide Range Two Bolt Couplings shall, as a minimum, shall meet all specifications as in Paragraphs 3.13.1, 3.13.2, and the following:
2. Wide Range Two Bolt Couplings shall have center ring, end rings, and bolt guides made of high strength ductile iron ASTM A-536 grade 65-45-12, latest revision. Center ring shall include a handle to ease installation.
3. Wide Range Two Bolt Couplings shall be provided with preassembled wide range gaskets and one additional gasket to cover extra wide range. The gasket shall be clearly labeled to show the diameter range it will cover. A heavy gauge 304 stainless steel armor shall be installed on each gasket.

### 3.13.6 Wide Range Two Bolt Couplings 16-inch to 24-inch

1. Wide Range Two Bolt Couplings shall, as a minimum, shall meet all specifications as in Paragraphs 3.13.1, 3.13.2, and the following:
2. Wide Range Two Bolt Couplings shall have end rings made of high strength ductile iron ASTM A-536 grade 60-40-18 for 16-inch or medium carbon steel ASTM A-795 for 18-inch to 24-inch, latest revisions.
3. Wide Range Two Bolt Couplings shall have center ring, made of high strength medium carbon steel ASTM A53 grade A, latest revisions.
4. Wide Range Two Bolt Couplings shall be provided with preassembled wide range gaskets. The gasket shall be clearly labeled to show the diameter range it will cover. A heavy gauge 304 stainless steel armor shall be installed on each gasket.

### 3.13.7 Large Diameter Wide Range Couplings 16-inch to 24-inch

1. Large Diameter Wide Range Couplings 16” and larger shall, as a minimum, shall meet all specifications as in Paragraphs 3.13.1, 3.13.2, and the following:



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2. Large Diameter Wide Range Couplings 16" and larger coupling shall have both center and end rings made of high strength ductile iron ASTM A-536 grade 65-45-12, latest revision.
3. Large Diameter Wide Range Couplings 16" and larger coupling shall be clearly labeled to show the diameter range it will cover.

### 3.13.8 Couplings 30" – 48"

1. Couplings 30" – 48" shall, as a minimum, shall meet all specifications as in Paragraphs 3.13.1, 3.13.2, and the following:
2. Couplings 30" – 48" shall have the center rings that are either beveled or flared and made of formed carbon steel per ASTM A-36 with minimum yield of 30,000 PSI.
3. Couplings 30" – 48" shall have end rings that are contoured rolled mill section carbon steel per AISI 1018-1020. End ring thickness shall be determined by pipe O.D. and pressure rating.
4. Vendor shall provide complete diameter range information on the couplings being bid.

### 3.13.9 Coupling with End Caps and Threaded Outlets up to 16-inch

1. Couplings with end caps and threaded outlets shall, as a minimum, shall meet all specifications as in Paragraphs 3.13.1, 3.13.2, and the following:
2. Couplings and end caps shall have the center ring, both end rings, and the end cap made of high strength ductile iron ASTM A-536 grade 65-45-12, latest revision.
3. End caps to be furnished with a 2" threaded NPT female outlet with plug.
4. Vendor shall provide complete diameter range information on the couplings being bid.

### 3.13.10 Coupling with End Caps and Threaded Outlets greater than 16-inch

1. Couplings with end caps and threaded outlets shall, as a minimum, shall meet all specifications as in Paragraphs 3.13.1, 3.13.2, and the following:
2. Couplings and end caps shall have the center rings that are either beveled or flared and made of formed carbon steel per ASTM A-36 with minimum yield of 30,000 PSI.



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3. Couplings with end caps shall have end rings that are contoured rolled mill section carbon steel AISI 1018-1020. End ring thickness shall be determined by pipe O.D. and pressure rating.
4. End caps to be furnished with a 2" threaded NPT female outlet with plug.
5. Vendor shall provide complete diameter range information on the couplings being bid.

### 3.13.11 Coupling Makes and Models Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. Standard Range Couplings 4" – 24" shall be
  - (a) Dresser – Style 253 (up to 16-inch only),
  - (b) Ford – Style FC1,
  - (c) Romac - Style 501 couplings,
  - (d) Smith-Blair – OMNI 441A (up to 16-inch only), or
  - (e) Equal provided the products are manufactured as per these specifications.
2. Wide Range Couplings 4" – 24" shall be
  - (a) Dresser – Style 253,
  - (b) Mueller – Maxi-Range,
  - (c) Romac - Style XR501 couplings, or
  - (d) Equal provided the products are manufactured as per these specifications.
3. Wide Range Two Bolt Couplings up to 12-inch shall be
  - (a) Romac – Macro HP, or
  - (b) or the equal product of another manufacturer.
4. Wide Range Two Bolt Couplings 16-inch to 24-inch shall be
  - (a) Krause – Hymax, or



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- (b) the equal product of another manufacturer.
- 5. Couplings 30” – 48” shall be
  - (a) Dresser – Style 38 or 138,
  - (b) Ford – Style FC4,
  - (c) Romac style 400,
  - (d) Smith Blair 411A or 413A, or
  - (e) the equal product of another manufacturer.
- 6. Coupling with End Caps and Threaded Outlets up to 16-inch
  - (a) Romac Style EC501, or
  - (b) the equal product of another manufacturer.
- 7. Coupling with End Caps and Threaded Outlets greater than 16-inch
  - (a) Dresser – Style 38 or 138
  - (b) Ford Style FC4,
  - (c) Romac Style FC400
  - (d) Smith Blair Style 481A, or
  - (e) the equal product of another manufacturer.



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### Section 3.14 CLAMPS

#### 3.14.1 General

1. All Clamps in this section provided to the Springfield Water and Sewer Commission (Commission) or installer shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.
2. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;
  - (a) North America shall mean the United States, Canada, and Mexico,
  - (b) Cast shall mean molten metal(s) poured into a mold to create Casting(s) for a finished product,
  - (c) Incidental parts may be purchased/obtained from other countries to provide a finished product , in accordance with these Material Specifications, and
  - (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or
  - (e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.
3. Inspection:
  - (a) All finished product(s) furnished shall be subject to inspection by the Commission at the place of manufacture and shall be subject to inspection after delivery to the Commission.
  - (b) Cost of re-inspection of materials or fabricated finished product(s) caused by the non-compliance of the manufacturer with the provisions of the specifications, shall be paid for by the manufacturer, and shall be deductible from the price paid for the finished product(s).
4. Delivery shall be made by truck in minimum truckload quantity to locations designated in the Commission's service area in and near Springfield, Massachusetts. The low bidder shall notify the Commission of the quantity comprising a minimum truckload.
5. The manufacturer/vendor/shipper must use care in preparing finished product(s) for shipment and in handling during shipment and delivery, to insure that the finished(s) are delivered without damage. Particular attention must be directed at



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protecting the protective coating from damage. Damaged finished products and/or protective coatings will not be accepted.

### 3.14.2 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.
2. The manufacturer and/or vendor shall furnish three (3) sets of 24-inch by 36-inch certified shop drawings for all materials to be used. All components shall be provided in accordance to these drawings. The drawings shall show the following:
  - (a) Cross sectional drawings of the clamp(s) showing overall dimensions,
  - (b) Material specifications for each component,
  - (c) Coating applied to each component, if applicable,
  - (d) Weight of each component and total weight, and
  - (e) Country of origin for each component.
3. The manufacturer and/or vendor shall furnish three (3) sets of coating specification(s) of each component that has a coating applied identifying component surface preparation, primer (if applicable), type of coating(s), color of coating(s), manufacturer of coating(s), part number of the coating(s), and a sample on a 3-inch by 5-inch chip.
4. The manufacturer and/or vendor shall furnish a letter certifying the product meets all the requirements of the AIS, an explanation, in the letter, of how the products meets the AIS requirements, and signed by the Owner or President of the Company.
5. The manufacturer and/or vendor shall furnish one (1) complete catalogue or manual for parts, repair, and maintenance.
6. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the finished product(s) and all materials in its construction exactly conform to the applicable requirements of these specifications and the applicable AWWA Standards.
7. The manufacturer and/or vendor shall furnish a certified statement that all butterfly valves of the same make and model bid, regardless of the year of manufactured, shall have interchangeable component parts and that the parts availability and delivery shall remain firm for ten (10) years.





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8. The manufacturer and/or vendor shall furnish a warranty for the clamp(s) that states that the clamp(s) shall be free from all defects in material and workmanship under normal use of the product for a minimum ten (10) year time period from time of delivery. The manufacturer shall replace and/or repair defective parts or the whole butterfly valve for a minimum ten (10) year time period from time of delivery.
9. The manufacturer and/or vendor shall furnish certified results of a proof of design test performed at an independent testing laboratory. Testing shall include a shell test and seal test to demonstrate the clamp(s) will hold pressure as required.
10. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:
  - (a) Name of Municipality/Utility
  - (b) Total amount of product bid on and amount delivered
  - (c) Date the bid was accepted and date the product was delivered
  - (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product
11. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification “Approved”, “Approved as Noted”, or “Rejected-Resubmit” and return to the manufacturer and/or vendor.
  - (a) Approved means the contractor can supply the material as shown on the drawing(s).
  - (b) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.
  - (c) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

### 3.14.3 Repair Clamps and Clamps with Outlets

1. Repair Clamps and Clamps with Outlets provided to the Springfield Water and Sewer Commission (Commission) or its Contractors or the Springfield Department of Public Works shall be manufactured, tested, inspected and delivered in full compliance with this Specification.
2. Repair Clamps and Clamps with Outlets shall, as a minimum, meet all specifications as in Paragraphs 3.14.1, 3.14.2, and the following:



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3. Repair clamps shall be single section up to 12-inch diameter and three sections for 16-inch through 24-inch diameter.
4. Shells shall be constructed of Grade 18-8, Type 304 stainless steel with stainless steel lugs and side bars welded to the shell.
5. Lugs and side bars shall be constructed of Grade 18-8, Type 304 stainless steel with stainless steel fasteners welded to the lugs and side bars.
6. All fasteners, excluding joint accessories, shall be made of Grade 304 stainless steel. Bolts shall be in accordance with ASTM A193 grade B8, latest revision. Nuts shall be in accordance with ASTM A194 grade 8, latest revision. Bolts and nuts shall be Unified National Coarse (UNC) rolled thread and heavy-duty hex nuts. Bolts installed into castings shall be provided with one (1) Grade 304 stainless steel flat washer and nuts and bolts shall be provided with two (2) Grade 304 stainless steel flat washers so that the epoxy coating is not damaged. At a minimum, nuts shall be coated with fluorocarbon, epoxy, zinc, or other anti-corrosion coating to help prevent galling.
7. To prevent galling; all stainless steel bolts shall be coated on the outside of all threads and the stainless steel nuts or castings on the inside of all threads at the factory, with an anti-seizing material such as provided by Henkel Technologies, Rocky Hill, Connecticut - product name: Loctite Nickel Anti-Seize Lubricant; Chesterton Technical Products, Stoneham, Massachusetts – product name: Chesterton 772 Premium Nickel Anti-Seize Compound; Permatex Inc. Hartford, Connecticut – product name: Permatex Nickel Anti-Seize Lubricant or equal product of another manufacturer and as specified in Section 3.18 of these Specifications.
8. All welds used in the construction of the repair clamps shall conform to all American Welding Society (AWS) codes. All welds shall be fully passivated in order to restore the stainless steel to its original corrosive resistant characteristics.
9. Repair clamps shall be provided with gaskets constructed of Styrene butadiene rubber (SBR) compound for water service and must meet or exceed ASTM-D-2000-AA-415.
10. Ranges must be clearly labeled on the package as well as on each clamp.
11. Clamps with outlets shall have Mueller CC thread.
12. Range diameter information must be provided from vendor on the clamps bid.



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### 3.14.4 Repair Clamp Makes and Models Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. Single section clamps shall be:
  - (a) Cascade - Style CR1,
  - (b) Dresser – Style 364 (up to 12-inch diameter)
  - (c) Ford – Style FS1,
  - (d) Romac - SS1, or
  - (e) Equal provided the products are manufactured as per these specifications.
2. Three section clamps shall be,
  - (a) Cascade - Style CR3,
  - (b) Ford – Style FS3
  - (c) Romac – SS3, or
  - (d) Equal provided the products are manufactured as per these specifications.

### 3.14.5 Bell Joint Clamps

3. Bell Joint Clamps provided to the Commission or Installer shall be manufactured, tested, inspected and delivered in full compliance with this Specification.
4. Bell Joint Clamps shall, as a minimum, meet all specifications as in Paragraphs 3.14.1, 3.14.2, and the following:
5. Bell Joint Clamps shall have the bell and spigot rings made of high strength ductile iron ASTM A-536 grade 65-45-12, latest revision or formed carbon steel per ASTM A-36 with minimum yield of 30,000 PSI.
6. Bell Joint Clamps shall have a minimum pressure rating of 150-PSI.
7. The coating for bell joint clamps shall be fusion-bonded epoxy coating in accordance with ANSI A21.16 / AWWA C116 of the latest revision and shall be



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applied to the interior and exterior of the fitting, unless otherwise approved by the Commission.

8. Bell joint clamps shall fit rubber ring joint (Tyton), caulked joint (poured), or both for all classes of cast iron and ductile iron pipe.
9. Bell joint clamps shall be provided with gaskets constructed of Styrene butadiene rubber (SBR) compound for water service and must meet or exceed ASTM-D-2000-MBA 710.
10. The coating all bell joint clamps shall be fusion-bonded epoxy coating in accordance with ANSI A21.16 / AWWA C116 of the latest revision and shall be applied to the interior and exterior of the clamp.
11. All fasteners, excluding joint accessories, shall be made of Grade 304 stainless steel. Bolts shall be in accordance with ASTM A193 grade B8, latest revision. Nuts shall be in accordance with ASTM A194 grade 8, latest revision. Bolts and nuts shall be Unified National Coarse (UNC) rolled thread and heavy-duty hex nuts. Bolts installed into castings shall be provided with one (1) Grade 304 stainless steel flat washer and nuts and bolts shall be provided with two (2) Grade 304 stainless steel flat washers so that the epoxy coating is not damaged. At a minimum, nuts shall be coated with fluorocarbon, epoxy, zinc, or other anti-corrosion coating to help prevent galling.
12. At the Commission's discretion, track-head or tee-head bolts made of high strength, low alloy, corrosion resistant, Cor-Ten steel may be substituted. A request for the substitution must be submitted in writing to E&TS. Track head bolts made of high strength, low alloy, corrosion resistant, Cor-Ten steel shall be in accordance AWWA C-111, ASTM A242, and/or ASTM A588 latest revisions. Nuts shall be in accordance with ASTM A194 grade 2H or ASTM A563 grade A latest revision. Bolts and nuts shall be Unified National Coarse (UNC) rolled thread and heavy-duty hex nuts. Bolts installed into castings shall be provided with one (1) medium carbon steel flat washer and nuts and bolts shall be provided with two (2) medium carbon steel flat washers so that the epoxy coating is not damaged. All the non-stainless steel bolts, nuts, and washers shall be rust proof coated or plated.
13. To prevent galling; all stainless steel bolts shall be coated on the outside of all threads and the stainless steel nuts or castings on the inside of all threads at the factory, with an anti-seizing material such as provided by Henkel Technologies, Rocky Hill, Connecticut - product name: Loctite Nickel Anti-Seize Lubricant; Chesterton Technical Products, Stoneham, Massachusetts – product name: Chesterton 772 Premium Nickel Anti-Seize Compound; Permatex Inc. Hartford, Connecticut – product name: Permatex Nickel Anti-Seize Lubricant or equal product of another manufacturer and as specified in Section 3.18 of these Specifications.



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### 3.14.6 Bell Joint Clamp Makes and Models Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. Bell joint clamps to fit rubber ring joint (Tyton) and caulked joint (poured) shall be:
  - (a) Dresser – Style 60 (up to 60-inch),
  - (b) Dresser – Style 160 (6-inch, 8-inch, 12-inch, & 16-inch)
  - (c) Romac - Style 516 (4-inch – 14-inch),
  - (d) Romac - Style 416 (12-inch – 24-inch, for pipe sizes greater than 24-inch specify Style 418 with pipe outside diameter (OD), bell OD, bell length, and maximum pressure),
  - (e) Ford - Style FBCF (14-inch – 36-inch, call for pipe sizes greater than 36-inch with pipe outside diameter (OD), bell OD, bell length, and maximum pressure),  
or
  - (f) Equal provided the products are manufactured as per these specifications.
2. Bell joint clamps to fit caulked joint (poured) with stab joint bells (long tapered bell with no shoulder for anchoring a bell ring) shall be:
  - (a) Dresser – Style 60S,
  - (b) Romac - Style 418 (12” – 24”), or
  - (c) Equal provided the products are manufactured as per these specifications.



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### 3.14.7 Socket Clamps

1. 4-bolt Socket Clamps provided to the Commission or Installer shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.
2. 4-bolt Socket clamps shall meet all the requirements of National Fire Protection Association (NFPA) 24 (Installation of Private Fire Service Mains and Their Appurtenances).
3. 4-bolt Socket clamps shall be constructed of carbon steel per ASTM A36 with minimum yield strength of 36000-PSI or material of equal or greater minimum yield strength.
4. 4-bolt Socket Clamps shall be two (2) half bands with four (4) bolts (two (2) on each side).
5. Socket Clamps shall have the minimum following dimensions:
  - (a) 4-inch to 6-inch pipe: ½-inch by 2-inch
  - (b) 8-inch to 10-inch pipe: 5/8-inch by 2-1/2-inch
  - (c) 12-inch pipe: 5/8-inch by 3-inch
  - (d) 16-inch pipe: ¾-inch by 4-inch
6. Socket Clamp bolt hole diameters shall be a 1/16-inch larger than the bolt diameter.
7. Socket Clamp bolts shall have the minimum following dimensions:
  - (a) 4-inch to 6-inch pipe: 5/8-inch-11 by 3-1/2-inch
  - (b) 8-inch pipe: 5/8-inch-11 by 4-inch
  - (c) 10-inch pipe: 3/4-inch-10 by 4-inch
  - (d) 12-inch pipe: 7/8-inch-9 by 4-inch
  - (e) 16-inch: 1-inch by 4-1/2-inch
8. Socket Clamps shall be provided plain without a coating.
9. All fasteners provided with the Socket Clamps shall be made of 4140 chrome moly steel per ASTM A193 grade B7, medium carbon steel per ASTM A194 grade 2H,



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or high strength low alloy steel per ASTM A588 grade B with Unified National Coarse (UNC) rolled thread, as specified in the following paragraphs and sections.

10. Delivery shall be specified in terms of number of days from receipt of order.
11. The manufacturer/vendor/shipper must use care in preparing the above product for shipment and in handling, to insure that the products are delivered without damage. Particular attention must be directed at protecting the products from damage. Damaged products will not be accepted.
12. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above product and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AWWA Standards.
13. References

The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

- (a) Name of Municipality/Utility
- (b) Total amount of product bid on and amount delivered
- (c) Date the bid was accepted and date the product was delivered
- (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

### 3.14.8 Socket Clamp Makes and Models Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. Socket Clamps shall be:
  - (a) PHD Manufacturing, Inc. - Figure 590,
  - (b) Anvil Company - Figure 595,
  - (c) Cooper B-Line - Figure B3134,
  - (d) Carpenter and Patterson - Figure 158DB, or



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(e) Equal provided the products are manufactured as per these specifications.

Last Modified: 04/09/2025 at 10:39AM EDT





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### 3.14.9 Fabricated Steel Harness Assembly

1. Fabricated Steel Harness Assembly provided to the Commission or Installer shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.
2. Fabricated Steel Harness Assembly shall be constructed of carbon steel per ASTM A36 with minimum yield strength of 36000-PSI.
3. Fabricated Steel Harness Assembly shall be provided plain without coating.
4. Fabricated Steel Harness Assembly shall be as manufactured by Ford – Style FR1, Dresser – Style 443, or equal product of another manufacturer.
5. Delivery shall be specified in terms of number of days from receipt of order.
6. The manufacturer/vendor/shipper must use care in preparing above product for shipment and in handling during shipment and delivery, to insure that the products are delivered without damage. Particular attention must be directed at protecting the product from damage. Damaged products will not be accepted.
7. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above product and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AWWA Standards.
8. References

The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

- (a) Name of Municipality/Utility
- (b) Total amount of product bid on and amount delivered
- (c) Date the bid was accepted and date the product was delivered
- (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product



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### 3.14.10 Socket Clamp Washer

1. Socket clamp washers provided to the Commission or Installer shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.
2. Socket clamp washers shall meet all the requirements of National Fire Protection Association (NFPA) 24 (Installation of Private Fire Service Mains and Their Appurtenances).
3. Socket Clamp Washer shall be cast iron, ductile iron, or low carbon steel and square or round.
4. Cast iron and ductile iron Socket Clamp Washers shall have the minimum following dimensions:
  - (a) 4-inch, 6-inch, 8-inch, and 10-inch pipe:
    - Square: 5/8-inch by 3-inch by 3-inch
    - Round: 5/8-inch by 3-inch diameter
  - (b) 12-inch pipe:
    - Square: 3/4-inch by 3-1/2-inch by 3-1/2-inch
    - Round: 3/4-inch by 3-1/2-inch diameter
  - (c) 16-inch pipe:
    - Square: 1-inch by 4-inch by 4-inch
    - Round: 1-inch by 4-inch diameter
5. Steel Socket Clamp Washers shall have the minimum following dimensions:
  - (a) 4-inch, 6-inch, 8-inch, and 10-inch pipe:
    - Square: 1/2-inch by 3-inch by 3-inch with 7/8-inch hole size
    - Round: 1/2-inch by 3-inch diameter with 7/8-inch hole size
  - (b) 12-inch and 16-inch pipe:
    - Square: 1/2-inch by 3-1/2-inch by 3-1/2-inch with 1-1/16-inch hole size
    - Round: 1/2-inch by 3-1/2-inch diameter with 1-1/16-inch hole size
6. Socket Clamp Washers shall be provided plain, with out a coating.



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7. Socket Clamps Washers shall be as provided by PHD Manufacturing, Inc. Figure 595, Anvil Company, Figure 594, Cooper B-Line, Figure B3134W, Carpenter and Patterson, Figure 258, or the equal product of another manufacturer.
8. Delivery shall be specified in terms of number of days from receipt of order.
9. The manufacturer/vendor/shipper must use care in preparing socket clamp washers for shipment and in handling during shipment and delivery, to insure that the socket clamp washers are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged bell joint clamps will not be accepted.
10. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the socket clamp washers and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AWWA Standards.
11. References

The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

- (a) Name of Municipality/Utility
- (b) Total amount of product bid on and amount delivered
- (c) Date the bid was accepted and date the product was delivered
- (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product



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### 3.14.11 Bent Eye Bolts

1. Bent Eye Bolts provided to the Commission or Installer shall be manufactured, tested, inspected and delivered in full compliance with this Specification.
2. Bent Eye Bolts shall meet all the requirements of National Fire Protection Association (NFPA) 24 (Installation of Private Fire Service Mains and Their Appurtenances).
3. Bent Eye Bolts diameters shall be:
  - (a) For ¾-inch threaded rod: ¾-inch diameter shank with a ¾-inch nominal inside diameter bolt hole.
  - (b) For 1-inch threaded rod: ¾-inch diameter shank with a 1-inch nominal inside diameter bolt hole.
4. Bent Eye Bolts shall be provided in the following minimum lengths:
  - (a) 4-inch thru 10-inch clamps shall be 4-inch minimum
  - (b) 12-inch and larger clamps shall be 5-inch minimum
5. Bent Eye Bolts shall be constructed of high strength low alloy steel, per ASTM A588, grade B, Unified National Coarse (UNC) rolled thread.
6. Bent Eye Bolts shall be provided with heavy hex nuts made of medium carbon steel, ASTM A194, grade 2H, and Unified National Coarse (UNC) thread.
7. Bent Eye Bolts shall have a minimum tensile strength of 50,000 PSI.
8. Bent Eye Bolts shall be as provided by PHD Manufacturing, Inc. - Figure 598B, Star National Products - Figures ¾”SST747 or ¾”SST757, Dresser Piping Specialties, Inc. – Style 442, or the equal product of another manufacturer.
9. Delivery shall be specified in terms of number of days from receipt of order.
10. The manufacturer/vendor/shipper must use care in preparing above product for shipment and in handling during shipment and delivery, to insure that the products are delivered without damage. Particular attention must be directed at protecting the products from damage. Damaged products will not be accepted.
11. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the products and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AWWA Standards.



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### 12. References

The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

- (a) Name of Municipality/Utility
- (b) Total amount of product bid on and amount delivered
- (c) Date the bid was accepted and date the product was delivered
- (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product



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### 3.14.12 Threaded Rods

1. Threaded rods provided to the Commission or Installer shall be manufactured, tested, inspected and delivered in full compliance with this Specification.
2. Threaded rods shall meet all the requirements of National Fire Protection Association (NFPA) 24 (Installation of Private Fire Service Mains and Their Appurtenances).
3. Threaded Rod diameters shall be:
  - (a) For 4-inch through 10-inch pipe: ¾-inch diameter.
  - (b) For 12-inch through 16-inch pipe: 1-inch diameter.
4. Threaded Rods shall be provided in either 3-foot, 6-foot, or 12-foot lengths.
5. Threaded Rods shall be constructed of 4140-alloy steel, per ASTM A193, grade B7, Unified National Coarse (UNC) rolled thread.
6. Threaded Rods shall have a minimum tensile strength of 62,500 PSI.
7. Threaded Rods shall be provided with heavy hex nuts made of medium carbon steel, ASTM A194, grade 2H, and Unified National Coarse (UNC) thread.
8. Threaded Rods shall be provided with case hardened steel washers made of C1006 steel, grade 2, Rockwell hardness B55, with the following dimensions:

	Nominal Inside Diameter (In Inches)	Nominal Outside Diameter (In Inches)	Thickness (In Inches)
¾" Threaded Rod	13/16	2	.122 - .177
1" Threaded Rod	1	2-1/2	.136 - .192



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- Washers may be provided with cadmium plating, another plating, or unplated.
9. Delivery shall be specified in terms of number of days from receipt of order.
  10. The manufacturer/vendor/shipper must use care in preparing above product for shipment and in handling during shipment and delivery, to insure that the products are delivered without damage. Particular attention must be at protecting the products from damage. Damaged products will not be accepted.
  11. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the threaded rods and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AWWA Standards.
  12. References

The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

- (a) Name of Municipality/Utility
- (b) Total amount of product bid on and amount delivered
- (c) Date the bid was accepted and date the product was delivered
- (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product



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### Section 3.15 TAPPING SLEEVES

#### 3.15.1 General

1. All Tapping Sleeves provided to the Springfield Water and Sewer Commission (Commission) or its Contractors shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.
2. All Tapping Sleeves in this section shall have all parts cast and assembled in North America or meet the requirements of the American Iron and Steel (AIS) as follows;
  - (a) North America shall mean the United States, Canada, and Mexico,
  - (b) Cast shall mean molten metal(s) poured into a mold to create Casting(s) for a finished product,
  - (c) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and
  - (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or
  - (e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.
3. Inspection:
  - (a) All finished product(s) furnished shall be subject to inspection by the Commission at the place of manufacture and shall be subject to inspection after delivery to the Commission.
  - (b) Cost of re-inspection of materials or fabricated finished product(s) caused by the non-compliance of the manufacturer with the provisions of the specifications, shall be paid for by the manufacturer, and shall be deductible from the price paid for the finished product(s).
4. Delivery shall be made by truck in minimum truckload quantity to locations designated in the Commission's service area in and near Springfield, Massachusetts. The low bidder shall notify the Commission of the quantity comprising a minimum truckload.
5. The manufacturer/vendor/shipper must use care in preparing finished product(s) for shipment and in handling during shipment and delivery, to insure that the finished(s) are delivered without damage. Particular attention must be directed at





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protecting the protective coating from damage. Damaged finished products and/or protective coatings will not be accepted.

6. All tapping sleeves shall be NSF 61 certified.
7. All fasteners, excluding joint accessories, shall be made of Grade 304 stainless steel. Bolts shall be in accordance with ASTM A193 grade B8, latest revision. Nuts shall be in accordance with ASTM A194 grade 8, latest revision. Bolts and nuts shall be Unified National Coarse (UNC) rolled thread and heavy-duty hex nuts. Bolts installed into castings shall be provided with one (1) Grade 304 stainless steel flat washer and nuts and bolts shall be provided with two (2) Grade 304 stainless steel flat washers so that the epoxy coating is not damaged. At a minimum, nuts shall be coated with fluorocarbon, epoxy, zinc, or other anti-corrosion coating to help prevent galling.
8. To prevent galling; all stainless steel bolts shall be coated on the outside of all threads and the stainless steel nuts or castings on the inside of all threads at the factory, with an anti-seizing material such as provided by Henkel Technologies, Rocky Hill, Connecticut - product name: Loctite Nickel Anti-Seize Lubricant; Chesterton Technical Products, Stoneham, Massachusetts – product name: Chesterton 772 Premium Nickel Anti-Seize Compound; Permatex Inc. Hartford, Connecticut – product name: Permatex Nickel Anti-Seize Lubricant or equal product of another manufacturer and as specified in Section 3.18 of these Specifications.

### 3.15.2 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.
2. The manufacturer and/or vendor shall furnish three (3) sets of 24-inch by 36-inch certified shop drawings for all materials to be used. All components shall be provided in accordance to these drawings. The drawings shall show the following:
  - (a) Cross sectional drawings of the gate valve showing overall dimensions,
  - (b) Material specifications for each component,
  - (c) Coating applied to each component, if applicable,
  - (d) Weight of each component and total weight, and
  - (e) Country of origin for each component.
3. The manufacturer and/or vendor shall furnish three (3) sets of coating specification(s) of each component that has a coating applied identifying

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component surface preparation, primer (if applicable), type of coating(s), color of coating(s), manufacturer of coating(s), part number of the coating(s), and a sample on a 3-inch by 5-inch chip.

4. The manufacturer and/or vendor shall furnish a letter certifying the product meets all the requirements of the AIS, an explanation, in the letter, of how the products meets the AIS requirements, and signed by the Owner or President of the Company.
5. The manufacturer and/or vendor shall furnish one (1) complete catalogue or manual for parts, repair, and maintenance.
6. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the finished product(s) and all materials in its construction exactly conform to the applicable requirements of these specifications and the applicable AWWA Standards.
7. The manufacturer and/or vendor shall furnish a certified statement that all butterfly valves of the same make and model bid, regardless of the year of manufactured, shall have interchangeable component parts and that the parts availability and delivery shall remain firm for ten (10) years.
8. The manufacturer and/or vendor shall furnish a warranty for the butterfly valves that states that the butterfly valves shall be free from all defects in material and workmanship under normal use of the product for a minimum ten (10) year time period from time of delivery. The manufacturer shall replace and/or repair defective parts or the whole butterfly valve for a minimum ten (10) year time period from time of delivery.
9. The manufacturer and/or vendor shall furnish certified results of a proof of design test performed at an independent testing laboratory. Testing shall include a shell test and seat test to demonstrate the valve body and seat will hold pressure as required.
10. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:
  - (a) Name of Municipality/Utility
  - (b) Total amount of product bid on and amount delivered
  - (c) Date the bid was accepted and date the product was delivered
  - (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product



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11. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification “Approved”, “Approved as Noted”, or “Rejected-Resubmit” and return to the manufacturer and/or vendor.
  - (a) Approved means the contractor can supply the material as shown on the drawing(s).
  - (b) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.
  - (c) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

### 3.15.3 Stainless Steel Tapping Sleeves

1. Tapping Sleeves shall, as a minimum, meet all specifications as in Paragraphs 3.15.1, 3.15.2, and the following:
2. Tapping sleeves shall be constructed of Grade 18-8, Type 304 stainless steel with removable stainless steel fasteners.
3. Tapping sleeves shall be provided with a ¾” NPT test port with a lead free brass lug with standard square head. Proper use of this feature assures positive seal before tapping.
4. Bolt Lugs shall be 3/16” minimum thickness.
5. Tapping sleeves shall be provided with gaskets made of gridded styrene butadiene rubber (SBR) or Nitrile (Buna-N) compounded for water service and shall meet ASTM D2000-80M 4AA607.
  - (a) The sleeve gasket shall provide 360 degree full circumferential support over the full length of the sleeve.
  - (b) The sleeve gasket shall have heavy gauge stainless steel armors, a minimum of 2-1/4” wide, bonded in place to span the gap between the tapping sleeve sections.
  - (c) The outlet gasket shall be made of Nitrile (Buna-N).
6. The flange shall be made of Grade 18-8, Type 304 Stainless Steel. The flange shall conform to AWWA C207 Class D ANSI 150 lb. The flange shall be recessed to accept standard AWWA tapping valves. The bolt holes shall straddle the pipe center line. Iron flanges shall not be accepted.



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7. Tapping sleeves shall be rated 150 PSI working pressure and 225 PSI minimum test pressure.
8. All welds used in the construction of the tapping sleeve shall conform to all American Welding Society (AWS) codes. All welds shall be fully passivated in order to restore the stainless steel to its original corrosive resistant characteristics.
9. Tapping sleeves shall be provided with a Grade 18-8, Type 304 Stainless Steel outlet. The outlet shall be double welded, at two places, the flange and the sleeve to provide maximum strength.

### 3.15.4 Ductile Iron Tapping sleeves

1. Tapping Sleeves shall, as a minimum, meet all specifications as in Paragraphs 3.15.1, 3.15.2, and the following:
2. Tapping sleeves shall be constructed of high strength ductile iron conforming to ASTM A-536 grade 65-45-12. The bolt holes shall straddle the pipe center line.
3. Tapping sleeves shall be mechanical joint conforming to ANSI A21.11/AWWA C-111, unless otherwise specified.
4. Tapping sleeves shall be provided with a 3/4" NPT test port with a lead free brass lug with standard square head. Proper use of this feature assures positive seal before tapping.
5. Tapping sleeves shall be provided with gland and body components made of grade 60-42-10 ductile iron conforming to ASTM A536-84.
6. Tapping sleeve outlet gasket shall be made of Nitrile (Buna-N).
7. The tapping sleeve outlet flange dimensions shall comply with ANSI B16.1 class 125 and with MSS SP-60. The flange shall be recessed to accept standard AWWA tapping valves.
8. Tapping sleeves shall be rated 150 PSI working pressure and 225 PSI minimum test pressure.
9. Exterior Coating shall be Fusion-bonded epoxy coating in accordance with ANSI A21.16 / AWWA C116 and shall be applied to the interior and exterior of the fitting.
10. Markings
  - (a) Fittings shall be marked with the weight.



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- (b) Fittings shall have distinctly cast upon them the pressure rating, the manufacturer's identification, nominal diameter of the openings, and the number of degree or fraction of the circle on all bends.

### 11. Testing

All tests shall be made in accordance with the methods prescribed by the above mentioned AWWA standards judgment.

#### **3.15.5 Stainless Steel Tapping Sleeves Makes and Models Approved for use by the Commission**

The following stainless steel tapping sleeves have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. Dresser Industries, Inc. - style 630,
2. Ford Meter Box Company - style FTSS,
3. Romac Industries, Inc. - style SSTIII,
4. Smith Blair – 622,
5. or the approved equal product of another manufacturer.

#### **3.15.6 Ductile Iron Tapping Sleeves Makes and Models Approved for use by the Commission**

The following ductile iron tapping sleeves have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. Clow – Model F-5205,
2. Mueller – Models H-615 & H-616,
3. U.S. Pipe – Models H-615 & H-616,
4. or the approved equal product of another manufacturer.



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### Section 3.16 JOINT ACCESSARIES

#### 3.16.1 General

1. All Joint Accessories or Kits provided to the Springfield Water and Sewer Commission (Commission) or its Contractors shall be manufactured, tested, inspected and delivered in full compliance with this Specification.
2. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;
  - (a) North America shall mean the United States, Canada, and Mexico,
  - (b) Cast shall mean molten metals poured into a mold to create Casting(s) for a finished product,
  - (c) Incidental parts may be purchased/obtained from other countries to provide a finished product , in accordance with these Material Specifications, and
  - (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or
  - (e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.
3. Inspection:
  - (a) All finished product(s) furnished shall be subject to inspection by the Commission at the place of manufacture and shall be subject to inspection after delivery to the Commission.
  - (b) Cost of re-inspection of materials or fabricated finished product(s) caused by the non-compliance of the manufacturer with the provisions of the specifications, shall be paid for by the manufacturer, and shall be deductible from the price paid for the product(s).
4. The manufacturer/vendor/shipper must use care in preparing finished product(s) for shipment and in handling during shipment and delivery, to insure that the finished(s) are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged finished product(s) will not be accepted.
5. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the finished product(s)



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and all materials in its construction exactly conform to the applicable requirements of these specifications and the applicable AWWA Standards.

### 3.16.2 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.
2. The manufacturer and/or vendor shall furnish three (3) sets of 24-inch by 36-inch certified shop drawings for all materials to be used. All components shall be provided in accordance to these drawings. The drawings shall show the following:
  - (a) Cross sectional drawings of the product(s) showing overall dimensions,
  - (b) Material specifications for each component,
  - (c) Coating applied to each component, if applicable,
  - (d) Weight of each finished product(s), and
  - (e) Country of origin for each component.
3. The manufacturer shall furnish three (3) sets of coating specification(s) of each component that has a coating applied identifying component surface preparation, primer (if applicable), type of coating(s), color of coating(s), manufacturer of coating(s), part number of the coating(s), and a sample on a 3-inch by 5-inch chip.
4. The manufacturer shall furnish a letter certifying the product meets all the requirements of the AIS, an explanation, in the letter, of how the products meets the AIS requirements, and signed by the Owner or President of the Company.
5. The manufacturer shall furnish one (1) complete catalogue or manual for parts, repair, and maintenance.
6. The manufacturer shall furnish a certified statement that all the product(s) of the same make and model bid, regardless of the year of manufactured, shall have interchangeable component parts and that the parts availability and delivery shall remain firm for ten (10) years.
7. The manufacturer shall furnish a warranty for the product(s) that states that the product(s) shall be free from all defects in material and workmanship under normal use of the product for a minimum one (1) year time period from time of delivery. The manufacturer shall replace and/or repair defective parts or the product(s) for a minimum one (1) year time period from time of delivery.



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8. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:
  - (a) Name of Municipality/Utility
  - (b) Total amount of product bid on and amount delivered
  - (c) Date the bid was accepted and date the product was delivered
  - (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product
9. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification “Approved”, “Approved as Noted”, or “Rejected-Resubmit” and return to the manufacturer and/or vendor.
  - (a) Approved means the contractor can supply the material as shown on the drawing(s).
  - (b) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.
  - (c) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

### 3.16.3 Delivery

1. Delivery shall be made by truck in minimum truckload quantity to locations designated in the Commission’s service area in and near Springfield, Massachusetts. The low bidder shall notify the Commission of the quantity comprising a minimum truckload.

### 3.16.4 Mechanical Joint Restraint for Ductile Iron Fittings and Valves

1. Mechanical Joint Restraint for Ductile Iron Fittings shall, as a minimum, meet all specifications as in Paragraphs 3.15.1, 3.15.2, and the following:
2. Mechanical Joint Restraint for Ductile Iron Fittings provided to the Commission or Installer shall be manufactured, tested, inspected and delivered in full compliance with this Specification.
3. Mechanical Joint Restraint for Ductile Iron Fittings and Valves shall conform to the American Water Works Association Standard C-111 (latest edition) for: “Rubber Gasket Joints for Ductile Iron Pipes and Fittings”.





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4. All Mechanical Joint Restraint for Ductile Iron Fittings and Valves shall be certified, by a third party, as suitable for contact with drinking water by an accredited certification organization in accordance with ANSI/NSF 61-8, Drinking Water System Components – Health Effects.
5. Mechanical Joint Restraint for Ductile Iron Fittings shall be provided with gland and body components made of grade 60-42-10 ductile iron conforming to ASTM A536-84. The casting shall be flat, with no protrusions, where the torque limiting twist-off nuts actuates the restraining wedges.
6. Mechanical Joint Restraint for Ductile Iron Fittings shall be incorporated into the design of the follower gland. The restraining mechanism shall consist of individually actuated wedges that increase their resistance to pull out as pressure or external forces increase.
7. Mechanical Joint Restraint for Ductile Iron Fittings shall be capable of full mechanical joint deflection during assembly and the flexibility of the joint shall be maintained after burial.
8. The joint restraint ring and its wedging components shall be made of grade 60-42-10 ductile iron conforming to ASTM A536-84.
  - (a) The wedge shall be ductile iron, heat-treated to a minimum hardness of 370 B H N.
  - (b) The joint restraint ring shall be provided with torque limiting twist-off nuts of high strength, low alloy, corrosion resistant, Cor-Ten steel. The twist-off nuts made of high strength, low alloy, corrosion resistant, Cor-Ten steel shall be in accordance in accordance with ASTM A194 grade 2H or ASTM A563 grade A latest revision. Twist-off nuts shall be Unified National Coarse (UNC) rolled thread.
9. Dimensions of the gland shall be such that it can be used with the standardized mechanical joint bell conforming to ANSI/AWWA C-111/AZ1.11 and ANSI/AWWA C-153/A21.53 of the latest revision. Torque limiting twist-off nuts shall be used to insure proper actuation of the restraining wedge.
10. Mechanical Joint Restraint for Ductile Iron Fittings shall be available in the four through forty-eight inch sizes.
11. Mechanical Joint Restraint for Ductile Iron Fittings shall have a rated working pressure as follows:
  - (a) 4-inch – 8-inch = 350 PSI



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- (b) 10-inch – 16-inch = 300 PSI
  - (c) 20-inch – 36-inch = 200PSI
  - (d) 42-inch – 48-inch = 175 PSI
12. Mechanical Joint Restraint for Ductile Iron Fittings shall be listed by Underwriters Laboratories up through the twenty-four-inch size and approved by Factory Mutual up through the twelve-inch size.
  13. Mechanical Joint Restraint for Ductile Iron Fittings shall be provided with tee-head bolts, washers, and nuts of high strength, low alloy, and corrosion resistant Cor-Ten steel. Tee head bolts made of high strength, low alloy, corrosion resistant, Cor-Ten steel shall be in accordance AWWA C-111, ASTM A242, and/or ASTM A588 latest revisions. Nuts shall be in accordance with ASTM A194 grade 2H or ASTM A563 grade A latest revision. Bolts and nuts shall be Unified National Coarse (UNC) rolled thread and heavy-duty hex nuts. Nuts and bolts shall be provided with two (2) medium carbon steel flat washers so that the epoxy coating is not damaged.
  14. Mechanical Joint Restraint for Ductile Iron Fittings shall be individually packaged and contain proper size rubber gasket and bolts.

### 3.16.5 Flange Gasket and Hardware for Ductile Iron Pipe, Fittings, & Valves

1. Flange Gaskets and Hardware provided to the Commission or Installer shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.
2. Flange gaskets for 12-in diameter flanges or less shall be Type E or “full-face” with bolt holes cut to match ANSI B16.1 drilling.
3. Flange gaskets 14-inch through 64-inch diameter shall be Type F or “ring gaskets” with inside and outside dimensions as specified in AWWA C115, Table A.1.
4. Flange gaskets shall be cut from sheet stock by a qualified gasket distributor to the dimensions included in AWWA C115, Table A.1. No field-cut or field-modified gaskets shall be allowed.
5. Flange gaskets for distribution system (operating pressure 150-psi or less) applications shall have documented physical properties, as follows:
  - (a) Flange gaskets shall be manufactured from premium quality red rubber made from natural rubber and styrene butadiene rubber (SBR) with a smooth finish.
  - (b) Thickness: 1/8-inch



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- (c) Hardness (Durometer) (Shore A) +/-5: 75
  - (d) Minimum Tensile Strength (ASTM D142): 700-psi
  - (e) Compression Set at 158°F (ASTM Method B): 22-hrs. 40% maximum
  - (f) Pressure Rating max.: 250-psi
  - (g) P x T min. (psi x T°F): 20,000
6. Flange gaskets for severe pressure (greater than 150-psi or as required by the Commission) applications shall have documented physical properties, as follows:
- (a) Flange gaskets shall be manufactured from premium quality compressed sheet stock of non-asbestos aramid fibers with a Nitrile binder.
  - (b) Thickness: 1/8-inch
  - (c) Minimum Tensile Strength across grain (ASTM F152): 2000-psi
  - (d) Compressibility Range (ASTM F36): 8-16%
  - (e) Recovery (ASTM F36): 50%
  - (f) Creep Relaxation Range (ASTM F38): 20%
  - (g) Gasket Maintenance Factor Range – *m* (ASTM F586): 4.2
  - (h) Minimum Seating Stress Range – *y* (ASTM F586): 2931-psi
  - (i) Seal Initiation Stress Range, *G<sub>b</sub>* (ROTT): 400-psi
  - (j) Gasket Stress/Tightness Ratio Range, *a* (ROTT): 0.35
  - (k) Unloading Gasket Stress Range, *G<sub>s</sub>* (ROTT): 20-psi
  - (l) P x T min. (psi x T°F): 52,500
7. All flange bolts and nuts shall be provided with flat washers so that the epoxy coating is not damaged during installations.
8. Flange bolts for distribution system (operating pressure 150-psi or less) applications shall have documented physical properties, as follows:
- (a) All flange bolts length shall be selected so that three full threads, as a minimum, protrude from the hex nut and washer after assembly,



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- (b) Bolts shall be Unified National Coarse (UNC) Class 2B rolled thread.
  - (c) Flange bolts shall be made of Type 304 stainless steel.
  - (d) Flange bolts shall be in accordance with ASTM A193 Grade B8, Class 2 all sizes, latest revision or ASTM F593C Condition CW1 sizes up to 5/8-inch or F593D Condition CW2 for sizes 3/4-inch and greater, latest revision,
  - (e) Minimum Tensile Strength (ASTM A193): 105 through 125-ksi
  - (f) Minimum Tensile Strength (ASTM F593): 85 through 150-ksi
  - (g) Minimum Yield Strength (ASTM A193): 65 through 100-ksi
  - (h) Minimum Yield Strength (ASTM F593): 45 through 65-ksi
  - (i)
9. Flange nuts for distribution system (operating pressure 150-psi or less) applications shall have documented physical properties, as follows:
- (a) Flange nuts shall be Unified National Coarse (UNC) Series Class 2B heavy-duty hex nuts.
  - (b) Flange nuts shall be made of Type 304 stainless steel.
  - (c) Flange nuts shall be in accordance with ASTM A194 Grade 8, Class 2 all sizes, latest revision or ASTM F594C Condition CW1 sizes up to 5/8-inch or F594D Condition CW2 for sizes 3/4-inch and greater, latest revision,
  - (d) Minimum Proof Stress (ASTM A194): 80-ksi
  - (e) Minimum Proof Stress (ASTM F594): 92 through 108-ksi
  - (f) Brinnell Hardness (ASTM A194): min. 126, max. 300
  - (g) Rockwell Hardness (ASTM F594): min. B80, max. C32
  - (h) At a minimum, nuts shall be coated with fluorocarbon, epoxy, zinc, or other anti-corrosion coating to help prevent galling
10. Flat washers to be used with flange bolts and nuts for distribution system (operating pressure 150-psi or less) applications shall have documented physical properties, as follows:
- (a) Flat washers shall be made of Type 304 stainless steel, type A SAE or ASME



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11. Flange bolts, nuts, and flat washers shall be made of Grade 304 stainless steel. Bolts shall be in accordance with ASTM A193 grade B8, latest revision. Nuts shall be in accordance with ASTM A194 grade 8, latest revision. Bolts and nuts shall be Unified National Coarse (UNC) rolled thread and heavy-duty hex nuts. Bolts installed into castings shall be provided with one (1) Grade 304 stainless steel flat washer and nuts and bolts shall be provided with two (2) Grade 304 stainless steel flat washers Type A SAE or ASME so that the epoxy coating is not damaged. At a minimum, nuts shall be coated with fluorocarbon, epoxy, zinc, or other anti-corrosion coating to help prevent galling.
12. To prevent galling; all stainless steel bolts shall be coated on the outside of all threads and the stainless steel nuts or castings on the inside of all threads at the factory, with an anti-seizing material such as provided by Henkel Technologies, Rocky Hill, Connecticut - product name: Loctite Nickel Anti-Seize Lubricant; Chesterton Technical Products, Stoneham, Massachusetts – product name: Chesterton 772 Premium Nickel Anti-Seize Compound; Permatex Inc. Hartford, Connecticut – product name: Permatex Nickel Anti-Seize Lubricant or equal product of another manufacturer and as specified in Section 3.18 of these Specifications.
13. To assist in assembly of flanged joints, an adhesive-backed flange gaskets may be used. Adhesive backing material shall be: 467MP High Performance Adhesive Transfer Tape, manufactured by 3M Industrial Adhesives and Tapes Division, St. Paul, Minnesota, or an approved equal.

### 3.16.6 Gasket Joint Restraint for Ductile Iron Pipe

1. Gasket Joint Restraint for Ductile Iron Pipe provided to the Commission or Installer shall be manufactured, tested, inspected and delivered in full compliance with this Specification.
2. The Gasket Joint Restraint for Ductile Iron Pipe shall conform to AWWA C-111 (most current revision) for Rubber-Gaskets Joints for Ductile Iron Pressure Pipe and Fittings.
3. Gasket Joint Restraint shall be for rubber ring joint (Tyton).
4. The restraint provided shall be a boltless, integral retaining system, and shall be rated for 350 PSI.

### 3.16.7 Mechanical Joint Restraint Approved for use by the Commission

The following Mechanical Joint Restraints have been approved for use by the Commission. Any change in any component(s) of the Mechanical Joint Restraint that



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does not allow for interchangeability of the component(s) shall result in the Mechanical Joint Restraint no longer being approved and removed from this list.

1. EBAA Iron Sales, Inc. – Series 1100,
2. Ford Meter Box Company, Inc. – Series 1400,
3. Romac – Roma Grip,
4. Tyler/Union – TUF Grip, or
5. Equal provided the Mechanical Joint Restraint are manufactured as per these specifications.

### **3.16.8 Flange Gasket for Distribution System (operating pressure 150-psi or less) Applications Approved for use by the Commission**

The following Flange Gaskets suppliers have been approved for use by the Commission. Any change in any component(s) of the flange gasket that does not allow for interchangeability of the component(s) shall result in the flange gasket no longer being approved and removed from this list.

1. 22-Red SBR rubber, manufactured by Garlock Sealing Technologies, Palmyra, New York,
2. Flange-Tyte SBR rubber, Manufactured by U.S. Pipe and Foundry Co., Birmingham, AL,
3. Toruseal by American Cast Iron Pipe Company, Birmingham, AL, or
4. Equal provided the Flange Gaskets are manufactured as per these specifications.

### **3.16.9 Flange Gasket for Severe Pressure (operating pressure greater than 150-psi) Applications Approved for use by the Commission**

The following Flange Gaskets suppliers have been approved for use by the Commission. Any change in any component(s) of the flange gasket that does not allow for interchangeability of the component(s) shall result in the flange gasket no longer being approved and removed from this list.

1. Durlon 8500, manufactured by Gasket Resources, Inc., Exton, Pennsylvania,
2. Blue-Gard 3000, manufactured by Garlock Sealing Technologies, Palmyra, New York,
3. Klingersil 4430, manufactured by Thermoseal, Inc., Sidney, Ohio,



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4. SF3300 manufactured by Flexitallic, Ltd, Deer Park, Texas, or
5. Equal provided the Flange Gaskets are manufactured as per these specifications.

### 3.16.10 Gasket Joint Restraint Approved for use by the Commission

The following Mechanical Joint Restraints have been approved for use by the Commission. Any change in any component(s) of the Mechanical Joint Restraint that does not allow for interchangeability of the component(s) shall result in the Mechanical Joint Restraint no longer being approved and removed from this list. Gasket Joint Restraint for rubber ring joint (Tyton) shall be as manufactured by

1. United States Pipe and Foundry Company – Field Lok 350 Gasket (4” – 24”),
2. Specification Rubber Products, Inc. – Barracuda Gaskets (4” – 24”), or
3. Equal provided the Gasket Joint Restraint is manufactured as per these specifications.



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### Section 3.17 ADAPTERS

#### 3.17.1 Bolt-thru Mechanical Joint Restraint (Foster Adapter)

1. The bolt-thru mechanical joint restraint shall be made of ductile iron conforming to ASTM A536, 80-55-06.
2. The bolt-thru mechanical joint restraint shall connect valves and/or fittings at a linear distance not to exceed one and one-half (1-1/2) inches and without attachment to pipe.
3. The bolt-thru mechanical joint restraint shall be provided with an NSF 61 asphaltic seal coat in accordance with ANSI A21/AWWA C-110, Section 4.3 of latest the revision.
4. The bolt-thru mechanical joint restraint shall be provided with mechanical joint gaskets made of styrene butadiene rubber (SBR) compounded for water service and shall conform to the latest revision of AWWA C111/ ASTM f-477.
5. The bolt-thru mechanical joint restraint shall be provided with tee-head bolts, washers, and nuts of high strength, low alloy, and corrosion resistant Cor-Ten steel. Tee head bolts made of high strength, low alloy, corrosion resistant, Cor-Ten steel shall be in accordance AWWA C-111, ASTM A242, and/or ASTM A588 latest revisions. Nuts shall be in accordance with ASTM A194 grade 2H or ASTM A563 grade A latest revision. Bolts and nuts shall be Unified National Coarse (UNC) rolled thread and heavy-duty hex nuts. Nuts and bolts shall be provided with two (2) medium carbon steel flat washers so that the epoxy coating is not damaged.
6. The bolt-thru mechanical joint restraint may be ordered with longer bolt packs to restrain full bodied fittings and certain butterfly valves, etc. with thicker flanges.
7. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;
  - (a) North America shall mean the United States, Canada, and Mexico,
  - (b) Cast shall mean molten metals poured into a mold to create Casting(s) for a finished product,
  - (c) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and
  - (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or





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- (e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.
- 8. Delivery shall be specified in terms of number of days from receipt of order.
- 9. The manufacturer/vendor/shipper must use care in preparing above product for shipment and in handling during shipment and delivery, to insure that the couplings are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged couplings will not be accepted.
- 10. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above product and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AWWA Standards.

### 11. References

The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

- (a) Name of Municipality/Utility
- (b) Total amount of product bid on and amount delivered
- (c) Date the bid was accepted and date the product was delivered
- (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product



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### Section 3.18 ANTI-SEIZE LUBRICANTS

#### 3.18.1 Anti-Seize Lubricants

1. Anti-seize lubricants provided to the Commission or Installer shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.
2. Anti-seize lubricants shall be a nickel anti-seize compound capable of achieving the required bolt torque and sealing stress, and future disassembly with minimal manual input.
3. Anti-seize compound shall be as provided by Henkel Technologies, Rocky Hill, Connecticut - product name: Loctite Nickel Anti-Seize Lubricant; Chesterton Technical Products, Stoneham, Massachusetts – product name: Chesterton 772 Premium Nickel Anti-Seize Compound; Permatex Inc. Hartford, Connecticut – product name: Permatex Nickel Anti-Seize Lubricant or equal product of another manufacturer.
4. Delivery shall be specified in terms of number of days from receipt of order.
5. The manufacturer/vendor/shipper must use care in preparing above products for shipment and in handling during shipment and delivery, to insure that the above product are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged products will not be accepted.
6. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above product and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AWWA Standards.
7. References

The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

- (a) Name of Municipality/Utility
- (b) Total amount of product bid on and amount delivered
- (c) Date the bid was accepted and date the product was delivered



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- (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product



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### Section 3.19 PROTECTIVE COATINGS

#### 3.19.1 General

1. Protective primer, protective coating tape, and/or protective outer wrap shall be provided in accordance with ANSI/AWWA C-217 the latest the revision and these Material Specifications.
2. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;
  - (a) North America shall mean the United States, Canada, and Mexico,
  - (b) Cast shall mean molten metals poured into a mold to create Casting(s) for a finished product,
  - (c) Incidental parts may be purchased/obtained from other countries to provide a finished product , in accordance with these Material Specifications, and
  - (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or
  - (e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.
3. Delivery shall be specified in terms of number of days from receipt of order.
4. The manufacturer/vendor and/or shipper must use care in preparing the product(s) for shipment and in handling during shipment and delivery, to insure that the product(s) are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged product(s) will not be accepted and returned to manufacturer/vendor at the manufacturer/vendor's cost.
5. The manufacturer/vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the product(s) and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AWWA Standards.
6. References

The manufacturer/vendor shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:



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- (a) Name of Municipality/Utility
- (b) Total amount of product bid on and amount delivered
- (c) Date the bid was accepted and date the product was delivered
- (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

### 3.19.2 Protective Primer

1. Protective Primer shall be a petrolatum based primer that exhibits preferential wetting capabilities to readily coat wet or dry surfaces and cavities prior to the application of protective wrap.
2. Protective Primer shall be provided in accordance with of ANSI/AWWA C-217 the latest the revision.
3. The Specific Gravity of the Protective Primer shall be 0.8 - 0.9.
4. Protective Primer is required be delivered in the following containers. At time of order the specific containers will be identified;
  - (a) cartons of 2 or 4 one gallon cans
  - (b) 12 one quart cans, or
  - (c) 5 gallon pails.
5. Protective Primer for below grade installations shall be Trenton Wax-Tape primer (Brown), Tapecoat Enviroprime, Denso Paste, or the equal product of another manufacturer.
6. Protective Primer for above ground, in chambers, or other facilities shall be Trenton Temcoat 3000 primer (Brown) or the equal product of another manufacturer.

### 3.19.3 Protective Coating Tape

1. Protective Coating Tape shall be a prefabricated petrolatum coating in tape form designed to protect wet or dry irregularly shaped metal surfaces.
2. Protective Coating Tape shall be provided in accordance with of ANSI/AWWA C-217 the latest the revision.
3. Protective Coating Tape shall be impervious to continuous moisture levels.



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4. Protective Coating Tape shall be for use with: bare metal, wood and concrete.
5. Protective Coating Tape shall be compatible with asphalt, coal tar, polyethylene, polypropylene, FBE and urethanes
6. Protective Coating Tape shall have a minimum thickness of 45-mils.
7. Protective Coating Tape shall be resistant to bacteria.
8. Protective Coating Tape shall be provided with a minimum shelf life of one (1) year.
9. Protective Coating Tape shall be delivered in the following size rolls. At time of order the specific size rolls will be identified;
  - (a) Protective Tape for Underground 2" x 9' rolls
  - (b) Protective Tape for Underground 4" x 9' rolls
  - (c) Protective Tape for Underground 6" x 9' rolls
  - (d) Protective Tape for Underground 6" x 18' rolls
  - (e) Protective Tape for Underground 9" x 18' rolls
  - (f) Protective Tape for Underground 12" x 18' rolls
  - (g) Protective Tape for Above ground 2" x 9' rolls
  - (h) Protective Tape for Above ground 4" x 9' rolls
  - (i) Protective Tape for Above ground 6" x 9' rolls
  - (j) Protective Tape for Above ground 6" x 18' rolls
  - (k) Protective Tape for Above ground 9" x 18' rolls
  - (l) Protective Tape for Above ground 12" x 18' rolls.
10. Protective Coating Tape for above ground and in chambers or other facilities shall harden as opposed to remaining pliable for below grade.
11. Protective Coating Tape for below grade installations shall be Trenton - # 1 Wax-Tape, TC - Envirotape, Denso – Denso Tape, or the equal product of another manufacturer.



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12. Protective Coating Tape for above ground and in chambers or other facilities shall be Trenton - # 2 Wax-Tape or the equal product of another manufacturer.

### 3.19.4 Protective Coating Outer Wrap

1. Protective Coating Outer Wrap shall be a clear flexible plastic film designed to provide extra mechanical protection for surfaces coated with protective coating tape.
2. Protective Coating Outer Wrap shall be provided in accordance with of ANSI/AWWA C-217 the latest the revision.
3. Protective Coating Outer Wrap shall have a minimum thickness of 1-mil.
4. Protective Coating Outer Wrap shall be delivered in the following size rolls. At time of order the specific size rolls will be identified;
  - (a) Protective Tape Outer wrap for Underground 4" x 50' rolls
  - (b) Protective Tape Outer wrap for Underground 6" x 50' rolls
  - (c) Protective Tape Outer wrap for Underground 9" x 50' rolls
  - (d) Protective Tape Outer wrap for Underground 12" x 50' rolls
5. Protective Coating Outer Wrap for below grade installations shall be Trenton Poly Ply, TC Envirostretchwrap, Denso – Densopol/Densoclad Tapes, or the equal product of another manufacturer.



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### Section 3.20 FILL MATERIAL

#### 3.20.1 Bank-run Gravel Aggregate

1. Bank run gravel shall be a granular material, well graded from fine to coarse with a maximum size of 3-inch and shall meet or exceed the Massachusetts Highway Department (MHD) specifications for Gravel Aggregate.
2. Bank-run gravel shall be obtained from approved natural deposits and unprocessed except for the removal of unacceptable material and stones larger than the maximum size permitted.
3. Bank-run gravel shall not contain vegetation, masses or roots, or individual roots more than 18” long or more than 1/2” in diameter.
4. Bank-run gravel shall be substantially free from loam and other organic matter, clay, frost, frozen lumps, clay, and other fine or harmful substances.
5. The gradation shall meet the grading requirements of the following table:

Sieve Designation	Percent by Weight Passing Square Mesh Sieve
3/8 inch	70 maximum
No. 10	50 maximum
No. 200	5 maximum





# Springfield Water and Sewer Commission

## Material Specifications

### 3.20.2 Screened Gravel Aggregate

1. Screened gravel shall be a granular material, well graded with hard, durable, particles of proper size and gradation.
2. Screened gravel shall not contain vegetation, masses or roots, or individual roots.
3. Screened gravel shall be free from sand, loam and other organic matter, clay, excess fines and deleterious materials, frost, and frozen lumps.
4. The gradation shall meet the grading requirements of the following table:

Sieve Designation	Percent by Weight Passing Square Mesh Sieve
1/2 inch	95 minimum
3/8 inch	40 - 70
No. 4	5 maximum



# Springfield Water and Sewer Commission

## Material Specifications

### 3.20.3 Structural Gravel Aggregate

1. Structural gravel shall be gravel, sandy gravel, or gravely sand of proper size and gradation.
2. Structural gravel shall not contain vegetation, masses or roots, or individual roots.
3. Structural gravel shall be free from organic material, loam, wood, clay, trash, snow, ice, frost, frozen lumps, and other objectionable material.
4. The gradation shall meet the grading requirements of the following table:

Sieve Designation	Percent by Weight Passing Square Mesh Sieve
6-inch	100
No. 4	20 - 95
No. 40	0 - 60
No. 4	8 maximum

Last Modified: 04/09/2025 at 10:39AM EDT



# Springfield Water and Sewer Commission

## Material Specifications

### 3.20.4 Common Borrow/Fill

1. Common borrow/fill shall be inert, inorganic natural soils and/or rock, not having more than 5% by weight passing the No. 200 sieve.
2. Common borrow/fill shall have maximum stone size not greater than 6-inch and material shall be well graded throughout entire size range.
3. Common borrow/fill shall be free from clay, organic material, roots, leaves, trash, snow, ice, frozen soil, and other objectionable material that may be compressible or which cannot be compacted properly.
4. Common borrow/fill shall not contain broken concrete, masonry, rubble, asphalt pavement, ceramic tiles, or other similar materials.
5. Common borrow/fill shall be free of ice or frost and no aggregations of soil particles frozen.
6. Common borrow/fill shall have a moisture content within plus or minus 4% optimum moisture content at the borrow/fill source.
7. Common borrow/fill shall have physical properties, as approved by the Commission, such that it can be readily spread and compacted.
8. Common borrow/fill shall meet the grading requirements of the following table:

Sieve	Percent by Weight
Designation	Passing Square Mesh Sieve
½ inch	50 - 85
No. 4	40 - 55
No. 50	8 - 28
No. 200	0 - 10



# Springfield Water and Sewer Commission

## Material Specifications

### 3.20.5 Select Common Borrow/Fill

Select common borrow/fill shall be as specified for Common Borrow/Fill except the material shall contain no stones larger than 2-inch in its largest dimension.

Last Modified: 04/09/2025 at 10:39AM EDT



# Springfield Water and Sewer Commission

## Material Specifications

### 3.20.6 Crushed Stone ¾-Inch

1. Crushed stone shall consist of sound, durable crushed rock or durable crushed gravel stone, angular in shape and free from structural defects, comparatively free of chemical decay, and free of any foreign material including, but not limited to ice, snow, sand, clay, loam, or other deleterious or organic material.
2. Crushed stone shall be maximum size passing a ¾-inch sieve and retained on a 3/8-inch sieve.



# Springfield Water and Sewer Commission

## Material Specifications

### 3.20.7 Crushed Stone 2-Inch

1. Crushed stone shall consist of sound, durable crushed rock or durable crushed gravel stone, angular in shape and free from structural defects, comparatively free of chemical decay, and free of any foreign material including, but not limited to ice, snow, sand, clay, loam, or other deleterious or organic material.
2. Crushed stone shall be maximum size passing a 2-inch sieve and retained on a 1-inch sieve.



# Springfield Water and Sewer Commission

## Material Specifications

### 3.20.8 Dense Grade Crushed Stone

1. Dense Grade Crushed Stone shall be crusher run coarse aggregates of crushed stone combined with fine aggregates uniformly premix with a predetermined quantity of water.
2. The crusher run coarse aggregates shall consist of hard, durable particles of stone. Materials that break up when alternately frozen and thawed or wetted and dried shall not be used.
3. The crusher run coarse aggregates shall have a percentage of wear, by the Los Angeles test of not more than 45.
4. Fine aggregates shall consist of natural or crushed sand.
5. The composite material shall be free from clay, loam or other plastic material, and shall meet the grading requirements of the following table:

Sieve Designation	Percent by Weight Passing Square Mesh Sieve
2 inch	100
1-1/2 inch	70 - 100
¾ inch	50 - 85
No. 4	30 - 55
No. 50	8 - 24
No. 200	3 - 10



# Springfield Water and Sewer Commission

## Material Specifications

### 3.20.9 Sand

1. Aggregate for sand shall consist of clean, inert, hard, durable grains of quartz or other hard durable rocks and free from vegetable matter, lumps or balls of clay and other deleterious substances.
2. Sand shall confirm to ASTM C33 for fine aggregate.
3. The gradation shall meet the grading requirements of the following table:

Sieve Designation	Percent by Weight Passing Square Mesh Sieve
1/2 inch	100
3/8 inch	85 - 100
No. 4	60 - 100
No. 16	35 - 80
No. 50	10 - 55
No. 200	2 - 10





# Springfield Water and Sewer Commission

## Material Specifications

### 3.20.10 Excavatable Flowable Fill

1. Excavatable Flowable fill shall be 100 PSI maximum.
2. Excavatable Flowable shall consist of Portland cement conforming to ASTM C-150, Type II.
3. Excavatable Flowable may have coarse and fine aggregate consisting of well graded crushed stone.
4. Excavatable Flowable shall have **NO** fly ash.
5. Excavatable Flowable shall have clean water free from oils, acid, and organic matter.



# Springfield Water and Sewer Commission

## Material Specifications

### 3.20.11 Non-Excavatable Flowable Fill

1. Non-Excavatable Flowable fill shall be 150 PSI minimum.
2. Non-Excavatable Flowable fill shall consist of Portland cement conforming to ASTM C-150, Type II.
3. Non-Excavatable Flowable fill may have coarse and fine aggregate consisting of well graded crushed stone.
4. Non-Excavatable Flowable fill shall have **NO** fly ash.
5. Non-Excavatable Flowable fill shall have clean water free from oils, acid, and organic matter.



# Springfield Water and Sewer Commission

## Material Specifications

### 3.20.12 Concrete for Fill

1. Concrete shall be 2500 PSI
2. Concrete shall be of Portland cement conforming to ASTM C-150, Type II,
3. Concrete shall have coarse aggregate consisting of well graded crushed stone with a maximum size of 2-inch
4. Concrete shall have clean water free from oils, acid, and organic matter.



# Springfield Water and Sewer Commission

## Material Specifications

### 3.20.13 Concrete for Thrust Blocks

1. Concrete shall be 4000 PSI
2. Concrete shall be of Portland cement conforming to ASTM C-150, Type II,
3. Concrete shall have coarse aggregate consisting of well graded crushed stone with a maximum size of  $\frac{3}{4}$ -inch
4. Concrete shall have clean water free from oils, acid, and organic matter.



# Springfield Water and Sewer Commission

## Material Specifications

### CHAPTER 4 WATER SERVICES, AND APPURTANANCES,

#### Section 4.1 DUCTILE IRON PUSH-ON JOINT WATER SERVICE PIPE

1. Ductile Iron water service pipe shall be at least 6-inches in diameter.
2. Ductile Iron water service pipe, ductile iron valves, and ductile iron appurtenances shall be as specified in Section 3.1 of these Specifications.



# Springfield Water and Sewer Commission

## Material Specifications

### Section 4.2 COPPER TUBE WATER SERVICE PIPE

#### 4.2.1 General

1. Copper tube water service pipe provided to the Commission or Installer shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.
2. Copper tube water service pipe as a minimum shall conform to the most current American Water Works Association Standard C-800, all addenda thereto and American Section of the International Association for Testing Materials (ASTM) B88, all addenda thereto.
3. Copper tube water service pipe shall be seamless, type "K", and copper alloy UNS C12200.
4. Copper tube water service pipe shall be NSF 61 compliant.
5. Copper tube water service pipe shall be  $\frac{3}{4}$ -inch, 1-inch, 1-1/4-inch, 1-1/2-inch, and 2-inch diameter.
  - (a) Please note  $\frac{3}{4}$ -inch and 1-1/4-inch diameters are for repair work only.
  - (b) The minimum diameter for new service pipe is 1-inch
  - (c) 1-1/2 and 2-inch are for new service pipe.
6. Copper tube shall be delivered in the following lengths as required by the Commission at time of order:
  - (a)  $\frac{3}{4}$ -inch and 1-inch shall be in 40-foot and/or 60-foot rolls
  - (b) 1-1/4-inch, 1-1/2-inch, and 2-inch shall be in 20-foot straights, 40-foot and/or 60-foot rolls
    - Please note that rolls of copper tube shall be soft copper and straights of copper tube shall be hard
7. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;
  - (a) North America shall mean the United States, Canada, and Mexico,
  - (b) Cast shall mean molten metals poured into a mold to create Casting(s) for a finished product,



# Springfield Water and Sewer Commission

## Material Specifications

- (c) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and
  - (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or
  - (e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.
8. Inspection:
- (a) All finished product(s) furnished shall be subject to inspection by the Commission at the place of manufacture and shall be subject to inspection after delivery to the Commission.
  - (b) Cost of re-inspection of materials or fabricated finished product(s) caused by the non-compliance of the manufacturer with the provisions of the specifications, shall be paid for by the manufacturer, and shall be deductible from the price paid for the hydrants.
9. Delivery shall be made by truck in minimum truckload quantity to locations designated in the Commission's service area in and near Springfield, Massachusetts. The low bidder shall notify the Commission of the quantity comprising a minimum truckload.
10. The manufacturer/vendor/shipper must use care in preparing finished product(s) for shipment and in handling during shipment and delivery, to insure that the finished(s) are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged finished(s) will not be accepted.
11. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the finished product(s) and all materials in its construction exactly conform to the applicable requirements of these specifications and the applicable AWWA Standards.

### 4.2.2 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.
2. The manufacturer and/or vendor shall furnish three (3) sets of 24-inch by 36-inch certified shop drawings for all materials to be used. All components shall be provided in accordance to these drawings. The drawings shall show the following:



# Springfield Water and Sewer Commission

## Material Specifications

- (a) Cross sectional drawings of the hydrant showing overall dimensions,
  - (b) Material specifications for each component,
  - (c) Coating applied to each component, if applicable,
  - (d) Weight of each component and total weight for each bury depth, and
  - (e) Country of origin for each component.
3. The manufacturer shall furnish three (3) sets of coating specification(s) of each component that has a coating applied identifying component surface preparation, primer (if applicable), type of coating(s), color of coating(s), manufacturer of coating(s), part number of the coating(s), and a sample on a 3-inch by 5-inch chip.
  4. The manufacturer shall furnish a letter certifying the product meets all the requirements of the AIS, an explanation, in the letter, of how the products meets the AIS requirements, and signed by the Owner or President of the Company.
  5. The manufacturer shall furnish one (1) complete catalogue or manual for parts, repair, and maintenance.
  6. The manufacturer shall furnish a warranty for the copper tube that states that the copper tube shall be free from all defects in material and workmanship under normal use of the product for a minimum thirty (30) year time period from time of delivery. The manufacturer shall replace and/or repair defective copper tube for a minimum thirty (30) year time period from time of delivery.
  7. The manufacturer shall furnish a certified statement that the required tests on the various materials and on the completed hydrant have been made, and the results of all tests conform to the requirements of the American Water Works Association Standard Specification C-502. The records of the tests shall be furnished for the individual parts with respect to physical and chemical properties.
  8. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:
    - (a) Name of Municipality/Utility
    - (b) Total amount of product bid on and amount delivered
    - (c) Date the bid was accepted and date the product was delivered
    - (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product





# Springfield Water and Sewer Commission

## Material Specifications

9. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification “Approved”, “Approved as Noted”, or “Rejected-Resubmit” and return to the manufacturer and/or vendor.
  - (a) Approved means the contractor can supply the material as shown on the drawing(s).
  - (b) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.
  - (c) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

### 4.2.3 Copper Tube Approved for use by the Commission

The following manufacturers and products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. Cambridge-Lee – Standard Tube
2. Cerro Flow – Cerro Tube
3. Great Lakes Copper – Great Lakes Tube
4. Mueller – Certified Tube
5. Equal provided the products are manufactured as per these specifications.



# Springfield Water and Sewer Commission

## Material Specifications

### Section 4.3 TAPPING SADDLES

#### 4.3.1 General

1. Tapping saddles provided to the Commission or Installer shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.
2. Tapping saddles as a minimum shall conform to the most current American Water Works Association Standard C-800, all addenda thereto and American Section of the International Association for Testing Materials (ASTM) A536 and ASTM A703, all addenda thereto
3. Bodies shall be constructed of high strength ductile iron per ASTM A536.
4. Tapping saddle outlets shall have Mueller CC thread.
5. Bands shall be constructed of Grade 18-8, Type 304 stainless steel with stainless steel lugs and sidebars welded to the band(s) per ASTM A703. Single bands shall be 3-1/4-inch minimum width and double bands shall be 2-inches minimum width each.
6. Lugs and sidebars shall be constructed of Grade 18-8, Type 304 stainless steel with stainless steel fasteners welded to the lugs and sidebars. A minimum of two (2) lugs per single side bar or one (1) lug per side bar, when tapping saddles are provided with two (2) side bars, shall be provided.
7. All fasteners, excluding joint accessories, shall be made of Grade 304 stainless steel. Bolts shall be in accordance with ASTM A193 grade B8, latest revision. Nuts shall be in accordance with ASTM A194 grade 8, latest revision. Bolts and nuts shall be Unified National Coarse (UNC) rolled thread and heavy-duty hex nuts. Bolts installed into castings shall be provided with one (1) Grade 304 stainless steel flat washer and nuts and bolts shall be provided with two (2) Grade 304 stainless steel flat washers so that the epoxy coating is not damaged. At a minimum, nuts shall be coated with fluorocarbon, epoxy, zinc, or other anti-corrosion coating to help prevent galling.
8. To prevent galling; all stainless steel bolts shall be coated on the outside of all threads and the stainless steel nuts or castings on the inside of all threads at the factory, with an anti-seizing material such as provided by Henkel Technologies, Rocky Hill, Connecticut - product name: Loctite Nickel Anti-Seize Lubricant; Chesterton Technical Products, Stoneham, Massachusetts – product name: Chesterton 772 Premium Nickel Anti-Seize Compound; Permatex Inc. Hartford, Connecticut – product name: Permatex Nickel Anti-Seize Lubricant or equal product of another manufacturer and as specified in Section 3.18 of these Specifications.



# Springfield Water and Sewer Commission

## Material Specifications

9. All welds used in the construction of the tapping saddles shall conform to all American Welding Society (AWS) codes. All welds shall be fully passivated in order to restore the stainless steel to its original corrosive resistant characteristics.
10. Tapping saddles shall be provided with gaskets constructed of Virgin STYRENE BUTADIENE RUBBER (SBR) compound for water service and must meet or exceed ASTM-D-2000-AA-415.
11. Ranges must be clearly labeled on the package as well as on each tapping saddle.
12. Range diameter information must be provided from vendor on the tapping saddle bid.
13. Coatings shall be fusion bonded epoxy (10 – 12 mils), nylon 11 (10 – 12 mils)
14. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;
  - (a) North America shall mean the United States, Canada, and Mexico,
  - (b) Cast shall mean molten metals poured into a mold to create Casting(s) for a finished product,
  - (c) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and
  - (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or
  - (e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.
15. Delivery shall be specified in terms of number of days from receipt of order.
16. The manufacturer/vendor/shipper must use care in preparing tapping saddle for shipment and in handling during shipment and delivery, to insure that the tapping saddle are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged tapping saddle will not be accepted.
17. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the tapping saddle and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AWWA Standards.



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## Material Specifications

### 4.3.2 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.
2. The manufacturer and/or vendor shall furnish three (3) sets of 24-inch by 36-inch certified shop drawings for all materials to be used. All components shall be provided in accordance to these drawings. The drawings shall show the following:
  - (a) Cross sectional drawings of the hydrant showing overall dimensions,
  - (b) Material specifications for each component,
  - (c) Coating applied to each component, if applicable,
  - (d) Weight of each component and total weight for each bury depth, and
  - (e) Country of origin for each component.
3. The manufacturer shall furnish three (3) sets of coating specification(s) of each component that has a coating applied identifying component surface preparation, primer (if applicable), type of coating(s), color of coating(s), manufacturer of coating(s), part number of the coating(s), and a sample on a 3-inch by 5-inch chip.
4. The manufacturer shall furnish a letter certifying the product meets all the requirements of the AIS, an explanation, in the letter, of how the products meets the AIS requirements, and signed by the Owner or President of the Company.
5. The manufacturer shall furnish one (1) complete catalogue or manual for parts, repair, and maintenance.
6. The manufacturer shall furnish a warranty for the tapping saddles that states that the tapping saddles shall be free from all defects in material and workmanship under normal use of the product for a minimum one (1) year time period from time of delivery. The manufacturer shall replace and/or repair defective tapping saddles for a minimum one (1) year time period from time of delivery.
7. The manufacturer shall furnish a certified statement that the required tests on the various materials and on the completed hydrant have been made, and the results of all tests conform to the requirements of the American Water Works Association Standard Specification C-800. The records of the tests shall be furnished for the individual parts with respect to physical and chemical properties.
8. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:



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## Material Specifications

- (a) Name of Municipality/Utility
  - (b) Total amount of product bid on and amount delivered
  - (c) Date the bid was accepted and date the product was delivered
  - (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product
9. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification “Approved”, “Approved as Noted”, or “Rejected-Resubmit” and return to the manufacturer and/or vendor.
- (a) Approved means the contractor can supply the material as shown on the drawing(s).
  - (b) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.
  - (c) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

### 4.3.3 Tapping Saddles Approved for use by the Commission

The following manufacturers and products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. Ford - FC202,
2. Mueller - DR2S,
3. Romac - 202NS
4. Smith Blair – 317A or,
5. Equal provided the products are manufactured as per these specifications.



# Springfield Water and Sewer Commission

## Material Specifications

### Section 4.4 WATER SERVICE APPURTENANCES

#### 4.4.1 General

1. Water service appurtenances i.e. valves and fittings provided to the Commission or Installer shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.
2. Water service appurtenances i.e. valves and fittings, shall conform to the most current American Water Works Association Standard C-800, all addenda thereto.
3. All valves and fittings, which come in contact with water, shall be made from Lead Free brass.
  - (a) This brass alloy is commercially called “Enviro Brass II”, “Federalloy”, “Selenium Free”, or “Red-Hed Lead Free Brass”
    - Enviro Brass II is a Lead Free copper alloy, UNS Copper Alloy C89520.
    - Federalloy is a Lead Free copper alloy, UNS Copper Alloy C89833.
    - Selenium Free Brass is a Lead Free copper alloy, UNS Copper Alloy C89836.
    - Red-Hed Lead Free Brass is a Lead Free copper alloy, UNS Copper Alloy, UNS - Copper Alloy C89833.
  - (b) Brass other than the above may be approved by the Springfield Water and Sewer Commission as an acceptable equal.
  - (c) Lead Free brass is defined as having the following content:

PRIMARY ELEMENTS	COMPOSITION % BY WEIGHT
Copper (Cu)	85.0-91.0
Tin (Sn)	4.0-7.0
Lead (Max) (Pb)	0-0.25
Zinc (Zn)	2.0-6.0
Bismuth (Bi)	1.6-3.5.2
Selenium (Se)	0.0-1.1
Nickel (Ni) (Including Cobalt)	0.9-1.0



# Springfield Water and Sewer Commission

## Material Specifications

4. All castings shall be clearly identified as being cast from Lead Free Brass.
  - (a) “EB”, “EBII”, “NL”, or “LF” are acceptable identifiers, and must be cast in high relief or deeply engraved.
  - (b) Lead Free identifiers other than “EB”, “EBII”, “NL”, or “LF” are subject to Commission review and approval.
5. Brass parts not in contact with water may be made from copper alloy No. 83600, in accordance with ASTM B30, ASTM B62, or ASTM B584 and AWWA C-800 latest version containing 85% copper, 5% tin, 5% lead, and 5%.
6. All water service valves and fittings shall be certified, by a third party, as suitable for contact with drinking water by an accredited certification organization in accordance with ANSI/NSF 61-8, Drinking Water System Components – Health Effects.
7. Valves and fittings shall be designed to withstand working pressure of a minimum of 150 PSI. The manufacturer shall factory test all valves and fittings (100%) to a minimum of 150 PSI.
8. Corporation Stop Valves may rotate 360 degrees in either direction or rotate ¼ turn only and **OPEN LEFT**, counter-clockwise.
9. Curb Stop Valves shall rotate ¼ turn only and **OPEN LEFT**, counter-clockwise.
10. Valves, fittings, and other service line materials shall be as manufactured by the manufacturers of equivalent products are specified in Section 3.2.10 Table of Equivalencies and Item Number Details or the approved equal of another manufacturer.
11. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;
  - (a) North America shall mean the United States, Canada, and Mexico,
  - (b) Cast shall mean molten metals poured into a mold to create Casting(s) for a finished product,
  - (c) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and
  - (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or



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(e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.

12. The manufacturer and/or vendor must use care in preparing materials for shipment and in handling during shipment and delivery, to insure receipt without damage. Damaged materials will not be accepted.

### 4.4.2 Ball Type Corporation Stops for New Installations (Items # 1, 2, 3, & 4)

1. Corporations shall include a Tee Head Adapter. Tee head adapters shall be secured to the corporation with a stainless steel set screw or rolled pin. Cotter pins are not acceptable.
2. Corporations shall have AWWA/CC (corporation cock) Taper Thread Inlet x Mueller 110 Compression Outlet.
3. The outlet thread (male) of compression joint must be capable of installation using a Mueller B-101 Drilling and Tapping Machine using an inserting tool for corporation stop, inside thread CTS Mueller 110 Conductive Compression Connection according to the following table:

INSERTING TOOL SIZE	MUELLER PART NUMBER
¾"	680600
1"	680601
1¼"	
1½"	680421
2"	680422

4. Equality of the outlet joint to the “Mueller 110 Compression” is mandatory. The “Quick Joint” (Ford), “McQuick Compression” (McDonald), and “CB Compression” (Cambridge) have been determined to be equal.
5. ALL corporations shall be subject to a sustained hydraulic pressure of 200 PSI and tested in both the open and closed positions for leakage and ease of turning.

### 4.4.3 Ball Type Curb Stops used at Property Line (Items # 5, 6, 7, & 8)

1. Curb stops shall have Mueller 110 Compression – both ends
2. Equality of the outlet joint to the “Mueller 110 Compression” is mandatory. The “Quick Joint” (Ford), “McQuick Compression” (McDonald), and “CB Compression” (Cambridge) have been determined to be equal.





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## Material Specifications

### 4.4.4 Ball Type Curb Stops for Service Replacements (Items # 9, 10, 11, & 12)

1. Curb stops shall have Female Iron Pipe Thread (FIP) Inlet x Mueller 110 Compression Outlet.
2. Equality of the outlet joint to the “Mueller 110 Compression” is mandatory. The “Quick Joint” (Ford), “McQuick Compression” (McDonald), and “CB Compression” (Cambridge) have been determined to be equal. (changed 08/11/03)

### 4.4.5 Straight Ball Meter Valves (Items # 13, 14, 15, & 16)

1. Straight ball meter valves shall have Mueller 110 Compression Inlet x Elliptical Meter Flange Outlet (Items 15 & 16) or Meter Swivel Nut (Items 13 & 14).
2. Equality of the outlet joint to the “Mueller 110 Compression” is mandatory. The “Quick Joint” (Ford), “McQuick Compression” (McDonald), and “CB Compression” (Cambridge) have been determined to be equal.
3. Straight ball meter valves shall be supplied with locking tabs.
4. Straight ball meter valves shall be provided with factory installed handles made of water works brass 85-5-5-5.

### 4.4.6 Straight Ball Meter Valves to Locate meter near wall (Items # 36, & 37)

1. Straight ball meter valves shall have Female Iron Pipe (FIP) X Elliptical Meter Flange (Items 36 & 37).
2. Straight ball meter valves shall be supplied with locking tabs.
3. Straight ball meter valves shall be provided with factory installed handles (85-5-5-5 brass).

### 4.4.7 Angled Ball Meter Valves (Items # 17, 18, 19, & 20)

1. Angled ball meter valves shall have Mueller 110 Compression Inlet x Meter Swivel Nut (Items 17 & 18) or Elliptical Meter Flange (Items 19 & 20).
2. Equality of the outlet joint to the “Mueller 110 Compression” is mandatory. The “Quick Joint” (Ford), “McQuick Compression” (McDonald), and “CB Compression” (Cambridge) have been determined to be equal.
3. Angled ball meter valves shall be supplied with locking tabs.
4. Angled ball meter valves shall be provided with factory installed handles (85-5-5-5 brass).



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### 4.4.8 Quick Joint Couplings (Items # 21, 22, 23, & 24)

1. Quick joint couplings shall have Mueller 110 Compression end – both ends
2. Equality of the outlet joint to the “Mueller 110 Compression” is mandatory. The “Quick Joint” (Ford), “McQuick Compression” (McDonald), and “CB Compression” (Cambridge) have been determined to be equal.

### 4.4.9 Handles for Meter Ball Valves (Items # 28, 29, 30 & 31)

1. Handles shall be water works brass 85-5-5-5.
2. Handle shall be provided with brass nut and bolt.
3. Meter Ball Valves the handle shall be a straight lever and a minimum of 4-1/4” long.

### 4.4.10 90-degree Elbows (Items # 32 & 33)

1. 90-degree elbow shall be 1-1/2-inch or 2-inch
2. 90-degree elbow shall have Mueller 110 Compression inlet x MIP on the outlet end
3. Equality of the outlet joint to the “Mueller 110 Compression” is mandatory. The “Quick Joint” (Ford), “McQuick Compression” (McDonald), and “CB Compression” (Cambridge) have been determined to be equal.

### 4.4.11 Elliptical Flange (Items # 34 & 35)

1. Elliptical Flange shall 1-1/2-inch or 2-inch.
2. Elliptical flange shall have FIP threads.



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### 4.4.12 Service Line Materials Table of Equivalencies

1. For lead free brass goods add the following to the listed Catalog Numbers below.
  - (a) Ford add “NL” as a suffix to the catalog number
  - (b) Red Hed supplies lead free only brass goods
  - (c) Mueller add “EB” as a suffix to the catalog number.
  - (d) McDonald add “7” as a prefix to the catalog number.
  - (e) Cambridge add “NL” as a prefix to the catalog number.



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## Material Specifications

SECTION	ITEM #	SIZE IN & OUT	CATALOG NUMBER					NOTES
			FORD	RED HED	MUELLER	MCDONALD	CAMBRIDGE	
4.2.2	1	1"	FB1000-4-Q-TA-NL	RHSB4382 1	B25008N	4104BQ 1"	311-A4H4	COMB CORP & CURB STOP CC x Q
	2		FB1000-5-Q-TA-NL	NA	NA	NA	NA	CC x Q
	3	1½"	FB1000-6-Q-TA-NL	RHSB4382 4	B25008N 1½"	4104BQ 1½"	311-A6H6	CC x Q
	4	2"	FB1000-7-Q-TA-NL	RHSB4382 5	B25008N 2"	4104BQ 2"	311-A7H7	CC x Q
4.2.3	5	1"	B44-444-Q-NL	RHSB4151 2	B25209N	6100Q 1"	202-H4H4	CURB STOP Q x Q
	6	1¼"	B44-555-Q-NL	RHSB4151 3	NA	6100Q 1¼" x 1"	202-H5H5	Q x Q
	7	1½"	B44-666-Q-NL	RHSB4151 4	B25209N 1½"	6100Q 1½"	202-H6H6	Q x Q
	8	2"	B44-777-Q-NL	RHSB4151 5	B25209N 2"	6100Q 2"	202-H7H7	Q x Q
4.2.4	9	1"	B41-444-Q-NL	RHSB4081 2	B25172N	6102Q 1"	202-H4F4	CURB STOP FIP x Q
	10	1¼"	B41-555-Q-NL	RHB40813	NA	NA	202-H5F5	FIP x Q
	11	1½"	B41-666-Q-NL	RHB40814	B25172N 1½"	6102Q 1½"	202-H6F6	FIP x Q
	12	2"	B41-777-Q-NL	RHB40815	B25172N 2"	6102Q 2"	202-H7F7	FIP x Q
4.2.5	13	1 x ¾"	B43-342W-Q-NL	NA	B24350N	6100MWQ 1"	NA	STR. METER VALVE Q x SWIVEL
	14	1¼ x 1"	B43-454W-Q-NL	NA	B24350N	NA	NA	Q x SWIVEL
	15	1½"	BF43-666W-QNL	NA	B24335N 1½"	6100MWQ 1½"	212-H6MF6H	Q x MTR FLGE
	16	2"	BF43-777W-QNL	NA	B24335N 2"	6100MWQ 2"	212-H7MF7H	Q x MTR FLGE
4.4.6	36	1½"	BF13-666W-NL	NA	B24337N 1½"	6101MW 1½"	212-F6MF6H	FIP x MTR FLGE
	37	2"	BF13-777W-NL	NA	B24337N 2"	6101MW 2"	212-F7MF7H	FIP x MTR FLGE
4.2.7	17	1 x ¾"	BA43-342W-QNL	NA	B24258N	4602BQ 1 x ¾"	210-H4T3H	ANGLE METER VALVE Q x SWIVEL
	18	1 x 1"	BA43-444W-QNL	NA	B24258N	4602BQ 1"	210-H4T4H	Q x SWIVEL
	19	1½"	BFA43-666W-QNL	NA	B24276N 1½"	4602BQ 1½"	210-H6MF6H	Q x MTR FLGE
	20	2"	BFA43-777W-QNL	NA	B24276N 2"	4602BQ 2"	210-H7MF7H	Q x MTR FLGE



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SECTION NUMBER	ITEM #	SIZE IN & OUT	CATALOG NUMBER					NOTES
			FORD	RED HED	MUELLER	MCDONALD	CAMBRIDGE	
4.2.8	21	1"	C44-44-QNL	RH41212	H15403	4758Q 1"	119-H4H4	COUPLING Q x Q
	22	1¼"	C44-55-QNL	RH41213	H15403N	4758Q 1¼"	119-H5H5	Q x Q
	23	1½"	C44-66-QNL	RH41214	H15403N 1½"	4758Q 1½"	119-H6H6	Q x Q
	24	2"	C44-77-QNL	RH41215	H15403N 2"	4758Q 2"	119-H7H7	Q x Q
4.4.9	28	¾" & 1"	HB34	NA	B-20298	6120B 1"	NA inc. w/ valve	Brass Handle
	29	1¼"	HH67S	NA	B-20298	6120B 1¼"	NA inc. w/ valve	Brass Handle
	30	1½"	HH67S	NA	B-20298	6120B 1½"	NA inc. w/ valv	Brass Handle
	31	2"	HH67S	NA	B-20298	6120B 2"	NA inc. w/ valv	Brass Handle
4.4.10	32	1½"	L84-66-QNL	NA	H15531N 1½"	4779M-22 1½"	105-H6M6NL 1½"	Elbow
	33	2"	L84-77-QNL	NA	H1553N 2"	4779M-22 2"	105-H6M6NL 2"	Elbow
4.4.11	34	1½"	CF31-66NL	NA	H10129N 1½"	610F 1½"	421-6-NL 1½"	Ellip. Flange
	35	2"	CF31-77NL	NA	H10129N 2"	610F 2"	421-6-NL 2"	Ellip. Flange
3.2.8	25	3 ½'	NA	NA	NA	NA	NA	Buffalo style curb box in street for 1-inch valves
	26	6'	NA	NA	NA	NA	NA	Buffalo style curb box @ property for 1-incn valves
	27	3 ½'	NA	NA	NA	NA	NA	Buffalo style curb box in street for 1-1/2 to 2-inch valves
	27a	6'	NA	NA	NA	NA	NA	Buffalo style curb box @ property for 1-1/2 to 2-incn valves

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### Section 4.5 WATER SERVICE BOXES

#### 4.5.1 General

1. Water service boxes provided to the Commission or installer shall be Buffalo/slide style and manufactured, tested, inspected and delivered in full compliance with this Specification.
2. The Water service boxes shall be certified to meet American Association of State Highway and Transportation Officials (AASHTO) M 105 Class 35B strength of materials requirements.
3. Water service boxes shall be strong, durable, even grained cast iron, smooth, free from scale, lumps, blisters, sand holes and defects of any kind.
  - (a) An HS20 load rating is required.
  - (b) Cast iron shall conform to American Society of Testing and Materials (ASTM) A48, Class 35B.
  - (c) Water service boxes covers and seats shall be machined to a true surface so that the cover does not rock in the frame no matter the position of the cover.
4. The Commission may require water service boxes be subjected to proof load testing as follows:
  - (a) Testing shall be in accordance with the National Institute of Standards Technology (NIST) standards.
  - (b) Water service boxes shall show no detrimental deformation or cracks when a proof load of 25,000-pounds is concentrated on an 9-inch by 9-inch area at the center of the cover for a 1-minute period of time.
  - (c) Permanent deformation shall not exceed 1/8-inch.
  - (d) All testing shall be at the supplier's expense.
5. Water service boxes top sections, bottom sections, covers, and enlarged bases shall be provided with individual permanent markings that are easily discernable and show the following:
  - (a) Name of the producing foundry and country of manufacture preceded by the words "Made in", such as "Made in USA"
  - (b) AASHTO designation or ASTM designation number



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- (c) Class by a number followed by a letter indicating the minimum tensile strength and size of test bar,
  - (d) Heat identification and cast date (MM/DD/YY),
  - (e) The above markings are required, but the Commission will allow some variation in how the above markings are provided on the finished product. The design and location of the markings must meet and be subject to the approval of the Commission's aesthetic judgment.
6. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;
- (a) North America shall mean the United States, Canada, and Mexico,
  - (b) Cast shall mean molten metals poured into a mold to create Casting(s) for a finished product,
  - (c) Incidental parts may be purchased/obtained from other countries to provide a finished product , in accordance with these Material Specifications, and
  - (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or
  - (e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.
7. All water service boxes tops, bottoms, and covers shall be coated with an approved petroleum asphaltic seal coat.
8. The manufacturer/vendor/shipper must use care in preparing valves boxes for shipment and in handling during shipment and delivery, to insure that the valves boxes are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged valves boxes will not be accepted.
9. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the valve and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AWWA Standards.

### 4.5.2 Submittals

- 1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.



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2. The manufacturer and/or vendor shall furnish three (3) sets of 24-inch by 36-inch certified shop drawings for all materials to be used. All components shall be provided in accordance to these drawings. The drawings shall show the following:
  - (a) Cross sectional drawings of the product(s) showing overall dimensions,
  - (b) Material specifications for each component,
  - (c) Coating applied to each component, if applicable,
  - (d) Weight of each component and total weight, and
  - (e) Country of origin for each component.
3. The manufacturer and/or vendor shall furnish three (3) sets of coating specification(s) of each component that has a coating applied identifying component surface preparation, primer (if applicable), type of coating(s), color of coating(s), manufacturer and/or vendor of coating(s), part number of the coating(s), and a sample on a 3-inch by 5-inch chip.
4. The manufacturer and/or vendor shall furnish a letter certifying the product(s) meet all the requirements of the AIS, an explanation, in the letter, of how the product(s) meets the AIS requirements, and signed by the Owner or President of the Company.
5. The manufacturer and/or vendor shall furnish one (1) complete catalogue or manual for parts, repair, and maintenance.
6. The manufacturer and/or vendor shall furnish a certified statement that all product(s) of the same make and model bid, regardless of the year of manufactured, shall have interchangeable component parts and that the parts availability and delivery shall remain firm for ten (10) years.
7. The manufacturer and/or vendor shall furnish a warranty for the product(s) that states that the product(s) shall be free from all defects in material and workmanship under normal use of the product for a minimum one (1) year time period from time of delivery. The manufacturer and/or vendor shall replace and/or repair defective parts or the whole product(s) for a minimum one (1) year time period from time of delivery.
8. The manufacturer and/or vendor shall furnish a certified statement that the required tests on the various materials and on the completed product(s) have been made, and the results of all tests conform to the requirements of the American Association of State Highway and Transportation Officials (AASHTO) M 105 Class 35B strength of materials requirements, American Society of Testing and Materials (ASTM)





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A48, Class 35B, and as the Commission may require the National Institute of Standards Technology (NIST) standards – Proof Load Testing.

9. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:
  - (a) Name of Municipality/Utility
  - (b) Total amount of product bid on and amount delivered
  - (c) Date the bid was accepted and date the product was delivered
  - (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product
10. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification “Approved”, “Approved as Noted”, or “Rejected-Resubmit” and return to the manufacturer and/or vendor.
  - (a) Approved means the contractor can supply the material as shown on the drawing(s).
  - (b) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.
  - (c) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

### 4.5.3 Buffalo Style Service Box (Items # 25, 26, 27, & 27a) for New and Existing Services

1. The Buffalo Style Service Box shall be heavy cast iron extension (adjustable) type, slide style, with arch pattern base and a recessed cover.
2. The Buffalo Style Service Box shall be 5-feet tall, with an approximate 24-inch top, an approximate 48-inch bottom, and weigh at least 41-pounds with top section, bottom section, and cover.
3. For ¾-inch to 1-inch ball type corporations and ball type curb stops the arch shall be at least 5-inches tall with a 3-inch by 3-inch arch.
4. For 1-1/2-inch to 2-inch ball type corporations and ball type curb stops an enlarged base is be required and the arch shall be at least 7-inches tall with a 4-inch by 4-inch arch.



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5. The inside diameter of the upper section shall be at least 3-inches. The inside diameter of the bottom section shall be at least 2-1/2-inches.
6. The Buffalo Style Service Box shall be provided with a heavy duty, flush fit, cast iron cover that has a brass pentagon head nut, and the word “WATER” cast into the cover.
7. The Buffalo Style Service Box shall have a heavy coat of Asphalt-base paint.

### 4.5.4 Buffalo Style Water Service Boxes Makes and Models Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

8. Bibby Ste-Croix:
  - (a) Water Service Box complete: V042 (95E)
  - (b) Top section only: S201,
  - (c) Bottom section only: V213,
  - (d) Enlarged base: V313,
  - (e) Heavy duty cover: V243, and
  - (f) Brass bolt: V312
9. Bingham and Taylor:
  - (a) Water Service Box complete: 94-F (Fig. 4901)
  - (b) Top section only: F (Fig. 4901),
  - (c) Bottom section only: 94 (Fig. 4901),
  - (d) Enlarged base: 14-E (Fig. 4980)
  - (e) Heavy duty cover: 4901-B, and
  - (f) Brass bolt: 4951, or
10. Equal provided the products are manufactured as per these specifications.



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### Section 4.6 Water Meters: 5/8-inch – 1-inch

#### 4.6.1 General

1. Water Meters shall conform to the American Water Works Association Standard C-700 (latest edition) for: “Cold Water Meter—Positive Displacement Type, Bronze Main Case”.
  - (a) The register shall be supplied mounted to the meter body.
  - (b) Registers may be mechanical or solid state
2. The Water Meter shall be supplied and warranted as a complete assemble unit that include the meter body, encoder register, and 8-foot cord.
3. All water meters shall be certified, by a third party, as suitable for contact with drinking water by an accredited certification organization in accordance with ANSI/NSF 61-8, Drinking Water System Components – Health Effects.
4. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;
  - (a) North America shall mean the United States, Canada, and Mexico,
  - (b) Cast shall mean molten metal poured into a mold to create Casting(s) for a finished product,
  - (c) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and
  - (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or
  - (e) The finished product shall meet all the requirements of the AIS language and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.
5. Inspection:
  - (a) All finished product(s) furnished shall be subject to inspection by the Commission at the place of manufacture and shall be subject to inspection after delivery to the Commission.
  - (b) Cost of re-inspection of materials or fabricated finished product(s) caused by the non-compliance of the manufacturer and/or vendor with the provisions of



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the specifications, shall be paid for by the manufacturer and/or vendor, and shall be deductible from the price paid for the water meters.

6. Delivery shall be made by truck in minimum truckload quantity to locations designated in the Commission's service area in and near Springfield, Massachusetts. The low bidder shall notify the Commission of the quantity comprising a minimum truckload.
7. The manufacturer/vendor/shipper must use care in preparing finished product(s) for shipment and in handling during shipment and delivery, to insure that the finished(s) are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged finished product(s) will not be accepted.
8. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the finished product(s) and all materials in its construction exactly conform to the applicable requirements of these specifications and the applicable AWWA Standards.

### 4.6.2 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.
2. The manufacturer and/or vendor and/or vendor shall furnish three (3) sets of 24-inch by 36-inch certified shop drawings for all materials to be used. All components shall be provided in accordance to these drawings. The drawings shall show the following:
  - (a) Cross sectional drawings of the Water Meters showing overall dimensions,
  - (b) Material specifications for each component,
  - (c) Coating applied to each component, if applicable,
  - (d) Weight of each finished product(s), and
  - (e) Country of origin for each component.
3. The manufacturer and/or vendor shall furnish three (3) sets of coating specification(s) of each component that has a coating applied identifying component surface preparation, primer (if applicable), type of coating(s), color of coating(s), manufacturer and/or vendor of coating(s), part number of the coating(s), and a sample on a 3-inch by 5-inch chip.



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4. The manufacturer and/or vendor shall furnish a letter certifying the product meets all the requirements of the AIS, an explanation, in the letter, of how the products meets the AIS requirements, and signed by the Owner or President of the Company.
5. The manufacturer and/or vendor shall furnish one (1) complete catalogue or manual for parts, repair, and maintenance.
6. The manufacturer and/or vendor shall furnish a certified statement that all Water Meters of the same make and model bid, regardless of the year of manufactured, shall have interchangeable component parts and that the parts availability and delivery shall remain firm for ten (10) years.
7. The manufacturer and/or vendor shall furnish a certified statement, by an accredited third party certification organization, that the water meter is suitable for contact with drinking water in accordance with ANSI/NSF 61-8, Drinking Water System Components – Health Effects.
8. The manufacturer and/or vendor shall furnish a warranty for the water meters that states that the water meters shall be free from all defects in material and workmanship under normal use in accordance with the following requirements:
  - (a) Lead free bronze housing for a minimum twenty (20) year time period from time of delivery,
  - (b) Encoder registers which are supplied with the water meters for a minimum ten (10) year time period from time of delivery,
  - (c) The supplier of the Water Meter unit shall be fully responsible for all components and warranties of the Water Meter unit and shall replace and/or repair defective parts or the whole water meter.
9. The manufacturer and/or vendor shall furnish a warranty for the water meters accuracy that states that the water meters shall meet or exceed AWWA Standard C-700, latest edition, under normal use in accordance with the following requirements:
  - (a) 5/8-inch by 3/4-inch for a minimum five (5) year time period from time of delivery or 100,000-cubic feet (750,000-gallons), whichever occurs first,
  - (b) 1-inch for a minimum five (5) year time period from time of delivery or 133,333-cubic feet (1,000,000-gallons), whichever occurs first,
  - (c) The manufacturer and/or vendor shall replace and/or repair defective parts or the whole water meter.



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10. The manufacturer and/or vendor shall furnish a certified statement that the required tests on the various materials and on the completed water meter have been made, and the results of all tests conform to the requirements of the American Water Works Association Standard Specification C-700. The records of the tests shall be furnished for the individual parts with respect to physical and chemical properties.
11. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:
  - (a) Name of Municipality/Utility
  - (b) Total amount of product bid on and amount delivered
  - (c) Date the bid was accepted and date the product was delivered
  - (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product
12. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification “Approved”, “Approved as Noted”, or “Rejected-Resubmit” and return to the manufacturer and/or vendor.
  - (a) Approved means the contractor can supply the material as shown on the drawing(s).
  - (b) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.
  - (c) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

### 4.6.3 Meter Body

1. The main meter body shall be rated for a minimum 150 psi continuous working pressure.
2. Measuring chamber shall be a nutating disc.
3. Coupling connections shall be standard National Pipe Thread (NPT) with the following connection types required:
  - (a) 5/8-inch by 3/4-inch: Male Thread Ends (MTE),
  - (b) 1-inch: MTE,



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4. A frost-protection type cast iron base plate is required for 5/8-inch and 1-inch meters and shall be attached with stainless screws.
  - (a) The base plate shall be coated with epoxy paint.
  - (b) A minimum of two (2) base screws will contain an eyelet suitable for inserting a wire tamper-evident seal.
5. All brass components which come in contact with water shall be made from Lead Free brass.
  - (a) This brass alloy is commercially referred to as “Enviro Brass II”, “Federalloy”, “Selenium Free”, or “Red-Hed Lead Free Brass”
    - Enviro Brass II is a Lead Free copper alloy, UNS Copper Alloy C89520.
    - Federalloy is a Lead Free copper alloy, UNS Copper Alloy C89833.
    - Selenium Free Brass is a Lead Free copper alloy, UNS Copper Alloy C89836.
    - Red-Hed Lead Free Brass is a Lead Free copper alloy, UNS Copper Alloy, UNS - Copper Alloy C89833.
  - (b) Brass other than the above may be approved by the Springfield Water and Sewer Commission as an acceptable equal.
  - (c) Lead Free brass is defined as having the following content:

PRIMARY ELEMENTS	COMPOSITION % BY WEIGHT
Copper (Cu)	85.0-91.0
Tin (Sn)	4.0-7.0
Lead (Max) (Pb)	0-0.25
Zinc (Zn)	2.0-6.0
Bismuth (Bi)	1.6-3.5.2
Selenium (Se)	0.0-1.1
Nickel (Ni) (Including Cobalt)	0.9-1.0

6. The meter body casting shall be clearly and deeply engraved with a unique 8 digit serial number which can be readily translated to determine the date of manufacture and shall be clearly identified as being cast from Lead Free Brass.



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- (a) “EB”, “EBII”, “NL”, or “LF” are acceptable identifiers, and must be cast in high relief or deeply engraved.
  - (b) Lead Free identifiers other than “EB”, “EBII”, “NL”, or “LF” are subject to Commission review and approval.
7. Brass parts not in contact with water may be made from copper alloy No. 83600, in accordance with ASTM B30, ASTM B62, or ASTM B584 and AWWA C-800 latest version containing 85% copper, 5% tin, 5% lead, and 5%.

### 4.6.4 Mechanical Register

- 1. The register shall be an encoder type with an encoded output, tamper-resistant (tamper-evident seal pin or seal wire screw), magnetically driven, and permanently sealed against moisture (1-100% operating humidity) and dirt.
- 2. Registers shall be a direct-read mechanical odometer wheel that registers in cubic feet.
  - (a) 5/8-inch through 1-inch shall be six (6) digits to the cubic foot decimal point with up to four (4) digits allowed after the decimal point.
- 3. Compatibility is required with any UI-1203 (such as provided by Sensus) protocol three (3) wire input devices.
- 4. The register shall have a minimum 8-foot encoded potted lead wire for attachment to external electronics.

### 4.6.5 Solid State Register

- 1. The register shall be a solid state LCD display tamper-resistant (tamper-evident seal pin or seal wire screw), magnetically driven, and permanently sealed against moisture and dirt.
- 2. The register shall have no internal battery.
- 3. Registers shall be direct-read LCD numeric; registering in cubic feet.
  - (a) 5/8-inch through 1-inch shall be six (6) digits to the cubic foot decimal point with up to four (4) digits allowed after the decimal point.
- 4. Compatibility is required with any UI-1203 (such as provided by Sensus) protocol three (3) wire input devices.
- 5. The register shall have a minimum 8-foot encoded potted lead wire for attachment to external electronics





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### 4.6.6 Manuals, Spare Parts, Tools, Training, Repairs

1. The requirements of this section are for Commission Price Agreements and are not for Commission Approved Contractors or Commission Capital Projects, unless specifically asked for in the project.
2. The manufacturer and/or vendor shall provide four (4) 24-inches by 36-inches (vertical) cut sheets showing all the water meter components, component material, and component part numbers with the first delivery. The vertical cut sheets shall be laminated.
3. The manufacturer and/or vendor shall provide six (6) complete sets catalogue or manual for parts, repair and maintenance with the first delivery.
4. The manufacturer and/or vendor shall provide at no additional cost four (4) complete sets of assembly/disassembly tools with the first delivery of meters.
5. The manufacturer and/or vendor shall provide training to Commission construction and maintenance staff every two (2) years. Training shall be by a factory trained representative at the Commission's Customer Service Office at 71 Colton Street, Springfield Massachusetts during normal business hours. The first training shall be provided within 30-days of the first delivery unless otherwise scheduled by the Commission.
6. The manufacturer and/or vendor shall provide the Commission with contact information for a factory trained representative who shall be responsible to respond to complaints from the Commission about defects in material, coatings, and workmanship under normal use of the product within ten (10) working days.

### 4.6.7 Water Meter Makes and Models Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. Badger Meter, Inc.:
  - (a) 5/8-inch by 3/4-inch w/ MTE: Model 25 w/ HR-E Encoder Register,
  - (b) 1-inch w/ MTE: Model 55 w/ HR-E Encoder Register,
2. Neptune:
  - (a) 5/8-inch by 3/4-inch w/ MTE: T-10 Pro Read Register,



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- (b) 1-inch w/ MTE: T-10 Pro Read Register,
  - (c) 5/8-inch by 3/4-inch w/ MTE: w/ E-CODER Solid State Register
  - (d) 1-inch w/ MTE: w/ E-CODER Solid State Register
3. Equal provided the products are manufactured as per these specifications.

### Section 4.7 Single Jet Water Meters – 5/8-inch X 3/4-inch, 1-inch, 1-1/2-inch, 2-inch, 3-inch, and 4-inch and Replacement Registers

#### 4.7.1 General

1. Water Meters shall conform to the American Water Works Association Standard C-712 (latest edition) for: “Cold-Water Meters-Single-jet Type” and the following.
2. The Water Meter shall be supplied and warranted as a complete assembled unit that includes the meter body, liquid crystal display (LCD) register and 3-foot cord or longer with an Itron connector compatible with Encoder-Receiver-Transmitters (ERT).
3. Water meters shall operate accurately with no requirements for straight runs of pipe before or after the meter.
4. Water meters shall operate without any leakage or damage to any part at a minimum continuous working pressure of 230-PSI (16-Bar).
5. Water meters shall be bid without strainers. The water meter operations shall be unaffected by sand or other particulate in the flow path. The manufacturer must warrant the meter operation and accuracy with no strainer installed.
6. All water meters shall be certified, by a third party, as suitable for contact with drinking water by an accredited certification organization in accordance with ANSI/NSF 61-8, Drinking Water System Components – Health Effects.
7. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;
  - (a) North America shall mean the United States, Canada, and Mexico,
  - (b) Cast shall mean molten metal poured into a mold to create Casting(s) for a finished product,



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- (c) Incidental parts may be purchased/obtained from other counties to provide a finished product, in accordance with these Material Specifications, and
  - (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or
  - (e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.
8. Inspection:
- (a) All finished product(s) furnished shall be subject to inspection by the Commission at the place of manufacture and shall be subject to inspection after delivery to the Commission.
  - (b) Cost of re-inspection of materials or fabricated finished product(s) caused by the non-compliance of the manufacturer and/or vendor with the provisions of the specifications, shall be paid for by the manufacturer and/or vendor, and shall be deductible from the price paid for the water meters.
9. Delivery shall be made by truck in minimum truckload quantity to locations designated in the Commission's service area in and near Springfield, Massachusetts. The low bidder shall notify the Commission of the quantity comprising a minimum truckload.
10. The manufacturer/vendor/shipper must use care in preparing finished product(s) for shipment and in handling during shipment and delivery, to insure that the finished(s) are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged finished product(s) will not be accepted.
11. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the finished product(s) and all materials in its construction exactly conform to the applicable requirements of these specifications and the applicable AWWA Standards.

### 4.7.2 Submittals

- 1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.
- 2. The manufacturer and/or vendor and/or vendor shall furnish three (3) sets of 24-inch by 36-inch certified shop drawings for all materials to be used. All



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components shall be provided in accordance to these drawings. The drawings shall show the following:

- (a) Cross sectional drawings of the Water Meters showing overall dimensions,
  - (b) Material specifications for each component,
  - (c) Coating applied to each component, if applicable,
  - (d) Rated working pressure and hydrostatic test pressure of each finished product(s), and
  - (e) Country of origin for each component.
3. The manufacturer and/or vendor shall furnish a letter certifying the product meets all the requirements of the AIS, an explanation, in the letter, of how the products meets the AIS requirements, and signed by the Owner or President of the Company.
  4. The manufacturer and/or vendor shall furnish one (1) complete catalogue or manual for parts, repair, and maintenance.
  5. The manufacturer and/or vendor shall furnish a certified statement that all Water Meters of the same make and model bid, regardless of the year of manufactured, shall have interchangeable component parts and that the parts availability and delivery shall remain firm for ten (10) years.
  6. The manufacturer and/or vendor shall furnish a certified statement, by an accredited third party certification organization, that the water meter is suitable for contact with drinking water in accordance with ANSI/NSF 61-8, Drinking Water System Components – Health Effects.
  7. The manufacturer and/or vendor shall furnish a warranty for the water meters that states that the water meters shall be free from all defects in material and workmanship under normal use in accordance with the following requirements:
    - (a) Lead free bronze main case for a minimum twenty (20) year time period from time of delivery,
    - (b) Registers which are supplied with the water meters for a minimum five (5) year time period from time of delivery,
    - (c) All other components which are supplied with the water meter for a minimum of five (5) year time period from time of delivery,



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- (d) The supplier of the Water Meter unit shall be fully responsible for all components and warranties of the Water Meter unit and shall replace and/or repair defective parts or the whole water meter.
8. The manufacturer and/or vendor shall furnish technical documentation for the water meters performance and accuracy that states that the water meters shall meet or exceed AWWA Standard C-712, latest edition, under normal use in accordance with Table 1, below.
- (a) The manufacturer and/or vendor shall furnish a warranty for the 5/8-inch X 3/4-inch, 1-inch, 1-1/2-inch, 2-inch, 3-inch, and 4-inch water meters accuracy that states that the water meters shall meet or exceed AWWA Standard C-712, latest edition, and in accordance with Table 1 below for a minimum five (5) year time period from time of delivery,
- (b) The manufacturer and/or vendor shall replace and/or repair defective parts or the whole water meter.
9. The manufacturer and/or vendor shall furnish a certified statement that the required tests on the various materials and on the completed water meter have been made, and the results of all tests conform to the requirements of the American Water Works Association Standard Specification C-712. The records of the tests shall be furnished for the individual parts with respect to physical and chemical properties.
10. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:
- (a) Name of Municipality/Utility
- (b) Total amount of product bid on and amount delivered
- (c) Date the bid was accepted and date the product was delivered
- (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product
11. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification, if applicable, “Approved”, “Approved as Noted”, or “Rejected-Resubmit” and return to the manufacturer and/or vendor.
- (a) Approved means the contractor can supply the material as shown on the drawing(s).
- (b) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.



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- (c) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

### 4.7.3 Meter Body – Main Case

1. The meter body shall be lead free brass as defined elsewhere in these specifications.
  - (a) 5/8-inch X 3/4-inch meters shall have composite meter chamber.
  - (b) 1-inch and larger shall have all brass meter chambers.
2. The meter body case shall have the meter serial number, size, an arrow indicating direction of flow, and identification of the main case as being lead free permanently cast, etched, or stamped on the main case.
  - (a) The unique multi digit serial number shall be readily translated to determine the date of manufacture.
  - (b) The size and an arrow indicating direction of flow shall be cast in raised characters on the main case.
3. The main case shall be of top loading design to facilitate meter access.
  - (a) 5/8-inch X 3/4-inch meters shall have the cover fastened to the main case by standard torx head bolts such that standard tools can be used to remove the cover.
  - (b) 1-inch and larger meters shall have the cover fastened to the main case by standard hex-head bolts such that standard tools can be used to remove the cover.
4. Meters shall utilize only one (1) measuring element, which shall be an impeller style, to achieve the performance required in the table below.
  - (a) No meters using two (2) or more measuring elements, such as combination meters or compound meters shall be accepted.
  - (b) 100% of water flow must be directly measured by the single-jet element to achieve performance in above table.
  - (c) Propeller type or proportional meters shall not be accepted.
5. Meters must meet the performance specifications summarized below as well as all defined by the AWWA 712, latest edition. These requirements are summarized in Table 1;



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Table 1

ITEM	Meter Size	Register Type/ telemetry type	Low Flow GPM at least at 95% accuracy	Accuracy Range 98.5-101.5%	Maximum Pressure Loss Over Accuracy Range	Max Lay Length in Inches (including spool or extension if needed)
1	5/8 X 3/4 inch	LCD/900 MHZ RF	1/8 gpm	0.25-22 gpm	15 PSI	7.5 INCH
2	5/8 X 3/4 inch	LCD/INTEGRAL CELLULAR	1/8 gpm	0.25-22 gpm	15 PSI	7.5 INCH
3	5/8 X 3/4 inch (extended flow range)	LCD/ REMOTE CELLULAR***	1/16 gpm	0.125 - 30 gpm	15 PSI	7.5 INCH
4	5/8 X 3/4 inch (extended flow range)	LCD/900 MHZ RF plus REMOTE Register with onboard CELLULAR	1/16 gpm	0.125 - 30 gpm	15 PSI	7.5 INCH
5	1 inch	LCD/900 MHZ RF	1/8 gpm	0.5-70 gpm	15 PSI	10.75 INCH
6	1 inch	LCD/INTEGRAL CELLULAR	1/8 gpm	0.5-70 gpm	15 PSI	10.75 INCH
7	1 inch	LCD/ REMOTE CELLULAR***	1/8 gpm	0.5-70 gpm	15 PSI	10.75 INCH
8	1-1/2 inch	LCD/900 MHZ RF	1/4 gpm	0.5-105 gpm	15 PSI	8 INCH
9	1-1/2 inch	LCD/INTEGRAL CELLULAR	1/4 gpm	0.5-105 gpm	15 PSI	8 INCH
10	1-1/2 inch	LCD/ REMOTE CELLULAR***	1/4 gpm	0.5-105 gpm	15 PSI	8 INCH
11	1-1/2 inch	LCD/900 MHZ RF	1/4 gpm	0.5-105 gpm	15 PSI	13 INCH*
12	1-1/2 inch	LCD/INTEGRAL CELLULAR	1/4 gpm	0.5-105 gpm	15 PSI	13 INCH*
13	1-1/2 inch	LCD/ REMOTE CELLULAR***	1/4 gpm	0.5-105 gpm	15 PSI	13 INCH*
14	2 inch	LCD/900 MHZ RF	1/4 gpm	0.75-165 gpm	15 PSI	10 INCH
15	2 inch	LCD/INTEGRAL CELLULAR	1/4 gpm	0.75-165 gpm	15 PSI	10 INCH
16	2 inch	LCD/ REMOTE CELLULAR***	1/4 gpm	0.75-165 gpm	15 PSI	10 INCH
17	2 inch	LCD/900 MHZ RF	1/4 gpm	0.75-165 gpm	15 PSI	17 INCH*
18	2 inch	LCD/INTEGRAL CELLULAR	1/4 gpm	0.75-165 gpm	15 PSI	17 INCH*
19	2 inch	LCD/ REMOTE CELLULAR***	1/4 gpm	0.75-165 gpm	15 PSI	17 INCH*
20	3 inch	LCD/900 MHZ RF	1/2 gpm	0.75-350 gpm	15 PSI	12 INCH
21	3 inch	LCD/INTEGRAL CELLULAR	1/2 gpm	0.75-350 gpm	15 PSI	12 INCH
22	3 inch	LCD/ REMOTE CELLULAR***	1/2 gpm	0.75-350 gpm	15 PSI	12 INCH
23	3 inch	LCD/900 MHZ RF	1/2 gpm	0.75-350 gpm	15 PSI	17 INCH**
24	3 inch	LCD/INTEGRAL CELLULAR	1/2 gpm	0.75-350 gpm	15 PSI	17 INCH**
25	3 inch	LCD/ REMOTE CELLULAR***	1/2 gpm	0.75-350 gpm	15 PSI	17 INCH**
26	4 inch	LCD/900 MHZ RF	3/4 gpm	1.5-500 gpm	15 PSI	14 INCH
27	4 inch	LCD/INTEGRAL CELLULAR	3/4 gpm	1.5-500 gpm	15 PSI	14 INCH
28	4 inch	LCD/ REMOTE CELLULAR***	3/4 gpm	1.5-500 gpm	15 PSI	14 INCH
29	4 inch	LCD/900 MHZ RF	3/4 gpm	1.5-500 gpm	15 PSI	20 INCH**
30	4 inch	LCD/INTEGRAL CELLULAR	3/4 gpm	1.5-500 gpm	15 PSI	20 INCH**
31	4 inch	LCD/ REMOTE CELLULAR***	3/4 gpm	1.5-500 gpm	15 PSI	20 INCH**
32	universal ****	LCD Cellular Network equipped register with mounting bracket and housing only				
33	universal ****	LCD Cellular Network equipped register with mounting bracket and housing only with 3' Itron ERT Connector				
34	universal ****	LCD Cellular Network equipped register with mounting bracket and housing only with wired remote antenna (15 to 25 ft); length at customer's request				

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35	universal ****	LCD Cellular Network equipped register with mounting bracket and housing only with wired remote antenna (15 to 25ft); length at customer's request and also with a two wire configurable (SCADA compatible) pulse output
36	universal ****	universal IV REMOTE Register for attachment to 3 wire industry standard AMR encoded meter output
37	universal ****	15ft to 50ft (length at customer's request) LCD Cellular Network equipped register only
38	universal ****	universal mounting bracket and housing for register
39	various	mounting plate and housing for register specific for Badger M series meters

\* Spool pieces for 1 1/2 and 2 inch meters will have a 1" NPT test port (with plug) built in

\*\* Spool pieces for 3 and 4 inch meters will have a 2" NPT test port (with plug) built in

\*\*\*Remote is a wired Transmission Endpoint with at least a 15 foot cord and up to 25 foot as requested

\*\*\*\* will work at least on any size Metron model d or newer top loading spectrum and enduro meter and on badger M25 or M70 Series Bases

6. Coupling connections shall be standard National Pipe thread (NPT) with the following connection types required:

(a) 5/8-inch X 3/4-inch: Male Thread Ends (MTE)

(b) 1-inch: MTE

7. Coupling connections shall be casing flanges with the following connection types required:

(a) 1-1/2-inch: Two (2) bolt oval flange ends,

(b) 2-inch: Two (2) bolt oval flange ends,

(c) 3-inch: Four (4) bolt round flanged ends, and conform to ANSI B16.24 for copper alloy

(d) 4-inch: Eight (8) bolt round flanged ends, and conform to ANSI B16.24 for copper alloy

8. Water meters shall be supplied with flange gaskets and all fasteners necessary for installation.





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9. All fasteners shall be made of Grade 316 stainless steel. Bolts shall be in accordance with ASTM A193 grade B8, latest revision. Nuts shall be in accordance with ASTM A194 grade 8, latest revision. Bolts and nuts shall be Unified National Coarse (UNC) rolled thread and heavy-duty hex nuts. Bolts installed into castings shall be provided with one (1) Grade 316 stainless steel flat washer and nuts and bolts shall be provided with two (2) Grade 316+ stainless steel flat washers so that the epoxy coating is not damaged. At a minimum, nuts shall be coated with fluorocarbon, epoxy, zinc, or other anti-corrosion coating to help prevent galling.
10. To prevent galling; all stainless steel bolts shall be coated on the outside of all threads and the stainless steel nuts or castings on the inside of all threads at the factory, with an anti-seizing material such as provided by Henkel Technologies, Rocky Hill, Connecticut - product name: Loctite Nickel Anti-Seize Lubricant; Chesterton Technical Products, Stoneham, Massachusetts – product name: Chesterton 772 Premium Nickel Anti-Seize Compound; Permatex Inc. Hartford, Connecticut – product name: Permatex Nickel Anti-Seize Lubricant or equal product of another manufacturer and as specified in Section 3.18 of these Specifications.
11. All brass components which come in contact with water shall be made from Lead Free brass.
  - (a) This brass alloy is commercially referred to as “Enviro Brass II”, “Federalloy”, “Selenium Free”, “Red-Hed Lead Free Brass”, or “Silicon Red Brass”
    - Enviro Brass II is a Lead Free copper alloy, UNS Copper Alloy C89520.
    - Federalloy is a Lead Free copper alloy, UNS Copper Alloy C89833.
    - Selenium Free Brass is a Lead Free copper alloy, UNS Copper Alloy C89836.
    - Red-Hed Lead Free Brass is a Lead Free copper alloy, UNS Copper Alloy, UNS - Copper Alloy C89833.
    - Silicon Red Brass is a Lead Free copper alloy, UNS Copper Alloy C69430.
  - (b) Brass other than the above may be approved by the Springfield Water and Sewer Commission as an acceptable equal.
  - (c) Lead Free brass is defined in Table 2 as having the following elemental content(s):



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Table 2

PRIMARY ELEMENTS	COMPOSITION % BY WEIGHT
Copper (Cu)	81.75-91.0
Tin (Sn)	0.0-7.0
Lead (Max) (Pb)	0-0.25
Zinc (Zn)	2.0-14.0
Bismuth (Bi)	0.0-3.5
Selenium (Se)	0.0-1.1
Nickel (Ni) (Including Cobalt)	0.9-1.0
Silicon (Si)	0.0-4.0

12. The meter body casting shall clearly identify the casting as being Lead Free Brass.
  - (a) “EB”, “EBII”, “NL”, or “LF” are acceptable identifiers, and must be cast in high relief or deeply engraved.
  - (b) Lead Free identifiers other than “EB”, “EBII”, “NL”, or “LF” are subject to Commission review and approval.
13. Brass parts not in contact with water may be made from copper alloy No. 83600, in accordance with ASTM B30, ASTM B62, or ASTM B584 and AWWA C-800 latest version containing 85% copper, 5% tin, 5% lead, and 5%.

### 4.7.4 Registers

1. The registers shall be a solid state liquid filled crystal display (LCD) or solid state LCD with built-in cellular technology for reading data upload to a web based cloud environment and in accordance with these Material Specifications.
2. The registers housing and lid, if applicable, shall be made of bronze or polymer.
3. The registers shall be sealed permanently against moisture and dirt with an IP68 rating.
4. The registers shall be a solid state electronic LCD type.
5. The registers shall be magnetically driven. No intermediate gearing shall be allowed.



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6. The registers shall be tamper proof and secured to the main case in such a manner that tampering can be easily determined.
7. The registers shall be configurable for either cubic feet or gallons upon request before or after being installed by the manufacturer or the Commission.
8. The registers lens window shall be polycarbonate plastic and in accordance with the following:
  - (a) The lens window shall be break resistant and scratch resistant,
  - (b) No liquid filled registers shall be accepted,
  - (c) UV rated cure adhesive for sealing,
  - (d) Self-healing dielectric gel is required for all wire connections (potting),
  - (e) The registers shall be able to withstand 100% humidity (submersible), and
  - (f) The display shall have a minimum range of -4-degrees Fahrenheit (F) to +176-degrees F with an Extended Range Option available.
9. The registers shall have on-board data logging with programmable intervals from 1-minute to 1-hour and on-board memory of at least 32,000-data points.
10. The registers shall be field serviceable without interruption of the meter's operation
11. The register box must be securely attached to the main case and be securely held in place.
12. The name of the manufacturer and the units of measure shall be clearly visible and identifiable and located on the exterior of the register, register box or lid.
13. The register shall be supplied mounted to the meter body.
14. All internal components shall be of non-corrosive materials as described in AWWA C712 standard.
15. The Registers output for radio frequency (RF) shall be compatible with ITRON-60W Encoder Receive Transmitter (ERT) and unless requested or otherwise approved come with a 15-foot or longer cord terminating with an Itron connector, as indicated in Table 1 above.
16. Registers with two-way cellular based communications shall allow for data log retrieval by a device connecting by either IrDA, Bluetooth, or equal in the event that the cellular data is not available, as indicated in Table 1 above.



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(g) Such device to be available from and supported by the meter manufacturer for a period of at least 10-years.

(h) Upon request a second output for either pulse or 4-20ma shall be available, as indicated in Table 1 above.

17. The maximum indications of the digits on the first display number and the minimum capacity of the register shall be as indicated in Table 3

Table 3

Meter Size	Maximum Allowable Indication of Initial Dial		Minimum allowable Capacity of Register (In million cubic-feet and million gallons)	
	Cubic Feet	Gallons	Cubic Feet	Gallons
5/8-inch X 3/4-inch	0.1	1.0	1.0	10
1-inch	0.1	1.0	1.0	10
1-1/2-inch	10	100	10	100
1-1/2-inch	10	100	10	100
2-inch	10	100	10	100
2-inch	10	100	10	100
3-inch	10	100	10	100
3-inch	10	100	10	100
4-inch	100	1000	10	100
4-inch	100	1000	10	100

### 4.7.5 Manuals, Spare Parts, Tools, Training, Repairs

1. The requirements of this section are for Commission Price Agreements and are not for Commission Approved Contractors or Commission Capital Projects, unless specifically asked for in the project.



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2. The manufacturer and/or vendor shall provide four (4) 24-inches by 36-inches (vertical) cut sheets showing all the water meter components, component material, and component part numbers with the first delivery. The vertical cut sheets shall be laminated.
3. The manufacturer and/or vendor shall provide six (6) complete sets catalogue or manual for parts, repair and maintenance with the first delivery.
4. The manufacturer and/or vendor shall provide at no additional cost four (4) complete sets of assembly/disassembly tools with the first delivery of meters.
5. The manufacturer and/or vendor shall provide training to Commission construction and maintenance staff every two (2) years. Training shall be by a factory trained representative at the Commission's Customer Service Office at 71 Colton Street, Springfield Massachusetts during normal business hours. The first training shall be provided within 30-days of the first delivery unless otherwise scheduled by the Commission.
6. The manufacturer and/or vendor shall provide the Commission with contact information for a factory trained representative who shall be responsible to respond to complaints from the Commission about defects in material, coatings, and workmanship under normal use of the product within ten (10) working days.



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### 4.7.6 Water Meter Makes and Models Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. Metron-Farnier.:
  - (a) 5/8-inch X 3/4-inch w/ NPT MTE: Model - S-30-D (Brass)
  - (b) 1-inch w/ NPT MTE; Model – Spectrum S-50-DL
  - (c) 1-1/2-inch w/ Two bolt oval flange ends: Model - Spectrum S-88-D,
  - (d) 2-inch w/ Two bolt oval flange ends: Model Spectrum S-130-D,
  - (e) 3-inch w/ Four bolt round flange ends: Model Spectrum S-175-D,
  - (f) 4-inch w/ Eight bolt round flange ends: Model Spectrum S-500-D, or
2. Equal provided the products are manufactured as per these specifications.



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### Section 4.8 Single Jet Water Meters – 6-inch and 8-inch

#### 4.8.1 General

1. Water Meters shall conform to the American Water Works Association Standard C-712 (latest edition) for: “Cold-Water Meters-Single-jet Type” and the following.
2. The Water Meter shall be supplied and warranted as a complete assembled unit that includes the meter body, liquid crystal display (LCD) register and 3-foot cord or longer with an Itron connector compatible with Encoder-Receiver-Transmitters (ERT).
3. Water meters shall operate accurately with no requirements for straight runs of pipe before or after the meter.
4. Water meters shall operate without any leakage or damage to any part at a minimum continuous working pressure of 230-PSI (16-Bar).
5. Water meters shall be bid without strainers. The water meter operations shall be unaffected by sand or other particulate in the flow path. The manufacturer must warranty the meter operation and accuracy with no strainer installed.
6. Water meters for dual fire and domestic applications shall be Factory Mutual (FM) approved.
7. All water meters shall be certified, by a third party, as suitable for contact with drinking water by an accredited certification organization in accordance with ANSI/NSF 61-8, Drinking Water System Components – Health Effects.
8. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;
  - (a) North America shall mean the United States, Canada, and Mexico,
  - (b) Cast shall mean molten metal poured into a mold to create Casting(s) for a finished product,
  - (c) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and
  - (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or



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- (e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.
9. Inspection:
- (a) All finished product(s) furnished shall be subject to inspection by the Commission at the place of manufacture and shall be subject to inspection after delivery to the Commission.
  - (b) Cost of re-inspection of materials or fabricated finished product(s) caused by the non-compliance of the manufacturer and/or vendor with the provisions of the specifications, shall be paid for by the manufacturer and/or vendor, and shall be deductible from the price paid for the water meters.
10. Delivery shall be made by truck in minimum truckload quantity to locations designated in the Commission's service area in and near Springfield, Massachusetts. The low bidder shall notify the Commission of the quantity comprising a minimum truckload.
11. The manufacturer/vendor/shipper must use care in preparing finished product(s) for shipment and in handling during shipment and delivery, to insure that the finished(s) are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged finished product(s) will not be accepted.
12. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the finished product(s) and all materials in its construction exactly conform to the applicable requirements of these specifications and the applicable AWWA Standards.

### 4.8.2 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.
2. The manufacturer and/or vendor and/or vendor shall furnish three (3) sets of 24-inch by 36-inch certified shop drawings for all materials to be used. All components shall be provided in accordance to these drawings. The drawings shall show the following:
  - (a) Cross sectional drawings of the Water Meters showing overall dimensions,
  - (b) Material specifications for each component,
  - (c) Coating applied to each component, if applicable,

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- (d) Rated working pressure and hydrostatic test pressure of each finished product(s), and
  - (e) Country of origin for each component.
3. The manufacturer and/or vendor shall furnish a letter certifying the product meets all the requirements of the AIS, an explanation, in the letter, of how the products meets the AIS requirements, and signed by the Owner or President of the Company.
  4. The manufacturer and/or vendor shall furnish one (1) complete catalogue or manual for parts, repair, and maintenance.
  5. The manufacturer and/or vendor shall furnish a certified statement that all Water Meters of the same make and model bid, regardless of the year of manufactured, shall have interchangeable component parts and that the parts availability and delivery shall remain firm for ten (10) years.
  6. The manufacturer and/or vendor shall furnish a certified statement, by an accredited third party certification organization, that the water meter is suitable for contact with drinking water in accordance with ANSI/NSF 61-8, Drinking Water System Components – Health Effects.
  7. The manufacturer and/or vendor shall furnish a warranty for the water meters that states that the water meters shall be free from all defects in material and workmanship under normal use in accordance with the following requirements:
    - (a) Lead free bronze main case for a minimum twenty (20) year time period from time of delivery,
    - (b) Registers which are supplied with the water meters for a minimum five (5) year time period from time of delivery,
    - (c) All other components which are supplied with the water meter for a minimum of five (5) year time period from time of delivery,
    - (d) The supplier of the Water Meter unit shall be fully responsible for all components and warranties of the Water Meter unit and shall replace and/or repair defective parts or the whole water meter.
  8. The manufacturer and/or vendor shall furnish technical documentation for the water meters performance and accuracy that states that the water meters shall meet or exceed AWWA Standard C-712, latest edition, under normal use in accordance with Table 1, below.
    - (a) The manufacturer and/or vendor shall furnish a warranty for the 6-inch and 8-inch water meters accuracy that states that the water meters shall meet or exceed

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AWWA Standard C-712, latest edition, and in accordance with Table 1 below for a minimum five (5) year time period from time of delivery,

- (b) The manufacturer and/or vendor shall replace and/or repair defective parts or the whole water meter.
9. The manufacturer and/or vendor shall furnish a certified statement that the required tests on the various materials and on the completed water meter have been made, and the results of all tests conform to the requirements of the American Water Works Association Standard Specification C-712. The records of the tests shall be furnished for the individual parts with respect to physical and chemical properties.
10. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:
- (a) Name of Municipality/Utility
  - (b) Total amount of product bid on and amount delivered
  - (c) Date the bid was accepted and date the product was delivered
  - (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product
11. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification, if applicable, “Approved”, “Approved as Noted”, or “Rejected-Resubmit” and return to the manufacturer and/or vendor.
- (e) Approved means the contractor can supply the material as shown on the drawing(s).
  - (f) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.
  - (g) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

### 4.8.3 Meter Body – Main Case

- 1. The meter body shall be lead free brass as defined elsewhere in these specifications and shall have all brass meter chambers.
- 2. The meter body case shall have the meter serial number, size, an arrow indicating direction of flow, and identification of the main case as being lead free permanently cast, etched, or stamped on the main case.



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- (a) The unique multi digit serial number shall be readily translated to determine the date of manufacture.
- (b) The size and an arrow indicating direction of flow shall be cast in raised characters on the main case.
3. The main case shall be of top loading design to facilitate meter access and shall have the cover fastened to the main case by standard hex-head bolts such that standard tools can be used to remove the cover.
4. Meters shall utilize only one (1) measuring element, which shall be an impeller style, to achieve the performance required in the table below.
  - (a) No meters using two (2) or more measuring elements, such as combination meters or compound meters shall be accepted.
  - (b) 100% of water flow must be directly measured by the single-jet element to achieve performance in above table.
  - (c) Propeller type or proportional meters shall not be accepted.
5. Meters must meet the performance specifications summarized below as well as all defined by the AWWA 712, latest edition. These requirements are summarized in Table 1;



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Table 1

ITEM	Meter Size	Register Type/ telemetry type	Low Flow GPM at least at 95% accuracy	Accuracy Range 98.5-101.5%	Maximum Pressure Loss Over Accuracy Range	Max Lay Length in Inches (including spool or extension if needed)
1	6 inch	LCD/ REMOTE CELLULAR ANTENNA*** as well as with an AMR three wire output to a 3 foot cord terminating with an Itron ERT Connector	5 gpm	6 - 2800 gpm	7 PSI	24 INCH
2	6 inch (SCADA)	LCD/ REMOTE CELLULAR ANTENNA*** as well as with an AMR three wire output to a 3 foot cord terminating with an Itron ERT Connector and a two wire pulse output for SCADA and similar systems	5 gpm	6 - 2800 gpm	7 PSI	24 INCH
3	6 inch (extended flow range)	LCD/ REMOTE CELLULAR ANTENNA*** as well as with an AMR three wire output to a 3 foot cord terminating with an Itron ERT Connector	15 gpm	15 - 3500 gpm	7 PSI	24 INCH
4	6 inch (extended flow range) (SCADA)	LCD/ REMOTE CELLULAR ANTENNA*** as well as with an AMR three wire output to a 3 foot cord terminating with an Itron ERT Connector and a two wire pulse output for SCADA and similar systems	15 gpm	15 - 3500 gpm	7 PSI	24 INCH
5	8 inch	LCD/ REMOTE CELLULAR ANTENNA*** as well as with an AMR three wire output to a 3 foot cord terminating with an Itron ERT Connector	5 gpm	6 - 2800 gpm	7 PSI	24 INCH
6	8 inch (SCADA)	LCD/ REMOTE CELLULAR ANTENNA*** as well as with an AMR three wire output to a 3 foot cord terminating with an Itron ERT Connector and a two wire pulse output for SCADA and similar systems	5 gpm	6 - 2800 gpm	7 PSI	24 INCH
7	8 inch (extended flow range)	LCD/ REMOTE CELLULAR ANTENNA*** as well as with an AMR three wire output to a 3 foot cord terminating with an Itron ERT Connector	15 gpm	15 - 3500 gpm	7 PSI	24 INCH
8	8 inch (extended flow range) (SCADA)	LCD/ REMOTE CELLULAR ANTENNA*** as well as with an AMR three wire output to a 3 foot cord terminating with an Itron ERT Connector and a two wire pulse output for SCADA and similar systems	15 gpm	15 - 3500 gpm	7 PSI	24 INCH

\*\*\*Remote is a wired Cellular Transmission Antenna Endpoint with at least a 15-foot cord and up to 25-foot as requested

- 6-inch and 8-inch meters shall have a 2-inch NPT test port (with plug) tapped in to the main body.



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7. Cellular devices shall include ten (10) years of pre-paid cellular service.
8. Coupling connections shall be casing flanges with the following connection types required:
  - (a) 6-inch: Eight (8) bolt round flanged ends, and conform to ANSI B16.24 for copper alloy
  - (b) 8-inch: Eight (8) bolt round flanged ends, and conform to ANSI B16.24 for copper alloy
9. Water meters shall be supplied with flange gaskets and all fasteners necessary for installation.
10. All fasteners shall be made of Grade 316 stainless steel. Bolts shall be in accordance with ASTM A193 grade B8, latest revision. Nuts shall be in accordance with ASTM A194 grade 8, latest revision. Bolts and nuts shall be Unified National Coarse (UNC) rolled thread and heavy-duty hex nuts. Bolts installed into castings shall be provided with one (1) Grade 316 stainless steel flat washer and nuts and bolts shall be provided with two (2) Grade 316+ stainless steel flat washers so that the epoxy coating is not damaged. At a minimum, nuts shall be coated with fluorocarbon, epoxy, zinc, or other anti-corrosion coating to help prevent galling.
11. To prevent galling; all stainless steel bolts shall be coated on the outside of all threads and the stainless steel nuts or castings on the inside of all threads at the factory, with an anti-seizing material such as provided by Henkel Technologies, Rocky Hill, Connecticut - product name: Loctite Nickel Anti-Seize Lubricant; Chesterton Technical Products, Stoneham, Massachusetts – product name: Chesterton 772 Premium Nickel Anti-Seize Compound; Permatex Inc. Hartford, Connecticut – product name: Permatex Nickel Anti-Seize Lubricant or equal product of another manufacturer and as specified in Section 3.18 of these Specifications.
12. All brass components which come in contact with water shall be made from Lead Free brass.
  - (a) This brass alloy is commercially referred to as “Enviro Brass II”, “Federalloy”, “Selenium Free”, “Red-Hed Lead Free Brass”, or “Silicon Red Brass”
    - Enviro Brass II is a Lead Free copper alloy, UNS Copper Alloy C89520.
    - Federalloy is a Lead Free copper alloy, UNS Copper Alloy C89833.
    - Selenium Free Brass is a Lead Free copper alloy, UNS Copper Alloy C89836.
    - Red-Hed Lead Free Brass is a Lead Free copper alloy, UNS Copper Alloy, UNS - Copper Alloy C89833.



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- Silicon Red Brass is a Lead Free copper alloy, UNS Copper Alloy C69430.
- (b) Brass other than the above may be approved by the Springfield Water and Sewer Commission as an acceptable equal.
- (c) Lead Free brass is defined in Table 2 as having the following elemental content(s):



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Table 2

PRIMARY ELEMENTS	COMPOSITION % BY WEIGHT
Copper (Cu)	81.75-91.0
Tin (Sn)	0.0-7.0
Lead (Max) (Pb)	0-0.25
Zinc (Zn)	2.0-14.0
Bismuth (Bi)	0.0-3.5
Selenium (Se)	0.0-1.1
Nickel (Ni) (Including Cobalt)	0.9-1.0
Silicon (Si)	0.0-4.0

13. The meter body casting shall clearly identify the casting as being Lead Free Brass.
- (a) “EB”, “EBII”, “NL”, or “LF” are acceptable identifiers, and must be cast in high relief or deeply engraved.
  - (b) Lead Free identifiers other than “EB”, “EBII”, “NL”, or “LF” are subject to Commission review and approval.
14. Brass parts not in contact with water may be made from copper alloy No. 83600, in accordance with ASTM B30, ASTM B62, or ASTM B584 and AWWA C-800 latest version containing 85% copper, 5% tin, 5% lead, and 5%.

### 4.8.4 Registers

1. The registers shall be a solid state liquid filled crystal display (LCD) or solid state LCD with both a built in RF output to a three (3) wire AMR standard setup and built-in cellular technology with either an onboard or wired remote antenna for reading data upload to a web based cloud environment and in accordance with these Material Specifications.
2. The registers housing and lid, if applicable, shall be made of bronze or polymer.
3. The registers shall be sealed permanently against moisture and dirt with an IP68 rating.
4. The registers shall be a solid state electronic LCD type.



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5. The registers shall be magnetically driven. No intermediate gearing shall be allowed.
6. The registers shall be tamper proof and secured to the main case in such a manner that tampering can be easily determined.
7. The registers shall be configurable for either cubic feet or gallons upon request before or after being installed by the manufacturer or the Commission.
8. The registers lens window shall be polycarbonate plastic and in accordance with the following:
  - (a) The lens window shall be break resistant and scratch resistant,
  - (b) No liquid filled registers shall be accepted,
  - (c) UV rated cure adhesive for sealing,
  - (d) Self-healing dielectric gel is required for all wire connections (potting),
  - (e) The registers shall be able to withstand 100% humidity (submersible), and
  - (f) The display shall have a minimum range of -4-degrees Fahrenheit (F) to +176-degrees F with an Extended Range Option available.
9. The registers shall have on-board data logging with programmable intervals from 1-minute to 1-hour and on-board memory of at least 32,000-data points.
10. The registers shall be field serviceable without interruption of the meter's operation
11. The register box must be securely attached to the main case and be securely held in place.
12. The name of the manufacturer and the units of measure shall be clearly visible and identifiable and located on the exterior of the register, register box or lid.
13. The register shall be supplied mounted to the meter body.
14. All internal components shall be of non-corrosive materials as described in AWWA C712 standard.
15. The Registers output for radio frequency (RF) shall be compatible with ITRON-60W Encoder Receive Transmitter (ERT) and unless requested or otherwise approved come with a 15-foot or longer cord terminating with an Itron connector, as indicated in Table 1 above.





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16. Registers with two-way cellular based communications shall allow for data log retrieval by a device connecting by either IrDA, Bluetooth, or equal in the event that the cellular data is not available, as indicated in Table 1 above.
- (g) Such device to be available from and supported by the meter manufacturer for a period of at least 10-years.
- (h) Upon request a second output for either pulse or 4-20ma shall be available, as indicated in Table 1 above.
17. The maximum indications of the digits on the first display number and the minimum capacity of the register shall be as indicated in Table 3

Table 3

Meter Size	Maximum Allowable Indication of Initial Dial		Minimum allowable Capacity of Register (In million cubic-feet and million gallons)	
	Cubic Feet	Gallons	Cubic Feet	Gallons
6-inch	100	1000	99	999
8-inch	100	1000	99	999



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### 4.8.5 Manuals, Spare Parts, Tools, Training, Repairs

1. The requirements of this section are for Commission Price Agreements and are not for Commission Approved Contractors or Commission Capital Projects, unless specifically asked for in the project.
2. The manufacturer and/or vendor shall provide four (4) 24-inches by 36-inches (vertical) cut sheets showing all the water meter components, component material, and component part numbers with the first delivery. The vertical cut sheets shall be laminated.
3. The manufacturer and/or vendor shall provide six (6) complete sets catalogue or manual for parts, repair and maintenance with the first delivery.
4. The manufacturer and/or vendor shall provide at no additional cost four (4) complete sets of assembly/disassembly tools with the first delivery of meters.
5. The manufacturer and/or vendor shall provide training to Commission construction and maintenance staff every two (2) years. Training shall be by a factory trained representative at the Commission's Customer Service Office at 71 Colton Street, Springfield Massachusetts during normal business hours. The first training shall be provided within 30-days of the first delivery unless otherwise scheduled by the Commission.
6. The manufacturer and/or vendor shall provide the Commission with contact information for a factory trained representative who shall be responsible to respond to complaints from the Commission about defects in material, coatings, and workmanship under normal use of the product within ten (10) working days.



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## Material Specifications

### 4.8.6 Water Meter Makes and Models Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. Metron-Farnier.:
  - (a) 6-inch w/ Eight bolt round flange ends: Model Enduro E-2800-D,
  - (b) 8-inch w/ Eight bolt round flange ends: Model Enduro E-2800-D, or
2. Equal provided the products are manufactured as per these specifications.



# Springfield Water and Sewer Commission

## Material Specifications

### Section 4.9 Encoder-Receiver-Transmitters

#### 4.9.1 General

1. Encoder Receiver Transmitters (ERT) shall conform to the American Water Works Association Standard C-712 (latest edition) for: “Cold-Water Meters-Single-jet Type” and the following.
2. All devices must be readable by drive by systems we have including the following Itron Mobile Collection (MC) devices:
3. MC3 with MV-RS v8.0 or higher and FCS with v2.2 or higher MC Lite with MV-RS v8.1 or higher and FCS with v2.3 or higher
4. All devices must have data logging capability to store at least 30 days of hourly consumption information that can be read either by mobile or fixed network.
5. The read data information must be presented in a manner it can be handled by Itron's MV-RS and/or FCS applications.
6. Transmission Parameters:
7. Data message:
8. Transmissions of meter register value cut cable and or communication error tamper(s), reverse flow, and leak status messages, as well as low battery indicator must be transmitted in an interval not greater than ten seconds in mobile mode.
9. All the information above and at least the last 6 time synchronized consumption intervals must transmit at least every five minutes.
10. A 12 bit message that contains a single, cumulative meter reading value along with the meter serial number, commodity type and checksum and tamper flags must be transmitted every 60 seconds in fixed network mode
11. Transmitter frequencies:
  - (a) 908 - 924 MHz in Mobile drive by mode
  - (b) 903 - 926.8 MHz in fixed network mode
12. Must operate in bubble-up mode and not require a license from the Federal Communications Commission FCC Part 15.247



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13. Operating temperature for basement applications must be  $-40^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$   
Humidity limits: 0 to 100% (submersible)
14. Compatibility: Badger Meter s with ADE Registers, Siemens Mag Meters, Master Meter Octave and other "Sensus Protocol" Meters
15. Warranty: 100% for minimum of 10 years



# Springfield Water and Sewer Commission

## Material Specifications

### Section 4.10 CONCRETE METER VAULTS

#### 4.10.1 General

1. Concrete Meter Vaults provided to the Commission or Installer shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.
2. All vaults interior dimensions must allow a clear working space around the meters of at least 18-inches.
3. All vaults must be adequately reinforced to bear traffic and have an H-20 load rating per AASHTO HS-20-44.
4. All vaults shall be constructed with shiplap joints.
5. All vaults shall be watertight and sealed with butyl rubber gaskets as follows:
  - (a) Seal bell and spigot joints of vault sections with butyl rubber flexible rope-like gasket material.
  - (b) Butyl rubber flexible rope-like gasket material shall conform to ASTM C990.
  - (c) Butyl rubber flexible rope-like gasket material shall be produced from blends of butyl rubber, refined hydro carbons, resins, and plasticized compounds reinforced with inert mineral filler and be solvent free.
  - (d) Each gasket shall have a self-adhesive nature.
  - (e) Each gasket shall be 1-inch diameter.
  - (f) Each gasket shall be furnished in coils.
6. All vaults shall have two (2) removable tops with lift rings made with ¾-inch galvanized rebar and have a 3-inch loop. The lift rings shall be located at the four (4) corners of each top piece.
7. All vaults shall have manhole rungs installed under each manhole opening.
8. Manhole rungs shall be made of reinforced steel, copolymer polypropylene, and 14-inch wide. Copolymer polypropylene shall conform to ASTM D4101 Classification PP0344 B33534 Z02. Steel reinforcing shall be 1/2-in diameter, conforming to ASTM A615, Grade 60 and shall be continuous throughout rung. Manhole rungs shall meet all OSHA requirements.



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9. All vaults shall have manhole rungs installed 12-inches apart, so that the top foothold is within 12-inches of the manhole cover, the bottom foothold is within 12-inches of the vault floor, and the footholds are 7-inches from the vault wall.
10. All vaults shall have an adequate floor sump beneath one of the manhole openings. The sump shall be 12 through 14-inches diameter by 3-inches deep.
11. The sump/drain shall not be connected to a sewer.
12. All vault floors shall be pitched to the drain.
13. Delivery shall be specified in terms of number of days from receipt of order.
14. The manufacturer/vendor/shipper must use care in preparing the above items for shipment and in handling during shipment and delivery, to insure that the above items are delivered without damage. Damaged items will not be accepted.
15. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above items and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AWWA Standards.

### 16. References

The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

- (a) Name of Municipality/Utility
- (b) Total amount of product bid on and amount delivered
- (c) Date the bid was accepted and date the product was delivered
- (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product



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## Material Specifications

### 4.10.2 Standard Concrete Meter Vault for Ductile Iron Water Service Pipe

1. Standard Concrete Meter Vaults for ductile iron water service pipes shall, as a minimum, meet all specifications as in Paragraphs 4.10.1 and the following:
2. Standard Concrete Meter Vaults for ductile iron water service pipes shall be provided in accordance with Standard **Meter Vault for Ductile Iron Water Service Pipe Detail (W-13.3)**, of these Material Specifications.
3. Concrete Meter Vaults for 8-inch service pipe shall be provided with inside dimensions of 10-feet long, 6-feet wide, and 6.5-feet tall.
4. Knockouts for the pipe shall be provided on each end shall be tapered with the center at least 2-feet above the floor and 2-feet from the same wall.
5. The knockout diameter shall be at least 12-inches.
6. Two (2) 30-inch manhole openings shall be provided and each shall be located on the same side of the top at each end across from the knockouts.
7. The walls, top, and bottom shall be 6-inches thick.
8. The Standard Concrete Meter Vaults shall be delivered in four (4) sections, as follows:
  - (a) Bottom riser with monolithic floor; 3-feet-9-inches high.
  - (b) Upper riser (without a top); 3-feet-3-inches high.
  - (c) Two-piece top; 6-inches high.





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## Material Specifications

### 4.10.4 Oversize Concrete Meter Vault for Ductile Iron Water Service Pipe

1. Oversize Concrete Meter Vaults for ductile iron water service pipes shall, as a minimum, meet all specifications as in Paragraphs 4.9.1 and the following:
2. Oversize Concrete Meter Vaults for ductile iron water service pipes shall be provided in accordance with **Oversize Meter Vault for Ductile Iron Water Service Pipe Detail (W-13.3)**, of these Material Specifications.
3. Oversize Concrete Meter Vaults for ductile iron water service pipe shall be provided with inside dimensions of 11-feet, 2-inches long, 8-feet wide, and 6.5-feet tall.
4. Two (2) tapered knockouts for the pipes shall be provided on each end with the centers at least 2-feet above the floor and 2-feet from the outer walls of the pit.
5. The knockout diameter shall be at least 12-inches.
6. Two (2) 30-inch manhole openings shall be provided and each shall be located on the same side of the top at each end across from the knockouts.
7. The walls and bottom shall be 6-inches thick. The top shall be 8-inches thick.
8. The Oversize Concrete Meter Vaults shall be delivered in four (4) sections, as follows:
  - (a) Bottom riser with monolithic floor; 3-feet-9-inches high.
  - (b) Upper riser (without a top); 3-feet-3-inches high.
  - (c) Two-piece top; 8-inches high.



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## Material Specifications

### 4.10.6 Concrete Meter Vaults Makes and Models Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. Standard Concrete Meter Vault:

- (a) Arrow Concrete Products. – Standard 6-feet x 10-feet x 6.5-feet, or
- (b) Equal provided the products are manufactured as per these specifications.

2. Oversize Concrete Meter Vault:

- (a) Arrow Concrete Products. – Oversize 8-feet x 11.17-feet x 6.5-feet, or
- (b) Equal provided the products are manufactured as per these specifications.

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### Section 4.11 MANHOLE FRAMES AND COVERS FOR WATER VAULTS

#### 4.11.1 General

1. Manhole frame and covers provided to the Commission or Installers shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.
2. The manhole frame and cover shall be certified to meet American Association of State Highway and Transportation Officials (AASHTO) M 306 Drainage, Sewer, Utility, and Related Casting Specification and M 105 Class 35B strength of materials requirements.
3. Manhole frames and covers shall be strong, durable, even grained cast iron, ductile iron, or Fiber Reinforced Polymer smooth, free from scale, lumps, blisters, sand holes and defects of any kind.
  - (a) An HS20 load rating is required.
  - (b) Cast iron shall conform to American Society of Testing and Materials (ASTM) A48, Class 35B.
  - (c) Ductile iron shall conform to ASTM A 536 Grade 80-55-06.
  - (d) Fiberglass Reinforced Polymer shall conform to ASTM C 1028.
  - (e) Manhole covers and frame seats shall be machined to a true surface so that the cover does not rock in the frame no matter the position of the cover.
4. The Commission requires that the Manhole Frame and Covers be subjected to proof load testing as follows:
  - (a) Testing shall be in accordance with the National Institute of Standards Technology (NIST) standards.
  - (b) The Manhole Frame and Covers shall show no detrimental deformation or cracks when a proof load of 40,000-pounds is concentrated on an 9-inch by 9-inch area at the center of the cover for a 1-minute period of time.
  - (c) Permanent deformation shall not exceed 1/8-inch.
  - (d) All testing shall be at the supplier's expense.
5. Manhole covers shall have a diamond pattern cast on the top.

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6. Manhole Frame and Cover shall be provided with individual permanent markings that are easily discernable and show the following:
  - (a) Name of the producing foundry and country of manufacture preceded by the words “Made in”, such as “Made in USA”
  - (b) AASHTO designation or ASTM designation number
  - (c) Class by a number followed by a letter indicating the minimum tensile strength and size of test bar,
  - (d) Heat identification and cast date (MM/DD/YY),
  - (e) The above markings are required, but the Commission will allow some variation in how the above markings are provided on the finished product. The design and location of the markings must meet and be subject to the approval of the Commission’s aesthetic judgment.
7. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;
  - (a) North America shall mean the United States, Canada, and Mexico,
  - (b) Cast shall mean molten metals poured into a mold to create casting(s) for a finished product,
  - (c) Manufactured shall mean raw material formed into a finished product,
  - (d) Incidental parts may be purchased/obtained from other countries to provide a finished product , in accordance with these Material Specifications, and
  - (e) Assembled shall mean castings and sourced parts are put together to build a finished product, or
  - (f) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement govern.
8. Delivery shall be specified in terms of number of days from receipt of order.
9. Delivery shall be made by truck in minimum truckload quantity to locations designated in the Commission’s service area in and near Springfield, Massachusetts. The low bidder shall notify the Commission of the quantity comprising a minimum truckload. The Commission reserves the right to mix depth of buries to reach a full truckload.



# Springfield Water and Sewer Commission

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10. The manufacturer/vendor/shipper must use care in preparing products for shipment and in handling during shipment and delivery, to insure that the water meters are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged manhole frame and covers will not be accepted.
11. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the manhole frame and cover and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AASHTO and ASTM Standards.

### 4.11.2 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.
2. The manufacturer and/or vendor shall furnish three (3) sets of 24-inch by 36-inch certified shop drawings for all materials to be used. All finished product(s) shall be provided in accordance to these drawings. The drawings shall show the following:
  - (a) Cross sectional drawings of the finished product(s) showing overall dimensions,
  - (b) Material specifications for each component of the finished product(s),
  - (c) Coating applied to each component of the finished product(s), if applicable,
  - (d) Weight of each component and total weight for each finished product(s), and
  - (e) Country of origin for each component.
3. If applicable, the manufacturer shall furnish three (3) sets of coating specification(s) of each component that has a coating applied identifying type of coating, color of coating, manufacturer of coating, part number of the coating, and a sample on a 3-inch by 5-inch chip.
4. The manufacturer shall furnish a letter certifying the finished product(s) meets all the requirements of the AIS, an explanation, in the letter, of how the finished product(s) meets the AIS requirements, and signed by the Owner or President of the Company.
5. The manufacturer shall furnish one (1) complete catalogue or manual for parts, repair, and maintenance.

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6. The manufacturer shall furnish a certified statement that all finished product(s) of the same make and model bid, regardless of the year of manufactured, shall have interchangeable component parts and that the parts availability and delivery shall remain firm for ten (10) years.
7. The manufacturer shall furnish a warranty for the finished product(s) that states that the finished product(s) shall be free from all defects in material, coatings, and workmanship under normal use of the product from time of delivery for a minimum ten (10) year time period.
8. The manufacturer shall furnish a certified statement that the required tests on the various materials and on the completed product(s) have been made, and the results of all tests conform to the requirements of the AASHTO M105 35B, ASTM A48 35B, and NIST. The records of the tests shall be furnished for the individual parts with respect to physical and chemical properties.
9. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product(s), in the last two (2) years. The listing is to include:
  - (a) Name of Municipality/Utility
  - (b) Total amount of product bid on and amount delivered
  - (c) Date the bid was accepted and date the product was delivered
  - (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product
10. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification “Approved”, “Approved as Noted”, or “Rejected-Resubmit” and return to the manufacturer and/or vendor.
  - (a) Approved means the contractor can supply the finished product(s) as shown on the drawing(s).
  - (b) Approved as Noted means the contractor can supply the finished product(s) as shown on the drawing(s), but with the changes as noted.
  - (c) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct finished product(s) to be used.

### 4.11.3 Standard Manhole Frame 32-inch by 8-inch

1. Standard Manhole Frame 32-inch by 8-inch provided to the Springfield Water and Sewer Commission (Commission) or its Contractors or the Springfield Department

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of Public Works shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. Standard Manhole Frame 32-inch by 8-inch shall, as a minimum, meet all specifications as in Paragraphs 4.11.1 and 4.11.2, and the following:
3. Standard Manhole Frame 32-inch by 8-inch shall be strong, durable, even grained Cast iron or Ductile iron smooth, free from scale, lumps, blisters, sand holes and defects of any kind.
4. Standard Manhole Frame 32-inch by 8-inch shall have a minimum dimensions shall be in accordance with **32" X 8" Water Frame Only Detail (W-13.6)**.
5. Standard Manhole Frame 32-inch by 8-inch shall have a minimum 30-inch diameter access opening.
6. Standard Manhole Frame 32-inch by 8-inch shall have a maximum height of 8-inches.

### 4.11.4 32-inch Standard Water Manhole Cover

1. 32-inch Standard Water Manhole Cover provided to the Springfield Water and Sewer Commission (Commission) or its Contractors or the Springfield Department of Public Works shall be manufactured, tested, inspected and delivered in full compliance with this Specification.
2. 32-inch Standard Water Manhole Cover shall, as a minimum, meet all specifications as in Paragraphs 4.11.1 and 4.11.2, and the following:
3. 32-inch Standard Water Manhole Cover shall be strong, durable, even grained Cast iron or Ductile iron smooth, free from scale, lumps, blisters, sand holes and defects of any kind.
4. 32-inch Standard Water Manhole Cover shall have a minimum dimensions shall be in accordance with **32" Standard Water Manhole Cover Detail (W-13.7)**.
5. The words "SPRINGFIELD WATER & SEWER COMMISSION" and the Commission Logo shall be raised relief.
6. The word "WATER" shall be raised relief.
7. 32-inch Standard Water Manhole Cover shall have two (2) penetrating pick-holes on each opposite side and one (1) 1-1/4-inch diameter penetrating pick-hole shall offset a minimum of 4-inches from the center, a 31-3/4-inch (plus or minus 1/16-inch) diameter cover, the rim shall be 1-3/4-inch thick (plus or minus 1/16-inch).



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8. The dimensions of the cover must match existing frames and covers such that parts are interchangeable with both the new and existing manhole frame and covers.

### 4.11.5 24-inch Replacement Water Manhole Cover

1. 24-inch Replacement Water Manhole Cover provided to the Springfield Water and Sewer Commission (Commission) or its Contractors or the Springfield Department of Public Works shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.
2. 24-inch Replacement Water Manhole Cover shall, as a minimum, meet all specifications as in Paragraphs 4.11.1 and 4.11.2, and the following:
3. 24-inch Replacement Water Manhole Cover shall be strong, durable, even grained Cast iron or Ductile iron smooth, free from scale, lumps, blisters, sand holes and defects of any kind.
4. 24-inch Replacement Water Manhole Cover shall have a minimum dimensions shall be in accordance with **24” Replacement Water Cover Detail (W-13.8)**.
5. The words “SPRINGFIELD WATER & SEWER COMMISSION” and the Commission Logo shall be raised relief.
6. The word “WATER” shall be raised relief.
7. 24-inch Replacement Water Manhole Cover shall have two (2) penetrating pick-holes on each opposite side and one (1) 1-1/4-inch diameter penetrating pick-hole shall offset a minimum of 4-inches from the center, a 23-3/4-inch (plus or minus 1/16-inch) diameter cover, the rim shall be 1-1/4-inch thick (plus or minus 1/16-inch).
8. The dimensions of the cover must match existing frames and covers such that parts are interchangeable with both the new and existing manhole frame and covers.

### 4.11.6 Replacement 26-inch Water Manhole Cover

1. 26-inch Replacement Water Manhole Cover provided to the Springfield Water and Sewer Commission (Commission) or its Contractors or the Springfield Department of Public Works shall be manufactured, tested, inspected and delivered in full compliance with this Specification.
2. 26-inch Replacement Water Manhole Cover shall, as a minimum, meet all specifications as in Paragraphs 4.11.1 and 4.11.2, and the following:





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3. 26-inch Replacement Water Manhole Cover shall be strong, durable, even grained Cast iron or Ductile iron smooth, free from scale, lumps, blisters, sand holes and defects of any kind.
4. 26-inch Replacement Water Manhole Cover shall have a minimum dimensions shall be in accordance with **26” Replacement Water Cover Detail (W-13.9)**.
5. The word “WATER” shall be raised relief.
6. 26-inch Replacement Water Manhole Cover shall have two (2) non-penetrating pick bars on each side that are approximately 1-inch by 1-1/2-inch with the slot/channel approximately 1-1/2-inch wide by 4-1/2inch long, a 26-inch (plus or minus 1/16-inch) diameter cover, the rim shall be 1-1/8-inch thick (plus or minus 1/16-inch).
7. The dimensions of the cover must match existing frames and covers such that parts are interchangeable with both the new and existing manhole frame and covers.

### 4.11.7 Composite Locking 24-inch or 32-inch Water Cover

1. Composite Locking Manhole Covers provided to the Springfield Water and Sewer Commission (Commission) or its Contractors or the Springfield Department of Public Works shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.
2. Composite Locking Manhole Covers shall, as a minimum, meet all specifications as in Paragraphs 4.11.1 and 4.11.2, and the following exceptions and additions:
3. Composite Locking Manhole Covers provided to the Commission or Installers shall be manufactured, tested, inspected and delivered in full compliance with this Specification.
4. Composite Locking Manhole Covers shall be certified to meet American Association of State Highway and Transportation Officials (AASHTO) M 306 Drainage, Sewer, Utility, and Related Casting Specification and M 105 and have a HS20 load rating.
5. Composite Locking Manhole Covers shall be strong, durable, even from fiber reinforced polymer (FRP). It shall consist of a FRP matrix consisting of between 45% to 70% fiber reinforcement by weight. Fiber reinforcement shall consist of fiberglass, carbon, aramid, basalt and/or natural fibers. The polymer matrix shall be thermoset consisting of a polyester, vinylester, epoxy, polyurethane, and/or hybrid chemical composition. The resin matrix must be thermoset. Composite Locking 24-inch Manhole Covers shall be smooth, free from scale, lumps, blisters, sand holes and defects of any kind.



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6. Composite Locking Manhole Covers shall be of uniform quality, with a dimensional tolerance of 1/16 of an inch. The finished product will feature a strength to weight ratio of 750:1. There shall be no possibility of corrosion welding between the cover and the frame, preventing damage to the infrastructure when opening. Gasket system shall be integrated to reduce traffic shock and abatement of noise and malodors. Static Coefficient of Friction shall be 0.6 or greater, as described in ASTM C1028 Standard, in both wet and dry applications.
7. Composite Locking Manhole Covers shall be shall be machined to a true surface so that the cover does not rock in the frame no matter the position of the cover.
8. The Commission requires that the Composite Locking 24-inch Manhole Covers shall be subjected to proof load testing as follows:
  - (d) Testing shall be in accordance with the National Institute of Standards Technology (NIST) standards.
  - (e) Composite Locking Manhole Covers shall be shall show no detrimental deformation or cracks when a proof load of 50,000-pounds is concentrated on an 9-inch by 9-inch area at the center of the cover for a 1-minute period of time.
  - (f) Permanent deformation shall not exceed 1/8-inch.
  - (g) All testing shall be at the supplier's expense.
9. Composite Locking 24-inch Manhole Covers shall have a non-slip pattern cast on the top.
10. Composite Locking Manhole Covers shall be provided with individual permanent markings that are easily discernable and show the following:
  - (h) Name of the producing manufacturer and country of manufacture preceded by the words "Made in", such as "Made in USA"
  - (i) AASHTO designation or ASTM designation number
  - (j) Class by a number followed by a letter indicating the minimum tensile strength and size of test bar,
  - (k) Manufacturing date (MM/DD/YY),
11. The above markings are required, but the Commission will allow some variation in how the above markings are provided on the finished product. The design and location of the markings must meet and be subject to the approval of the Commission's aesthetic judgment.



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12. The word “WATER” shall be raised relief.
13. Composite Locking 24-inch Manhole Cover shall fit any of the Standard 24-inch Manhole Frames and the dimensions of the cover must match existing frames and covers such that parts are interchangeable with both the new and existing manhole frame and covers.
14. Composite Locking 24-inch Manhole Cover dimensions shall be in accordance with **24” Composite Locking Water Cover Detail (W-13.10)**.
15. The Composite Locking 24-inch Manhole Cover shall have one (1) non-penetrating pick bar on one side that is approximately 1-inch by 1-1/2-inch with the slot/channel approximately 1-1/2-inch wide by 4-1/2-inch long, one (1) 1-1/4-inch diameter penetrating pick-hole, two ¼-turn penta head laches on each side of the cover, a 23-3/4-inch (plus or minus 1/16-inch) diameter cover, and the rim shall be 1-inches thick (plus or minus 1/16-inch).
16. Composite Locking 32-inch Manhole Cover shall fit any of the Standard 32-inch Manhole Frames and the dimensions of the cover must match existing frames and covers such that parts are interchangeable with both the new and existing manhole frame and covers.
17. Composite Locking 32-inch Manhole Cover dimensions shall be in accordance with **32” Composite Locking Water Cover Detail (W-13.11)**
18. The Composite Locking 32-inch Manhole Cover shall have one (1) non-penetrating pick bar on one side that is approximately 1-inch by 1-1/2-inch with the slot/channel approximately 1-1/2-inch wide by 4-1/2-inch long, one (1) 1-1/4-inch diameter penetrating pick-hole, two ¼-turn penta head laches on each side of the cover, a 1-1/2-inch (plus or minus 1/16-inch) diameter cover, and the rim shall be 1-inches thick (plus or minus 1/16-inch).
19. The dimensions of the cover must match existing frames and covers such that parts are interchangeable with both the new and existing manhole frame and covers.

### 4.11.8 Coatings

No coatings are required for manhole frame and covers or covers.

### 4.11.9 Water Manhole Frame and Covers Makes and Models Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the



# Springfield Water and Sewer Commission

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component(s) shall result in the product no longer being approved and removed from this list.

1. East Jordan Iron Works
  - (a) Standard MHF 32-inch by 8-inch, Part #: 2008 11
  - (b) Standard MHC 32-inch, Part #: 2006 81
  - (c) Replacement MHC 24-inch, Part #: 1246 75
  - (d) Replacement MHC 26-inch, Part #: 2110 24
  - (e) Composite Locking MHC 24-inch, Part #: COM 2401 \_\_
  - (f) Composite Locking MHC 32-inch, Part #: COM 2401 \_\_
2. Approved equal of another manufacturer provided the product(s) are manufactured as per these specifications.



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### Section 4.12 PLASTIC PIT METER SETTER FOR COLD CLIMATES

1. Plastic Pit Meter Setters provided to the Commission or Installer shall be manufactured, tested, inspected and delivered in full compliance with this Specification.
2. Plastic Pit Meter Setters shall be constructed of 20-inch or 36-inch diameter high quality, high-density polyethylene pipe. Unless otherwise approved by the Commission, pit dimensions for the following meter sizes shall be:
  - (a) 5/8-inch meter; shall be 20-inch diameter by 48-inches deep.
  - (b) 5/8-inch by 3/4-inch meter; shall be 20-inch diameter by 48-inches deep.
  - (c) 3/4-inch meter; shall be 20-inch diameter by 48-inches deep.
  - (d) 3/4-inch by 1-inch meter; shall be 20-inch diameter by 48-inches deep.
  - (e) 1-1/2-inch meter; shall be 36-inch diameter by 48-inches deep.
  - (f) 2-inch meter; shall be 36-inch diameter by 48-inches deep.
3. Plastic Pit Meter Setters inlet valve shall be a lead free meter angle valve.
  - (a) 5/8-inch to 1-inch meters require a quick connection on the outlet side of the meter valve.
  - (b) 1-1/4-inch to 2-inch require a flange connection on the outlet side of the meter valve.
4. Plastic Pit Meter Setters outlet valve shall be a lead free angle cartridge dual check valve.
  - (a) 5/8-inch to 1-inch meters require a quick connection on the inlet side of the check valve.
  - (b) 1-1/4-inch to 2-inch require a flange connection on the inlet side of the check valve.
5. Plastic Pit Meter Setters shall include copper tube, K type risers.
6. Plastic Pit Meter Setters shall include a male iron pipe connection on both the inlet and outlet connection of the risers.
7. Delivery shall be specified in terms of number of days from receipt of order.



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8. The manufacturer/vendor/shipper must use care in preparing the above items for shipment and in handling during shipment and delivery, to insure that the above items are delivered without damage. Damaged items will not be accepted.
9. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above items and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AWWA Standards.
10. References

The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

- (a) Name of Municipality/Utility
- (b) Total amount of product bid on and amount delivered
- (c) Date the bid was accepted and date the product was delivered
- (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product



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### Section 4.13 FRAME AND LIDS FOR PLASTIC METER PIT SETTER

1. Frame
  - (a) Frames shall be made of cast iron or ductile iron and have a 25,000 PSI tensile strength.
  - (b) Frames for plastic meter setters for 5/8-inch through 1-inch shall have tile size of 20-inches and a lid size of 12-inches.
  - (c) Frames for plastic meter setters for 1-1/2-inch through 2-inch shall have tile diameter of 36-inches and a lid diameter of approximately 12-1/2-inches.
  - (d) Frames shall be provided with double lids.
  - (e) Frames shall provide a recessed lip to allow the top lid to remain flush with the top of the frame.
2. Lids
  - (a) Inner lids shall be plastic.
  - (b) Inner lids shall be approximately 11-1/2-inches in diameter.
  - (c) Top lids shall be plastic.
  - (d) Top lids shall be approximately 12-1/2-inches in diameter.
  - (e) Top lids shall be provided with a worm type locking device.
  - (f) Top lids shall be provided with a standard 27/32-inch brass pentagon nut.
  - (g) Top lids shall be provided with a 2-inch hole and plug for an automatic meter reading device.
  - (h) Top lids shall have "WATER METER" printed clearly on them. The printings shall be permanently made on to the lids.
3. Delivery shall be specified in terms of number of days from receipt of order.
4. The manufacturer/vendor/shipper must use care in preparing the above items for shipment and in handling during shipment and delivery, to insure that the above items are delivered without damage. Damaged items will not be accepted.
5. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above items and

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all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AWWA Standards.

### 6. References

The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

- (a) Name of Municipality/Utility
- (b) Total amount of product bid on and amount delivered
- (c) Date the bid was accepted and date the product was delivered
- (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product





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### CHAPTER 5 CROSS CONNECTION DEVICES,

#### Section 5.1 BACKFLOW PREVENTERS

##### 5.1.1 General

1. Cross Connection Devices provided to the Springfield Water and Sewer Commission or Installers shall be manufactured, tested, inspected, and delivered in full compliance with the Commission's Specifications.
2. The Cross Connection Devices shall conform to AWWA C-110 (most current revision) Standard for Double Check Valve Backflow Prevention Assembly and/or AWWA C-511 (most current revision) Standard for Reduced Pressure Principle Backflow Preventer.
  - (a) Devices are the back flow preventer only.
  - (b) Assemblies are from the manufacturer and include two shut off valves and the back flow preventer.
3. Devices may have either bronze, stainless steel, cast iron or ductile iron bodies.
  - Ductile and Cast Iron bodies shall be epoxy coated
4. All devices and assemblies shall be lead free.
5. All shut off valves shall be slow closing, have tamper switches, and open close indicators in accordance with National Fire Protection Association (NFPA) 13.
6. All devices and assemblies shall be rated for a minimum of 175-PSI.
7. Devices installed on hot water lines with elevated temperatures shall be approved for hot water use.
8. Cross Connection Devices shall be delivered with proof of testing by the University of California (USC) and/or the American Society of Sanitary Engineering (ASSE), as set forth in Massachusetts Drinking Water Regulations 310 CMR 22.22.
9. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), or meet the requirements of the Buy American Act (BAA),as follows;
  - (a) North America shall mean the United States, Canada, and Mexico,
  - (b) Cast shall mean molten metal poured into a mold to create Casting(s) for a finished product,

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- (c) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and
  - (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or
  - (e) The finished product shall meet all the requirements of the BAA language, and all guidance issued by the Government Accountability Office (GAO), or
  - (f) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.
10. Delivery shall be specified in terms of number of days from receipt of order.
11. The manufacturer/vendor/shipper must use care in preparing the above items for shipment and in handling during shipment and delivery, to insure that the above items are delivered without damage. Damaged items will not be accepted.
12. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above items and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AWWA Standards.
13. References

The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

- (a) Name of Municipality/Utility
- (b) Total amount of product bid on and amount delivered
- (c) Date the bid was accepted and date the product was delivered
- (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product



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### 5.1.2 Fire Systems

#### 1. Fire Systems without Chemicals Added

- (a) At a minimum, based on the degree of health hazard, a double check valve device or assembly is required on all new systems and shall be provided in accordance with Section 5.1.1 and with the following:
- Devices and assemblies 2-inches and larger require a double check valve detector assembly (DCDA).
  - Devices and assemblies less than 2-inches do not require a detector meter.
- (b) The DCDA or device shall be provided with a water meter that reads in cubic feet and a double check in the bypass line.
- (c) Up to 2-inch assemblies may be provided with bronze or stainless steel ball valves or butterfly valves.
- The valves and device may have all flange or grooved (Victaulic) connections, or some combination of both.
  - Threaded outlets on the shut off valves for testing the back flow assemblies are allowed and shall be provided with bronze ball type test cocks or plugs.
- (d) 3-inch and larger assemblies may be provided with Ductile Iron Outside Spindle and Yoke (OS&Y) Gate Valves in accordance with Section 3.6.4 of these Specifications or ductile iron butterfly valves.
- The valves and device may have all flange or grooved (Victaulic) connections, or some combination of both.
  - Threaded outlets on the shut off valves for testing the back flow assemblies are allowed and shall be provided with bronze ball type test cocks or plugs.

#### 2. Fire Systems with Chemicals Added

- (a) A reduced pressure zone (RPZ) backflow preventer device or assembly is required on all new systems with chemicals added and shall be provided in accordance with Section 5.1.1 and with the following:
- Devices and assemblies 2-inches and larger require a RPZ detector assembly (RPDA).
  - Devices and assemblies less than 2-inches do not require a detector meter.
- (b) The RPDA or device shall be provided with a water meter that reads in cubic feet and a RPZ in the bypass line.



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- (c) Up to 2-inch assemblies may be provided with bronze or stainless steel ball valves or butterfly valves.
  - The valves and device may have all flange or grooved (Victaulic) connections, or some combination of both.
  - Threaded outlets on the shut off valves for testing the back flow assemblies are allowed and shall be provided with bronze ball type test cocks or plugs.
- (d) 3-inch and larger assemblies may be provided with Ductile Iron Outside Spindle and Yoke (OS&Y) Gate Valves in accordance with Section 3.6.4 of these Specifications or butterfly valves.
  - The valves and device may have all flange or grooved (Victaulic) connections, or some combination of both.
  - Threaded outlets on the shut off valves for testing the back flow assemblies are allowed and shall be provided with ball type test cocks or plugs.
- (e) The RPZ backflow preventer shall be provided with two independent check valves with an intermediate relief valve.
- (f) The RPZ backflow preventer shall be provided with a drain sized to the manufacturer's discharge rate list.



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### 5.1.3 Irrigation Systems

1. At a minimum, a testable pressure vacuum breaker device or assembly is required on all new systems and shall be provided in accordance with Section 5.1.1 and with the following:
  - (a) Pressure Vacuum breakers may be rated for 150-PSI or greater.
  - (b) Up to 2-inch assemblies may be provided with bronze or stainless steel ball valves or butterfly valves.
    - The valves shall have FIP threads.
    - Threaded outlets on the shut off valves for testing the back flow assemblies shall be provided with ball type test cocks.
  - (c) The pressure vacuum breaker shall be provided with a bronze body with MIP threads.
  - (d) The pressure vacuum breaker shall be provided with a stainless steel spring loaded single float and disc with an independent first check.
  - (e) The pressure vacuum breaker shall be provided with shut-off valves and ball type test cocks. The shut-off handles may be brass or stainless steel.
2. A double check valve assembly is also acceptable and shall be provided in accordance with Section 5.1.2 above. If the service is metered no detector meter is required.
3. A reduced pressure zone (RPZ) backflow preventer is also acceptable and shall be provided in accordance with Section 5.1.2 above. If the service is metered no detector meter is required.



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## Material Specifications

### 5.1.4 Metered Process, Commercial, or Industrial Systems

1. At a minimum, reduced pressure zone (RPZ) backflow preventer device or assembly is required on all new systems and shall be provided in accordance with the General Section above and with the following:
  - (a) Detector meters are not required on metered connections.
  - (b) Up to 2-inch assemblies may be provided with bronze or stainless steel ball valves or butterfly valves.
    - The valves and device shall have all threaded connections.
    - Threaded outlets on the shut off valves for testing the back flow assemblies are allowed and shall be provided with bronze ball type test cocks or plugs.
  - (c) 3-inch and larger assemblies shall be provided with Ductile Iron Outside Spindle and Yoke (OS&Y) Gate Valves in accordance with Section 3.6.4 of these Material Specifications.
    - The valves and device shall have all flange connections.
    - Threaded outlets on the shut off valves for testing the back flow assemblies are allowed and shall be provided with ball type test cocks or plugs.
  - (d) The RPZ backflow preventer shall be provided with two independent check valves with an intermediate relief valve.
  - (e) The RPZ backflow preventer shall be provided with a drain.

### 5.1.5 Threaded Connections

1. All threaded connections shall be provided with a hose connection vacuum breaker.
  - (a) The hose connection vacuum breaker shall be provided with a single check valve with an atmospheric vacuum breaker vent.



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## Material Specifications

### 5.1.6 Backflow Preventers Makes and Models Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

Assembly Description	Watts	Ames	FEBCO
<b>Assemblies without Detector</b>			
Up to 2" Double Check Assembly (Bronze Body)	007	2000B	850
Up to 2" Double Check Assembly	719	200B	
Up to 2" Reduced Pressure Zone Assembly	009	4000B	825Y
Up to 2" Reduced Pressure Zone Assembly	919	400B	860
1" or 2" Testable Vacuum Breaker	800M4QT	A200	765
<b>Double Check Assemblies with Detector</b>			
2" Double Check Detector Assembly (Bronze Body)	007DCDA	3000B	
2-1/2" - 3" Double Check Detector Assembly (Iron Body)	007DCDA		858
3" - 10" Double Check Detector Assembly (Iron Body)	709DCDA		806YD & 856
2-1/2" - 8" Double Check Detector Assembly w/ B-fly	757 BF	M300 BF Maxim & C300 BF Colt	
2-1/2" - 8" Double Check Detector Assembly w/ B-fly	757N BF	M300N BF Maxim & C300N BF Colt	
2-1/2" - 10" Double Check Detector Assembly	757	M300 Maxim & C300 Colt	
2-1/2" - 10" Double Check Detector Assembly	757N	M300N Maxim & C300N Colt	
2-1/2" - 12" Double Check Detector Assembly	774DCDA	3000SS Silver Bullet	
<b>Reduced Pressure Zone Assemblies with Detector</b>			
2-1/2" - 10" Reduced Pressure Zone Detector Assembly	909RPDA	4000CIV	826YD
2-1/2" - 6" Reduced Pressure Zone Detect. Ass. w/ B-fly	957RPDA BF	M400 BF Maxim & C400 BF Colt	
2-1/2" - 6" Reduced Pressure Zone Detect. Ass. w/ B-fly	957NRPDA BF	M400N BF Maxim & C400N BF Colt	
2-1/2" - 6" Reduced Pressure Zone Detect. Ass. w/ B-fly	957ZRPDA BF	M400Z BF Maxim & C400Z BF Colt	
2-1/2" - 10" Reduced Pressure Zone Detector Assembly	957RPDA	M400 Maxim & C400 Colt	
2-1/2" - 10" Reduced Pressure Zone Detector Assembly	957NRPDA	M400N Maxim & C400N Colt	
2-1/2" - 10" Reduced Pressure Zone Detector Assembly	957ZRPDA	M400Z Maxim & C400Z Colt	
2-1/2" - 10" Reduced Pressure Zone Detector Assembly	994RPDA	4000SS	

2. Or the approved equal of another manufacturer provided the product(s) are manufactured as per these specifications.



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### 5.1.7 Enclosures – Permanent

1. Enclosures shall meet all American Society of Sanitary Engineers (A.S.S.E.) 1060 requirements.
2. Enclosures shall be kept in dry shipping containers until installation.
3. Acceptable materials for enclosures shall be aluminum or fiberglass for small enclosures.
4. Insulation thickness for enclosures shall be sufficient to withstand freezing.
5. Adhesive applied stock or material secured by mechanical fasteners may be cause for rejection.
6. Structural members for enclosures shall be aluminum, or fiberglass. Wood or particleboard shall not be allowed.
7. The roof, walls, and access panels for enclosures shall be constructed of specified materials in specified thickness.
8. Heaters shall be provided with heaters and sized to prevent freezing of backflow preventers, meters, valves, and/or piping.
9. Enclosures shall allow the device(s) to be installed at least three (3) to four (4) feet above the floor, eighteen (18) inches from any wall, ceiling, or other device and with clear access to the BFP and/or meter if installed in same enclosure.
10. Delivery shall be specified in terms of number of days from receipt of order.
11. The manufacturer/vendor/shipper must use care in preparing the above items for shipment and in handling during shipment and delivery, to insure that the above items are delivered without damage. Damaged items will not be accepted.
12. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above items and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AWWA Standards.
13. References

The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

- (a) Name of Municipality/Utility





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- (b) Total amount of product bid on and amount delivered
- (c) Date the bid was accepted and date the product was delivered
- (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

### 5.1.8 Enclosures – Seasonal

1. Enclosures shall be kept in dry shipping containers until installation.
2. Acceptable materials for enclosures including structural members for enclosures may be epoxy coated steel, aluminum, polyethylene, or fiberglass. Wood or particleboard shall not be allowed.
3. Insulation is not required as these are seasonal water services.
4. The enclosures shall be forest green.
5. The enclosures may be attached to the pad with minimum 1-inch angle iron frame and at least four (4) 3/8-inch by 5-inch L anchors or two lockable steel latches on each end of the enclosure flange.
6. A drain with animal proof screen shall be provided.
7. The enclosures shall be a minimum size of 48-inches long, 24-inches wide, and 32-inches high, a maximum of 54-inches long, 44-inches wide, and 38-inches high, or as otherwise approved by SWSC during the submittal process. Please note the enclosures submitted must fit on the pads and must enclose the complete meter and backflow preventer assembly described herein.
8. Enclosure shall be lockable and may be hinged.
9. The roof, walls, and access panels for enclosures shall be constructed of specified materials in specified thickness.
10. Delivery shall be specified in terms of number of days from receipt of order.
11. The manufacturer/vendor/shipper must use care in preparing the above items for shipment and in handling during shipment and delivery, to insure that the above items are delivered without damage. Damaged items will not be accepted.
12. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above items and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AWWA Standards.

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### 13. References

The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

- (a) Name of Municipality/Utility
- (b) Total amount of product bid on and amount delivered
- (c) Date the bid was accepted and date the product was delivered
- (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product



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### CHAPTER 6 TEMPORARY BYPASS PIPE AND APPURTENANCES

#### Section 6.1 TEMPORARY WATER MAINS, VALVES, FITTINGS, AND SERVICES

##### 6.1.1 General

1. Temporary water mains, valves, fittings, water service hose, and hose fittings provided to the Commission or installer shall be manufactured, tested, inspected and delivered in full compliance with this Specification.
2. Temporary water mains, valves, water service hose, and hose fittings shall be suitable for potable water, and certified to NSF 61 standards.
3. Temporary water mains, fittings, and valves shall be galvanized steel, polyvinylchloride (PVC) plastic, or polyethylene (PE) of the highest quality, and suitable for all conditions of use, unless otherwise approved by the Engineer or SWSC.
4. PVC used to make temporary PVC water mains, couplings, and fittings shall meet or exceed the minimum requirements of ASTM D 1784, and the following:
  - (a) PVC shall be 1120 defined as type 1, grade 1, class 12454-B
  - (b) Tensile strength: 7,000-PSI minimum
  - (c) Modulus of Elasticity: 400,000-PSI minimum
  - (d) Impact Strength (Izod): 0.65-ft-lbs per 1-inch of notch
  - (e) Deflection Temperature: 158-degrees F minimum
  - (f) Flammability: self-extinguishing
5. Temporary water service hose, and hose fittings shall be rated for 200 PSI.
6. All joints shall be non-permanent restrained either groove and spine or Victaulic, unless otherwise approved by the E&TS. Glued joints are not allowed unless approved by the E&TS. All joints shall be water tight.
7. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;
  - (a) North America shall mean the United States, Canada, and Mexico,



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- (b) Cast shall mean molten metals poured into a mold to create Casting(s) for a finished product,
  - (c) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and
  - (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or
  - (e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.
8. The manufacturer/vendor/shipper must use care in preparing temporary water mains, valves, hydrants, water service hose, and hose fittings for shipment and in handling during shipment and delivery, to insure that the product(s) are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged product(s) will not be accepted.
9. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the product(s) and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AWWA Standards.

### 6.1.2 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.
2. The manufacturer and/or vendor shall furnish three (3) sets of 24-inch by 36-inch certified shop drawings for all materials to be used. All components shall be provided in accordance to these drawings. The drawings shall show the following:
  - (a) Cross sectional drawings of the product(s) showing overall dimensions,
  - (b) Material specifications for each component,
  - (c) Coating applied to each component, if applicable,
  - (d) Weight of each component and total weight, and
  - (e) Country of origin for each component.
3. The manufacturer shall furnish three (3) sets of coating specification(s) of each component that has a coating applied identifying component surface preparation,



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primer (if applicable), type of coating(s), color of coating(s), manufacturer of coating(s), part number of the coating(s), and a sample on a 3-inch by 5-inch chip.

4. The manufacturer shall furnish a letter certifying the product(s) meet all the requirements of the AIS, an explanation, in the letter, of how the product(s) meets the AIS requirements, and signed by the Owner or President of the Company.
5. The manufacturer shall furnish one (1) complete catalogue or manual for parts, repair, and maintenance.
6. The manufacturer shall furnish a certified statement that all product(s) of the same make and model bid, regardless of the year of manufactured, shall have interchangeable component parts and that the parts availability and delivery shall remain firm for ten (10) years.
7. The manufacturer shall furnish a warranty for the product(s) that states that the product(s) shall be free from all defects in material and workmanship under normal use of the product for a minimum one (1) year time period from time of delivery. The manufacturer shall replace and/or repair defective parts or the whole product(s) for a minimum one (1) year time period from time of delivery.
8. The manufacturer shall furnish a certified statement that the required tests on the various materials and on the completed product(s) have been made, and the results of all tests conform to the requirements of the American Association of State Highway and Transportation Officials (AASHTO) M 105 Class 35B strength of materials requirements, American Society of Testing and Materials (ASTM) A48, Class 35B, and as the Commission may require the National Institute of Standards Technology (NIST) standards – Proof Load Testing.
9. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:
  - (a) Name of Municipality/Utility
  - (b) Total amount of product bid on and amount delivered
  - (c) Date the bid was accepted and date the product was delivered
  - (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product
10. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification “Approved”, “Approved as Noted”, or “Rejected-Resubmit” and return to the manufacturer and/or vendor.



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- (a) Approved means the contractor can supply the material as shown on the drawing(s).
- (b) Approved as Noted means the contractor can supply the material as shown on the drawing(s), but with the changes as noted.
- (c) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct materials to be used.

### 6.1.3 Temporary PVC Water Mains

- 1. Temporary PVC water mains shall be a restrained joint type/spline connected, high impact polyvinyl chloride (PVC) with grooved ends to be connected with specially designed couplings, splines, and O-ring seals. Couplings, splines, and O-ring seals shall be supplied with the pipe.
- 2. Temporary PVC water mains shall be designed to meet or exceed the minimum requirements of ASTM D 2241.
- 3. Temporary PVC water mains shall be a minimum Standard Dimension Ratio (SDR) 17 and rated for 250 PSI.
- 4. Temporary PVC water mains shall be provided in 20-foot length, minimum.
- 5. Temporary PVC water mains shall be provided with the following dimensions::

Nominal Diameter in inches	Actual Outside Diameter in inches	Minimum Wall Thickness in inches	Weight in lbs/foot
2-inch	2.375	0.140	0.69
4-inch	4.5	0.265	2.5
6-inch	6.625	0.390	5.18

### 6.1.4 Temporary PVC Couplings

- 1. Temporary PVC water mains shall be provided with PVC couplings that are designed to meet or exceed the minimum requirements of ASTM D 3139, and the following:



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- (a) PVC couplings shall provide joint restraint by means of a nylon spline inserted into a space created when a groove on the pipe and a groove in the coupling are aligned.
  - (b) PVC couplings shall be a minimum Standard Dimension Ratio (SDR) 17 and rated for 250 PSI.
  - (c) PVC couplings shall contain a non-permanent pre-lubricated O-ring seal on each end.
  - (d) PVC couplings shall be NSF-61 listed.
2. O-ring seals shall meet or exceed ASTM F-477 and made from either Nitrile Butadiene Rubber (NBR) or Polyisoprene Rubber (IR).
  3. Splines shall be nylon, round, and for 2-inch temporary pipe, couplings, fittings, and valves the diameter of the spline shall be 0.188-inches. For 4-inch and 6-inch temporary pipe, couplings, fittings, and valves the diameter of the nylon splines shall be 0.25-inches.

### 6.1.5 Temporary Couplings for Plain End PVC Mains

1. Temporary couplings for used to join plain end PVC water mains shall be a bolted mechanical assembly rated for a minimum of 250-PSI.
2. The body of the coupling shall be ductile iron in accordance with ASTM A-536, grade 65-45-12.
3. The body shall have integral gripping teeth that provide connection to the pipe.
4. The body shall be painted with enamel paint.
5. The rubber gasket shall be pre lubricated and be a grade T nitrile compound conforming to ASTM D-2000, designation 5BG615A14B24.
6. Bolts and nuts shall be provided with flat washers. The hardware shall be Zinc plated carbon steel. Minimum tensile strength of bolts shall 110,000- PSI.

### 6.1.6 Temporary PVC Fittings

1. Temporary PVC fittings shall be designed to meet or exceed the minimum requirements of ASTM D 3139, and the following:
2. PVC fittings shall be provided with spline grooved ends for use with temporary PVC water mains and PVC couplings.



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3. PVC fittings shall be a minimum Standard Dimension Ratio (SDR) 17 and rated for 250 PSI.
4. PVC fittings shall be NSF-61 listed.
5. Other ends may be allowed and must be approved by E&TS before purchase.

### 6.1.7 Temporary Valves

1. Temporary valves for PVC water mains shall be butterfly valves rated for 250-PSI.
2. The body of the valve shall be PVC 1120 defined as type 1, grade 1, class 12454-B meet or exceed the minimum requirements of ASTM D 1784.
3. The vane/disc shall be enclosed in a ductile iron housing in accordance with ASTM A-536, grade 65-45-12.
4. The vane/disc shall be ductile iron in accordance with ASTM A-536, grade 65-45-12.
5. The vane/disc shall be rubber encapsulated with grade T nitrile compound conforming to ASTM D-2000, designation 5BG615A14B24.
6. The valves shall have removable handles.

### 6.1.8 Temporary Water mains, Couplings, Fittings, and Valves, and Model Numbers Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. Aquamine, LLC (A Victaulic Company)
  - (a) 2-inch water main: 290021725
  - (b) 4-inch water main: 290041725
  - (c) 6-inch water main: 290061725
  - (d) 2-inch coupling: 290400002
  - (e) 4-inch coupling: 290400004
  - (f) 6-inch coupling: 290400006





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- (g) 2-inch butterfly valve: 295000002
- (h) 4-inch butterfly valve: 295000004
- (i) 6-inch butterfly valve: 295000006
- (j) 2-inch X 2-inch X 2-inch tee: 291700002
- (k) 4-inch X 4-inch X 4-inch tee: 291700004
- (l) 6-inch X 6-inch X 6-inch tee: 291700006
- (m) 4-inch X 4-inch X 2-inch reducing tee: 291800442
- (n) 6-inch X 6-inch X 2-inch reducing tee: 291800662
- (o) 6-inch X 6-inch X 4-inch reducing tee: 291800664
- (p) 4-inch X 2-inch reducer: 291900042
- (q) 6-inch X 2-inch reducer: 291900062
- (r) 6-inch X 4-inch reducer: 291900064
- (s) 2-inch end caps: 291500002
- (t) 4-inch end caps: 291500004
- (u) 6-inch end caps: 291500006
- (v) 2-inch 90-degree bend: 291000002
- (w) 4-inch 90-degree bend: 291000004
- (x) 6-inch 90-degree bend: 291000006
- (y) 2-inch 45-degree bend: 291200002
- (z) 4-inch 45-degree bend: 291200004
- (aa) 6-inch 45-degree bend: 291200006

### 2. Certa-lok, Yelomine Pipe

- (a) 2-inch water main: 216213
- (b) 4-inch water main: 218217



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- (c) 6-inch water main: 219214
- (d) 2-inch coupling: 715020
- (e) 4-inch coupling: 715044
- (f) 6-inch coupling: 715068
- (g) 2-inch butterfly valve: NOT AVAILABLE (NA)
- (h) 4-inch butterfly valve: NA
- (i) 6-inch butterfly valve: NA
- (j) 2-inch X 2-inch X 2-inch tee: \_\_\_\_\_
- (k) 4-inch X 4-inch X 4-inch tee: \_\_\_\_\_
- (l) 6-inch X 6-inch X 6-inch tee: \_\_\_\_\_
- (m) 4-inch X 4-inch X 2-inch reducing tee: \_\_\_\_\_
- (n) 6-inch X 6-inch X 2-inch reducing tee: \_\_\_\_\_
- (o) 6-inch X 6-inch X 4-inch reducing tee: \_\_\_\_\_
- (p) 4-inch X 2-inch reducer: \_\_\_\_\_
- (q) 6-inch X 2-inch reducer: \_\_\_\_\_
- (r) 6-inch X 4-inch reducer: \_\_\_\_\_
- (s) 2-inch end caps: \_\_\_\_\_
- (t) 4-inch end caps: \_\_\_\_\_
- (u) 6-inch end caps: \_\_\_\_\_
- (v) 2-inch 90-degree bend: \_\_\_\_\_
- (w) 4-inch 90-degree bend: \_\_\_\_\_
- (x) 6-inch 90-degree bend: \_\_\_\_\_
- (y) 2-inch 45-degree bend: \_\_\_\_\_
- (z) 4-inch 45-degree bend: \_\_\_\_\_



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- (aa) 6-inch 45-degree bend: \_\_\_\_\_
- 3. Equal provided the products are manufactured as per these specifications.



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### CHAPTER 7 SEWER MAINS AND APPURTENANCES

#### Section 7.1 SEWER PIPE

##### 7.1.1 Polyvinyl Chloride (PVC) Sewer Pipe

1. Pipe provided to the Commission or Installers shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.
2. All pipe furnished shall be either in 13-foot, 18-foot or 20-foot lengths. Straight pipe shall be furnished in lengths according to ASTM D3034.
3. All pipe and fittings furnished shall be clearly marked on the outside indicating name, manufacturer, nominal diameter, ASTM, schedule, and/or pipe or pressure class designation.
4. PVC pipe provided for depths between 4-feet and 15-feet shall be:
  - (a) sizes 4-inch to 15-inch shall conform with ASTM D3034 for solid wall PVC. The PVC pipe shall have an SDR ratio of 35 and a pipe stiffness of 46 psi.
  - (b) 18-inch and above shall conform with ASTM F679 for large diameter pipes. The PVC pipe shall have an SDR ratio of 35 and a pipe stiffness of 46 psi.
5. PVC pipe provided for depths between 16-feet and 30-feet shall be:
  - (a) sizes 4-inch to 15-inch shall conform with ASTM D3034 for solid wall PVC. The PVC pipe shall have an SDR ratio of 26 and a pipe stiffness of 115 psi.
  - (b) 18-inch and above shall conform with ASTM F679 for large diameter pipes. The PVC pipe shall have an SDR ratio of 26 and a pipe stiffness of 115 psi.
6. The pipe manufacturer shall be required to meet all the requirements for PVC Solid Wall Pipe as stated in ASTM D3034 or ASTM F679 whichever is applicable. Specifically, the manufacturer shall perform stiffness, deflection, acid resistances and joint and fitting tightness tests on PVC sanitary sewer pipe and will be required to show certification for such test(s) and at the option of Commission. The pipe manufacturer will be required to perform such test(s) in the presence of the Commission's representative.
7. PVC pipe shall have bell and spigot push-on joints. The bell shall consist of an integral wall section with a solid cross-section elastomeric gasket securely locked in place to prevent displacement during assembly. Installation of elastomeric gasketed joints and performance of the joint shall conform to ASTM F477, ASTM D3139 or ASTM D3212.



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8. Sewer lines shall be green in color or as approved by the Commission.
9. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;
  - (a) North America shall mean the United States, Canada, and Mexico,
  - (b) Cast shall mean molten metals poured into a mold to create Casting(s) for a finished product,
  - (c) Incidental parts may be purchased/obtained from other countries to provide a finished product , in accordance with these Material Specifications, and
  - (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or
  - (e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.
10. Delivery shall be specified in terms of number of days from receipt of order.
11. The manufacturer/vendor/shipper must use care in preparing the above items for shipment and in handling during shipment and delivery, to insure that the above items are delivered without damage. Damaged items will not be accepted.
12. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above items and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable ASTM Standards.
13. References

The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

- (a) Name of Municipality/Utility
- (b) Total amount of product bid on and amount delivered
- (c) Date the bid was accepted and date the product was delivered
- (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product



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### 7.1.2 Polyvinyl Chloride (PVC) Sewer Fittings

1. Polyvinyl Chloride (PVC) fittings provided to the Commission or Installers shall be manufactured, tested, inspected and delivered in full compliance with this Specification.
2. In addition to Section 7.1.1 of these Material Specifications, PVC fittings shall be provided as follows:
3. PVC wyes shall be furnished in lengths of not more than 3-ft. Saddle wyes are not allowed.
4. PVC fittings and accessories for sewers shall have bell and/or spigot configurations compatible with the pipe. The bell shall consist of an integral wall section with a solid cross-section elastomeric gasket securely locked in place to prevent displacement during assembly. Installation of elastomeric gasketed joints and performance of the joint shall conform to ASTM F477, ASTM D3139 or ASTM D3212.
5. Delivery shall be specified in terms of number of days from receipt of order.
6. The manufacturer/vendor/shipper must use care in preparing the above items for shipment and in handling during shipment and delivery, to insure that the above items are delivered without damage. Damaged items will not be accepted.
7. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above items and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable ASTM Standards.
8. References

The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

- (a) Name of Municipality/Utility
- (b) Total amount of product bid on and amount delivered
- (c) Date the bid was accepted and date the product was delivered
- (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product



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## Material Specifications

### 7.1.3 Sewer Service Connections

1. Sewer Service Connections, when not connected to a sewer manhole or wye, may be provided to the Commission or Installer, and shall be manufactured, tested, inspected and delivered in full compliance with this Specification.
2. In addition to Section 7.1.1 of these Material Specifications, Sewer Service Connections shall be provided as follows:
3. Sewer Service Connections shall consist of a PVC hub, rubber sleeve and stainless steel band.
4. Sewer Service Connection shall be a compression fit into the cored wall of a mainline pipe. Hub shall be made from heavy-duty PVC material.
5. Sewer Service Connection shall be provided with a stainless steel clamping assembly and shall be made from minimum 301 grade stainless steel.
6. Sewer Service Connections gaskets shall be installed by the manufacturer. The manufacturer shall use a water-based solution during assembly. Pipe lube is not allowed.
7. The Sewer Service Connection's rubber sleeve and gasket, when applicable, shall meet the requirements of ASTM F477, ASTM D3139 or ASTM D3212.
8. Sewer Service Connections shall be manufactured by Inserta Tee or acceptable equivalent product.
9. Delivery shall be specified in terms of number of days from receipt of order.
10. The manufacturer/vendor/shipper must use care in preparing the above items for shipment and in handling during shipment and delivery, to insure that the above items are delivered without damage. Damaged items will not be accepted.
11. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above items and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable ASTM Standards.
12. References

The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

(e) Name of Municipality/Utility

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- (f) Total amount of product bid on and amount delivered
- (g) Date the bid was accepted and date the product was delivered
- (h) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product





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## Material Specifications

### 7.1.4 Ductile Iron Push-on Joint for Sewer Pipe

1. Ductile Iron (DI) Pipe provided to the Commission or Installers shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.
2. In addition to Section 3.1.1 of these Material Specifications, DI Pipe shall be provided as follows:
3. Ductile iron pipe shall conform to AWWA C151 standards and shall be supplied in industry 18-foot and 20-foot lengths.
4. Delivery shall be specified in terms of number of days from receipt of order.
5. The manufacturer/vendor/shipper must use care in preparing the above items for shipment and in handling during shipment and delivery, to insure that the above items are delivered without damage. Damaged items will not be accepted.
6. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above items and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable ASTM Standards.
7. References

The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

- (a) Name of Municipality/Utility
- (b) Total amount of product bid on and amount delivered
- (c) Date the bid was accepted and date the product was delivered
- (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product.

### 7.1.5 Ductile Iron Fittings for Sewer Pipe

1. Ductile Iron (DI) fittings provided to the Commission or Installers shall be manufactured, tested, inspected and delivered in full compliance with this Specification.
2. In addition to Section 3.12.1 of these Material Specifications, DI fittings shall be provided as follows:

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3. Pipe fittings shall be ductile iron with pressure rating of 350 PSI for 24-in and smaller piping and 250 PSI for 30-in and larger piping.
4. Fittings shall meet the requirements of AWWA C110 or AWWA C153 as applicable.
5. PVC fittings and accessories for sewers shall have bell and/or spigot configurations compatible with the pipe. The bell shall consist of an integral wall section with a solid cross-section elastomeric gasket securely locked in place to prevent displacement during assembly. Installation of elastomeric gasketed joints and performance of the joint shall conform to ASTM F477, ASTM D3139 or ASTM D3212.
6. Delivery shall be specified in terms of number of days from receipt of order.
7. The manufacturer/vendor/shipper must use care in preparing the above items for shipment and in handling during shipment and delivery, to insure that the above items are delivered without damage. Damaged items will not be accepted.
8. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above items and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable ASTM Standards.
9. References

The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

- (a) Name of Municipality/Utility
- (b) Total amount of product bid on and amount delivered
- (c) Date the bid was accepted and date the product was delivered
- (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product



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### Section 4.1 SANITARY SEWER MANHOLES

#### 4.1.1 General

1. Pre-cast Concrete Manholes provided to the Commission or Installers shall be manufactured, tested, inspected and delivered in full compliance with this Specification.
2. Materials' quality, manufacturing process and finished sections are subject to inspection and approval by the Commission at either place of manufacture or at work site.
3. Materials will be examined for compliance with ASTM standards, these Materials Specifications, and approved manufacturer's drawings. The Commission will also take note regarding appearance, dimensions, blisters, cracks and other anomalies, if any.
4. The Commission reserves the right to reject any manhole or structure that fails to meet any requirements specified herein. Rejection may occur at place of manufacture, at work site, or following installation and will not cause the Commission to incur any additional costs.
5. Minor repairs to pre-cast concrete sections, if required, are not accepted unless authorized by the Commission.
6. Materials and equipment shall be the end products of one manufacturer in order to provide standardization for appearance, operation, maintenance, spare parts and manufacturer's service.
7. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;
  - (a) North America shall mean the United States, Canada, and Mexico,
  - (b) Cast shall mean molten metals poured into a mold to create Casting(s) for a finished product,
  - (c) Incidental parts may be purchased/obtained from other countries to provide a finished product , in accordance with these Material Specifications, and
  - (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or



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- (e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement governs.
8. Delivery shall be specified in terms of number of days from receipt of order.
9. The manufacturer/vendor/shipper must use care in preparing the above items for shipment and in handling during shipment and delivery, to insure that the above items are delivered without damage. Damaged items will not be accepted.
10. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above items and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable ASTM Standards.
11. References
12. The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:
  - (a) Name of Municipality/Utility
  - (b) Total amount of product bid on and amount delivered
  - (c) Date the bid was accepted and date the product was delivered
  - (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

### 4.1.4 Pre-cast Concrete Manholes

1. Pre-cast concrete shall be manufactured with concrete that meets the following requirements:
  - (a) Minimum compressive strength shall be 5,000 PSI at 28 days.
    - Pre-cast concrete sections shall not be shipped until after concrete has attained a minimum 5,000 PSI compressive strength.
  - (b) Maximum water-to-cement ratio shall be 0.40 by weight.
  - (c) Minimum cement content shall be 600 lbs of cement per cubic yard of concrete.
  - (d) Shall conform to American Concrete Institute (ACI) 318 and ACI 350R.



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- (e) When "fy" exceeds 40,000 psi, "z" (ACI 318) shall not exceed 95 kips/in, "fs" shall be completed and shall not exceed 50 percent of "fy".
- (f) Products shall be designed to support their own weight, weight of soil at 130-PCF, and a live load equal to AASHTO HS-20 applied to top slab.
- 2. Lifting lugs or holes in each pre-cast section shall be provided for proper handling. Lifting lugs shall be provided for the top and bottom slab.
- 3. Pre-cast concrete manholes base sections, riser sections, transition top sections, flat slab tops and grade rings shall conform to ASTM C478.
- 4. Pre-cast concrete manholes bottom slab thickness, riser wall thickness, shall be as follows:

<b>Diameter (feet)</b>	<b>Wall Thickness (inches)</b>	<b>Base Thickness (inches)</b>	<b>Max Pipe* (RCP) Diameter Allowed (inches)</b>	<b>Max Pipe* (DI/PVC) Diameter Allowed (inches)</b>
<b>4</b>	<b>5</b>	<b>6</b>	<b>18</b>	<b>24</b>
<b>5</b>	<b>6</b>	<b>8</b>	<b>30</b>	<b>36</b>
<b>6</b>	<b>7</b>	<b>8</b>	<b>36</b>	<b>48</b>

\* Pipe diameter may vary depending on number of penetrations.

- 5. Pre-cast concrete manholes top section shall be eccentric cone where cover over pipe exceeds 4-ft. Top section shall be a flat slab where cover over top of pipe is 4-ft or less.
- 6. Pre-cast concrete manholes base, riser and transition top sections shall have bell and spigot or joints tongue and groove joints.
- 7. Pre-cast concrete manhole base, riser, transition top, flat slab top and grade ring shall be designed for a minimum H-20 loading plus earth load. Earth load is 130 Pounds per Cubic Foot (PCF).
- 8. Pre-cast concrete manhole shall be marked on the inside of each pre-cast section with the date of manufacture, name and trademark of manufacturer.
- 9. Pre-cast concrete manhole sections shall have a formed, tapered circular opening larger than the intended pipe size (outside diameter).
- 10. Base slab and walls shall be cast together to form a monolithic base section.



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11. Structure walls shall be designed for a lateral pressure based on an equivalent fluid unit weight of 90-Pounds per Cubic Foot (PCF). Pressure diagram shall originate at finished ground surface. Lateral pressure from vehicles shall be included in accordance with AASHTO.
12. Discontinuities in structures produced by openings and joints shall be considered in the design. Additional reinforcing around openings shall be provided. Frame openings shall carry full design loads to support walls.
13. Manhole shall be designed against flotation with ground water level at finished ground surface. Flotation prevention shall be achieved by dead weight of manhole and soil load above it. Skin friction, soil friction, or weight of equipment in manhole, if any, cannot be considered in the design against flotation.
14. Manhole shall be designed with a minimum number of joints. Maximum number of structure sections, including top slab, shall be four.
15. Pre-cast concrete manholes shall be constructed with a bell and spigot or tongue and groove joint.
16. Access openings, wall sleeves, and knockouts shall be provided at locations where indicated by the Commission or shown on Design Drawings and as follows:
  - (a) Integrally cast knockout panels shall be sized for intended pipe sizes. Knockout panels shall have no steel reinforcing.
  - (b) Pre-cast manhole sections shall have a formed, tapered circular opening larger than the intended pipe size (outside diameter).
  - (c) Horizontal wall joints shall be located 18-inches minimum from horizontal centerline of wall openings.
17. Manhole rungs shall be reinforced steel, copolymer polypropylene, 14-in wide, M.A. Industries Inc, PF Series or equal. Copolymer polypropylene shall conform to ASTM D4101 Classification PP0344 B33534 Z02. Steel reinforcing shall be 1/2-in diameter, conforming to ASTM A615, Grade 60 and shall be continuous throughout rung. Manhole rungs shall meet all OSHA requirements.
18. Wall sleeves shall be provided by the pre-cast concrete manufacturer.



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### Section 7.2 DAMP PROOF COATING

1. Damp proofing provided to the Commission or Installers shall be manufactured, tested, inspected and delivered in full compliance with this Specification.
2. Damp proofing shall be of bituminous material and shall conform to ASTM D449
3. Damp proofing shall be Hydrocide 648 by Sonneborn Building Products; Dehydratine 4 by W.R. Grace and Company; Meadows Trowel Mastic (Type 3), or equal products of another manufacturer.
4. Delivery shall be specified in terms of number of days from receipt of order.
5. The manufacturer/vendor/shipper must use care in preparing the above items for shipment and in handling during shipment and delivery, to insure that the above items are delivered without damage. Damaged items will not be accepted.
6. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above items and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable ASTM Standards.
7. References

The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

- (a) Name of Municipality/Utility
- (b) Total amount of product bid on and amount delivered
- (c) Date the bid was accepted and date the product was delivered
- (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product



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### Section 7.3 BRICK MASONRY

#### 7.3.1 General

1. Bricks for masonry provided to the Commission or Installers shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.
2. Bricks for masonry shall be sound, hard, uniformly burned, regular and uniform in shape and size. Under burned or salmon brick are not acceptable. Only whole brick shall be used.
3. Bricks for masonry shall be clay, shale, or similarly naturally occurring earthy substance and subjected to a heat treatment process at elevated temperatures.
4. Delivery shall be specified in terms of number of days from receipt of order.
5. The manufacturer/vendor/shipper must use care in preparing the above items for shipment and in handling during shipment and delivery, to insure that the above items are delivered without damage. Damaged items will not be accepted.
6. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above items and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable ASTM Standards.
7. References

The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

- (a) Name of Municipality/Utility
- (b) Total amount of product bid on and amount delivered
- (c) Date the bid was accepted and date the product was delivered
- (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

#### 7.3.2 Bricks for Channels and Shelves

1. Bricks for channels and shelves shall conform to ASTM C32, Grade SS.





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2. Bricks for channels and shelves tested so that the mean of five tests for absorption shall not exceed 8 percent and no individual brick exceed 11 percent.

### 7.3.3 Bricks for Frame and Cover Adjustment

Bricks intended for use in raising manhole frames to finished grade shall conform to ASTM C62.



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### Section 7.4 MORTAR

1. Mortar provided to the Commission or Installers shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.
2. Mortar shall be composed of 1 part Portland cement, 2 parts sand, and hydrated lime not to exceed 10-lbs to each bag of cement.
3. Portland cement shall be ASTM C150, Type II; hydrated lime shall conform to ASTM C207.
4. Sand shall be washed, cleaned, screened, well graded with all particles passing a No. 4 sieve and conform to ASTM C33.
5. Delivery shall be specified in terms of number of days from receipt of order.
6. The manufacturer/vendor/shipper must use care in preparing the above items for shipment and in handling during shipment and delivery, to insure that the above items are delivered without damage. Damaged items will not be accepted.
7. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above items and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable ASTM Standards.
8. References

The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

- (a) Name of Municipality/Utility
- (b) Total amount of product bid on and amount delivered
- (c) Date the bid was accepted and date the product was delivered
- (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product



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## Material Specifications

### Section 7.5 MANHOLE FRAMES AND COVERS FOR SANITARY SEWERS

#### 7.5.1 General

1. Manhole frame and covers provided to the Commission or Installers shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.
2. The manhole frame and cover shall be certified to meet American Association of State Highway and Transportation Officials (AASHTO) M 306 Drainage, Sewer, Utility, and Related Casting Specification and M 105 Class 35B strength of materials requirements.
3. Manhole frames and covers shall be strong, durable, even grained Cast iron, Ductile iron, or Fiber Reinforced Polymer smooth, free from scale, lumps, blisters, sand holes and defects of any kind.
  - (a) An HS20 load rating is required.
  - (b) Cast iron shall conform to American Society of Testing and Materials (ASTM) A48, Class 35B.
  - (c) Ductile iron shall conform to ASTM A 536 Grade 80-55-06.
  - (d) Fiber Reinforced Polymer shall conform to ASTM C 1028
  - (e) Manhole covers and frame seats shall be machined to a true surface so that the cover does not rock in the frame no matter the position of the cover.
4. The Commission requires that the Manhole Frame and Covers be subjected to proof load testing as follows:
  - (a) Testing shall be in accordance with the National Institute of Standards Technology (NIST) standards.
  - (b) The Manhole Frame and Covers shall show no detrimental deformation or cracks when a proof load of 40,000-pounds is concentrated on an 9-inch by 9-inch area at the center of the cover for a 1-minute period of time.
  - (c) Permanent deformation shall not exceed 1/8-inch.
  - (d) All testing shall be at the supplier's expense.
5. Manhole covers shall have a diamond pattern cast on the top.



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6. Manhole Frame and Cover shall be provided with individual permanent markings that are easily discernable and show the following:
  - (a) Name of the producing foundry and country of manufacture preceded by the words “Made in”, such as “Made in USA”
  - (b) AASHTO designation or ASTM designation number
  - (c) Class by a number followed by a letter indicating the minimum tensile strength and size of test bar,
  - (d) Heat identification and cast date (MM/DD/YY),
  - (e) The above markings are required, but the Commission will allow some variation in how the above markings are provided on the finished product. The design and location of the markings must meet and be subject to the approval of the Commission’s aesthetic judgment.
7. The product(s) shall have all parts cast or manufactured and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;
  - (a) North America shall mean the United States, Canada, and Mexico,
  - (b) Cast shall mean molten metals poured into a mold to create casting(s) for a finished product,
  - (c) Manufactured shall mean raw material formed into a finished product,
  - (d) Incidental parts may be purchased/obtained from other countries to provide a finished product , in accordance with these Material Specifications, and
  - (e) Assembled shall mean castings and sourced parts are put together to build a finished product, or
  - (f) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement govern.
8. Delivery shall be specified in terms of number of days from receipt of order.
9. Delivery shall be made by truck in minimum truckload quantity to locations designated in the Commission’s service area in and near Springfield, Massachusetts. The low bidder shall notify the Commission of the quantity comprising a minimum truckload. The Commission reserves the right to mix depth of buries to reach a full truckload.



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10. The manufacturer/vendor/shipper must use care in preparing products for shipment and in handling during shipment and delivery, to insure that the water meters are delivered without damage. Particular attention must be directed at protecting the protective coating from damage. Damaged manhole frame and covers will not be accepted.
11. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the manhole frame and cover and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable AASHTO and ASTM Standards.

### 7.5.2 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.
2. The manufacturer and/or vendor shall furnish three (3) sets of 24-inch by 36-inch certified shop drawings for all materials to be used. All finished product(s) shall be provided in accordance to these drawings. The drawings shall show the following:
  - (a) Cross sectional drawings of the finished product(s) showing overall dimensions,
  - (b) Material specifications for each component of the finished product(s),
  - (c) Coating applied to each component of the finished product(s), if applicable,
  - (d) Weight of each component and total weight for each finished product(s), and
  - (e) Country of origin for each component.
3. If applicable, the manufacturer shall furnish three (3) sets of coating specification(s) of each component that has a coating applied identifying type of coating, color of coating, manufacturer of coating, part number of the coating, and a sample on a 3-inch by 5-inch chip.
4. The manufacturer shall furnish a letter certifying the finished product(s) meets all the requirements of the AIS, an explanation, in the letter, of how the finished product(s) meets the AIS requirements, and signed by the Owner or President of the Company.
5. The manufacturer shall furnish one (1) complete catalogue or manual for parts, repair, and maintenance.



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## Material Specifications

6. The manufacturer shall furnish a certified statement that all finished product(s) of the same make and model bid, regardless of the year of manufactured, shall have interchangeable component parts and that the parts availability and delivery shall remain firm for ten (10) years.
7. The manufacturer shall furnish a warranty for the finished product(s) that states that the finished product(s) shall be free from all defects in material, coatings, and workmanship under normal use of the product from time of delivery for a minimum ten (10) year time period.
8. The manufacturer shall furnish a certified statement that the required tests on the various materials and on the completed product(s) have been made, and the results of all tests conform to the requirements of the AASHTO M105 35B, ASTM A48 35B, and NIST. The records of the tests shall be furnished for the individual parts with respect to physical and chemical properties.
9. The manufacturer and/or vendor shall furnish references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product(s), in the last two (2) years. The listing is to include:
  - (a) Name of Municipality/Utility
  - (b) Total amount of product bid on and amount delivered
  - (c) Date the bid was accepted and date the product was delivered
  - (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product
10. The Springfield Water and Sewer Commission will mark one (1) set of plans and coating specification “Approved”, “Approved as Noted”, or “Rejected-Resubmit” and return to the manufacturer and/or vendor.
  - (a) Approved means the contractor can supply the finished product(s) as shown on the drawing(s).
  - (b) Approved as Noted means the contractor can supply the finished product(s) as shown on the drawing(s), but with the changes as noted.
  - (c) Rejected – Resubmit means the contractor must resubmit three (3) sets of new shop drawings for correct finished product(s) to be used.

### 7.5.3 Standard Manhole Frame 24-inch by 4-inch

1. Standard Manhole Frame 24-inch by 4-inch provided to the Springfield Water and Sewer Commission (Commission) or its Contractors or the Springfield Department

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of Public Works shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. Standard Manhole Frame 24-inch by 4-inch shall, as a minimum, meet all specifications as in Paragraphs 7.5.1 and 7.5.2, and the following:
3. Standard Manhole Frame 24-inch by 4-inch shall be strong, durable, even grained Cast iron or Ductile iron smooth, free from scale, lumps, blisters, sand holes and defects of any kind.
4. Standard Manhole Frame 24-inch by 4-inch shall have a minimum dimensions shall be in accordance with **24" X 4" Sewer Frame Only Detail (S-02.51)**.
5. Standard Manhole Frame 24-inch by 4-inch shall have a minimum 21-3/4-inch diameter access opening.
6. Standard Manhole Frame 24-inch by 4-inch shall have a maximum height of 4-inches.

### 7.5.4 Standard Manhole Frame 24-inch by 6-inch

1. Standard Manhole Frame 24-inch by 6-inch provided to the Springfield Water and Sewer Commission (Commission) or its Contractors or the Springfield Department of Public Works shall be manufactured, tested, inspected and delivered in full compliance with this Specification.
2. Standard Manhole Frame 24-inch by 6-inch shall, as a minimum, meet all specifications as in Paragraphs 7.5.1 and 7.5.2, and the following:
3. Standard Manhole Frame 24-inch by 6-inch shall be strong, durable, even grained Cast iron or Ductile iron smooth, free from scale, lumps, blisters, sand holes and defects of any kind.
4. Standard Manhole Frame 24-inch by 6-inch shall have a minimum dimensions shall be in accordance with **24" X 6" Sewer Frame Only Detail (S-02.52)**.
5. Standard Manhole Frame 24-inch by 6-inch shall have a minimum 21-3/4-inch diameter access opening.
6. Standard Manhole Frame 24-inch by 6-inch shall have a maximum height of 6-inches.

### 7.5.5 Standard Manhole Frame 24-inch by 8-inch

1. Standard Manhole Frame 24-inch by 8-inch provided to the Springfield Water and Sewer Commission (Commission) or its Contractors or the Springfield Department

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of Public Works shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. Standard Manhole Frame 24-inch by 8-inch shall, as a minimum, meet all specifications as in Paragraphs 7.5.1 and 7.5.2, and the following:
3. Standard Manhole Frame 24-inch by 8-inch shall be strong, durable, even grained Cast iron or Ductile iron smooth, free from scale, lumps, blisters, sand holes and defects of any kind.
4. Standard Manhole Frame 24-inch by 8-inch shall have a minimum dimensions shall be in accordance with **24" X 8" Sewer Frame Only Detail (S-02.53)**.
5. Standard Manhole Frame 24-inch by 8-inch shall have a minimum 21-3/4-inch diameter access opening.
6. Standard Manhole Frame 24-inch by 8-inch shall have a maximum height of 8-inches.

### 7.5.6 Replacement Manhole Frame 26-inch by 6-inch

1. Replacement Manhole Frame 26-inch by 6-inch provided to the Springfield Water and Sewer Commission (Commission) or its Contractors or the Springfield Department of Public Works shall be manufactured, tested, inspected and delivered in full compliance with this Specification.
2. Replacement Manhole Frame 26-inch by 6-inch shall, as a minimum, meet all specifications as in Paragraphs 7.5.1 and 7.5.2, and the following:
3. Replacement Manhole Frame 26-inch by 6-inch shall be strong, durable, even grained Cast iron or Ductile iron smooth, free from scale, lumps, blisters, sand holes and defects of any kind.
4. Replacement Manhole Frame 26-inch by 6-inch shall have a minimum dimensions shall be in accordance with **26" X 6" Sewer Frame Only Detail (S-02.54)**.
5. Replacement Manhole Frame 26-inch by 6-inch shall have a minimum 24-inch diameter access opening.
6. Replacement Manhole Frame 26-inch by 6-inch shall have a maximum height of 6-inches.

### 7.5.7 Standard Manhole Frame 32-inch by 6-inch

1. Standard Manhole Frame 32-inch by 6-inch provided to the Springfield Water and Sewer Commission (Commission) or its Contractors or the Springfield Department

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of Public Works shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. Standard Manhole Frame 32-inch by 6-inch shall, as a minimum, meet all specifications as in Paragraphs 7.5.1 and 7.5.2, and the following:
3. Standard Manhole Frame 32-inch by 6-inch shall be strong, durable, even grained Cast iron or Ductile iron smooth, free from scale, lumps, blisters, sand holes and defects of any kind.
4. Standard Manhole Frame 32-inch by 6-inch shall have a minimum dimensions shall be in accordance with **32" X 6" Sewer Frame Only Detail (S-02.55)**.
5. Standard Manhole Frame 32-inch by 6-inch shall have a minimum 30-1/4-inch diameter access opening.
6. Standard Manhole Frame 32-inch by 6-inch shall have a maximum height of 6-1/2-inches.

### 7.5.8 Standard Manhole Frame 32-inch by 8-inch

1. Standard Manhole Frame 32-inch by 8-inch provided to the Springfield Water and Sewer Commission (Commission) or its Contractors or the Springfield Department of Public Works shall be manufactured, tested, inspected and delivered in full compliance with this Specification.
2. Standard Manhole Frame 32-inch by 8-inch shall, as a minimum, meet all specifications as in Paragraphs 7.5.1 and 7.5.2, and the following:
3. Standard Manhole Frame 32-inch by 8-inch shall be strong, durable, even grained Cast iron or Ductile iron smooth, free from scale, lumps, blisters, sand holes and defects of any kind.
4. Standard Manhole Frame 32-inch by 8-inch shall have a minimum dimensions shall be in accordance with **32" X 8" Sewer Frame Only Detail (S-02.56)**.
5. Standard Manhole Frame 32-inch by 8-inch shall have a minimum 30-inch diameter access opening.
6. Standard Manhole Frame 32-inch by 8-inch shall have a maximum height of 8-inches.

### 7.5.9 24-inch Standard Sewer Manhole Cover

1. 24-inch Standard Sewer Manhole Cover provided to the Springfield Water and Sewer Commission (Commission) or its Contractors or the Springfield Department

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of Public Works shall be manufactured, tested, inspected and delivered in full compliance with this Specification.

2. 24-inch Standard Sewer Manhole Cover shall, as a minimum, meet all specifications as in Paragraphs 7.5.1 and 7.5.2, and the following:
3. 24-inch Standard Sewer Manhole Cover shall be strong, durable, even grained Cast iron or Ductile iron smooth, free from scale, lumps, blisters, sand holes and defects of any kind.
4. 24-inch Standard Sewer Manhole Cover shall have a minimum dimensions shall be in accordance with **24” Standard Sewer Cover Detail (S-02.61)**.
5. The words “SPRINGFIELD WATER & SEWER COMMISSION” and the Commission Logo shall be raised relief.
6. The word “SEWER” shall be raised relief.
7. 24-inch Standard Sewer Manhole Covers shall have two (2) penetrating pick-holes on each opposite side and one (1) 1-1/4-inch diameter penetrating pick-hole shall offset a minimum of 4-inches from the center, a 23-3/4-inch (plus or minus 1/16-inch) diameter cover, the rim shall be 1-1/4-inch thick (plus or minus 1/16-inch).
8. The dimensions of the cover must match existing frames and covers such that parts are interchangeable with both the new and existing manhole frame and covers.

### 7.5.10 32-inch Standard Sewer Manhole Cover

1. 32-inch Standard Sewer Manhole Cover provided to the Springfield Water and Sewer Commission (Commission) or its Contractors or the Springfield Department of Public Works shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.
2. 32-inch Standard Sewer Manhole Cover shall, as a minimum, meet all specifications as in Paragraphs 7.5.1 and 7.5.2, and the following:
3. 32-inch Standard Sewer Manhole Cover shall be strong, durable, even grained Cast iron or Ductile iron smooth, free from scale, lumps, blisters, sand holes and defects of any kind.
4. 32-inch Standard Sewer Manhole Cover shall have a minimum dimensions shall be in accordance with **32” Standard Sewer Cover Detail (S-02.62)**.
5. The words “SPRINGFIELD WATER & SEWER COMMISSION” and the Commission Logo shall be raised relief.



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6. The word “SEWER” shall be raised relief.
7. 32-inch Standard Sewer Manhole Cover shall have two (2) penetrating pick-holes on each opposite side and one (1) 1-1/4-inch diameter penetrating pick-hole shall offset a minimum of 4-inches from the center, a 31-3/4-inch (plus or minus 1/16-inch) diameter cover, the rim shall be 1-3/4-inch thick (plus or minus 1/16-inch).
8. The dimensions of the cover must match existing frames and covers such that parts are interchangeable with both the new and existing manhole frame and covers.

### 7.5.11 26-inch Replacement Sewer Manhole Cover

1. 26-inch Replacement Sewer Manhole Cover provided to the Springfield Water and Sewer Commission (Commission) or its Contractors or the Springfield Department of Public Works shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.
2. 26-inch Replacement Sewer Manhole Cover shall, as a minimum, meet all specifications as in Paragraphs 7.5.1 and 7.5.2, and the following:
3. 26-inch Replacement Sewer Manhole Cover shall be strong, durable, even grained Cast iron or Ductile iron smooth, free from scale, lumps, blisters, sand holes and defects of any kind.
4. 26-inch Replacement Sewer Manhole Cover shall have a minimum dimensions shall be in accordance with **26” Replacement Sewer Cover Detail (S-02.63)**.
5. The word “SEWER” shall be raised relief.
6. 26-inch Replacement Sewer Manhole Cover shall have two (2) non-penetrating pick bars on each side that are approximately 1-inch by 1-1/2-inch with the slot/channel approximately 1-1/2-inch wide by 4-1/2inch long, a 26-inch (plus or minus 1/16-inch) diameter cover, the rim shall be 1-1/8-inch thick (plus or minus 1/16-inch).
7. The dimensions of the cover must match existing frames and covers such that parts are interchangeable with both the new and existing manhole frame and covers.

### 7.5.12 30-inch Replacement Sewer Manhole Cover

1. 30-inch Replacement Sewer Manhole Cover provided to the Springfield Water and Sewer Commission (Commission) or its Contractors or the Springfield Department of Public Works shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.



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2. 30-inch Replacement Sewer Manhole Cover shall, as a minimum, meet all specifications as in Paragraphs 7.5.1 and 7.5.2, and the following:
3. 30-inch Replacement Sewer Manhole Cover shall be strong, durable, even grained Cast iron or Ductile iron smooth, free from scale, lumps, blisters, sand holes and defects of any kind.
4. 30-inch Replacement Sewer Manhole Cover shall have a minimum dimensions shall be in accordance with **30” Replacement Sewer Cover Detail (S-02.64)**.
5. The word “SEWER” shall be raised relief.
6. 30-inch Replacement Sewer Manhole Cover shall have two (2) penetrating pick-holes on each opposite side and one (1) 1-1/4-inch diameter penetrating pick-hole at the center, a 29-3/4-inch (plus or minus 1/16-inch) diameter cover, the rim shall be 2-inch thick (plus or minus 1/16-inch).
7. The dimensions of the cover must match existing frames and covers such that parts are interchangeable with both the new and existing manhole frame and covers.

### 7.5.13 Composite Locking 24-inch or 32-inch Sewer Cover

1. Composite Locking Manhole Covers provided to the Springfield Water and Sewer Commission (Commission) or its Contractors or the Springfield Department of Public Works shall be manufactured, tested, inspected and delivered in full compliance with this Specification.
2. Composite Locking Manhole Covers shall, as a minimum, meet all specifications as in Paragraphs 7.5.1 and 7.5.2, and the following exceptions and additions:
3. Composite Locking Manhole Covers provided to the Commission or Installers shall be manufactured, tested, inspected, and delivered in full compliance with this Specification.
4. Composite Locking Manhole Covers shall be certified to meet American Association of State Highway and Transportation Officials (AASHTO) M 306 Drainage, Sewer, Utility, and Related Casting Specification and M 105 and have a HS20 load rating.
5. Composite Locking Manhole Covers shall be strong, durable, even from fiber reinforced polymer (FRP). It shall consist of a FRP matrix consisting of between 45% to 70% fiber reinforcement by weight. Fiber reinforcement shall consist of fiberglass, carbon, aramid, basalt and/or natural fibers. The polymer matrix shall be thermoset consisting of a polyester, vinyl ester, epoxy, polyurethane, and/or hybrid chemical composition. The resin matrix must be thermoset. Composite



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Locking 24-inch Manhole Covers shall be smooth, free from scale, lumps, blisters, sand holes and defects of any kind.

6. Composite Locking Manhole Covers shall be of uniform quality, with a dimensional tolerance of 1/16 of an inch. The finished product will feature a strength to weight ratio of 750:1. There shall be no possibility of corrosion welding between the cover and the frame, preventing damage to the infrastructure when opening. Gasket system shall be integrated to reduce traffic shock and abatement of noise and malodors. Static Coefficient of Friction shall be 0.6 or greater, as described in ASTM C1028 Standard, in both wet and dry applications.
7. Composite Locking Manhole Covers shall be shall be machined to a true surface so that the cover does not rock in the frame no matter the position of the cover.
8. The Commission requires that the Composite Locking Manhole Covers shall be subjected to proof load testing as follows:
  - (a) Testing shall be in accordance with the National Institute of Standards Technology (NIST) standards.
  - (b) Composite Locking Manhole Covers shall be shall show no detrimental deformation or cracks when a proof load of 50,000-pounds is concentrated on an 9-inch by 9-inch area at the center of the cover for a 1-minute period of time.
  - (c) Permanent deformation shall not exceed 1/8-inch.
  - (d) All testing shall be at the supplier's expense.
9. Composite Locking Manhole Covers shall have a non-slip pattern cast on the top.
10. Composite Locking Manhole Covers shall be provided with individual permanent markings that are easily discernable and show the following:
  - (a) Name of the producing manufacturer and country of manufacture preceded by the words "Made in", such as "Made in USA"
  - (b) AASHTO designation or ASTM designation number
  - (c) Class by a number followed by a letter indicating the minimum tensile strength and size of test bar,
  - (d) Manufacturing date (MM/DD/YY),
11. The above markings are required, but the Commission will allow some variation in how the above markings are provided on the finished product. The design and



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location of the markings must meet and be subject to the approval of the Commission's aesthetic judgment.

12. The word "SEWER" shall be raised relief.
13. Composite Locking Manhole Cover shall fit any of the Standard 24-inch Manhole Frames and the dimensions of the cover must match existing frames and covers such that parts are interchangeable with both the new and existing manhole frame and covers.
14. Composite Locking 24-inch Manhole Cover dimensions shall be in accordance with **24" Composite Locking Sewer Cover Detail (S-02.65)**.
15. The Composite Locking 24-inch Manhole Cover shall have one (1) non-penetrating pick bar on one side that is approximately 1-inch by 1-1/2-inch with the slot/channel approximately 1-1/2-inch wide by 4-1/2-inch long, one (1) 1-1/4-inch diameter penetrating pick-hole, two 1/4-turn penta head latches on each side of the cover, a 23-3/4-inch (plus or minus 1/16-inch) diameter cover, and the rim shall be 1-inches thick (plus or minus 1/16-inch).
16. Composite Locking 32-inch Manhole Cover shall fit any of the Standard 32-inch Manhole Frames and the dimensions of the cover must match existing frames and covers such that parts are interchangeable with both the new and existing manhole frame and covers.
17. Composite Locking 32-inch Manhole Cover dimensions shall be in accordance with **32" Composite Locking Sewer Cover Detail (S-02.66)**.
18. The Composite Locking 32-inch Manhole Cover shall have one (1) non-penetrating pick bar on one side that is approximately 1-inch by 1-1/2-inch with the slot/channel approximately 1-1/2-inch wide by 4-1/2-inch long, one (1) 1-1/4-inch diameter penetrating pick-hole, two 1/4-turn penta head latches on each side of the cover, a 1-1/2-inch (plus or minus 1/16-inch) diameter cover, and the rim shall be 1-inches thick (plus or minus 1/16-inch).
19. The dimensions of the cover must match existing frames and covers such that parts are interchangeable with both the new and existing manhole frame and covers.



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### 7.5.14 Gasketed 24-inch Sewer Cover

1. Gasketed 24-inch Manhole Cover provided to the Springfield Water and Sewer Commission (Commission) or its Contractors or the Springfield Department of Public Works shall be manufactured, tested, inspected and delivered in full compliance with this Specification.
2. Gasketed 24-inch Manhole Cover shall, as a minimum, meet all specifications as in Paragraphs 7.5.1 and 7.5.2, and the following:
3. Gasketed 24-inch Manhole Cover shall fit any of the Standard 24-inch Manhole Frames and the dimensions of the cover must match existing frames and covers such that parts are interchangeable with both the new and existing manhole frame and covers.
4. The words “SPRINGFIELD WATER & SEWER COMMISSION” and the Commission Logo shall be raised relief.
5. The word “SEWER” shall be raised relief.
6. The Gasketed 24-inch Manhole Cover shall have two (2) non-penetrating pick bars on each side that are approximately 1-inch by 1-1/2-inch with the slot/channel approximately 1-1/2-inch wide by 4-1/2-inch long, a 23-3/4-inch (plus or minus 1/16-inch) diameter cover, and the rim shall be 1-1/4-inch thick (plus or minus 1/16-inch).
7. The Gasketed 24-inch Manhole Cover shall also include a continuous, self-sealing gasket cemented in a machine groove on the underside of the cover or as otherwise approved by the Commission.
8. The Gasketed 24-inch Manhole Frame shall have a minimum 21-3/4-inch diameter access opening.

### 7.5.15 Gasketed 32-inch Sewer Cover

1. Gasketed 32-inch Manhole Cover provided to the Springfield Water and Sewer Commission (Commission) or its Contractors or the Springfield Department of Public Works shall be manufactured, tested, inspected and delivered in full compliance with this Specification.
2. Gasketed 32-inch Manhole Cover shall, as a minimum, meet all specifications as in Paragraphs 7.5.1 and 7.5.2, and the following:





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3. Gasketed 32-inch Manhole Cover shall fit any of the Standard 24-inch Manhole Frames and the dimensions of the cover must match existing frames and covers such that parts are interchangeable with both the new and existing manhole frame and covers.
4. The words “SPRINGFIELD WATER & SEWER COMMISSION” and the Commission Logo shall be raised relief.
5. The word “SEWER” shall be raised relief.
6. The Gasketed 32-inch Manhole Cover shall have two (2) non-penetrating pick bars on each side that are approximately 1-inch by 1-1/2-inch with the slot/channel approximately 1-1/2-inch wide by 4-1/2-inch long, a 23-3/4-inch (plus or minus 1/16-inch) diameter cover, and the rim shall be 1-1/4-inch thick (plus or minus 1/16-inch).
7. The Gasketed 32-inch Manhole Cover shall also include a continuous, self-sealing gasket cemented in a machine groove on the underside of the cover or as otherwise approved by the Commission.
8. The Gasketed 32-inch Manhole Frame shall have a minimum 21-3/4-inch diameter access opening.

### 7.5.16 Pressure (locking) Manhole Frame and Cover 26-inch by 7-inch

1. Pressure (locking) Manhole Frame and Covers 24-inch by 8-inch shall meet all the requirements of the Gasketed Manhole Frame and Covers 24-inch by 8-inch with the following exceptions:
2. The 26-inch Pressure (locking) Manhole Frame shall have a seat cast in the frame to support the cover.
3. The 26-inch Pressure (locking) Manhole Frame shall have a self-sealing gasket cemented in a machine groove on the topside of the frame or as otherwise approved by the Commission.
4. Cam locks or J-bar locks shall be provided to secure the cover to the frame.
5. If cam locks are provided the 26-inch Pressure (locking) Manhole Frame shall have a minimum of three (3) cam lock supports cast into the frame. Each cam lock shall be provided with stainless steel cams, nuts, and bolts to secure cover to the frame.
6. If cam locks are provided the 26-inch Pressure (locking) Manhole Cover shall have a rabbit cast or machined around the outer diameter of the cover to allow the cam locks to secure the cover to the frame.





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7. If J-bar locks are provided the 26-inch Pressure (locking) Manhole Cover shall have a minimum of three (3) J-bar locks cast into the frame. Each J-bar lock shall be provided with stainless steel J-bars, nuts, and bolts to secure cover to the frame.
8. The 26-inch Pressure (Locking) Manhole Frame shall have a minimum 24-inch diameter access opening.

### 7.5.17 Pressure (locking) Manhole Frame and Cover 32-inch by 7-inch

1. Pressure (locking) Manhole Frame and Covers 32-inch by 7-inch shall meet all the requirements of the Gasketed Manhole Frame and Covers 32-inch by 7-inch with the following exceptions:
2. The 32-inch Pressure (locking) Manhole Frame shall have a seat cast in the frame to support the cover.
3. The 32-inch Pressure (locking) Manhole Frame shall have a self-sealing gasket cemented in a machine groove on the topside of the frame or as otherwise approved by the Commission.
4. Cam locks or J-bar locks shall be provided to secure the cover to the frame.
5. If cam locks are provided the 32-inch Pressure (locking) Manhole Frame shall have a minimum of three (3) cam lock supports cast into the frame. Each cam lock shall be provided with stainless steel cams, nuts, and bolts to secure cover to the frame.
6. If cam locks are provided the 32-inch Pressure (locking) Manhole Cover shall have a rabbit cast or machined around the outer diameter of the cover to allow the cam locks to secure the cover to the frame.
7. If J-bar locks are provided the 32-inch Pressure (locking) Manhole Cover shall have a minimum of three (3) J-bar locks cast into the frame. Each J-bar lock shall be provided with stainless steel J-bars, nuts, and bolts to secure cover to the frame.
8. The 32-inch Pressure (Locking) Manhole Frame shall have a minimum 30-inch diameter access opening.



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### 7.5.18 Coatings

No coatings are required for manhole frame and covers or covers.

### 7.5.19 Sewer Manhole Frame and Covers Makes and Models Approved for use by the Commission

The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.

1. East Jordan Iron Works
  - (a) MHF 24-inch by 4-inch, Part #: 1244 11
  - (b) MHF 24-inch by 6-inch, Part #: 1246 11
  - (c) MHF 24-inch by 8-inch, Part #: 1248 11
  - (d) MHF 26-inch by 6-inch, Part #: 2266 11
  - (e) MHF 32-inch by 6-inch, Part #: 1322 13
  - (f) MHF 32-inch by 8-inch, Part #: 2008 11
  - (g) Standard MHC 24-inch, Part #: 1246 74
  - (h) Standard MHC 32-inch, Part #: 2006 62
  - (i) Replacement MHC 26-inch, Part #: 2111 23
  - (j) Replacement MHC 30-inch, Part #: 2308 22
  - (k) Replacement MHC Composite Locking 24-inch, Part # COM 2401 29
  - (l) Replacement MHC Composite Locking 32-inch, Part # COM 3200 \_\_
2. Approved equal of another manufacturer provided the product(s) are manufactured as per these specifications.



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- (m) Gasketed MHF&C 24-inch by 8-inch, Part #: 00124674C03GS
- (n) Gasketed MHF&C 32-inch by 8-inch, Part #: 00200662C03GS
- (o) Gasketed MHF&C 24-inch by 8-inch, Part #: 00124674C03GS
- (p) Gasketed MHF&C 32-inch by 8-inch, Part #: 00200662C03GS
- (q) Gasketed MHC 24-inch, Part #: 00124811GS
- (r) Gasketed MHC 32-inch, Part #: 00200662GS
- (s) Pressure (locking) MHF&C 26-inch by 7-inch, Part #: 42339048W01
- (t) Pressure (locking) MHF&C 32-inch by 7-inch, Part #: 41420041W01



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### Section 7.6 FLEXIBLE MANHOLE SLEEVES/SEALS

#### 7.6.1 General

1. Manhole sleeves, gaskets, and sealants for Pre-cast Manholes provided to the Commission or Installers shall be manufactured, tested, inspected and delivered in full compliance with this Specification.
2. Manhole sleeves, gaskets, and sealants for Pre-cast Manholes shall be furnished complete with lubricants, stainless steel stops, inserts, clamps, etc.
3. Manhole sleeves, gaskets, and sealants for Pre-cast Manholes shall assure water tightness and permanent seal.
4. Delivery shall be specified in terms of number of days from receipt of order.
5. The manufacturer/vendor/shipper must use care in preparing the above items for shipment and in handling during shipment and delivery, to insure that the above items are delivered without damage. Damaged items will not be accepted.
6. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above items and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable ASTM Standards.
7. References

The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

- (a) Name of Municipality/Utility
- (b) Total amount of product bid on and amount delivered
- (c) Date the bid was accepted and date the product was delivered
- (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product

#### 7.6.2 Flexible Sleeve/Seals from Pre-cast Concrete Manhole Manufacturer

Flexible sleeves/seals from Pre-cast Concrete Manhole Manufacturer shall be New Lok Joint Flexible Sleeve by Interpace, A-Lok Manhole sleeve by L & L Concrete Products, Press Wedge II by Pre-Seal Basket Corporation, or equal products of another manufacturer.

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### 7.6.3 Flexible Sleeve/Seals Field Applied

Flexible sleeves/seals Field Applied shall be K or N Seal boot, or equal products of another manufacturer.



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### Section 7.7 NON-SHRINK GROUT

1. Non-Shrink Grout provided to the Commission or Installers shall be manufactured, tested, inspected and delivered in full compliance with this Specification.
2. Grout shall be non-shrink and waterproof.
3. Grout shall be Hallemite, Waterplug, Embeco or approved equal. Plastic pipes shall have a water-stop gasket secured to pipe with a stainless steel clamp.
4. Delivery shall be specified in terms of number of days from receipt of order.
5. The manufacturer/vendor/shipper must use care in preparing the above items for shipment and in handling during shipment and delivery, to insure that the above items are delivered without damage. Damaged items will not be accepted.
6. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above items and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable ASTM Standards.
7. References

The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:

- (a) Name of Municipality/Utility
- (b) Total amount of product bid on and amount delivered
- (c) Date the bid was accepted and date the product was delivered
- (d) Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product



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### CHAPTER 8 SEWER PUMP STATIONS

#### Section 8.1 SUBMERSIBLE SEWAGE PUMP STATIONS

##### 8.1.1 General

1. The submersible pumping station shall include all materials, equipment and incidentals required to install wastewater pumping stations with all related interior piping and electrical works as specified herein and in accordance with the **Pre-cast Wet Well and Valve Vault Detail (S-06.0)**, unless otherwise approved by the Commission.
2. Pumps shall be designed for use in wastewater non-clog submersible pumping stations.
3. Reference to specific manufacturers is for the purpose of establishing a quality or parameter for specification writing and not to be considered proprietary.
4. One complete spare pump with motor, power and signal cable, attachments to the guide rails, and pipe connection adaptor for the wastewater pumping station is required.
5. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;
  - (a) North America shall mean the United States, Canada, and Mexico,
  - (b) Cast shall mean molten metals poured into a mold to create casting(s) for a finished product,
  - (c) Incidental parts may be purchased/obtained from other countries to provide a finished product , in accordance with these Material Specifications, and
  - (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or
  - (e) The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement govern.
- 6.



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### 8.1.2 Submersible Sewage Pumps – Quality Criteria

1. The system shall be furnished by a single supplier who shall be responsible for the coordination of the system design and who shall assume complete responsibility for the proper installation and operation of the system. All parts shall be properly stamped for identification and location. Nameplates giving the name of the manufacturer, the rated capacity, head, speed and all other pertinent data shall be attached to each pump and motor.
2. All equipment furnished shall be new and unused, shall be the standard product of manufacturers having a successful record of manufacturing and servicing the equipment and systems specified herein for a minimum of 5 years.
3. All the equipment specified herein is intended to be standard equipment for pumping all material found in domestic wastewater.

### 8.1.3 Submersible Sewage Pumps and Pumping System

1. The design characteristics of the pump station shall be and in accordance with the **Pre-cast Wet Well and Valve Vault Detail (S-06.0)**, and as specified herein, unless otherwise approved by the Commission.
2. Two non-clog submersible pumps shall be installed in the pumping station wet well. The two pumps shall be programmed to operate in an alternating lead/lag mode.
3. Pumps shall be automatically started from high level switch and automatically stopped from a low level switch. An alternating switch shall be provided in the control panel such that the operation of one pump shall switch the next automatic start to the other pump. The pumps shall also be capable of manual operation from the control panel.
4. Each of the two pumps shall be sized to handle the maximum flows, thus the pumping system shall provide 100% redundancy.
5. At least one pump shall be equipped with a backwash valve or flush valve. The flush valve shall be designed to allow a minimum of 30 seconds circulation of wastewater in the wet well to re-suspend and de-sludge settled solids.
6. The non-clog pumps and motors shall be designed and manufactured so they can operate completely submerged in the sewage and wastewater. Pump motors shall run indefinitely without overheating with motors un-submerged.





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7. The centrifugal pump impeller unit shall be attached to a common motor and pump shaft of stainless steel. Pump and motor housings shall be high quality gray iron castings. Impeller shall be single vane cast iron.
8. All fasteners, excluding joint accessories, shall be made of Grade 316 stainless steel. Bolts shall be in accordance with ASTM A193 grade B8, latest revision. Nuts shall be in accordance with ASTM A194 grade 8, latest revision. Bolts and nuts shall be Unified National Coarse (UNC) rolled thread and heavy-duty hex nuts. Bolts installed into castings shall be provided with one (1) Grade 316 stainless steel flat washer and nuts and bolts shall be provided with two (2) Grade 316 stainless steel flat washers so that the epoxy coating is not damaged. At a minimum, nuts shall be coated with fluorocarbon, epoxy, zinc, or other anti-corrosion coating to help prevent galling.
9. To prevent galling; all stainless steel bolts shall be coated on the outside of all threads and the stainless steel nuts or castings on the inside of all threads at the factory, with an anti-seizing material such as provided by Henkel Technologies, Rocky Hill, Connecticut - product name: Loctite Nickel Anti-Seize Lubricant; Chesterton Technical Products, Stoneham, Massachusetts – product name: Chesterton 772 Premium Nickel Anti-Seize Compound; Permatex Inc. Hartford, Connecticut – product name: Permatex Nickel Anti-Seize Lubricant or equal product of another manufacturer and as specified in Section 3.18 of these Specifications.
10. The pump-motor shaft shall be sealed by two mechanical tungsten carbide faced seals within an oil filled chamber to provide clean, constant lubrication. The shaft shall be supported by an upper ball radial and thrust bearing and a two row angular contact lower bearings both grease lubricated. The upper bearing shall be supported by an O-ring sealed, movable cap so that impeller clearance may be adjusted externally for most efficient operation.
11. The motor winding and rotor shall be mounted in a sealed, submersible type housing which is able to transmit heat from motor winding to outer housing. Motor winding shall be Class F insulated and securely held in the housing with machine screws so that it may be removed in the field without the use of heat or a press.
12. Pump motors shall be air filled and shall have cooling characteristics suitable to permit continuous operation in a totally, partially or non-submerged condition. Jacket water-cooling shall not be required. The pump and motor shall be capable of running without damage for extended periods. Pump and motor shall be explosion-proof, suitable for Class 1, Division 1, Group C or D applications. Motor shall be provided with pilot thermal sensors embedded in the stator windings. Pumps shall have factory installed moisture detectors (seal failure probes) in the seal chamber.



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13. The impellers shall be of the semi-open, single vane, non-clog type with the forward ends of the blades generously rounded to avoid catching trash. The blades shall be tapered toward the periphery of the impeller to generate the maximum possible shutoff head, and the outer tips of the blades shall occupy only a negligible portion of the area of the impeller throat or periphery. The impellers shall be accurately balanced before assembling.

### 8.1.4 Pumps Station Chambers – Wet Well and Valve Vault

1. The Wet Well and Valve Vault of the pump station shall be and in accordance with the **Pre-cast Wet Well and Valve Vault Detail (S-06.0)**, and as specified herein, unless otherwise approved by the Commission.
2. The underground pump station chambers shall of reinforced concrete construction.
3. Pre-cast concrete barrel sections and pre-cast bases shall conform to ASTM C478, and shall meet the following requirements.
4. No pump station chamber shall be less than 72-inches in diameter.
5. The wall thickness shall not be less than:

Diameter (inches)	72	84	96
Wall Thickness (inches)	7	8	9

6. Structure walls shall be designed for an equivalent water pressure of 90 Pounds per Square Foot (PSF). Pressure diagram shall originate at finished ground surface. Lateral pressure from vehicles shall be included in accordance with AASHTO.
7. Barrel sections shall have tongue and groove gasketed joints.
8. All sections shall be cured and shall not be shipped nor subjected to loading until after 5 days after fabrication and/or repair, or when the concrete compressive strength has attained 5,000 PSI, whichever is longer.
9. Pre-cast concrete barrel sections with pre-cast top slabs shall be designed for a minimum of H-20 loading plus the weight of the soil above. Cracked and/or chipped slabs will not be accepted unless manufacturer's proposed repair methods and manufacturer's guarantees are reviewed and approved by the Commission.
10. The date of manufacture and the name and trademark of the manufacturer shall be clearly marked on the inside of each pre-cast section.



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11. Pre-cast concrete base shall be constructed and installed as recommended by the manufacturer and/or detailed by the design engineer. However, the thickness of the bottom slab of the pre-cast base shall not be less than the manhole barrel sections or the top slab, whichever is greater. Bolting of the structure to the base slab shall be with Type 304 stainless steel bolts.
12. The pre-cast base shall be firmly anchored to a reinforced concrete slab designed such that the pumping station is able to fully resist flotation when the groundwater elevation is at the finished ground surface level.
13. The design shall resist flotation and shall account for the dead weight of the structure and base in addition to soil load above the structure. Accounting for skin friction, soil friction, or weight of equipment in the structure is not allowed. Flotation safety factor shall be not less than 1.15.
14. Entrance hatches for the concrete chambers (both wet well and valve vault) shall be aluminum single leaf 30-in by 48-in, complete with upper guide holder, chain holder, and cable holder for pumps. Hatches shall be designed with lift assisting springs for easy opening and closing, and with hold-open arm with red vinyl grip handle that automatically locks cover in the open position against weight and wind. Hatches shall be equipped with a locking mechanism that can be unlocked only by the operator.
15. Hatches shall be designed for H-20 loading.
16. Manhole rungs shall be reinforced steel, copolymer polypropylene, 14-in wide, M.A. Industries Inc, PF Series or equal. Copolymer polypropylene shall conform to ASTM D4101 Classification PP0344 B33534 Z02. Steel reinforcing shall be 1/2-in diameter, conforming to ASTM A615, Grade 60 and shall be continuous throughout rung. Manhole rungs shall meet all OSHA requirements. No rungs shall be allowed in the wet well chamber.
17. The wet well chamber shall be supplied with pump mounting plates with upper and lower rail supports attached to the concrete with stainless steel expansion bolts. Two (2) 2-inch stainless steel pipe or fiberglass I-beam rails shall be installed between the mounting plates. The rails shall be used to raise and lower the pumps into the stations. A stainless steel lifting cable shall be attached to the top of each station chamber and to the top of each pump assembly.
18. The valve vault shall be designed with a minimum internal vertical clearance of 7-feet.



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### 8.1.5 Pumps Station Controls and Ancillary Equipment

1. Sealed tilt type switches shall be supplied to control wet well level and alarm signal. The mercury switches shall be sealed in a solid polyurethane float for corrosion and shock resistance. The support wire shall have a heavy Neoprene jacket. A weight shall be attached to each cord above the float to hold each switch in place in the wet well. The weight shall be placed above or inside the float to effectively prevent sharp bends in the cord when the float operates. The float switches shall hang in the wet well supported only by the cord. Four float switches shall be used to control and signal level; one for high level alarm, one for pump turn-on, one for pump turn-off and one for low-level alarm.
2. The Commission may approve an alternate wet well level control set up utilizing an ultrasonic level transducer and one tilt type switch for high level alarm. The Commission may consider this method if the Commission is satisfied that physical and hydraulic conditions in the wet well do not impede the accuracy of the ultrasonic transducer readings. The Commission reserves the right to reject this method at its own discretion.
3. Level settings shall be as designed to ensure a minimum pumping cycle of 15 minutes under maximum flows.
4. Power cables shall be suitable for submersible pump and Class 1, Division 1, Group C or D applications. Cable sizing shall conform to National Electrical Code specifications for pump motors. Cable entry to each pump motor shall be designed for submersible pump applications. The cable entry junction box and motor shall be separated by a stator load sealing gland which shall isolate the motor interior from foreign materials gaining access through the pump top. The electrical power cords shall be sealed by use of a cord grip, with individual conductors additionally sealed into the cord cap assemblies with epoxy sealing compound.
5. The cord grip shall have a male tapered pipe thread, threaded into a female tapered pipe thread in a cord cap. The cord cap shall be sealed into the motor housing with an O-ring. The pumps shall be supplied with a sufficient length of cord to connect to junction boxes inside the station.
6. Level settings shall be as follows:
  - (a) On wet well level rise, the "pump OFF" level mercury switch shall be energized. When the level reaches the "pump ON" level switch, it shall be energized and send a signal to the control panel and automatically turn on a pump. One pump shall operate until the wet well level drops down to the "pump off" and the switch automatically turns the pump off. Under normal operation, the duty and standby pumps shall alternate service after each pump cycle is complete and the in-service pump called to stop.



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- (b) If wet well level rises to the high water level or falls to the low water level, the alarm level switches shall be energized with an alarm signal that there is a malfunction at the Pumping Station. Upon high water level alarm, the duty pump shall be called to stop and the standby pump shall be started in its place. The high water alarm shall also disable the alternation circuit to prevent re-starting of the faulty pump. A momentary contact pushbutton shall be provided and mounted within the control panel to reset the alternator circuit once both pumps have become operational.
  - (c) Should the duty pump fail to start, the standby pump shall be automatically started after a one minute time delay, the failed duty pump shall be locked out, an alarm transmitted and the standby pump shall continue to operate through every cycle. Both pumps shall not be capable of running at the same time when operating in the automatic mode. Each pump shall be capable of being operated manually from the control panel. All level switches shall be adjusted for level setting from the surface.
7. Each float switch shall have a sufficient length of cord, be intended for submersible service and Class 1, Division 1, Group C or D applications, such that the switches can be connected to junction boxes inside the station.

### 8.1.6 Pumps Station Control Panels

1. The control panels shall be housed in the emergency generator building.
2. Unless approved by the Commission, power supply to the control panels shall be 480 Volts, 3-Phase, 60 Hz. A combination motor circuit protector / disconnect switch and magnetic starter with Class 10 overload protection, and two NO, two NC contacts shall be provided for each pump.
3. The motor circuit protector disconnect switch shall have short circuit rating of 22,000 AIC and shall be interlocked with the door handle of the control panel. An interlock relay shall be provided to automatically re-connect the control circuit in case of circuit breaker trip on one pump. Each pump control circuit shall be supplied with an H-O-A switch, on-off lights LED Type Cluster and running time meter.
4. An automatic alternator shall be provided to alternate the sequence of operation of the pumps on the completion of each pumping cycle. Terminal strips shall be provided for connecting pump and control wires. Additional terminals shall be provided to connect alarms. A transformer shall be supplied to provide 24-volt power to the control circuit. An essentially safe barrier relay shall be provided between each float level switch and the terminal strip in the pump control panel. Relays shall be GEM Safe-Pac Division of Delaval or equal.



# Springfield Water and Sewer Commission

## Material Specifications

5. Lockout-Tag out provision shall be provided. At a minimum, provisions shall be provided to padlock unit disconnect handles in the OFF position with up to three padlocks.
6. The following control panel mounted indicating lights and nameplates shall be included:
  - (a) High Level
  - (b) Low Level
  - (c) Moisture in Motor No. 1
  - (d) Moisture in Motor No. 2
  - (e) Over-heating - Motor No. 1
  - (f) Over-heating - Motor No. 2
7. All alarms shall be common to an output contact rated 5 amperes at 120 VAC. See SCADA requirements in Section---

### 8.1.7 Pumps Station Communication System

1. The pump station shall be equipped with radio contact and SCADA system for relay of alarms and monitoring signals to pump station operator.
2. Radio/SCADA systems must be compatible with the Springfield Water and Sewer Commission Operator's system, namely United Water (UW). Contact UW at (413) 732-0293 for coordination of design/procurement of communications equipment.

### 8.1.8 Pumps Station Piping and Valves

1. Ductile iron (DI) pipe shall be used for sewer pump station piping and shall be in accordance with the **Pre-cast Wet Well and Valve Vault Detail (S-06.0)** and as specified herein, unless otherwise approved by the Commission.
2. DI pipe shall conform to AWWA C151, and shall in accordance with the Commission's Material Specifications for Water Pipe – Flanged Ductile Iron Pipe, unless otherwise approved by the Commission.
3. Gaskets shall be full-face rubber ethylene propylene diene Monomer (EPDM) rubber in accordance with [ASTM](#) standard D-1418 with cloth insertion, 1/8-in thick and shall conform to the dimensions shown in Table A.1 of AWWA C115, unless otherwise approved by the Commission.



# Springfield Water and Sewer Commission

## Material Specifications

4. Flanged joints shall be supplied with bolts, bolt studs with a nut on each end, or studs with nuts where the flange is tapped. The number and size of bolts shall conform to the same standard as the flange. Low carbon steel bolts and nuts shall conform to ASTM A307, Grade B.
5. Fittings shall be ductile iron, shall have the same pressure rating as the DI pipe, shall be in accordance with the Commission's Material Specifications for Ductile Iron Pipe Fittings and provided in accordance with the **Pre-cast Wet Well and Valve Vault Detail (S-06.0)** and as specified herein, unless otherwise approved by the Commission Fittings.
6. All pipe and fittings shall have a double thick cement mortar lining and bituminous seal coat on the inside, in accordance with AWWA C104.
7. All pipe and fittings shall have a bituminous seal coat on the outside, in accordance with AWWA C104.
8. The valves for isolation shall be flanged gate valves, and shall be in accordance with the Commission's Material Specifications for Gates Valves for pressure class 250, and provided in accordance with the **Pre-cast Wet Well and Valve Vault Detail (S-06.0)** and as specified herein, unless otherwise approved by the Commission
9. The check valves required for prevention of backflow shall be flanged, 250 psi working pressure, bronze-mounted, with bronze seat ring and bronze gate ring. Check valves shall comply with the applicable portions of AWWA Standard for Gate Valves. Valves shall be fitted with an extended hinge arm with outside lever and spring.
10. Sleeve type couplings for exposed ductile iron pipe shall be of steel construction and shall be in accordance with the Commission's Material Specifications for Couplings, and provided in accordance with the **Pre-cast Wet Well and Valve Vault Detail (S-06.0)** and as specified herein, unless otherwise approved by the Commission. Gaskets shall be of a composition resistant to wastewater components.

### 8.1.9 Pressure Gauges

1. Pump Station Pressure Gauges shall have a 4-1/2-in nominal diameter black case with phosphor bronze Bourdon tubes (beryllium copper bellows), 1/4-in NPT male connections, stainless steel rack and pinion movement micro-adjustment for calibration, white dials and black figures and threaded ring case. All gauges shall be furnished with factory mounted protective diaphragm attachment suitable for wastewater service. Gauges shall read 0 to 50 PSI unless otherwise required by design conditions and as approved by the Commission.





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## Material Specifications

2. Pump Station Pressure Gauges shall be provided with copper nipples complete with "T"-handle cocks. Nipples shall be at least 2-in long and provided with elbows for easy installation and reading of the gauges.
3. Gauges shall be manufactured by U.S. Gauge, Feasterville, PA; Crosby-Ashton, Wrentham, MA; or approved equal.

### 8.1.10 Vent

1. Vent shall be Steel Schedule 40, ASTM A53, hot-dipped galvanized with threaded, 150 lb, hot-dipped galvanized malleable iron fittings.
2. Vent shall be provided with a stainless steel bug screen.
3. The Commission may consider an alternate, such as Schedule 80 PVC for material depending on Pump Station location, site accessibility and proximity to traffic. Approval of this alternative is at the sole discretion of the Commission.

### 8.1.11 Emergency Power Generation

1. Pump station shall be equipped with a stand-by emergency power generation source.
2. Power generators shall be provided to supply adequate power required to energize the pumps at full flow capacity, and the pump station electrical and incidental systems.
3. Type of fuel, storage capacity, and storage location shall be approved by the City of Springfield Fire Department.
4. Power generators shall be Cummins, Caterpillar, or approved equal.

### 8.1.12 Housing for the Emergency Power Generation

1. The housing shall be pre-cast concrete building and sized and configured to adequately house all equipment and incidentals specified herein including, but not limited to, the emergency power generator, pump station control panels, transfer switch, generator controls, heaters, SCADA and communication equipment, and anything else incidental to the pump station design and as required by the design engineer.
2. The building shall meet American Concrete Institute (ACI) 318-02, the Building Code Requirements for Structural Concrete IBC 2003, and City of Springfield Code Enforcement requirements, all the latest versions,
3. Minimum design criteria:





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- (a) Floor live load: as required by weight of generator. Minimum 150 psf
  - (b) Roof live load: 60 psf unless otherwise directed by the design engineer
  - (c) Wind Load: 130 mph
  - (d) Load factors: Live = 1.7; Dead = 1.4
  - (e) Concrete minimum compressive strength: 5,000 psi @ 28 days, reinforcing steel shall meet ASTM A615, Grade 60
4. The housing shall be suitable for securing the power generator unit; shall provide weather and sound attenuation; and shall be designed to meet the cooling air flow, heat exchange, exhaust air, sound muffling, space heating and all else required by the emergency generator unit manufacturer.
  5. The housing façade shall be brick, wood, vinyl, or other type of siding as approved by the Commission. The Commission shall select the building façade type that is most similar to the pump station area houses/buildings.
  6. Roof shall consist of weather proof shingles and UV blockers, shall be resistive to cracking and splitting and shall be non-combustible providing a UL Class A fire rating.
  7. Prefabricated housing units may be proposed for the Commission's consideration. The Commission reserves the right to approve or reject this alternative at its sole discretion.

### 8.1.13 Pump Station Site

Pump station site shall be in accordance with the Commission's Guidelines and Policies.

### 8.1.14 Submittals

1. Submittals are required at time of bid award, at time of purchase, or as required by the Commission's Purchasing Agent.
2. Shop drawings detailing all materials, equipment performance information, and design drawings including structural, architectural, mechanical, civil and general. All design drawings shall be stamped by a professional engineer registered in the Commonwealth of Massachusetts.
3. Pumps manufacturer shall include rating curves and details of pump construction. The curves shall indicate head, discharge rate, pump efficiency, and horsepower characteristics throughout the full operating range.



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4. Stand-by power generator manufacturer shall include generator unit dimensions, weight, fuel consumption rates, radiator cooling air requirement, combustion air volume, heat radiated to room, noise level, and all else required for completing the pump station design.
5. A pump station testing, startup, and operation plan listing name of qualified pump station operator(s) who is responsible of testing, operating, maintaining, and monitoring the pump station.



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## Material Specifications

### CHAPTER 9 LOW PRESSURE SANITARY SEWER SYSTEMS

#### Section 9.1 Low Pressure Sanitary Sewer (LPSS) Systems

##### 9.1.1 Low Pressure Sanitary Sewer – General

1. The Low Pressure Sanitary Sewer System shall include all materials, equipment and incidentals required to install the low pressure system, the low pressure lateral, and the grinder pump station with all related piping, structures, boxes, pump stations, and electrical works as specified herein and in accordance with the **Low Pressure Sanitary Service / Main 2-1/2-inch Valve Box in Non-Paved Areas Detail (S-09.1)**, **Low Pressure Sanitary Sewer Pipe Trench Detail (S-09.2)**, **Low Pressure Sanitary Sewer Service Lateral Detail (S-09.3)**, **Low Pressure Sanitary Sewer Main Inline Flushing Structure Detail (S-09.4)**, and **Low Pressure Sanitary Sewer Terminal flushing Structure Detail (S-09.5)**, unless otherwise approved by the Commission.
2. Pumps shall be designed for use in wastewater non-clog submersible pumping stations.
3. Reference to specific manufacturers is for the purpose of establishing a quality or parameter for specification writing and not to be considered proprietary.
4. One complete spare pump with motor, power and signal cable, attachments to the guide rails, and pipe connection adaptor for the wastewater pumping station is required.
5. The product(s) shall have all parts cast and assembled in North America or meet the requirements of the American Iron & Steel (AIS), as follows;
  - (a) North America shall mean the United States, Canada, and Mexico,
  - (b) Cast shall mean molten metals poured into a mold to create casting(s) for a finished product,
  - (c) Incidental parts may be purchased/obtained from other counties to provide a finished product , in accordance with these Material Specifications, and
  - (d) Assembled shall mean castings and sourced parts are put together to build a finished product, or
6. The finished product shall meet all the requirements of the AIS language, and all guidance issued by the EPA. For any Massachusetts State Revolving Fund (SRF) project this requirement govern.

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## Material Specifications

7. Delivery shall be specified in terms of number of days from receipt of order.
8. The manufacturer/vendor/shipper must use care in preparing the above items for shipment and in handling during shipment and delivery, to insure that the above items are delivered without damage. Damaged items will not be accepted.
9. The manufacturer and/or vendor, on request, shall provide the purchaser with an affidavit for each and every delivery of an order, stating that the above items and all materials in its construction exactly conform to the applicable requirements of these specifications to include the applicable ASTM Standards.
10. References
  - (a) The Supplier shall provide references, on request, which shall list a minimum of three (3) Municipalities/Utilities that were, supplied this product, in the last two (2) years. The listing is to include:
    - Name of Municipality/Utility
    - Total amount of product bid on and amount delivered
    - Date the bid was accepted and date the product was delivered
    - Reference person with address and desk top phone number whom the Commission has authorization to contact regarding the product
11. This specification section is intended to establish the minimum criteria and requirements for private grinder pump stations to be installed on private property for sewer service for a location which cannot be served by gravity sewer.
12. The Commission is not responsible for the design, procurement, delivery, installation, and maintenance of grinder pump station units.
13. Each grinder pump station shall conform to all state, federal, and local regulations, and meet accepted standards for plumbing equipment for use near residences. It shall be free from noise, odor, or health hazards, and shall have been tested by an independent laboratory to certify its capability to perform as specified in either individual or low pressure sewer system applications. As evidence of compliance with this requirement, the grinder pump shall bear the National Sanitation Foundation seal.
14. Sewage grinder pump stations and appurtenances are private structures that are to be owned, operated, and maintained by the property Owner.
15. The grinder pump station supplier, or manufacturer, and project Engineer of Record shall participate in the installation and start-up testing of the grinder pump station.



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## Material Specifications

### 9.1.2 Low Pressure Sanitary Sewer – Mains < 3 inch Diameter

1. Pipe provided to the Commission or Installers shall be manufactured, tested, inspected and delivered in full compliance with this Specification and Section 9.1.1 of these Material Specifications.
2. Pipe provided to the Commission or Installers shall be manufactured, tested, inspected and delivered in full compliance with this Specification.
3. All pipe and fittings furnished shall be clearly marked on the outside indicating name, manufacturer, nominal diameter, ASTM, schedule, and/or pipe or pressure class designation.
4. All materials used for the pressure portion of these systems must be pressure rated at a minimum of 160 psi operating pressure and suitable for the wastewater environment and resistant to corrosion.
5. All pipe and fittings shall be 100 percent hydrostatically tested to 150 psi in the factory.
6. All metal components and hardware shall be 304 stainless steel unless otherwise specified herein or approved by the SWSC.
7. Pipe and fitting material shall be one of the following SDR-21 PVC, Sch 40 PVC, or SDR-11 HDPE per ASTM D 3035. Final determination of the type and size is the responsibility of the project owner's consulting engineer (MA P.E.) and must be approved by the SWSC.

### 9.1.3 Low Pressure Sanitary Sewer – Mains < 3 inch Diameter – Pre-Insulated

1. Pre-Insulated Pipe provided to the Commission or Installers shall be manufactured, tested, inspected and delivered in full compliance with this Specification and Section 9.1.1 and Section 9.1.2 of these Material Specifications.
2. The insulation shall be a foamed in place closed cell polyurethane which completely fills the annular space between the carrier pipe and the exterior casing. The insulation shall have the following physical properties:
  - (a) Minimum Density (lb./cu. ft.) 2.0 ASTM D-1621
  - (b) Closed Cell ASTM D-2856
  - (c) "K" Factor BTU/Hr. sq. ft. °F/in. 147 ASTM C-177
3. The exterior casing shall be High Density Polyethylene (H.D.P.E.) ASTM D-1248 with the following physical properties:



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## Material Specifications

- (a) ASTM D-3350...Resin Type III, Grade P34
  - (b) ASTM D-638...Ultimate Elongation 850%
  - (c) ASTM D-638...Tensile Yield Strength 3300 psi
  - (d) ASTM D-790...Tangent Flexural Modules 175,000 psi
4. The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.
- (a) Urecon Pre-Insulated Pipe,
  - (b) Perma Pipe,
  - (c) Tricon, or
  - (d) Approved equal product of another manufacture provided the product(s) are manufactured as per these Material Specifications.

### 9.1.4 Low Pressure Sewer System – Engineered Thermoplastic Fittings

1. Plastic fitting components provided to the Commission or Installers shall be manufactured, tested, inspected and delivered in full compliance with all applicable ASTM standars, this Specification, and Section 9.1.1 of these Material Specifications.
2. All pipe connections shall be made using compression fitting connections including a Buna-N O-ring for sealing to the outside diameter of the pipe. A split-collet locking device shall be integrated into all pipe connection fittings to securely restrain the pipe from hydraulic pressure and external loading caused by shifting and settling.

### 9.1.5 Low Pressure Sewer System – Service Lateral Kit

1. The Service Lateral Kit provided to the Commission or Installers shall be manufactured, tested, inspected and delivered in full compliance with this Specification and Section 9.1.1 of these Material Specifications.
2. The Service Lateral Kit shall prevent backflow from the sewer main and into the grinder pump station.
3. The Service Lateral Kit shall be sized to match LPSS main pipe diameter.



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## Material Specifications

4. The Service Lateral Kit (exclusive of piping) shall consist of three (3) compression fittings, one (1) combination curb stop/check valve assembly and one (1) curb box.
5. The Curb Stop and Check Valve Assembly shall be 316 stainless steel and have a two-piece cast 316 stainless steel housing, creating a unilateral body. All plastic compression fittings are to be molded from polypropylene and shall be tested for resistance to aging, pressure rating, tensile strength, and flexural strength. All components shall incorporate compression fitting connections for easy, reliable installation of piping. The lateral kit shall be rated for 150 psi service.
6. Curb Stop and Check Valve Assembly shall be designed for use with HDPE and PVC pressure sewer piping.
7. Curb Stop and Check Valve Assembly shall be an integrated stainless steel ball valve curb stop and check valve and be fully field serviceable with a top service port that allows access to check valve and hinge pin.
8. Curb Stop and Check Valve Assembly shall be designed and tested to 235 psi service pressure.
9. Curb Stop and Check Valve Assembly shall be pressure-tight in both directions. The ball valve actuator shall include position stop features at the fully opened and closed positions.
10. Curb Stop and Check Valve Assembly check valve shall be integral with the curb stop valve. The check valve will provide a full-ported 1-1/4" passageway and shall introduce minimal friction loss at maximum rated flow. The flapper hinge design shall provide a maximum degree of freedom and ensure seating at low back pressure.
11. The following products have been approved for use by the Commission. Any change in any component(s) of the product that does not allow for interchangeability of the component(s) shall result in the product no longer being approved and removed from this list.
  - (a) Uni-Lateral E/One assembly — NB0184PXX or NC0193GXX, or
  - (b) Approved equal product of another manufacture provided the product(s) are manufactured as per these Material Specifications.

### 9.1.6 Terminal Flushing Structure

1. The Terminal Flushing Structure provided to the Commission or Installers shall be manufactured, tested, inspected and delivered in full compliance with this Specification and Section 9.1.1 of these Material Specifications.



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2. The Terminal Flushing Structure shall be standard pre-cast barrel section combinations of 1', 2', 3' or 4' lengths as needed.
3. Pre-cast reinforced concrete manhole sections conforming to ASTM c478.
4. Pre-cast reinforced manhole sections shall have design loading per AASHTO HS20-44, ACI 318-83; ASTM c478-82, c890-82, c913-71.
5. Pre-cast reinforced manhole sections shall be either tongue and groove joints or bell and spigot joints with the following gaskets:
  - (a) Tongue & groove gasket shall be o-ring rubber gasket conforming to ASTM c443
  - (b) Bell & spigot gasket shall be butyl rubber gasket joints conforming to ASTM c990
6. The Terminal Flushing Structure shall be provided with (2) coats of bituminous damp proofing.
7. Pre-cast reinforced concrete manhole concrete and reinforcing shall conform to the following:
  - (a) Pre-cast concrete shall be 5,000 psi @ 28 days.
  - (b) Admixtures, air & plasticizers per ASTM c233-82.
  - (c) Reinforcing per ASTM a615 for wire fabric.
8. The Terminal Flushing Structure shall be provided with one (1) 316 stainless steel fully ported quarter turn ball valve, with a corrosion resistant handle and installed inside the manhole and the following:
  - (a) A 1-inch MPT 316 stainless steel flushing connection and cap.
  - (b) The LPSS pipe, fittings, and valves shall be restrained every 18-inches with  $\frac{3}{4}$ -inch threaded rod 1-1/2-inch wide X 1/8-inch thick anchor straps.

### 9.1.7 Inline Flushing Structure

1. The Inline Flushing Structure provided to the Commission or Installers shall be manufactured, tested, inspected and delivered in full compliance with this Specification and Sections 9.1.1 and 9.1.6 of these Material Specifications.





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## Material Specifications

2. The Inline Flushing Structure shall be provided with two (2) 316 stainless steel fully ported quarter turn ball valve, with a corrosion resistant handle and installed inside the manholes.

### 9.1.8 Sanitary Sewer Manhole

1. The Sanitary Sewer Manhole provided to the Commission or Installers shall be manufactured, tested, inspected and delivered in full compliance with this Specification and Section 7.5 of these Material Specifications.
2. Frame shall be a standard 32-inch by 8-inch in accordance with **Sewer Frame and Cover Detail (S-02.56 and 02.62)**

### 9.1.9 Detectable Warning Tape

1. Detectable Warning Tape provided to the Commission or Installers shall be manufactured, tested, inspected and delivered in full compliance with this Specification and Section 9.1.1 of these Material Specifications.
2. Detectable warning tape shall meet the following requirements:
  - (a) "Caution Buried Force Main Below", green color for sewer
  - (b) Minimum thickness of 5-mil, with a solid aluminum foil core.
  - (c) Construction is 2-mil clear film, reverse print laminated to aluminum foil to 2-mil clear fill making the film permanently printed.
  - (d) Minimum width of 3 inches
  - (e) Color coded green for sewer
  - (f) Tensile strength of 35 lfs/in (15,000psi)
  - (g) Elongation of 80%
  - (h) Adhesives with a value of Morton 548 or higher
  - (i) Bottom layer of virgin PE
  - (j) Top layer of virgin PET printability value of 45 dynes
  - (k) Rated for direct burial
  - (l) Proline part #103123083 or approved equal



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### 9.1.10 LPSS Service Lateral Valve Box

1. LPSS Service Lateral Valve Box provided to the Commission or Installers shall be manufactured, tested, inspected and delivered in full compliance with this Specification, Section 4.5, and Section 9.1.1 of these Material Specifications.
2. LPSS Service Lateral Valve Box shall have the word “SEWER” cast into cover.



## SWSC GUIDELINES AND POLICIES

Last Modified: 04/09/2025 at 10:39AM EDT

# **SPRINGFIELD WATER AND SEWER COMMISSION**



## **GUIDELINES AND POLICIES**

**Version 4 – November 1, 2020**

William E. Leonard, Commissioner  
Vanessa Otero, Commissioner  
Daniel Rodriguez, Commissioner



# Springfield Water and Sewer Commission

## Guidelines and Policies

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## Guidelines and Policies

### CHAPTER 1 REVISIONS

1. Version 1 of these Guidelines and Policies was written April 1, 2008.
2. Revisions of these Guidelines and Policies as of June 18, 2008
  - 4.1.1 - Crossing Policy added and referenced to new Chapter 16
  - 4.2.3 - Paragraph 3 Utility Separation defined and added
  - 4.3.2 - Paragraph 1 Utility Separation approval added
  - 4.3.5 – Surety Release added
  - Section 4.5 -  $\geq$  4-inch Water Services with Backflow Preventer added
  - Section 5.1 - Defines who is required to follow Safety guidelines added, Commission issued hard hats and vests, added, class 2 coats added, competent person shall complete Pre-Job checklist added, safety vests shirts & jackets added, questions directed to Safety, Security and Training Manager added, continue to monitor air quality if atmospheric conditions can change added, plate and/or fence open trenches added, and notify Safety, Security and Training Manager of accidents or cave-ins added
  - 6.1.1 Paragraph 1 - Dig Permit Required added
  - 6.2.1 - Moved all Air Valve Assembly and Air Corp language to last paragraph at end of Section
  - 6.2.6 - Clarified when gate valve and butterfly valves may be used added
  - 6.3.3 - Check valve replaced backflow preventer on flushing device added
  - 7.5.1 - Install jumper wire before removing 5/8-inch – 2-inch meters added
  - 7.5.2 – Meter couplings to seal meters and Plastic Meter Pit installations added
  - Section 8.4 - Water Valve Box Top Replace and Adjust and Service Box Top Replace and Adjust added
  - Section 10.3 - Acceptance of Back Flow Preventers added
  - Section 11.4 - Sewer Manhole minimum diameter clarified
  - Section 12.1 - Building Sewer Connections clarified
  - Section 12.2 - Building Sewer Connection pipe diameters defined
  - 15.1.10 - Application for Crossing Commission Transmission Mains added
  - Chapter 16 – Crossing Commission Transmission Main and Property Policy added



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- Detail W-02.2: Structural Gravel Aggregate changed to Dense Grade Crushed Stone for road base and all paving Type1-I
  - Detail W-02.3: Flow fill for Remainder of trench changed to 12-inches of flow fill for road base and all paving Type1-I
  - Detail W-02.4: Structural Gravel Aggregate changed to Dense Grade Crushed Stone for road base and all paving Type1-I
  - Detail W-02.5: Temporary Trench Backfilling Method for all Streets in Springfield and Ludlow except for Arterial Streets Detail in Springfield
  - Detail W-02.6: Temporary Trench Backfilling Method for Arterial Streets in Springfield Detail
  - Detail W-06.7: Socket Clamp Detail minimum bolt size increased for 8-inch and 10-inch
  - Detail W-10.0: Changed Hose Connection Vacuum Breaker to Check Valve
  - Detail W-11.2: Water Meter Sealing Detail added
  - Detail S-02.4 Changed tee to cross and required 6-foot minimum inside diameter
  - Detail S-03.0: Clarified section views, minimum distance from edge of trench, and require 4-mil poly between pipe and concrete fill
3. Version 2 of these Guidelines and Policies was written March 1, 2019 and include the following revisions.
- Chapter 3. Added all the definitions from R&R
  - Chapter 4. Created a Water Detail for Vertical Datum conversions and ask designers to use New City of Springfield datum. The detail provides info to convert to New City datum.
  - Chapter 4. Added minimum fire flow requirements for new water main extensions for residential and commercial/municipal/industrial sites.
  - Chapter 4. Created Record Sketch and Water Service Card details and instructions how to enter proper info. Described workflow with E&TS and GIS input.
  - Chapter 5. Trench Safety – for SWSC employees 4-foot trench requires shoring. For contractors OSHA requirements – 5-foot requires shoring. Contractors to sign attached Safety Assurance form and Indemnity form
  - Chapter 5. Updated PPE language to reflect latest memo from KP



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- Chapter 6. Updated Dig Safe requirement per the language on our web page. Added 5 Service Area Maps to help others know where our infrastructure is located. Provide these maps to Jaimye to add to our web page.
- Chapter 6. All ductile iron pipe to be encased on 6-mil polyethylene.
- Chapter 6. Any pipe installed within 200-feet of underground fuel storage tanks need special gaskets
- Chapter 6. Added section on installing insulated pipe underground and overhead
- Chapter 6. Added section on installing temporary bypass including a more descriptive ADA requirement
- Chapter 7. Added section for installing seasonal water services
- Chapter 7. Greater description on how to install 4-inch and larger ductile iron services through the basement wall, into a meter vault, and/or up thru a basement floor
- Chapter 7. Added description on how to install a plastic meter pit for copper tube services
- Chapter 7. Reduced the number of options for large ductile iron meter vaults from four to two: Standard and Oversize
- Chapter 7. Fire Service are required to be in a heated building or enclosure above grade
- Chapter 15. Added Safety Assurance Form. Placed it after the Commission Approved Contractor Form. Moved the Indemnity Form after the Safety Assurance Form so all three are together.
- Chapter 15. Deleted the G&P Acknowledgement Form and Trenching & Safety Form. Safety Assurance Form to replace these.
- Detail W-08.0 Valve Box: Changed backfill material.
- Detail W-08.1 Replace, Raise, or Reset Valve Box: Changed backfill material.
- Detail W-08.2 Raise Valve Box with Riser Detail added
- Detail W-11.0 New Water Service: Added Detail A to include plan view of meter valve types with connections and fittings also added 18-inch from walls and floors.
- Detail W-11.1 Replacement Water Service: Added Detail A to include plan view of meter valve types with connections and fittings also added 18-inch from walls and floors.



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- Detail W-11.3 Plastic Meter Pit For 5/8" – 1" Meters detail added
- Detail W-11.4 Plastic Meter Pit For 1-1/2" – 2" Meters detail added
- Detail W-12.0 Typical Service Box Detail in Paved Areas: Changed backfill materials and clarified brick type.
- Detail W-12.1 Typical Service Box Detail in Non-Paved Areas: Changed backfill materials and clarified brick type.
- Detail W-12.2 Replace, Raise, Or Reset Service Box Detail: Changed backfill materials and clarified brick type
- Detail W-12.3 Raise Service Box with Riser: Added Detail
- Detail W-13.0 Meter Vault Piping: Deleted old drawing and added this detail with more explanation to represent correct install.
- Detail W-13.1 Large Meter Installation: Deleted old drawing and added this detail with more explanation to represent correct install. Clearly identified where adapter flange is located after the meter.
- Details W-13.2 and W-13.3 Standard and Oversize Meter Pit for Ductile Iron Water Service Pipe: Deleted the old W-13.2, W-13.3, W-13.4 and W-13.5 Concrete Meter Vaults and simplified selections to these two.
- Detail W-13.4 Typical Ductile Iron Water Service Detail through Foundation Wall: Added Detail.
- Detail W-13.5 Typical Ductile Iron Water Service Detail through Concrete Floor: Added detail.
- Detail W-16.0 Record Sketch Detail: Added detail.
- Detail W-16.1 Water Service Card Detail: Added detail
- Detail W-17.0 Seasonal Water Service Detail: Added detail and changed vacuum pressure breaker requirements to RPZ if highest sprinkler head is 12-inches or greater above.
- Detail W-17.1 Seasonal Water Service Base Detail: added detail and changed clasp detail.
- Detail W-17.2 Seasonal Water Service Cover Detail: Added detail.
- Detail M-01.0 Springfield Water Mains Service Area Map: Added Detail
- Detail M-02.0 Ludlow Water Mains Service Area Map: Added Detail
- Detail M-03.0 Water Transmission Mains Service Area Map Cobble Mountain To Provin Mountain: Added Detail
- Detail M-03.1 Water Transmission Mains Service Area Map Provin Mountain To Springfield: Added Detail



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- Detail M-04.0 Springfield Sewer Mains Service Area Map: Added Detail
4. Version 3 of these Guidelines and Policies was written July 1, 2020 and include the following revisions.
- Chapter 2. Sections 2.1.2 and 2.1.4 inserted “Commission’s Health and Safety Plan”. Throughout document safety language has been relocated to the Commission’s Health and Safety Plan.
  - Chapter 4, Sections 4.1.2, 4.1.3, and 4.1.4 deleted “separate application for each water service and/or sewer connection” to ease application procedure and better match what is accepted at Operation Center.
  - Chapter 4, Section 4.2.3 Minimum Design Standards: Paragraph (m) Added Private Yard Hydrant requirements. Paragraph (n) deleted requirement for 45-degree bends and now allow 90-degree bends. Paragraph (p) looped water services and Fire Service Pipes require check valves.
  - Chapter 4, Section 4.4.1 and 4.6.1 changed contact phone number from 787-6206 to 310-3500.
  - Chapter 5. Deleted most of the original safety language.
  - Chapter 5, Section 5.1, General: All employees and Installers to follow Commission’s new Health and Safety Plan as well as local, state, and federal regulations including but not limited to Massachusetts Dept. of Labor and OSHA.
  - Chapter 5, Section 5.2, Trenching Excavation: Commission employees will not enter trenches 4-feet or deeper without shoring in place.
  - Chapter 5, Section 5.3, Underground Utility Location (DIG SAFE) Requirements: Site Massachusetts Law to call DIG SAFE before any excavation. Identify Commission service areas for water and sewer maps.
  - Chapter 6, Section 6.1.2, Valve Operations: Tag Out procedures Paragraph (m) deleted “tag out device” in accordance with Commission’s Material Specifications”. Because it is repeated in Section 6.1.3.
  - Chapter 6, Section 6.1.3, Valve Lock-out: Paragraph 1. Inserted “and OSHA CFR 1910.147 – Control of Hazardous Energy”.
  - Chapter 6, Deleted Section 6.1.7, Underground Utility Location (DIG SAFE) Requirements in its entirety and Inserted Existing Underground Utilities and Structures and inserted Paragraph 1 which references Section 5.3 of these G&P.
  - Chapter 6, Section 6.2.7, Ductile Iron Mechanical Joint fittings: Deleted Paragraph 8. in its entirety. Two 45-degree bends were required in past, but



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during review of a project the loss of head through one 90-degree bend was found to be equal or less.

- Chapter 6, Section 6.4.3, Pressure and Leakage Test: Paragraph 2. Deleted “200-PSI or 2x” and replaced with “150-PSI or 1-1/2times” as this is what AWWA suggests.
- Chapter 7, Water Services, Section 7.1.1, General: Inserted Paragraph 5. “Excavate trench to ensure sides of trench are stable. Slope trench walls or provide support in conformance with the CHAPTER 5 Safety of these Guidelines and Policies and the Commission’s Health and Safety Policies”.
- Chapter 7, Water Services, Section 7.2.3, Copper Tubing: Inserted Paragraph 8. “Copper tubing water services installed with less than 18-inches of tubing beyond the wall or above the floor shall be reinstalled in its entirety by the Installer.” This allows for room to work on meters.
- Chapter 7, Water Services, Section 7.2.5, Compression Coupling: Inserted Paragraph 4. “No couplings are allowed before meter valves in building.” This reduces chance of leaks and makes sure meter is restrained.
- Chapter 7, Water Services, Section 7.2.6, Service Boxes: Deleted “magnetized and” Inserted “after installation.” Magnetized boxes are no longer available or required and SWSC paints new WS boxes blue after installation.
- Chapter 7, Water Services, Section 7.4.1, Replacement of Existing Water Service Pipe, Paragraph 5.: Inserted Paragraphs (a) Installer shall open cut all water services from main to home/building and replace Water Service Pipes in accordance with Section 7.3 of these Guidelines and Policies and (b) Commission Construction Crews or Commission Approved Contractors hired by the Commission to replace water service may pull Water Service Pipes in accordance with this Section of these Guidelines and Policies.” This clarifies Installers/Commission Approved Contractors shall open cut and Commission Approved Contractors hired to install Commission CIP projects may install water service pipes by pulling the pipe
- Chapter 7, Water Services, Section 7.4.3, Product Installation – Existing Water Service Pipe, Paragraph 4.: inserted “or replace by open trench”. This paragraph directs abandonment in place of replacement by open trench to Section 7.3.
- Chapter 7, Seasonal Water Services, Section 7.5.2, Product Installation – Seasonal Water Services 2-inch and less, Paragraph 7. (g):. Inserted **A testable Pressure Vacuum Breaker assembly (PVB) is allowed when the PVB can be installed at least 12 inches or greater above the highest sprinkler head. A PVB is designed to prevent only back-siphonage and is designed for use under static line pressure. A PVB is not allowed where back-pressure is**



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possible. A Reduced Pressure Zone assembly (RPZ) is required when a PVB does not meet the installation requirements. A single spigot is allowed on the downstream side of a RPZ and on the downstream side of a PVB installed 12 inches below the PVB. (The highest sprinkler head and/or fixture shall be 12-inches or greater below the PVB. If it is less than 12-inches a RPZ is required.)”

- Chapter 7, Water Services, Section 7.4.3, Product Installation – Existing Water Service Pipe, Paragraph 5.: Inserted after service “by pulling the old and new water service pipe shall be allowed as follows:”
  - Chapter 11, Deleted Section 11.1.5, Underground Utility Location (DIG SAFE) Requirements in its entirety and Inserted Existing Underground Utilities and Structures and inserted Paragraph 1 which references Section 5.3 of these G&P.
  - Detail W-08.0 Valve Box: Clarified type of brick under base.
  - Detail W-08.1 Replace, Raise, or Reset Valve Box: Clarified type of brick under base.
  - Details W-13.6, W-13.7, W-13.8, W-13.9 and W-13.10 are various approved frames and covers for Meter Vaults: Deleted the old W-13.6 32” x 8” Water Frame and Cover to expand options for SWSC.
  - Detail W-15.0 Relation of Vertical Datums To Springfield City Base: Added detail and added conversion to MWRA and Boston City Base.
  - Details S-02.51, S-02.52, S-02.53, S-02.54, S-02.55 and S-02.56 are various approved frames for sewer manholes and S-02.61, S-02.62, S-02.63, S-02.64, S-02.65 and S-02.66 are various approved sewer covers: Deleted the old S-02.5, S-02.6, and S-02.7 sewer frame and covers to expand options for SWSC.
5. Version 4 of these Guidelines and Policies was written November 1, 2020 and include the following revisions.
- Chapter 4. APPLICATIONS, SUBMITTALS/PLANS, APPROVALS, and INSPECTIONS, Section 4.2.3 Minimum Design Standards, Paragraph 1, (p) 4-inch – 12-inch Water Service, 9<sup>th</sup> bullet: added OS&Y GV required as a building control valve before BFP or assembly. 10<sup>th</sup> bullet: Fire Services may have OSY gate valves or B-fly valves with either flange or grooved connections on both sides of the assembly.

The above changes were made to clarify what was acceptable on fire services and the BFP requirements for the same. Grooved (Victaulic) connections will now be allowed along with flanged connections. Butterfly valves will now be allowed along with OS&Y gate valves.





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- Chapter 4. APPLICATIONS, SUBMITTALS/PLANS, APPROVALS, and INSPECTIONS, Section 4.4.2 Commission Responsibilities Prior to Arriving at the Installation, Paragraph 4 was edited to clarify 2 inspections for water service and two inspections for sewer connections. Refunds would be credited to account if all charges were not used. Paragraphs 5 and 6 were deleted as this will no longer apply since SWSC billing software cannot share costs. The intent is to have the contractors ready for inspection so SWSC Inspectors not going to site and installation is not ready.
- Chapter 4. APPLICATIONS, SUBMITTALS/PLANS, APPROVALS, and INSPECTIONS, Section 4.5 Inspections for 4-inch and Larger Water and Fire Service Installations, 4.5.4 Water or Fire Service into Service, Paragraphs added 1(a), 1(b), and edited 1(c); as follows;

1(a): Water Services or Fire Services up to 2-inch the Installer shall have the correct meter valve installed before any testing being scheduled.

1(b): For metered Water Services 4-inch and larger that require a Back Flow Preventer the Installer shall have the correct Outside Spindle and Yoke (OS&Y) gate valve (building control valve) installed along with a temporary blank flange with a 2-inch threaded outlet and 2-inch ball valve onto the first flange into the building for testing. The Installer may then schedule testing.

1(c): For Fire Services 4-inch and larger the Installer shall have the correct OS&Y gate valve installed along with a temporary blank flange with a 2-inch threaded outlet and 2-inch ball valve. The Installer may then schedule testing.

The above additions and edits were made to ensure a correct valve in accordance with SWSC Material Specifications is installed prior to any testing. For Water Services or Fire Services up to 2-inch a meter valve in accordance with SWSC Standard details is required. For 4-inch and larger metered Water Services a F x F OS&Y gate valve is required before any testing or meter installation is scheduled. This is not a change just a clarification. For 4-inch and larger Fire Services a F x F OS&Y gate valve is required before any testing or backflow preventer installation is scheduled. This valve will be referred to as a building control valve. This is new. All installations by the site contractor should be from the main to the first valve (building control valve or meter valve) in the building. Testing will be completed with a temporary companion (blank) flange bolted to the outlet side of the valve flange. The blank flange shall have a 2-inch threaded outlet and a 2-inch ball valve for leak testing, flushing Fire Dept. flushing, and bacteria testing.

- Chapter 7. WATER SERVICES, Section 7.2 Water Service 2-inch and less, 7.2.2 Ball Type Corporation Stops, Paragraphs 2 and 3; Changed 1-inch Direct Taps to none. Reason being SWSC makes the taps and no longer has



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equipment to direct tap so all 2-inch and less shall be through a tapping saddle supplied by the Installer.

- Chapter 10. CROSS CONNECTION DEVICES, Section 10.1 General, Paragraphs 2; added Paragraphs (a) and (b) which defined devices as the back flow preventer only and assemblies are from the manufacturer and include two isolation valves with the back flow preventer.
- Chapter 10. CROSS CONNECTION DEVICES, Section 10.1 General, Paragraphs 4; deleted bullet “All facilities listed in Paragraph 3, above shall have two (2) BFP devices installed, unless otherwise approved by the Commission” which was repetitive as Paragraph 3 already defined which type of facilities required a BFP at meter and at point of use in the facility.
- Chapter 10. CROSS CONNECTION DEVICES, Section 10.1 General, Paragraphs 5; added “and assemblies” after Devices and added “in a horizontal position at least” after installed to clarify devices and assemblies must be installed in a horizontal position.
- Chapter 10. CROSS CONNECTION DEVICES, Section 10.1 General, added Paragraphs 7., 8., 9., 10., 11., 12., and 13; These additions and edits were made to ensure a correct valve is installed prior to any testing and the correct device with valves or assembly, connection types, and connection hardware are installed after all successful testing. For Water Services or Fire Services up to 2-inch a meter valve in accordance with SWSC Standard details is required. For 4-inch and larger metered Water Services a F x F OS&Y gate valve is required before any testing or meter installation is scheduled. This is not a change just a clarification. For 4-inch and larger Fire Services an F x F OS&Y gate valve in accordance with the SWSC’s Material Specifications is required before any testing or backflow preventer installation is scheduled. This valve will be referred to as a building control valve. This is new. All installations by the site contractor should be from the main to the first valve (building control valve or meter valve) in the building. Testing is defined in Section 4.5.4 and will be completed with a temporary companion (blank) flange bolted to the outlet side of the valve flange. The blank flange shall have a 2-inch threaded outlet and a 2-inch ball valve for leak testing, flushing Fire Dept. flushing, and bacteria testing.
- Detail W-11.0 New Water Service: Corrected 12-inch to 18-inch from floors.
- Detail W-11.1 Replacement Water Service: Corrected 12-inch to 18-inch from floors.
- Detail W-13.11 Typical Ductile Iron Fire Service Detail Through Foundation Wall: Added to help clarify fire Service Installations.
- Detail W-13.12 Typical Ductile Iron Fire Service Detail Through Floor: Added to help clarify fire Service Installations.



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- Detail W-13.13 Typical Ductile Iron Fire Service Detail in a Hot Box: Added to help clarify fire Service Installations.
- Detail W-13.14 Typical DIP Commercial & Industrial Service Detail Through Foundation Wall: Added to help clarify fire Service Installations.
- Detail W-13.15 Typical DIP Commercial & Industrial Service Detail Through Floor: Added to help clarify fire Service Installations.
- Detail W-11.3 Plastic Meter Pit for 5/8” – 1” Meters: Added 2” hole with automatic meter reading plug for electric reading device.
- Detail W-11.4 Plastic Meter Pit For 1-1/2” – 2” Meters: Added 2” hole with automatic meter reading plug for electric reading device.
- Detail S-04.0 Existing Sewer Main to Building Connection: Removed “long sweeps” as PVC bends are typically installed. Clarified cleanouts required every 100’ and upstream of horizontal deflection  $\geq 45$ -degrees.
- Detail S-04.1 New Sewer Main to Building Connection: Removed “long sweeps” as PVC bends are typically installed. Clarified cleanouts required every 100’ and upstream of horizontal deflection  $\geq 45$ -degrees.
- Detail S-04.2 Clean Out with Sweep: Clarified cleanouts required every 100’ and upstream of horizontal deflection  $\geq 45$ -degrees.



# Springfield Water and Sewer Commission

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Last Modified: 04/09/2025 at 10:39AM EDT



# Springfield Water and Sewer Commission

## Guidelines and Policies

### CHAPTER 2 GENERAL PROVISIONS

#### 2.1.1 Introduction

1. These Guidelines and Policies will govern all work performed in the Springfield Water and Sewer Commission's (Commission) transmission and distribution systems.
2. The only persons allowed to work on the Commission's water transmission, water distribution systems, and/or sewer collection system are as follows:
  - (a) The Commission's own employees (Commission Construction Crew),
  - (b) Contractors hired directly by the Commission (Installer),
  - (c) Commission Approved Contractors (Installer) hired by an Owner of a property in the Commission's Service Area
3. When there is a conflict between these Guidelines and Policies and other referenced standards then these Guidelines and Policies shall govern.
4. The Guidelines and Policies contained herein are in accordance with Commission's Rules and Regulations.
5. Commission Guidelines and Policies do not supplant the Installer's obligation to comply with the Department of Labor, and Occupational Safety and Health Administration regulations. Construction site safety is the Installer's responsibility.
6. Questions regarding construction or other activities will be directed to the Commission's Authorized Field Representative or in accordance with Section 2.1.8 of these Guidelines and Policies.
7. All Installers hired by Owners shall become Commission Approved Contractors to perform work in the Commission's Service Area.
8. Failure of any Commission employee to comply with these Guidelines and Policies may result in disciplinary action and possible termination.
9. Failure of a Commission Approved Contractor or Installer to meet the requirements of these Guidelines and Policies may result in removal of the Commission Approved Contractor's name from the approved list.
10. Failure of a Commission employee, Commission Approved Contractor, or Installer to meet the requirements of these Guidelines and Policies may



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additionally result in fines in accordance with the Commission's Rules and Regulations.

11. The Commission reserves the right to remove anyone from the Commission Approved Contractors list for any reason. If a Commission Approved Contractor is removed from the list, that contractor shall not be allowed to perform any work in the Commission's Service Area.

### 2.1.2 Review of these Guidelines and Policies

These Guidelines and Policies will be reviewed annually and revised as necessary. In addition, if a near miss or incident occurs, CHAPTER 5 SAFETY of these Guidelines and Policies and the Commission's Health and Safety Policies, will immediately be reviewed and revised if necessary.

### 2.1.3 Maintenance of these Guidelines and Policies

1. These Guidelines and Policies will be revised and updated by the Commission's Engineering and Technical Services.
2. At a minimum, the Version Number of these Guidelines and Policies, the Chapter and Section, and the date of last Revision shall be recorded in CHAPTER 1 of these Guidelines and Policies.

### 2.1.4 Acknowledgement of Safety Assurance Form

Commission Approved Contractors and Contractors hired by the Commission shall read CHAPTER 5 SAFETY of these Guidelines and Policies and the Commission's Health and Safety Policies, and sign the attached Safety Assurance Form in CHAPTER 15 of these Guidelines and Policies,

### 2.1.5 General Installer Responsibilities

1. The Installer proposing to perform construction in the Commission's Transmission and/or Distribution System and who executes the appropriate paperwork with the Commission, to allow the same, shall conform to the following:
  - (a) Furnish all water pipe, hydrant, assemblies, valves and valve boxes, fittings, couplings, backfill materials, concrete thrust blocking, labor, tools, and equipment necessary to lay and joint all pipe in accordance with the Commission's Specifications and these Guidelines and Policies.
  - (b) All construction shall conform to the design provided by the Commission's Engineering and Technical Services (E&TS), the design provided by the



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Owner and approved by the Commission, or the Commission's Authorized Field Representative.

- (c) All contracts, deposits, applications, and easements will be finalized before the Commission E&TS will schedule inspection.
  - (d) Prior to job start, all main and service materials and area of land to be developed will be subject to inspection by an Authorized Field Representative of the Commission.
  - (e) All work related to services and inspections provided by Commission will be subject to fees and will be the responsibility of the Owner.
  - (f) The Owner is responsible for obtaining and using the most recent Material Specifications of the Commission.
  - (g) The Owner is responsible for obtaining and using the most recent copy of these Guidelines and Policies.
2. The most recent versions are available on [www.springfieldwaterandsewer.org](http://www.springfieldwaterandsewer.org).
  3. The Commission shall be notified one week prior to the start of a project to schedule inspection.

### 2.1.6 General Commission Construction Crew Responsibilities

1. The Commission Construction Crew performing construction in the Commission's Transmission and/or Distribution System shall conform to the following:
  - (a) Furnish all water pipe, hydrant, assemblies, valves and valve boxes, fittings, couplings, backfill materials, concrete thrust blocking, labor, tools, and equipment necessary to lay and joint all pipe in accordance with the Commission's Specifications and these Guidelines and Policies.
  - (b) All construction shall conform to the design provided by the Commission's Engineering and Technical Services (E&TS), the design provided by the Owner and approved by the Commission, or the Commission's Authorized Field Representative.
  - (c) Prior to job start, all main and service materials and area of land to be developed will be subject to inspection by an Authorized Field Representative of the Commission.
  - (d) All work related to services and inspections provided by Commission will be subject to fees and will be the responsibility of the Owner.



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- (e) The Commission Construction Crew is responsible for obtaining and using the most recent Material Specifications of the Commission.
  - (f) The Commission Construction Crew is responsible for obtaining and using the most recent copy these Guidelines and Policies.
2. The most recent versions are available on [www.springfieldwaterandsewer.org](http://www.springfieldwaterandsewer.org).
  3. The Commission shall be notified one week prior to the start of a project to schedule inspection.

### 2.1.7 Material Approval

1. All materials shall meet to the Commission's Material Specification and/or the Commission's Authorized Field Representative's approval.
2. At an minimum all the components and chemicals that will come in contact with drinking water shall meet the requirements of the following:
  - (a) American Water Works Association
  - (b) Massachusetts Department of Environmental Protection
  - (c) NSF/ANSI Standards 60 (Drinking Water Treatment Chemicals)
  - (d) NSF/ANSI Standards 61 (Drinking Water Components).
3. When the quality of any material is questioned, it will be the Commission's Construction Crew's or the Installer's responsibility to prove to the Commission's Authorized Field Representative's satisfaction that the materials in question comply with the Commission Material Specifications.
4. Materials that, in the Commission's Authorized Field Representative's opinion, are damaged, mishandled, or defective shall be rejected from use on the job.
5. Materials that have been rejected from use by the Commission's Authorized Field Representative shall be immediately removed from the construction site.

### 2.1.8 Clarification of Issues – Who to Call with Questions

1. For general questions relating to the Springfield Water and Sewer Commission call the Commission's Field Services Office @ 413-310-3500.
2. For questions relating to filling, flushing, and disinfecting water mains, and other water quality related issues call the Water Quality Manager @ 413-310-3500





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3. For questions relating to scheduling, valve operations, water & sewer main installations or repairs, water & sewer service installations or repairs, hydrant flow tests, hydrant meter rentals, facilities mark out, Commission Approved Contractor, and other construction related issues call the Commission's Field Services Office @ 413-310-3500.
4. Questions relating directly to these Guidelines and Policies or Material Specifications call Engineering and Technical Services @ 413-452-1300.
5. Questions relating to **main extensions only** call the Commission's Construction Inspectors Group @ 413-452-1300.

### 2.1.9 Reference to Guidelines & Policies

These guidelines and policies may be referred to as the Commission's Guidelines and Policies.

### 2.1.10 Severability

The provisions of these Guidelines and Policies are severable. If any provision of these Guidelines and Policies or any specific application to any person or circumstance is held invalid, such invalidity shall not affect other provisions or applications, which can be given effect in the absence of the invalid provision or application.

### 2.1.11 Applicable Regulations

Every user of the public water system, private water mains, public sewer system, or private sewer mains shall be subject to regulations of the Commission, as they apply, and to any charges, rates, fees and assessments which are or may be established by the Commission. Any user of the public water system, private water mains, public sewer system, or private sewer mains shall also be subject to applicable Local, State, and Federal regulations.

### 2.1.12 Reference Standards

Where reference is made to one of the below standards, the revision in effect at the time is applicable.

1. American Concrete Institute (ACI)
2. American Iron and Steel Institute (AISI)
3. American National Standards Institute (ANSI)
4. American Society of Testing and Materials (ASTM)
5. American Water Works Association (AWWA)



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6. American Welding Society (AWS)
7. Ductile Iron Pipe Research Association (DIPRA)
8. Manufacturing Standardization Society of the Valve and Fittings (MSS)
9. National Fire Protection Association (NFTA)
10. NSF International (NSF)



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### CHAPTER 3 DEFINITIONS

Unless the context specifically indicates otherwise, the meaning of terms used in these Guidelines and Policies shall be as follows:

1. Abutter means one who holds titles to real property within the limits of a Sewer Improvement Area and his/her successors in title.
2. Additional Meter shall mean a meter for the purpose of determining sub-divisions of supply through master meters and are owned and maintained by the Owner.
3. Applicant shall mean any Owner or duly authorized Owner's agent applying for any services provided by the Commission.
4. Application Fee shall mean the fee charged to apply for any Water Facility, Fire Flow Test, and/or Sewer Facility, in accordance with the Commission's Rules and Regulations. A single Application Fee will be charged for both water and sewer main extensions provided they are applied for at the same time. New Water Service Pipes, Fire Service Pipes, and Building Sewer Connections Application Fees shall be separate and in addition to any main extensions.
5. Application Fee to Review Crossing Commission Property shall mean the fee charged to review plans, specifications, and easements and inspect the crossing of Commission owned property.
6. Appurtenances shall mean any piece of water and/or sewer infrastructure that is not a water or sewer main, service pipe, or hydrant, such as: a check valve, pump, meter, storage tank, dam, and/or other water or sewer treatment facility.
7. As-Built Plan Fee shall mean the Fee charged for as-built plans. The Commission will return the Fee upon receipt of completed as-built plans. The as-built plans shall be provided to the Commission within 120 days after the final acceptance of a water and/or sewer main installation and /or a water and or sewer service installation.
8. Authorized Field Representative shall mean any Commission employee or Person hired by the Commission to oversee an activity on the Commission's water transmission system, water distribution system, or waste water collection system.
9. Automatic Meter Reading Device (AMR) shall mean a device(s) used for reading a water meter without having to enter a premise.
10. Auxiliary Meter shall mean a meter for the purpose of determining water use for lawn sprinklers or other approved process use and are owned and maintained by the Commission. Auxiliary Meters in Ludlow shall be owned and maintained by



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the Owner and are subject to Commission inspection in accordance with the Commission's Rules and Regulations.

11. Backflow Prevention Device (BFP) shall mean an approved mechanical device designed to prevent Backflow.
12. Backflow shall mean the flow of water or other fluids, mixtures or substances into the distribution pipes of a potable supply of water from any source or sources other than its intended source.
13. Best Management Practices (BMP) means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to implement the prohibitions as listed in the Commission's Rules and Regulations. BMP include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw materials storage.
14. Building Drain means that part of the lowest horizontal piping of a drainage system which receives the discharge from soil, waste, and/or other stacks inside the building and terminates ten (10) feet outside the inner face of the building wall. The Owner owns and shall operate and maintain the Building Drain from the building to the Building Sewer.
15. Building Sewer means sanitary sewer and that part of the horizontal piping, which begins ten (10) feet outside the inner face of the building wall and extends to a Public Sewer, Private Sewer or other place of Wastewater disposal. The Owner owns and shall operate and maintain the Building Sewer from the Building Drain to the main.
16. Building shall mean any roofed and walled structure.
17. Categorical Industrial User shall refer to industrial users subjected to EPA categorical pretreatment standards.
18. Charges means all fees, rates, rents, assessments, or liens for water, sewer, drainage or other services, facilities and commodities which are furnished or supplied by the Commission and for which it is authorized under MGL 40-N to assess.
19. City shall mean the City of Springfield, Massachusetts.
20. Combined Service shall mean a service pipe that is used to provide both Water Service and private fire protection service.
21. Combined Sewer means a Sewer receiving and conveying both sanitary Wastewater and surface runoff from storms.



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22. Commercial shall mean a classification of Water Users and/or Wastewater Users that are engaged in providing products or services, whether to the general public or to its members, which includes all retail and wholesale establishments, businesses, and offices, including but not limited to office buildings, retail and wholesale outlets, service agencies, agents, brokers, professional offices, stores, cafes, theaters, bakeries, bus terminals, warehouses, store-houses, hotels, motels, restaurants, rooming-houses, trailer parks, funeral parlors, garages, farming, gas stations, newspapers, churches, private schools and colleges, Medical Facilities, libraries, museums, cemeteries, not-for-profits, homes for aged and children, State buildings, State facilities, builder's use- metered and un-metered, water tankers. Property, which contains both Residential and Commercial Water Users, shall be classified as Commercial.
23. Commission Approved Contractor Application Fee shall mean the fee charged to review the qualifications and experience of the Persons seeking to become Commission Approved Contractors. The Fee is non-refundable. This Fee is for review of the Application Form and for the term of the approval period. The approval period shall be for a term of three (3) years. Each approval period shall begin immediately after the previous approval period ends. Applications and Fees can be submitted any time before or during the approval period, but shall be for the existing approval period and must be resubmitted for each approval period.
24. Commission Approved Contractor Application Renewal Fee shall mean the fee charged to review the qualifications and experience of the Persons seeking to renew their Commission Approved Contractors status at the end of the previous approval period. All other provision of the approval process shall remain the same.
25. Commission Approved Contractor shall mean any Contractor approved by the Executive Director in accordance with the Commission's Guidelines and Policies to provide a construction service for an Owner. All approved contractors shall have appropriate bonding, insurance, and experience with references to perform work on the Commission's water distribution system, sewer collection system, and water and/or sewer services on behalf of the Owner.
26. Commission Construction Crew shall mean construction personnel regularly employed by the Commission to install, maintain, repair, and replace water and sewer infrastructure in accordance with the Commission's Rules and Regulations, these Guidelines and Policies.
27. Commission means the Springfield Water and Sewer Commission, an independent body politic and corporate and political subdivision of the Commonwealth of Massachusetts created under MGL 40-N as adopted by the City of Springfield on March 28, 1996, the powers of which are exercised by a board of three members



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appointed in accordance with the MGL 40-N, and includes without limitation all its departments, divisions and Sections or pertaining or belonging to said Commission.

28. Commissioners refers to a board of three appointed members who shall govern the Commission as set forth in MGL 40-N.
29. Critical Valves shall mean any valve 20-inch or larger or as determined by Engineering and Technical Services that has the ability to severely impact the SWSC's transmission system, storage system, distribution system, pump stations, and/or significant customers; such as Wholesale (Towns) Customers, Medical Facilities, and/or Industrial/Commercial/Institutional Customers
30. Cross Connection shall mean any actual or potential connection between a distribution pipe of potable water supplied by the public water system and any waste pipe, soil pipe, sewer, drain or any other unapproved source. Without limiting the generality of the foregoing, the term "cross connection" shall also include any bypass arrangement, jumper connection, removal section, swivel or changeover connection and any other temporary or permanent connection through which Backflow can or may occur.
31. Customer means a Person or entity listed on the records of the Commission as the party of record responsible for payment of Bills for Charges for water and Sewer services to the Premise/Property.
32. Customer Water Service shall be defined as the entire water service excluding any corporation stop and/or valves directly associated with the water main. The Customer will be assessed for any repairs, replacements, or other services rendered to the Customer Water Service.
33. Developed Property means property that generates wastewater.
34. Discontinuance shall mean a temporary cessation of Water Service at the Premise at the request a Customer for reasons other than ordinary repair or maintenance.
35. Domestic Wastewater means the liquid Wastes and liquid borne Wastes discharged from the sanitary conveniences such as toilets, washrooms, urinals, sinks, showers, drinking fountains, laundry rooms, kitchens, cafeterias and floor drains essentially free of industrial Wastes or toxic materials.
36. Drain For the meaning of "Drain," see "Storm Drain."
37. Dry Industry shall mean a classification of Wastewater Users which includes all industries which do not use water for processes, do not use large volumes of water



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for cleaning, or for which total annual wastewater production is less than one hundred thousand (100,000) cubic feet.

38. Easement shall mean an acquired legal right for the specific use of land owned and maintained by others, whether recorded or by prescription.
39. EPA means United States Environmental Protection Agency.
40. Executive Director means the Executive Director of the Commission or his/her Authorized Field Representatives.
41. Facilities include structures, conduits, pumping stations, treatment and disposal works, and other appurtenances for the purpose of collecting, treating and disposal of domestic and/or Industrial Wastewater.
42. Fire Department Permit to shut off sprinkler system shall mean the completed permit approved by the Fire Department and submitted to the Commission by the Owner or by the Owner's agent prior to demolition of any building having water or fire suppression system connections to the Commission's water system.
43. Fire Flow Test shall mean a standard flow test performed as specified in Section 6.5 of these Guidelines and Policies with at least two (2) hydrants to determine static and residual pressures and flow producing capabilities at a specific location within the Commission's water distribution system. The results of such testing shall provide data on how much water is available to fight fires, but may also indicate the general condition of the Commission's distribution system.
44. Fire Service Pipe shall mean the private water piping and associated valves, control valves, and Appurtenances installed solely to furnish water for extinguishing fires that extend from a Water Service connection into a Premise. The Customer owns the Fire Service Pipe.
45. Guidelines and Policies shall mean, but not limited to, these standards for access, design, operation, maintenance, construction, rehabilitation and / or use of the public water and sewer systems used by the Commission.
46. Hydrant shall mean a device connected to a Public Water Main or private water service for the purpose of extinguishing fires or other authorized purpose.
47. Industrial shall mean a classification of Water Users that are primarily engaged in applying skill and labor to giving of new shapes, qualities or new combinations to matter as material products, or to the assembly or processing of manufactured or natural products.
48. Industrial User means an Industry discharging Industrial Wastewater to a Public Sewer.



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49. Industrial Wastewater means the liquid Wastes from industrial manufacturing processes, laboratories, trades or businesses which predominate as distinct from Domestic Wastewaters.
50. Industry shall mean an establishment with facilities for manufacturing, processing, fabricating, finishing, assembly, testing, or packaging goods including materials, chemicals byproducts, and finished and unfinished products. The Industry may be classified as a Wet Industry or Dry Industry.
51. Institutional shall mean a classification of Wastewater User including public or private schools, churches, State or Federal governmental buildings and offices, religious organizations, and similar facilities both profit and nonprofit.
52. Interceptor Sewer means a Sewer, located in public and/or private property, which collects the entire flow from a number of Public and/or Private Sewers, conveys the flow to a suitable collection point for final discharge to a place of Wastewater treatment and is entirely controlled by the municipality.
53. Leak shall mean an escape of water from the Commission's water mains, hydrants, or in the Owner's Water Service Pipe, Fire Service Pipe, or a Combined Service.
54. License Agreement shall mean a form prescribed by the Commission that provides for the construction of Public Water Mains and Public Sewers and other Water and Sewer Facilities and permission for limited use with respect to Commission property, easements, and other Water and Sewer Facilities.
55. Lot means real property, which is described by deed, or filed subdivision plan, as a single entity and cannot be the further subdivided.
56. Main Extension Application shall mean the form provided by the Commission and completed by the Owner or by an Owner's authorized agent and submitted to the Commission prior to construction, reconstruction, repair or modification of a Public Water Main. A completed application includes verification that the Premise address listed therein is correct.
57. Master Meter shall mean the primary water meter used for billing purposes serving a building, group of buildings, or Premises / Property. There may be more than one (1) meter serving a building, group of buildings, or Premises / Property.
58. Material Specifications shall mean the Commission supplied description of materials to be used for construction and rehabilitation of the Public Water and Sewer Systems.
59. MDEP shall mean the Massachusetts Department of Environmental Protection.
60. Meter Pit shall mean an underground vault enclosing a Meter.





# Springfield Water and Sewer Commission

## Guidelines and Policies

61. Meter shall mean an instrument or device, including any appurtenances thereto, for measuring the flow of water.
62. MGL 40-N means the Chapter 40-N of the Massachusetts General Laws, as amended.
63. Municipal shall mean a classification for Water User and/or Wastewater User facilities that are owned and operated by the City of Springfield and/or the Town of Ludlow solely for the purposes of providing the following municipal services: Administrative; Public Works; Police; Fire and Safety; Educational; Parks and Recreational facilities; Libraries. This does not include Wastewater services provided by the Town of Ludlow.
64. Owner shall mean a Person(s) who alone or jointly or severally with others, has the legal title to any Premises.
65. Parcel means real property consisting of one (1) Lot, or two (2) or more contiguous Lots, under one (1) ownership.
66. Person(s) shall mean any individual, any agency of the federal government, any agency or political subdivision of the Commonwealth, any public or private corporation or authority, any corporation trust, firm, joint stock company, partnership or association, or other entity, or any group thereof, and any officer, employee, or agent of such person, and any group of persons.
67. Plumber shall mean a person with a current and valid license as a plumber by the Commonwealth of Massachusetts.
68. Potable Water shall mean water fit for human consumption in conformance with the regulations of the MDEP.
69. Premise / Property shall mean a parcel of real estate or portion thereof, including any improvements thereon, which are determined by the Commission to be a single user for purposes of receiving, using and paying for Water Service and/or Sewer Service.
70. Private Drain means any Drain located on private property and not under the full care and control of the Commission or the City of Springfield.
71. Private Fire Protection shall mean private water mains, Fire Service Pipes and other appurtenances installed for the purpose of fire protection and suppression at a particular Premise.
72. Private Hydrant shall mean a hydrant installed and maintained by an Owner for the purpose of private fire protection/suppression at a particular Premise.



# Springfield Water and Sewer Commission

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73. Private Sewer means any Sewer located on private property that collects and conveys Wastewater from two (2) or more Building Sewers, discharges into a Public Sewer, and is not under the full care and control of the Commission.
74. Private Water Main shall mean a water main that is not owned by the Commission.
75. Public Drain means a Drain located in a public, private way, or easement in which all owners of abutting properties have equal rights and is under the full care and control of the City of Springfield.
76. Public Fire Protection shall mean the Public Water mains, Hydrants, and Appurtenances installed for the purpose of fire protection in a public way, Commission owned Easement, whether recorded or by prescription or private way open to public travel.
77. Public Sewer means any Sewer owned or maintained by the Commission and any Sewer situated outside the City of Springfield that is owned or maintained by a city, town, or district that discharges into Commission's Wastewater Treatment Works.
78. Public Water Main shall mean the piping and associated valves, hydrants and appurtenances owned by the Commission installed in a public way, publicly-owned easements whether recorded or by prescription, or private way open to public travel, for the purpose of supplying water to one or more customers or for public fire protection.
79. Public Water Supply shall mean the water and/or ground water that is provided to the public for human consumption.
80. Public Water System shall mean a system for the provision to the public of piped water for human consumption. The Commission is a Public Water System.
81. Remote Meter Device means an instrument for reading a Water Meter, located at a distance from the meter, generally outside the building being metered.
82. Requirements for Site Plans shall mean the document that describes the information that must be included in site plans submitted to the Commission. A Site Plan is required by the Commission for review and approval by the Executive Director of a proposed connection or reconstruction, repair or modification of a Water Service Pipe or Fire Service Pipe or appurtenance, which connects, to the Commission's water distribution system. The document also includes requirements for connections to the Commission's sanitary and combined sewers systems.



# Springfield Water and Sewer Commission

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83. Residential shall mean a classification of Water Users that use or engage in providing housing facilities which include all dwellings, tenements, apartments, trailer houses (single), and other forms of housing.
84. Sanitary Sewer means a Sewer, which carries domestic, and/or Industrial Wastewaters and to which surface runoff from storms and groundwater is not intentionally admitted.
85. Service Application shall mean the form provided by the Commission and completed by the property Owner or by an Owner's agent and submitted to the Commission prior to construction, reconstruction, repair or modification of a Water Service Pipe or a Fire Service Pipe from a Public Water Main. A completed application includes verification that the premise address listed therein is correct.
86. Service Area shall mean the geographic area that is or can be serviced by the Commission's existing water and/or Sewer systems.
87. Sewer means a pipe or conduit for carrying Wastewater.
88. Sewer Facilities include structures, conduits, pumping stations, treatment and disposal works, and other appurtenances for the purpose of collecting, treating and disposal of domestic and/or Industrial Wastewater.
89. Shut Off shall mean to temporarily stop Water Service or to terminate Water Service, in accordance with the Commission's Rules and Regulations.
90. Storm Drain means a pipe or conduit for conveying rainwater, groundwater, subsurface water, condensate, cooling water, or other similar discharge.
91. Surety Required shall mean the bond, letter of credit, or other Commission approved financial guarantee to be posted as surety by an Owner to extend a Public Water Main, Sewer Main, and /or build a water and/or sewer pump station. Bonds Required shall also mean the bond, letter of credit, or other Commission approved financial guarantee to be posted as surety by a Commission Approved Contractor to work on the Commission's Water Distribution System or Sewer Collection System for an approval period.
92. Tapping Main Charge (Basic) shall mean the cost charged for connecting to existing water mains for new mains, main extensions, and service connections. The Commission shall provide labor and equipment to tap the existing main. The following items are not included in this charge and are provided by the Applicant: permits, paving, location work, excavation, backfill, and compaction, police, traffic control, tapping sleeve, tapping valve, pipe installation, appurtenances, flowable fill, rock excavation, frost excavation, concrete removal, and hauling in suitable fill. This charge shall be paid when application is submitted.



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93. Tapping Main Charge (Complete) shall mean the cost charged for connecting to existing water mains for new mains, main extensions, and service connections. The Commission provides excavation, materials, installation, and backfill. The following items are not included in this charge: permits, paving, flowable fill, rock excavation, frost excavation, pipe installation, police, traffic control, concrete removal, and hauling in suitable fill. This charge shall be paid when application is submitted.
94. Turn-On shall mean initiate or restore Water Service in accordance with the Commission's Rules and Regulations. No Turn-on will occur for any account with an overdue balance.
95. Undeveloped Property means property that is void of any buildings, does not have Wastewater facilities, and does not require a connection to the Public Sewer.
96. User shall mean a Person who receives water and/or Sewer service(s) from the Commission within the Commission's Service Area.
97. Wastes mean substances in liquid, solid or gaseous form that can be carried in water.
98. Wastewater means the spent water of the municipality and may be a combination of the liquid and liquid borne wastes from residences, Commercial buildings, industrial plants, and institutions, together with any groundwater and surface water that may be present.
99. Wastewater Works or Wastewater Treatment Works means any arrangement of devices and all structures, equipment and processes for collecting, pumping, treating and disposing of Wastewater and associated residuals.
100. Water / Sewer Pipe Inspection shall mean the cost charged to inspect the layout, installation, repair, water quality test, retest or re-inspection of a scheduled Backflow Prevention Device of a Commission Water Facility, Public Sewer, Public Drain, Sewer, or Drain on a per day or per inspection basis. This charge shall be paid as a deposit when application is submitted based on an estimated number of days and/or inspections required in accordance with Section 3.10.1 of these Rules and Regulations. A final invoice shall be sent to the Customer that includes the actual number of days.
101. Water and Sewer Service shall include but not be limited to water, sewer and other services, facilities and commodities furnished or supplied by the Commission pursuant to MGL 40-N.
102. Water Facilities will mean Meters, Backflow Prevention Devices, water valves, water mains, Water Service Pipes, Fire Service Pipes, and water hydrants.



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103. Water Meter means any device for measuring and recording the water consumption at a building or property, installed by or at the order of the Commission, which may be used for billing by the Commission.
104. Water Service Connection shall mean the connection and the associated valves and appurtenances at the water main for the purpose of turning Water Service on and off for the purpose of supplying water and for fire protection and suppression. The Commission owns the Water Service Connection.
105. Water Service Pipe shall mean the piping and associated valves and appurtenances that extend from a Water Service Connection to the Commission's Meter for the purpose of supplying water, other than for fire protection and suppression. The Customer owns the Water Service Pipe. A new Water Service Pipe is installed by a Commission Approved Contractor. A replacement Water Service Pipe is installed by the Commission.
106. Water Service shall mean the readiness to supply or actual supplying of water to Premises in which a Water Service Pipe or Fire Service Pipe has been installed.
107. Water Users or Water Consumers shall mean all public and private users of the Commission's water system, irrespective of any person's responsibility for billing purposes for water used at any particular facility.
108. Watershed lands, Reservoir lands, Roads and Trails, and Waterways shall include boulevards, roadways, driveways, trails, bridges, buildings, structures, land, beaches, ponds, lakes, rivers and other waters under the care and control of the Springfield Water and Sewer Commission.
109. Well shall mean any dug, driven or drilled hole, with a depth greater than its largest surface diameter, developed to supply water intended and/or used for human consumption, irrigation, or industry and not subject to regulation by 310 CMR 22.00.
110. Wet Industry means a classification of Users which includes all industries which produce large volumes of Wastewater; or which produces a Wastewater of greater strength than residential Wastewater (or contains constituents which require pretreatment in accordance with Chapter 1) shall be classified as Wet Industry for purposes of this chapter.



# Springfield Water and Sewer Commission

## Guidelines and Policies

### CHAPTER 4 APPLICATIONS, SUBMITTALS/PLANS, APPROVALS, and INSPECTIONS

#### Section 4.1 Applications

##### 4.1.1 General

1. An application is required for, but not limited to, the following:
  - (a) Water Service
  - (b) Water Main Extension
  - (c) Sewer Service
  - (d) Sewer Main Extension
  - (e) Commission Approved Contractor
  - (f) Cross Commission Transmission Mains, Easements, or Property
  - (g) Fire Flow Test
2. All applications except Application to Cross Commission Transmission Mains, Easements, or Property, can be made at the Commission's Customer Field Service office at 71 Colton Street, Springfield, MA. Applications to Cross Commission Transmission Mains, Easements, or Property can be made at the Commission's Engineering and Technical Services office at 250-M Street Extension, Agawam, MA 01001.
  - (a) Fill out an application form(s) according to Section 4.1 of these Guidelines and Policies;
  - (b) Pay application fees as set forth in the Commission's Schedule of Rates Fees and Charges in its Rules and Regulations;
  - (c) Submit Proposed Site Plan(s) according to Section 4.2 of these Guidelines and Policies;
  - (d) Submit information on Fire Suppression System Plan according to Section 4.2 of these Guidelines and Policies;
  - (e) Submit information on Backflow Prevention Devices according to Section 4.2 of these Guidelines and Policies and;



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(f) Submit information on Grease Interceptors for FOG control, according to Section 4.2 of these Guidelines and Policies.

(g) Application procedures, submittals and all other requirements to Cross Commission Transmission Mains, Easements, or Property shall be in accordance with 15.1.9 of these Guidelines and Policies.

3. An Applicant shall be the Owner or the Owner's authorized representative. The Owner's authorized representative shall have a letter signed by the Owner of the property to be serviced authorizing the Owner's authorized representative to apply for service. The letter shall include the Owner's name, billable address, and phone number.
4. An Application fee is required at the time of application and at rates as set forth in the Commission's Schedule of Rates Fees and Charges in its Rules and Regulations. The fee includes the cost of the site plan review.
5. Typically, one (1) service application is required for each billing account and may include both water service and sewer connections with the appropriate Application Fees and Plan Submittals.

### 4.1.2 Application Procedure for Residential Water/Sewer Service Pipe:

1. An Applicant shall submit a separate Residential Water/Sewer Service Application for each water service pipe requested entering a Property. A Building Sewer Connection for the same Property may be included on the Application.
2. An Applicant shall submit a Proposed Site Plan for review. See Section 4.2 for plan submittals.

### 4.1.3 Application Procedure for Commercial/Industrial Water Service Pipe or Fire Service Pipe:

1. An Applicant shall submit a Water Service Application for the water service pipe(s) requested entering a Property.
  - (a) A Fire Service Pipe Application for the same Property may be included on the Application.
  - (b) A Building Sewer Connection Application for the same Property may be included on the Application.
2. An Applicant shall submit a Proposed Site Plan for review. See Section 4.2 for plan submittals.





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3. If applicable, an Applicant shall submit fire suppression system plans for review. See Section 4.2 for plan submittals.
4. If applicable, an Applicant shall submit backflow prevention plans for review. See Section 4.2 for plan submittals.

### **4.1.4 Application Procedure for Residential Building Sewer Connection:**

1. An Applicant shall submit a separate Building Sewer Connection Application for each building sewer connection requested. A Water Service Pipe for the same Property may be included on the Application.
2. An Applicant shall submit a Proposed Site Plan for review. See Section 4.2 for plan submittals.

### **4.1.5 Application Procedure for Non-Residential Building Sewer Connection:**

1. An Applicant shall submit a separate Building Sewer Connection Application for each building sewer connection requested. A Water Service Pipe for the same Property may be included on the Application.
2. An Applicant shall submit a Proposed Site Plan for review. See Section 4.2 for plan submittals.
3. An Applicant shall submit a Proposed Plumbing Plan for review. See Section 4.2 for plan submittals.
4. An Applicant shall submit a Proposed Fats, Oils, and Grease (FOG) design, sizing and construction plan for review. See Section 4.2 for plan submittals.
5. An Applicant shall submit an FOG Maintenance Plan for review. See Section 4.2 for plan submittals.

### **4.1.6 Application Procedure for New Water Main, Water Main Extension, or Replacement:**

1. An Applicant shall submit a separate Water Main Extension Application for each new water main, water main extension, and/or water main replacement requested.
2. An Applicant shall submit a separate Water and Sewer Application for each type of service requested in addition to the Water Main Extension Application. See the above Water Service and Building Connection Applications.
3. An Applicant shall submit a Proposed Site Plan when applying for a New Water Main, Water Main Extension, or Replacement. See Section 4.2 for plan submittals.





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4. The Applicant shall also submit the Proposed Site Plan to the local Department of Publics Works and local Fire Department that have jurisdiction.
5. The Applicant may also be required submit the Proposed Site Plan to the local Planning Department, local Fire Department, and/or local Conservation Commission that have jurisdiction as determined by the Commission.
6. The Applicant shall submit the block plan or Assessor's Plan. See Section 4.2 for plan submittals.
7. The New Water Main Installation/Extension Charge at rates as set forth in the Commission's Rules and Regulations.

### 4.1.7 Application Procedure for Subdivisions

1. Subdivisions require a single application for the water main and sewer main extension.
2. Each house requires a single application for both the water service and sewer connection.

### 4.1.8 Application Procedure for Commission Approved Contractor

1. The Installer is required to have completed the approval process to perform work on projects relating to the Commission's Public Water Mains and/or Public Sewers.
2. This policy will evaluate Installers to determine if the Installer has the qualifications and experience to perform work on projects relating to the Commission's Public Water Mains and/or Public Sewers.
3. The scope of work for projects relating to the Commission's Public Water Mains and/or Public Sewers is limited to small to medium sized projects. Examples of this work are:
  - (a) Water mains — installation, repair
  - (b) Hydrants — installation, repair
  - (c) Valves and other appurtenances — installation, repair
  - (d) Bypass piping – installation, maintain
  - (e) Services — new installations, replacements, and cut offs
  - (f) Sewer Mains – installation, repair, cleaning, jetting



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- (g) Manholes – installation, repair, rehabilitation
  - (h) Repairs to sewer service
  - (i) Video inspection and analysis of sewer mains
  - (j) Excavation, backfilling, compaction, and/or surface restoration
4. Installers shall provide Required Bonding, as set forth in the Commission’s Rules and Regulations, at the time of application.
  5. At the time of Application Installers shall provide proof of Required Insurance as defined below:
    - (a) Workmen’s Compensation, Employer’s Liability Insurance, and Occupational Disease Insurance: The INSTALLER shall, before commencing the Work, provide by insurance for the payment of compensation and the furnishing of other benefits under MGL Chapter 152 (Ter. Ed.) to all persons employed under the contract and the INSTALLER shall continue such insurance in force and effect during the term thereof.
    - (b) Comprehensive General Liability Insurance: The INSTALLER shall, before commencing the Work, carry Public Liability Insurance and Property Damage Insurance, including coverage for contractual liability, and (if sub-contractors are involved) INSTALLER’s Protection Liability Insurance, satisfactory to the COMMISSION so as to save the COMMISSION harmless from any and all claims for damages arising out of bodily injury to, accidental death, or destruction of property caused by accident resulting from the use of implements, equipment, or labor used in the performance of the contract or from any neglect, default, or omission or want of proper care, or misconduct on the part of the INSTALLER or anyone in the INSTALLER’s employ during the execution of the Work.
    - (c) Limits in the amounts of not less than \$250,000.00 for bodily injury insurance and accidental death insurance for each occurrence and not less than \$100,000.00 for property damage insurance.
    - (d) When any motor vehicles are used in connection with the Work to be performed, Automobile Public Liability Insurance with limits of not less than \$250,000.00 for bodily injury insurance and accidental death insurance for each occurrence and not less than \$100,000.00 for property damage insurance.
  6. The approval period will be 3 years.
  7. The method of approval is as follows:



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- (a) The Installer must complete the Commission Approved Contractor Application Form, attached in Section 15.1.1, sign and date the Safety Assurance Form, attached in Section 15.1.2, and sign and date the Indemnity Form, attached in Section 15.1.3 of these Guidelines and Policies. The completed application must be submitted to the Commission at the Commission's Customer Field Service Office at 71 Colton Street, Springfield, MA.
- (b) The Installer shall have at least one (1) responsible supervisor with a cellular phone number for immediate contact at any job site.
- (c) The Installer's history shall indicate the Installer's company has been in business a minimum of five (5) years installing and repairing Public Water Systems and/or Public Sewer.
- (d) The Installer's procedure and equipment for pressure testing water and sewer mains shall indicate the Installer's company has the proper equipment and method of work to successfully pressure test said mains in projects work as defined in Paragraph 3 above.
  - Hiring of a subcontractor to perform the pressure test is allowed provided specific information about the subcontractor, such as Name, Company, Company's core business, address, phone number, name of responsible supervisor is submitted.
- (e) The Installer's procedure and equipment for disinfecting water mains and services shall indicate the Installer's company has the proper equipment and methods to successfully disinfect and put into service the water mains and services.
  - Hiring of a subcontractor to perform the disinfection procedure is allowed provided specific information about the subcontractor, such as Name, Company, Company's core business, address, phone number, name of responsible supervisor is submitted.
- (f) Any person licensed by the Commonwealth of Massachusetts as a Master or Journeyman Plumber shall be deemed qualified to make connections to sewers, but still must obtain a Commission Approved Contractor Card for such activities.
- (g) Any person licensed by the Commonwealth of Massachusetts as a Drinking Water Operator – Distribution 2 or higher shall be deemed qualified to install or repair water mains, water services, and/or other water appurtenances, but still must obtain a Commission Approved Contractor Card for such activities.



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- (h) Provide proof of the Required Bonding as defined on the Application Form, attached in Section 15.1.1 of these Guidelines and Policies.
  - (i) Provide proof of Required Insurance as defined in Paragraph 5 above.
  - (j) The Installer shall provide references, on request, which shall list a minimum of five (5) Municipal projects that the Installer performed on water and/or sewer work, in the last five (5) years. The listing is to include:
    - Name of Municipal project
    - Description of services provided
    - Date the work was performed and date the work was completed
    - Point of contact with address and a desk top phone number whom the Commission has authorization to contact regarding the project
8. The Commission shall evaluate all Application Forms submitted by the Installer, interview the Installer, and make a recommendation to the Executive Director for approval or denial.
9. Installers, who have their request denied, may appeal the decision, in writing to the Executive Director of the Commission.

### 4.1.9 Application and Scheduling Procedure for Fire Flow Testing

1. An Applicant shall submit a separate Fire Flow Test Application, Fee, and Deposit for each Fire Flow Test requested in accordance with the Commission's Rules and Regulations.
2. The Applicant is be required to submit a plan or Commission distribution map showing the hydrants to be used during the Fire Flow Testing.
3. The Commission shall schedule to have all valves in the Fire Flow Test area operated to ensure the valves are in the open position. The valves will be operated within 14-days of the Applicant submitting the Application, Fee, and Deposit.
4. The Applicant shall schedule a day, after the valve(s) position have been operated, to perform the Fire Flow Test through Customer Service or if unable to schedule at time of application call the Commission's Inspection office at 413-787-6069. Weather conditions may require the Fire Flow Test(s) to be rescheduled. No Fire Flow Test(s) shall be scheduled when temperatures are below freezing, unless special arrangements are approved by E&TS.
5. The Applicant shall demonstrate experience in the art of performing Fire Flow Tests and shall demonstrate the experience to the satisfaction of the Commission.



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## Guidelines and Policies

6. Fire Flow Testing shall be performed in accordance with Section 6.5 of these Guidelines and Policies.

### Section 4.2 Submittals, As-Built Plans, Record Sketches, and Service Cards

#### 4.2.1 General

1. The Applicant for any new water and/or sewer service must submit a Proposed Site Plan(s) Backflow Prevention Plan(s), Fire Suppression Plan(s), Plumbing Plan(s) and/or Fats Oils and Grease Interceptor Plan(s) for review, comments, and potential approval by the Commission.
2. The Commission reviews Proposed Site Plan(s) and other plan(s), as appropriate to determine compliance with Commission Rules and Regulations, the Guidelines and Policies, and the Commission's Material Specifications.
3. The Applicant's engineer may contact the Commission for copies of records of existing water and sewer mains and services.
4. The Commission needs one (1) Proposed Site Plan for draft review and comment and after the draft is approved, five (5) Final Site Plans shall be submitted.
5. A License Agreement(s), according to the Commission's Rules and Regulations and Section 4.3.2 of these Guidelines and Policies, for all Water and Sewer Main Extensions shall be submitted after the Final Site Plan has been approved and before construction can begin. The License Agreement Form is attached in Section 15.1.4 of these Guidelines and Policies.
6. Surety Required, according to the Commission's Rules and Regulations, in a form approved by the Commission for all Water and Sewer Main Extensions, shall be submitted after the Final Site Plan has been approved and before construction can begin.
7. The Commission, at its discretion, may require additional design requirements based on site conditions, capacity issues, existing infrastructure materials, and/or other unknown conditions.

#### 4.2.2 Proposed Site Plans

1. Proposed Site Plans for New Water Main Extensions and New Sewer Main Extensions shall include the following;
  - (a) A narrative letter briefly describing the proposed project, type of establishment and anticipated average daily and peak water demand and sewer discharge is required;



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- (b) at a minimum may be submitted on 24-inches X 36-inches;
  - (c) MA Professional Engineer stamp;
  - (d) a Title Block that includes Street Name, sewer or water main extension, extents of extension, such cross street to cross street, date for submittal and latest revision, vertical datum and horizontal datum (if applicable), and scale of plan;
  - (e) a Block Plan or Geographical Information System (GIS) map from the City of Springfield Department of Public Works-Engineering or an Assessor's Plan from the Town of Ludlow Assessor's office at Town Hall showing the lot and/or parcel to be serviced and an intersecting street may also be required;
  - (f) new water and/or sewer main and/or service locations and existing water and/or sewer main and/or service locations, shall be shown on the Proposed Site Plan;
  - (g) existing and proposed water and/or sewer main structures, fittings and appurtenances to be connected;
  - (h) existing and proposed lots or parcels, right of way layout, labels of lots, and any existing street addresses of the project site;
  - (i) existing and proposed utilities particularly underground for the project area;
  - (j) proposed easements through which water and or sewer services are proposed;
  - (k) widths of proposed easements are to be determined by the Commission and;
2. There are several options for overall project sanitary service. In addition to Paragraph 1 above, the Proposed Site Plans for **Sewer Main Extensions** shall also include the following, in order of preference by the Commission;
- (a) Gravity sanitary flows to other existing gravity sewers.
  - (b) Gravity flows to an existing sanitary pump station. Capacity availability at the pump station and in existing sanitary mains must be determined based upon proposed peak design flows for this project and other potential building lots outside of this project area but served by proposed sewers.



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- (c) In some cases an existing sanitary pump station is in the area. If available capacity of an existing sanitary Pump Station, force main, or gravity sewers is not adequate to serve the proposed project, the developer must fund the analysis, design, and construction of Commission infrastructure upgrades such that there is adequate capacity. The Commission would participate in the analysis of existing capacity of structures.
  - (d) Design and construction of new private pumping facilities for project flows to existing public gravity sewers. The Commission currently has a moratorium on new public pump stations. Any proposed new pump station must be approved by the Commission Executive Director.
  - (e) Engineers will explore each alternative in order before proposing new private sanitary pump stations.
3. Proposed Site Plans for **Subdivisions** shall include the following;
4. Comply with the Water Main Extensions and Sewer Main Extensions requirements in Paragraphs 1 and 2, above;
- (a) if the subdivision is to be built in phases then the phases shall be defined so that proper appurtenances for water and sewer can be installed at the end of each phase, so that the next phase can be started without adverse effect on existing customers;
  - (b) any local Planning Board requirements must also be met by the Applicant's engineer, including, but not limited to, Preliminary Plan submission as defined by the State of Massachusetts and Definitive Plan submission as defined by the State of Massachusetts;
  - (c) any local Fire Department requirements must also be met by the Applicant's engineer;
  - (d) any local Department of Publics Works requirements must also be met by the Applicant's engineer;
  - (e) A coordination meeting(s) may be required to achieve this.
5. Proposed Site Plans for **Residential Water and Sewer Service** shall include the following;
- (a) At a minimum may be submitted on 8.5-inches X 11-inches;
  - (b) a mortgage survey is acceptable for a Residential Proposed Site Plan;



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- (c) a Title Block that includes Service address, type of service(s) the plan is for, date for submittal and latest revision, vertical datum and horizontal datum (if applicable), and scale of plan;
  - (d) a Block Plan or Geographical Information System (GIS) map from the City of Springfield Department of Public Works-Engineering or an Assessor's Plan from the Town of Ludlow Assessor's office at Town Hall showing the lot and/or parcel to be serviced and an intersecting street may also be required;
  - (e) a street address and a lot or parcel number must be obtained from the Department of Public Works, that has jurisdiction;
  - (f) the proposed building(s) footprint;
  - (g) new water and/or sewer service locations, existing water and/or sewer service locations, and any water and/or sewer service locations to be discontinued and;
  - (h) may require MA Professional Engineer's stamp for unusual layouts and/or easements though adjacent properties of other Owners.
6. Proposed Site Plans for Commercial/Industrial and Multi-family Residential (3-family or more) Water and Sewer Service shall include the following;
- (a) A narrative letter briefly describing the proposed project, type of establishment and anticipated average daily and peak water demand and sewer discharge is required;
  - (b) at a minimum may be submitted on 24-inches X 36-inches;
  - (c) MA Professional Engineer stamp;
  - (d) a Title Block that includes Service address, type of service(s) the plan is for, date for submittal and latest revision, vertical datum and horizontal datum (if applicable), and scale of plan;
  - (e) a Block Plan or Geographical Information System (GIS) map from the City of Springfield Department of Public Works-Engineering or an Assessor's Plan from the Town of Ludlow Assessor's office at Town Hall showing the lot and/or parcel to be serviced and an intersecting street may also be required;
  - (f) a street address and a lot or parcel number must be obtained from the Department of Public Works, that has jurisdiction;
  - (g) the proposed building(s) footprint;





# Springfield Water and Sewer Commission

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- (h) new water and/or sewer service locations, existing water and/or sewer service locations, and any water and/or sewer service locations to be discontinued;
  - (i) existing and proposed water and/or sewer main structures, fittings and appurtenances within the site and within any right of way which contains mains serving the project site;
  - (j) existing and proposed lots or parcels, right of way layout, labels of lots, and any existing street addresses of the project site;
  - (k) existing and proposed utilities particularly underground for the project area;
  - (l) proposed easements through which water and or sewer services are proposed and;
  - (m) widths of proposed easements are to be determined by the Commission.
7. When applicable, a Demolition Plan showing the Discontinuance of Existing water and sewer services will also be submitted at this time. Discontinuance submittals include the following:
- (a) Location of service to be discontinued;
  - (b) Method that the Installer or Owner will be used to discontinue the service.
8. When applicable, a plan showing any Cross Connection will also be submitted at this time. Any Cross Connection must be separated from the public water supply by a Backflow Prevention Device (BFP) for certain water uses according to CHAPTER 10 of these Guidelines and Policies.
9. **Backflow Prevention Device** submittals include the following:
- (a) Plumbing plan showing location of backflow prevention device (BFP) according to Section 10.1, Paragraph 6 of these Guidelines and Policies;
  - (b) the type of BFP to be installed and;
  - (c) the specifications of BFP to be installed.
10. When applicable, a plan showing a Fire Suppression System will also be submitted at this time. All fire suppression systems are a Cross Connection and must be separated from the public water supply by a Backflow Prevention Device (BFP) for certain water uses according to CHAPTER 10 of these Guidelines and Policies.
11. **Fire Suppression System** submittals include the following:
- (a) Comply with the BFP requirements in Paragraph 9, above;



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- (b) The fire suppression system design is the responsibility of the Applicant's engineer;
  - (c) a proposed site plan and plumbing plans of fire suppression system which is separate from the domestic water system to the public water main;
  - (d) Fire Flow Testing may be required - Fire Flow Test results only represent the conditions of the public water system at the time of the test. Public water system functioning may vary from day to day and hour to hour within the parameters of DEP requirements. The Commission does not review or approve fire suppression systems for adequacy of flow or pressure;
  - (e) all public and private hydrants existing and proposed;
  - (f) the location of the External Fire Department Connections (FDC) (typically the FDC must be located within 100 feet of a public hydrant) on the exterior of building
  - (g) any Fire Department requirements must also be met by the Applicant's engineer and;
  - (h) a coordination meeting(s) may be required to achieve this.
12. When applicable a plan showing any internal and/or external Fats, Oils, and Grease (FOG) Interceptor will also be submitted at this time according to the Commission's Rules and Regulations.
13. **Fats, Oils, and Grease Interceptor** submittals include the following:
- (a) Grease interceptor equipment design and sizing and construction details.
  - (b) Plumbing plan and/or site plan showing location of installation.
  - (c) FOG Maintenance Plan.
14. **Industrial Pretreatment Sanitary Survey** – Certain industries require pretreatment of sanitary flows before being discharged to the public sewer system. Contact the Commission's Industrial Pretreatment Program for specific requirements at 787-6207 x 213.

### 4.2.3 Minimum Design Standards

1. New Water Mains and Appurtenances shall be shown and designed on Proposed Site Plan(s) according to CHAPTER 6 of these Guidelines and Policies and these minimum design standards as follows;



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- (a) The Commission reserves the right to change any of the below requirements at its discretion during the review process.
- (b) When horizontal or vertical control is required the Massachusetts State Plane Coordinate System in feet using the North American Datum 1983 (NAD83) (NAD83 is a horizontal datum) shall be utilized, unless otherwise approved by the Commission. Vertical Datum should be provided in New City of Springfield Base which may be converted in accordance with Relation of Vertical Datums to Springfield City Base Detail (W-15.0), unless otherwise approved by the Commission. Please note that the Relation of Vertical Datums to Springfield City Base Detail (W-15.0) provided is a reference and a guide. If vertical control is critical to a project than a survey by a professional surveyor is required.
- (c) The minimum pressure in all new public water mains shall be twenty (20) pounds per square inch (PSI) under any and all flow conditions including peak hourly flow and maximum day demand with a fire.
- (d) The minimum required fire flow from all new public hydrants shall be as follows:
- Residential zoned areas shall be designed to provide 500 gallons per minute (GPM) or as required by the local Fire Department having jurisdiction, whichever is greater, or
  - Commercial, Industrial, or Municipal areas shall be designed to provide 1500 gallons per minute (GPM) or as required by the local Fire Department having jurisdiction, whichever is greater, and
  - A signed letter from the local Fire Department having jurisdiction stating that the minimum required fire flow requirements have been met is required before an application can be processed.
- (e) Water mains shall be a minimum of 8-inch diameter, ductile iron, thickness class 52, and cement lined. Pipes with 6-inch diameter may be allowed with the Commission's approval.
- (f) Water mains shall be designed to loop or have dual connections to the Commission's existing distribution system. When this cannot be achieved water mains shall be installed in accordance with the next paragraph.
- (g) Water mains in a cul-de-sacs or dead ends that cannot be extended or looped may be 6-inch diameter with Commission approval and the following conditions are met;



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- Up to six (6) homes may be provided water services, unless otherwise approved by the Commission.
  - Hydrants shall be placed according to paragraph (k) of this Section and shall have one (1) length of pipe placed after the hydrant tee, unless otherwise approved by the Commission.
  - The majority of the water services shall be connected after the last hydrant on one length of pipe.
- (h) The water mains will be installed on the north or east side of the street.
- (i) Typically, water mains in streets shall be located at least 7-feet from sewer mains and water services shall be located at least 10-feet from sewer services and 4-feet from other utilities, unless otherwise approved by the Commission.
- On 40-foot wide streets the pipe will be located 13-feet from the appropriate street line.
  - On 50-foot wide streets the pipe will be located 18-feet from the appropriate street line.
  - On 60-foot wide streets the pipe will be located 23-feet from the appropriate street line.
  - On street widths not defined above the Applicant's engineer shall contact the Commission's Engineering and Technical Services group to determine the location of the water main.
- (j) Valves:
- Three (3) Isolation valves shall be installed on each side of three-way intersections at each street line.
  - Four (4) Isolation valves shall be installed on each side of four-way intersections at each street line.
  - Isolation valves shall be installed every 500-feet on straight runs of water main.
  - Isolation valves shall be the same size as the water main being installed.
  - Isolation valves shall be gate valves up 12-inch in diameter. Isolation valves 16-inch may be butterfly valves but require Commission approval prior to installation. Isolation valves larger than 16-inch shall be approved by the Commission prior to installation.
- (k) Public Hydrants:



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- Public Hydrants shall be located approximately every 300-feet to 400-feet, on the same side of the street as the water main, on a property line, and as approved by the local Fire Department.
- Public Hydrants are not to be placed at the end of the main in a cul-de-sac, but rather at or before the point of curvature (PC).
- Public Hydrants are connected directly to public water mains.
- Public water mains are only found in street right of ways or easements given to the Commission by the property owner.
- Public Hydrants used to supply water to private fire protection systems shall be in street right of ways or easements given to the Commission by the property owner.
- The Applicant's engineer must provide information to the Commission and local Fire Department with flow and demand requirements and available flow.

### (l) Private Hydrants:

- Private Hydrants within a site shall be installed so as to protect the public water supply per DEP requirements, Commission requirements and the local Fire Department requirements.
- The Applicant's engineer will contact the Commission's Engineering and Technical Services for each such installation.
- Private Hydrants shall not be connected to the Public Water main.
- Private Hydrants shall be installed after a meter and/or back flow preventer.
- Private Hydrants shall conform to the Commission's Material Specification except they shall NOT be provided with a pumper connection.
- Private Hydrants are owned, operated, and maintained by the property owner. It is encouraged to work with the local Fire Department having jurisdiction for any private hydrants to be part of the hydrant certification process, if applicable.

### (m) Private Yard Hydrants

- Private Yard Hydrants within a site shall be installed so as to protect the public water supply per DEP requirements, Commission requirements and the local Fire Department requirements.
- The Applicant's engineer will contact the Commission's Engineering and Technical Services for each such installation.
- Private Yard Hydrants shall not be connected to the Public Water main.



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- Private Yard Hydrants shall be installed after a meter in accordance with the **Typical Yard Hydrant Detail (W-11.5)**.
- Private yard Hydrants shall have a back flow preventer installed on the threaded outlet or as required by the Commission.
- Private Yard Hydrants shall conform to the Commission's Material Specification except they shall NOT be provided with a pumper connection.
- Private Yard Hydrants are owned, operated, and maintained by the property owner. The Owner is encouraged to work with the local Fire Department having jurisdiction for any private hydrants to be part of the hydrant certification process, if applicable.

### (n) Fittings:

- All fittings shall be mechanically restrained, unless otherwise approved by the Commission.

### (o) 1-inch through 2-inch Water Service, new replacement and/or seasonal:

- All material shall be in accordance with the Commission's Material Specifications and installed in accordance with these Guidelines and Policies, unless otherwise approved by the Commission.
- Typically, Ball Type Corporation Stops (corporation) shall be installed horizontally at the water main for connecting all services to the new mains. A Ball Type Curb Stop (curb stop) shall be installed at the property line for connecting copper tube from the main to copper tube from the building. A Straight or Angle Ball Meter Valves (meter valve) shall be installed at the building for connecting copper tube from the curb stop to the building. Finally, copper tubing shall be used to make connections between new corporations, new curb stops, and new meter valves.

### (p) 4-inch through 12-inch Water Service:

- All material shall be in accordance with the Commission's Material Specifications and installed in accordance with these Guidelines and Policies, unless otherwise approved by the Commission.
- All shut-off valves at the water main shall be 6-inch or larger. If a 4-inch ductile iron water service is required, the Installer shall provide a 6-inch connection and 6-inch shut-off valve and then reduce to 4-inch.
- A stainless steel (SS) or ductile iron (DI) tapping sleeve, or a mechanical joint (MJ) tee is required on the main in front of the property to be served, unless otherwise approved by E&TS.



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- A 6-inch or larger tapping by MJ or MJ by MJ gate valve is required, unless otherwise approved by E&TS.
- Any Water Service or Fire Service Pipe that is looped to the Commission's Public Water Main(s) requires check valves at each meter and/or back flow preventer.
- All tees, bends, crosses, and other fittings shall be ductile iron mechanical joint unless otherwise approved by the Commission. If a reducer is required it shall be DI MJ by MJ.
- All pipe shall be DI, thickness class 52, cement lined, and push-on joints. The final 20-feet shall be fully restrained from the flange (F) connection(s) for the outside, spindle and yoke (OS&Y) gate valve(s).
- A companion flange(s) shall be temporarily bolted onto the flanged OS&Y gate valve(s). The companion flange(s) shall have a 2-inch threaded outlet. The threaded outlet shall be utilized for flushing, leak testing, and disinfection.
- When the water service pipe through the wall or floor is to be utilized for a fire service pipe only an OS&Y gate valve in accordance with the Commission's Material Specifications is required as a building control valve. A temporary companion flange with a 2-inch threaded outlet and 2-inch ball valve may be installed on the building control valve for leak testing, flushing and bacteria testing..
- Fire Services may install either OS&Y gate valves or butterfly valves on both sides of the backflow preventer assemblies. Flanged or grooved connections are allowed. The building control valve does not take the place of the assembly valves.
- All joints outside/underground shall be MJ or push-on.
- All joints inside/above grade shall be flanged.

### (q) Special Conditions and Requirements:

- New or replacement water mains and/or water services installed within 200-feet of a Fuel Storage Tank and/or if a potable water line is to traverse an area saturated with low molecular weight petroleum products shall be installed with fluorocarbon gaskets, in accordance with the Commission's Material Specifications, for 100-feet on each side of the fuel storage tank or as required by the Commission.
2. Sewer Mains and Appurtenances shall be shown on Proposed Site Plan(s) according to CHAPTER 11 of these Guidelines and Policies and the minimum standards as follows;





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- (a) The Commission reserves the right to change any of the below requirements at its discretion during the review process.
  - (b) Sewer mains shall be a minimum of 8-inch diameter, PVC SDR 35, or RCP, or Ductile Iron thickness class 52, epoxy lined.
  - (c) Sewer mains shall be installed in the center of the street.
  - (d) Sewer mains shall be a minimum of 4-feet deep.
  - (e) 8-inch Sewer mains shall be sloped at 0.4% (4.8-inch/100-feet).
  - (f) Manholes shall be at no more than 300-feet apart and at all changes in diameter, material, slope, and direction.
3. All installations of utilities adjacent to Commission water and sewer mains must be a minimum of 4-feet from the existing water and/or sewer main, edge to edge of pipe. Adjacent utilities may include but not be limited to underground conduits for cable, electric, fiber optic, gas, and telephone.

### 4.2.4 As-Built Plans

1. An As-Built plan of all water and sewer mains and any other appurtenances, which have been constructed as part of the main extension construction shall be provided to the Commission. It is recommended that the engineer of record submit an initial paper draft for Commission review before submitting a mylar.
2. As-Built plans shall be submitted 60-days after the water and/or sewer main has been put into service.
3. For each new or relocated utility installed, including those installed or relocated by others during the main extension, the engineer of record shall perform an as-built location survey by coordinates prior to backfilling the excavation.
  - The survey data shall be obtained by Global Positioning Survey (GPS) and certified by a Professional Land Surveyor registered in Massachusetts.
4. The following information shall be included on any As-Built Plan of water and sewer main extensions and/or Subdivisions to be submitted to the Springfield Water and Sewer Commission.
  - (a) At a minimum, the description and location of sanitary structures includes size, material, and slope of mains, rim elevation, invert elevation of manholes, cleanouts, chimneys, and building sewer connections.
  - (b) At a minimum, the description and location of water structures must include size, material, of all mains, hydrants, fittings, bends, and water services.





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- (c) Any other information required for a full description of the infrastructure to be turned over to the Commission shall be included. The location and description of all other utilities, which have been constructed within the new or existing right of way will be included as practicable.
  - (d) The location and description of all easements, which are pre-existing and were created as part of the main extensions or the subdivision process, within the project area, shall be included.
  - (e) A full description of the layout of the newly established or existing street right of way and/or easements to be deeded to the Commission shall include the location, metes and bounds description of all monumentation.
  - (f) The lots, which have been established, and are pre-existing, within the project area shall be labeled with lot numbers and street addresses as appropriate.
5. The plan shall be stamped and signed by the main extension's design engineer, who shall be a Professional Engineer in the Commonwealth of Massachusetts, certifying that the information shown on the plan reflects a field investigation of the water and sewer mains and appurtenances which were constructed.
  6. The quality of the plan and its material must be such that it can be recorded in the Hampden County Registry of Deeds. This includes but is not limited to a plan on mylar with original Professional Engineer's stamp and signature.
  7. A complete digital base plan shall be provided in AutoCAD DWG format Release 2000i or later on a Compact Disk (CD), properly referenced to the Massachusetts State Plane Coordinate System in feet using the North American Datum 1983 (NAD83) (NAD83 is a horizontal datum) unless otherwise approved by the Commission. Vertical Datum should be provided in New City of Springfield Base which may be converted in accordance with **Relation of Vertical Datums to Springfield City Base Detail (W-15.0)**., unless otherwise approved by the Commission. Please note that the **Relation of Vertical Datums to Springfield City Base Detail (W-15.0)** provided is a reference and a guide. If vertical control is critical to a project than a survey by a professional surveyor is required. The following standards shall be applicable:
    - (a) All text shall be drawn using a STYLE of "L100-XX" (where XX refers to the plotted scale) and a font file of "SIMPLEX" as provided in the AutoCAD. The style shall be defined as a "fixed height" style and have a height of 0.10 times the drawing plotted scale. (i.e. 4.0 for 40 scale plan, 2.0 for 20 scale etc.).
    - (b) Precision and Accuracy shall be as indicated below:
      - Horizontal survey:



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- Precision: Horizontal control and surveyed points shall maintain a minimum precision of 1:10,000.
- Accuracy: No more than 10% of the survey points shall be in error by more than 1/100 inch or 0.25 mm when viewed at the requested scale.
- Vertical survey:
  - Precision: Vertical Control shall have a maximum error of closure no greater than .075 feet or .02 meters.
  - Accuracy: No more than 10% of elevations when interpolated from a Surface shall be in error of more than 1/2 a contour interval.
- Surface Data:
  - The data format shall conform to Autodesk Land Development Desktop Project files. If the Contractor uses a different software product to create a surface, then the surface must be represented as a TIN (Triangulated Irregular Network) of 3D lines on a separate, distinct layer within the AutoCAD drawing file. 3D faces or 2 dimensional lines are NOT acceptable.

### 4.2.5 Record Sketches

1. Record Sketches by Commission Inspectors shall be in accordance with the **Record Sketch Detail (W-16.0)** and include the following information:
  - (a) Street name, City or Town, limits of sketch, and page number starting in upper right hand corner.
    - Identify which water main, if more than one main in street, by size and/or which side of street (N, S, E, or W).
    - Identify “Easement” in street name when water main is installed in an easement.
  - (b) Pipe diameter, material, pressure class or pipe class, lining, manufacturer, section length, joint type, installed by, and install date at top of page
  - (c) The sketch should show a North arrow, street lines, all fittings, valves, hydrants, air corps and air valve assemblies, and 4-inch and larger water services with distances in feet and inches from center of each component. A distance from street line to center of pipe should be shown. Dates and by whom of any cut-in or tapped components should be shown.
  - (d) Totals of each main extension installation should be tabulated at bottom of page.
  - (e) A note should be provided to describe the repair, replacement, new cut-in or removed fitting or valve.



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- Deductions for abandoned or replaced pipe should be noted on bottom of page.
  - Abandoned mains are mains that are disconnected and left in place.
  - Replaced mains are water mains that are removed and another main is installed in its place.
  - Date, type of pipe, and who did work should be noted next to totals.
- (f) Each Record Sketch page should show what is installed on each page. Overlap should be avoided. The totals of pipe installed on each page are the information that will be used to create the Geographical Information System (GIS) database.
2. Cut-in valve(s), fitting(s), service(s), hydrant(s) or other infrastructure/repair should be measured to another existing valve(s), fitting(s), service(s), hydrant(s) or other infrastructure/repair in order to locate it along the main.
  3. All measurements should be with measuring tape (steel or cloth).
  4. Record Sketch drafts shall be reviewed and entered into SWSC data systems as follows:
    - (a) Capital Projects shall be reviewed by the Project Manager
    - (b) Repairs, replacements, and main, valve, and hydrant installs by SWSC shall be reviewed by Senior Inspector
  5. If there are no corrections or missing information the data will be entered into the Asset Management System.
  6. Capital Projects, repairs, replacements, and main, valve, and hydrant installs by SWSC and/or Installers shall be scanned by the Inspection Group and entered into the Commission's Asset Management System.
    - (a) Scanned documents should include Record Sketch copies with written valve numbers, Valve Forms, Hydrant Forms, and Foreman's Work Order documents.

After entry into the Asset Management System the scanned documents should be submitted to the Commission's GIS group for review and entry into the GIS database. Submission shall be by attaching the documents to the GIS Review work order in the Commission's Asset Management System.



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7. If corrections or missing information are found during any of the reviews steps the Record Sketch shall be returned to the Commission Inspectors and the needed information shall be added to the record sketch and resubmitted to the reviewer.
8. Always remember more information is better than not enough information when trying to locate Commission facilities.

### 4.2.6 Water Service Card

1. Water Service Card by Commission Inspectors shall be in accordance with the **Water Service Card Detail (W-16.1)** and include the following information on the front of the card:
  - (a) Address number, street name and community, Owner, and a Service Record number at the top of the card.
  - (b) Date and Work done should be in the middle of the card.
  - (c) Ties to the primary shut-off valve should be in the bottom of the card and should begin with the type of valve box located in street or treebelt and over the primary shut-off valve, a minimum of four (4) ties with two (2) from either side of the main structure and one (1) out from the main structure and one (1) additional tie to another structure or permanent facility should be provided. Ties from street line and intersecting street lines are acceptable alternative or additional ties.
  - (d) Distances to the valve(s) buried in street should be provided.
  - (e) If the ball IK is made onto an existing or new ball corporation it should be noted in the tie. If there is no IK it should be noted that a ball corporation is tapped into the main.
2. Water Service Card by Commission Inspectors shall be in accordance with the **Water Service Card Detail (W-16.1)** and include the following information on the back of the card:
  - (a) Water Service size, length, material, date installed, and who installed it should be at the top of the card.
  - (b) The sketch should show street lines, water main(s) with diameter that the water service is connected to, structure, such as building or meter pit, the water service enters with address number if applicable, a second structure, or permanent facility, such as a hydrant or gate marker.
  - (c) Ties to the primary shut-off valve should include a minimum of four (4) ties with two (2) from either side of the main structure and one (1) out from the



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main structure and one (1) additional tie to another structure or permanent facility should be provided. Ties from street line and intersecting street lines are acceptable alternative or additional ties. Distances in feet and inches from center of each component.

(d) North arrow should be provided.

(e) Distances along the water service pipe to other or buried valves, copper to coppers, repairs, or other underground structures or crossings should be provided.

3. All measurements should be with measuring tape (steel or cloth).
4. Always remember more information is better than not enough information when trying to locate Commission facilities.

### Section 4.3 Approvals

#### 4.3.1 Site Plan Approval

1. A Status Memo that defines the status of project for all associated water and sewer mains, services, and appurtenances is written by ET&S.
2. The Status Memo is attached to the Final Site Plan(s) once the Proposed Site Plan(s) has met all Commission requirements.
3. The Applicant and/or Applicant's engineer is notified, by phone or email, once the Status Memo and final design plans are complete and available for pick-up at the Commission's Customer Field Services Office located at 71 Colton St., Springfield, MA.
4. The Applicant must pick up the Status Memo and Final Site Plan(s) and pay all required fees as described in the memo. Those fees may include, but not be limited to:
  - (a) remaining application fees,
  - (b) connection fees,
  - (c) tapping main fees,
  - (d) main shut down / turn on fees,
  - (e) service discontinuance fees,
  - (f) inspection fees, other construction related fees.



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5. All Commission fees as set forth in the Commission's Schedule of Rates, Fees, and Charges in its Rules and Regulations are also available on line at <http://www.waterandsewer.org/>
6. It is highly recommended that the Installer receive the Contractor's copies of the Status Memo and Final Site Plan(s), as there are important records and instructions included.
7. The Status Memo, Final Site Plan(s), and any other attachments are also distributed to the Commission's Inspectors, Customer Service, Customer/Owner/Developer, Billing office, and the record file in E&TS's office.

### 4.3.2 Utility Installation Approvals

1. All installations of utilities adjacent to Commission water and sewer mains must be a minimum of 4-feet from the existing water and/or sewer main, edge to edge of pipe. Adjacent utilities may include but not be limited to underground conduits for cable, electric, fiber optic, gas, and telephone.
2. **Standard Details** - Standard offsets of utilities from Commission water and sewer mains shall be in accordance with the **Utility Separation Detail (W-01.0)** and Springfield DPW Street Typical Section for Utilities, unless otherwise approved as described below.
3. **Alternative Locations Approval** - To obtain Commission approval for alternative locations and offsets, plans shall be submitted for review and approval to the local DPW having jurisdiction and the Commission's Engineering and Technical Services Office in accordance with these Guidelines and Policies. This review and approval must be complete before the beginning of construction.
4. **Inspections and Enforcement** – Commission Inspectors will perform periodic inspections of utility installations for compliance with this policy. If encroachments are noted, the local DPW having jurisdiction will be notified for enforcement of their street occupancy permit requirements.
5. **Failure to comply** with this Policy due to encroachment into the offsets to water and/or sewer mains as described above may be cause for the removal of said conduits, pipes, and other property located within the encroachment area by the Commission. It may also result in the Commission or their agents relocating said conduits, pipes, and other property at cost to the encroaching utility, and possible removal of the contractor from the Commission Approved Contractor's List.

### 4.3.3 License Agreement Approval

1. One (1) draft License Agreement Form, attached in Section 15.1.4 of these Guidelines and Policies, will be submitted to the Commission's Engineering and

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Technical Services (E&TS) for review and approval prior to the Status Memo, Final Site Plans, and any other attachments are distributed.

- A draft form of Surety, according to Section 4.3.4 of these Guidelines and Policies, will be submitted at this time as it is a requirement of the License Agreement.
- 2. E&TS and the Commission's legal Council will review the License Agreement. E&TS will contact the Applicant with any changes or corrections prior to the Applicant submitting the signed originals.
- 3. Two (2) original License Agreements shall be submitted and signed by the Applicant.
- 4. The Commission's Engineering and Technical Services (E&TS) will review the License Agreements and submit them to the Executive Director for Signature.
- 5. The Executive Director (or his/her designee) will sign the License Agreements.
- 6. One (1) original License Agreement will be attached to the Applicant's Status Memo.
- 7. One (1) original License Agreement will be filed at the Commission in the E&TS's Record Vault and one (1) copy will be filed in the street file in E&TS's office.

### 4.3.4 Surety Approval

1. One (1) draft form of a Surety document(s) will be submitted with the draft License Agreement to the Commission's Engineering and Technical Services (E&TS) for review and approval prior to the Status Memo, Final Site Plans, and any other attachments are distributed.
  - (a) The Surety document(s) will be in the form of a Bond. Other forms of surety may be submitted in place of a Bond but must be approved prior to submittal.
    - Performance / Payment Bond shall be for the construction period until all water and sewer mains have been approved. The construction period shall be considered over on the date the final bacteria test for the water main and the pressure test for the sewer main have passed.
    - Maintenance Bond shall be after the construction period from time of all main approvals until end of warranty period, typically one (1) year minimum, but may be longer at the Commission's discretion. The warranty period shall be considered over after one (1) year, all installation issues including, but not limited to raising water and sewer structures, pavement (as it relates to the water and sewer installation), and the approval of the Town or City having jurisdiction of said paving have been addressed to the satisfaction of the





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Commission, and an As-Built drawing, according to Section 4.2.4 of these Guidelines and Policies has been submitted and approved by the Commission.

- Originals of Sureties shall be attached as part of the License Agreement for the Commission
- (b) The Surety document(s) shall be made out to the Springfield Water and Sewer Commission.
- (c) The Surety document(s) shall not have an expiration date.
- (d) The Surety document(s) shall be made out for the project.
2. E&TS and the Commission's legal Council will review the Surety document(s). E&TS will contact the Applicant with any changes or corrections prior to the Applicant submitting the signed original(s).
  3. One (1) original Surety document(s) shall be submitted and signed by the Applicant.
  4. The Commission's Engineering and Technical Services (E&TS) will review the Surety document(s).
  5. One (1) original Surety document(s) will be filed at the Commission in the Billing Office, one (1) copy will be filed in the E&TS's Record Vault, and one (1) copy will be filed in the street file in E&TS's office.

### 4.3.5 Surety Release

1. The Commission's Billing Office will notify E&TS when any Surety Document is to expire.
2. E&TS will determine when the surety will be released and send notification to the Surety provider and Applicant. Copies of the release will be kept in each file.
3. Surety shall be released one (1) year from the date of water main acceptance for service, which will be the day that the final bacteria test passes and/or one year from the date of sewer main acceptance, which will be the day that the television inspection was completed and reviewed by the SWSC's Inspectors.
4. No surety shall be released if the Applicant has not completed the above and submitted an approved As-Built drawings on mylars to the Commission's E&TS.





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### Section 4.4 Inspections for 1-inch to 2-inch Water Service (by Installers)

#### 4.4.1 Installer Responsibilities at the Installation

1. The Owner or Installer shall have all Fees paid online at VASF@waterandsewer.org, before a Commission Work Order will be issued to have an installation inspected. Typically, single-family homes will require two (2) site visits for inspections. The Commission's Inspectors must have a Work Order issued by the Customer Service Office to perform an inspection.
2. The Owner or Installer shall call the Commission's Customer Service Office at 71 Colton Street, at 413-310-3500 to schedule the next available inspection appointment. A minimum 48-hours advance notice is required. The Customer Service Office at 71 Colton Street will schedule time slots during Regular Hours, at the Commission's discretion, and the water main installation shall be ready for inspection.
3. A responsible supervisor, as defined in Section 6.1.6 these Guidelines and Policies, of the Installer shall be on site at all times during an installation.
4. The responsible supervisor of the Installer shall have all the Commission issued paperwork including, but not limited to, receipts, plans, and memoranda, at the site at all times during an installation.
5. The Owner or Installer shall provide OSHA compliant safe access, including trench shoring and safe ladders if necessary, to all trenches. The Owner or Installer shall provide OSHA compliant safe access, including safe ladders to all foundations. Other areas that require inspection by the Commission Inspectors shall also be required to provide safe access as determined by the Inspectors.
6. The Owner or Installer shall have all work completed prior to when the Inspector arrives. If the work is not completed when the Commission Inspector arrives, the Owner or Installer must make additional repairs and schedule an additional inspection, at rates as set forth in the Commission's Rules and Regulations, by calling the Commission's Customer Service Office.
7. Inspection from water main to tree belt:
  - (a) The tap at the main must be completed by the Commission in accordance with the 2-inch and less Water Service Installation Section of these Guidelines and Policies.
  - (b) The copper tube shall be laid by the Installer from the shut-off valve at the main to the shut-off valve in the tree-belt prior to the Commission Inspectors arriving at the site.



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- (c) The Commission Inspectors must witness the water service pipe being flushed, the valve at the tree-belt being turned off, and the water service pipe, including all copper tube, fittings, and valves not having any water leaks at static line pressure.
- If leaks are observed by the Commission's Inspector, the Installer will be allowed to make minor repairs to stop the leak at this time. If the leak continues or the repair is not acceptable to the Commission Inspector, the Owner or Installer must make additional repairs and schedule an additional inspection at rates as set forth in the Commission's Rules and Regulations by calling the Commission's Customer Service Office.
- (d) No work shall be backfilled before the water service installation is inspected and approved by the Commission's Inspectors.
8. Inspection from water main to house:
- (a) The tap at the main must be completed by the Commission in accordance with the 2-inch and less Water Service Installation Section of these Guidelines and Policies.
- (b) The copper tube shall be laid by the Installer from the shut-off valve at the main to the shut-off valve in the tree-belt and from the shut-off valve in the tree-belt to the meter valve in the building prior to the Commission Inspectors arriving at the site.
- (c) The Commission Inspectors must witness the water service pipe being flushed, the meter valve in the building being turned off, and the water service pipe, including all copper tube, fittings, and valves not having any water leaks at static line pressure.
- If leaks are observed by the Commission's Inspector, the Installer will be allowed to make minor repairs to stop the leak at this time. If the leak continues or the repair is not acceptable to the Commission Inspector, the Owner or Installer must make additional repairs and schedule an additional inspection at rates as set forth in the Commission's Rules and Regulations by calling the Commission's Customer Service Office.
- (d) No work shall be backfilled before the water service pipe is inspected by the Commission's Inspectors.
9. Inspections for complete Water Services from the main to the building that cannot be completed in a single day:



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- (a) Inspection of water service from shut-off valve at the main to the shut-off valve in the tree-belt shall be as described in Paragraph 8 of this Section, so that the Installer can backfill the trench in the street.
  - No open trench shall be allowed in the street or right of way over night.
- (b) Inspection of water service from the shut-off valve in the tree-belt to the end of the copper tube shall be left open until it is inspected and approved by the Commission's Inspectors.
- (c) The Installer may backfill after each installation has been inspected and approved by the Commission's Inspector. The Installer shall not backfill over any connection, joints, and/or valves until the water service pipe is installed into the building and tested and approved.
- (d) Inspection of water service from the shut-off valve in the tree-belt to the meter valve in the building, including all connections, joints, and/or valves shall be as described in Paragraph 8 of this Section, so that the Commission Inspectors can witness proper depth of cover and no leakage at joints.

### 4.4.2 Commission Responsibilities Prior to Arriving at the Installation

1. The Commission's Engineering and Technical Services Department will provide the Commission's Customer Service Office and Inspectors with copies of all reviewed plans, memoranda, and details associated with each installation.
2. The Commission's Customer Service Office will issue a work order to the Commission's Inspectors after the Owner or Installer has paid all fees and the time slot(s) that the installation will be inspected is scheduled.
3. The Commission's Inspectors will arrive at the installation during the time slot.
4. Typically, single-family homes will require inspections for the Water Service and Building Sewer Connection in accordance with Section 4.4.1 of these Guidelines and Policies. The Commission will allow up to two site visits for the Water Service Connection and up to two site visits for the Building Sewer Connection. The Owner or Installer shall pay for one Inspection Charge for the Water Service and one Inspection Charge for the Building Sewer.
  - (a) The first inspection for the Water Service or Building Connection shall be from the main to the treebelt for each.
  - (b) The second inspection for the Water Service or Building Connection shall be from the treebelt to the building for each.



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(c) The trench and pipe(s) shall be safe and ready for inspection in accordance with Section 4.4.1 of these Guidelines and Policies.

### 4.4.3 Inspectors Responsibilities at the Installation

1. The Commission's Inspectors will visually inspect the job site and installation for unsafe conditions and/or inaccessible areas to be inspected.
2. The Commission's Inspectors will enter the Installer's OSHA compliant safe trench, confirm that all fittings are no-lead brass, and meet the Commission's Specifications.
3. The Commission's Inspectors will confirm shut-off in the tree-belt is closed.
4. The Commission's Inspectors will open shut-off valve at main and the Installer will partially open the shut-off valve in the treebelt to fill the Water Service Pipe with water.
5. The Commission's Inspectors check for leaks from main to shut-off valve in tree-belt.
6. The Commission's Inspectors will check backfill material. Common borrow/fill, as specified in the Commission's Specifications, shall be placed around the copper pipe.
7. The Commission's Inspectors will enter the building to open the meter valve, so the water service pipe is ready to be flushed.
8. The Commission's Inspectors will open shut off valve in tree-belt so that the water service pipe may be flushed. The Inspector will wait for the water to run clear before shutting the meter valve
9. The Commission's Inspectors will close the meter valve and perform visual leak test. The copper tube service line and valves shall not have any water leaks at static line pressure. The Owner or Installer may be allowed to make minor repairs during inspection so that any leaking joints may be tightened.
10. If any of the above items is not ready for inspection at the scheduled time slot or fails inspection, then the Commission Inspector shall notify the Owner or Installer that the inspection must be rescheduled. The Owner or Installer must schedule an additional inspection at rates as set forth in the Commission's Rules and Regulations by calling the Commission's Customer Service Office. The Commission's Customer Service Office will schedule the next available time slot during which the installation shall be ready for inspection.



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11. The Commission's Inspectors will attach a completed meter valve tag to the meter valve inside the building after the inspection is complete and the meter is ready to be installed.
12. The Commission's Inspectors will close the shut-off valve in the tree-belt before leaving the site.
13. The Commission's Inspectors will leave the shut-off valve at the main open unless conditions exist that will not allow, such as leaks, improper installation, unapproved material, and/or other conditions as determined by the Commission's Inspector.
14. The Commission's Inspectors will take pictures, measurements, and ties including depths as defined in Section 4.4.4 of these Guidelines and Policies.
15. The Commission's Inspectors may remain on-site until the Owner or Installer has backfilled the water service pipe with a minimum of 8-inch of clean Common Borrow/Fill.
16. The Commission's Inspectors will send the Work Order back to Customer Service Office stamped "Complete" and signed by Inspector. This completed Work Order will be considered the Inspection Certificate, as defined in the Commission's Rules and Regulations. The completed Work Order will be filed at Customer Service Office.

### **4.4.4 Commission Record Requirements for 1-inch through 2-inch Water Service Installations**

1. After each water service is installed, the Commission's Inspectors will inspect the installation, as defined in Section 4.4.3 of these Guidelines and Policies, prior to backfilling to record location and ensure proper depth and quality of workmanship.
2. The Commission Inspectors will take pictures of the installation. The Commission's Inspectors will keep the picture records for at least one (1) year.
3. The Commission's Inspectors will take location ties to all water service pipe valves by measuring and tying the location of each water box.
  - (a) Measurements will be taken and recorded by the Commission's Inspectors when final paving is complete. Temporary ties may be required prior to finish paving.
  - (b) Buried valves shall have at least three (3) ties to a permanent structure.
  - (c) Temporary ties shall have at least three (3) ties to a permanent structure.



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(d) Valves installed with a gate box or water service box shall have ties taken as follows:

- When possible, measure at least three ties from a permanent structure such as a building, including two from each end of the structure and one tie will be taken one out from the structure.
  - Monuments will be installed when a permanent structure is not available to take ties from. Monuments are Commission Gate Markers, property line pins or stone bounds, hydrants, or other permanent structure that is not a building.
  - At least one other tie will be taken from another permanent structure such as another building, monument, or a hydrant.
  - Also, a tie will be taken from street line, property line or edge of easement.
4. The Commission's Inspectors will measure locations along the length of the water service pipe to each bend, coupling, tee, cross, and/or any other type of fitting.
  5. The Commission's Inspectors will measure the depth of water service pipe and location from street line, property line and/or edge of easement, if needed. Typically, the depth of pipe is needed if the pipe is not installed with five (5) feet of cover.
  6. The Commission's Inspectors will include on the record sketch the size and type of water main, the street name, any side streets abutting the building property, and any unusual installation details.
  7. The Commission's Inspectors will create a finished record sketch of the finished installation that is not to scale. The finished record sketch will be sent to Customer Service Office where it will be permanently filed.

### Section 4.5 Inspections for 4-inch and Larger Water and Fire Service Installations

#### 4.5.1 Installer Responsibilities

1. The Owner or Installer shall have all Fees paid online at [VASF@waterandsewer.org](mailto:VASF@waterandsewer.org), before a Commission Work Order will be issued to have a water or fire service installation inspected. Typically, the Commission will estimate the number of site visits required at about 100-feet per site visit. The Commission's Inspectors must have a Work Order to perform an inspection.
2. The Owner or Installer shall call the Commission's Customer Service Office at 71 Colton Street, at 413-310-3500 to schedule the next available inspection appointment. A minimum 48-hours advance notice is required. The Customer Service Office at 71 Colton Street will schedule time slots during Regular Hours,



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at the Commission's discretion, and the water main installation shall be ready for inspection.

3. A responsible supervisor (as defined in the Control of Work Section below) of the Installer shall be on site at all times during an installation.
4. The responsible supervisor of the Installer shall have all the Commission issued paperwork including, but not limited to, receipts, plans, and memoranda, at the site at all times during an installation.
5. The Owner or Installer shall layout the new water or fire service installation according to the approved plan.
6. The Owner or Installer shall provide OSHA compliant safe access, including trench shoring and safe ladders if necessary, to all trenches.
7. The Owner or Installer shall provide OSHA compliant safe access, including safe ladders to all foundations.
8. The Owner or Installer shall have all work completed prior to when the Inspector arrives. If the work is not completed when the Commission Inspector arrives, the Owner or Installer must schedule an additional inspection, at rates as set forth in the Commission's Rules and Regulations, by calling the Commission's Customer Service Office.
9. Installation of water or fire service shall be as follows:
  - (a) New water or fire service connection may be either by tapping an existing main or shutting an existing main and installing a mechanical joint tee, gate valve(s), and other fittings as required and shall be as follows:
    - The tap at the main must be completed by the Commission in accordance with the Tapping sleeve and Mechanical Joint Valve Section of these Guidelines and Policies.
    - The of shutting an existing main or water service(s) must be by the Commission and installing a mechanical joint tee, gate valve(s), and other fittings as required by the Installer in accordance with the Ductile Iron Fitting and Mechanical Joint Valve Sections of these Guidelines and Policies.
  - (b) The ductile iron water or fire service shall be laid by the Installer from the new connection in accordance with the Ductile Iron Water Main Section of these Guidelines and Policies, prior to the Commission Inspectors arriving at the site.
  - (c) No work shall be backfilled before the water or fire service installation is inspected by the Commission's Inspectors.



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- (d) The Springfield Fire Department must witness the fire service being flushed by the Installer.
- (e) The Installer is responsible to schedule the fire department flush along with the Commission leak test, disinfection, and bacteria testing. The fire department flush shall be before the Commission pressure test and bacteria test.
- (f) The Commission Inspectors must witness the water or fire service being leak tested by the Installer.
- (g) The water or fire service shall not be Turned-on or put into service until the backflow preventer has been inspected by the Commission's Cross Connection Inspector.

### 4.5.2 Layout

1. The Owner or Installer shall have the road or easement to sub-grade, lot pins, and easement boundaries installed before any layout begins.
2. The Owner or Installer shall have the project laid-out according to plan, memo, and any attachments.
3. After a Work Order is received by the Inspectors from Customer Service then the layout can be field checked by the Commission's Inspectors.
4. The Commission's Inspectors will check the lay out of the project to confirm that it has been performed according to the plan, memo, and any attachments.
  - (a) It shall remain the Owner's responsibility that the layout has been performed according to the plan, memo, and any attachments.
  - (b) Construction cannot begin until the layout has been field checked by the Commission.
5. All questions to the Commission's Engineering and Technical Services.
6. Layout, at a minimum, includes:
  - (a) Location of connection to existing facilities;
  - (b) Location of new main, valves, hydrants, air valve assemblies, and other appurtenances on the plan;
  - (c) Provide center line of water and/or sewer main;
  - (d) Provide offset stakes that will not get damaged during construction and;





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(e) Provide line stakes at end of main.

### 4.5.3 Inspection of Water or Fire Service Installation

1. Inspectors must inspect the installations daily prior to backfilling
2. Inspection includes that the pipe is installed and located according to the plan and at the proper depth.
3. Use the Ductile Iron Pipe Research Association (DIPRA) Installation Guide for Ductile Iron Pipe as a guide to inspect for properly installed water pipe.
4. Measure location along the length of the pipe to each bends, couplings, tees, crosses, and any other type of fittings.
  - (a) Start at the beginning of the new work.
  - (b) These measurements shall be taken prior to back filling.
  - (c) Measure depth of pipe and location from street line, property line or edge of easement.
5. Take pictures of installation
6. Backfilling can begin.

### 4.5.4 Water or Fire Service into Service

1. After water or fire service and all other appurtenances are installed then the Inspectors will contact the water quality group to operate the valves to allow the main to fill and air bled out of the main.
  - (a) For Water Services or Fire Services up to 2-inch the Installer shall have the correct meter valve installed before any testing being scheduled.
  - (b) For metered Water Services 4-inch and larger that require a Back Flow Preventer the Installer shall have the correct Outside Spindle and Yoke (OS&Y) gate valve (building control valve) that is in accordance with the Commission's Material Specifications installed along with a temporary blank flange with a 2-inch threaded outlet and 2-inch ball valve onto the building control valve into the building for testing. The Installer may then schedule testing.
  - (c) For Fire Services 4-inch and larger the Installer shall have the correct OS&Y gate valve (building control valve) that is in accordance with the Commission's Material Specifications installed along with a temporary blank flange with a 2-inch threaded outlet and 2-inch ball valve. The Installer may then schedule testing.



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- (d) Inspector will inform supervisor or call Water Quality Group.
  - (e) The customer/owner/developer will supply all material to fill and bleed air out of water main such as hoses, diffusers, erosion control, etc.
2. The Springfield Fire Department must witness the fire service being flushed by the Installer.
    - (a) The Installer is responsible to schedule the fire department flush along with the Commission leak test, disinfection, and bacteria testing.
    - (b) The fire department flush shall be before the Commission leak test, disinfection, and bacteria test.
  3. The Commission Inspectors must witness the water or fire service being leak tested by the Installer.
  4. After leak test passes, Inspectors will contact the water quality group to operate the valves to flush water main and begin disinfection procedures according to Section 6.3 of these Guidelines and Policies.
    - (a) Inspector will inform supervisor or call Water Quality Group.
    - (b) The customer/owner/developer will supply all material to fill and bleed air out of water mains such as hoses, diffusers, erosion control, etc.
  5. The Water Quality Group will sample for Cl2 residual, pH, and turbidity.
  6. The Water Quality Group will call the lab to take bacteria samples.
  7. The Lab will report to all Commission groups the bacteria results.
  8. After two (2) consecutive bacteria tests passing the Water Quality Group will put the new water or fire service in service by:
    - (a) Shutting all flush and sample sites.
    - (b) Allow the Installer/owner/developer to remove all flushing equipment.
    - (c) For water services with meter only the service shall not be Turned-on or put into service until the correct fittings and shut off valves are installed and has been inspected by the Commission's Inspector.
    - (d) For water or fire services that require a backflow preventer the service shall not be Turned-on or put into service until the backflow preventer has been installed by the Installer and inspected by the Commission's Cross Connection Inspector.



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- (e) Open all water valves and notify all other Commission groups that the water or fire service is in service.
- 9. Paving may begin.
- 10. Location ties shall be taken to all valves, hydrants, and other operable appurtenances by measuring the location of each water box.
  - (a) Start at the beginning of the new work.
  - (b) These measurements shall be taken when final paving is complete. Temporary ties may be required prior to finish paving.
  - (c) When possible, measure at least three ties from a permanent structure such as a building, including two from each end of the structure and one out from the structure and at least one other tie from another permanent structure such as another building or a hydrant. In addition, a tie from street line, property line or edge of easement will be taken.

### Section 4.6 Inspections for Water Main Installation (by Installers)

#### 4.6.1 Installer Responsibilities

1. The Owner or Installer shall have all Fees paid online at [VASF@waterandsewer.org](mailto:VASF@waterandsewer.org), before a Commission Work Order will be issued to have a water main installation inspected. Typically, the Commission will estimate the number of site visits required at about 100-feet per site visit. The Commission's Inspectors must have a Work Order to perform an inspection.
2. The Owner or Installer shall call the Commission's Customer Service Office at 71 Colton Street, at 413-310-3500 to schedule the next available inspection appointment. A minimum 48-hours advance notice is required. The Customer Service Office at 71 Colton Street will schedule time slots during Regular Hours, at the Commission's discretion, and the water main installation shall be ready for inspection.
3. A responsible supervisor (as defined in the Control of Work Section below) of the Installer shall be on site at all times during an installation.
4. The responsible supervisor of the Installer shall have all the Commission issued paperwork including, but not limited to, receipts, plans, and memoranda, at the site at all times during an installation.
5. The Owner or Installer shall layout the new water main installation according to the approved plan.



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6. The Owner or Installer shall provide OSHA compliant safe access, including trench shoring and safe ladders if necessary, to all trenches. The Owner or Installer shall provide OSHA compliant safe access, including safe ladders to all foundations.
7. The Owner or Installer shall have all work completed prior to when the Inspector arrives. If the work is not completed when the Commission Inspector arrives, the Owner or Installer must schedule an additional inspection, at rates as set forth in the Commission's Rules and Regulations, by calling the Commission's Customer Service Office.
8. Installation of water main shall be as follows:
  - (a) New water main connection may be either by tapping an existing main or shutting an existing main and installing either a valve, solid sleeve, or coupling shall be as follows:
    - The tap at the main must be completed by the Commission in accordance with the Tapping sleeve and Mechanical Joint Valve Section of these Guidelines and Policies.
    - The of shutting an existing main must be by the Commission and installing either a valve, solid sleeve, or coupling must be by the Installer in accordance with the Ductile Iron Valve and Mechanical Joint Valve Sections of these Guidelines and Policies.
  - (b) The ductile iron water main shall be laid by the Installer from the new connection in accordance with the Ductile Iron Water Main Section of these Guidelines and Policies, prior to the Commission Inspectors arriving at the site.
  - (c) The Commission Inspectors must witness the water main being pressure tested by the Installer.
  - (d) No work shall be backfilled before the water main installation is inspected by the Commission's Inspectors.

### 4.6.2 Layout

1. The Owner or Installer shall have the road or easement to sub-grade, lot pins, and easement boundaries installed before any layout begins.
2. The Owner or Installer shall have the project laid-out according to plan, memo, and any attachments.
3. After a Work Order is received by the Inspectors from Customer Service then the layout can be field checked by the Commission's Inspectors.



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4. The Commission's Inspectors will check the lay out of the project to confirm that it has been performed according to the plan, memo, and any attachments.
  - (a) It shall remain the Owner's responsibility that the layout has been performed according to the plan, memo, and any attachments.
  - (b) Construction cannot begin until the layout has been field checked by the Commission.
5. All questions to the Commission's Engineering and Technical Services.
6. Layout, at a minimum, includes:
  - (a) Location of connection to existing facilities;
  - (b) Location of new main, valves, hydrants, air valve assemblies, and other appurtenances on the plan;
  - (c) Provide center line of water and/or sewer main;
  - (d) Provide offset stakes that will not get damaged during construction and;
  - (e) Provide line stakes at end of main.

### 4.6.3 Inspection of Water Main Installation

1. Inspectors must inspect the installations daily prior to backfilling
2. Inspection includes that the pipe is installed and located according to the plan and at the proper depth.
3. Use the Ductile Iron Pipe Research Association (DIPRA) Installation Guide for Ductile Iron Pipe as a guide to inspect for properly installed water pipe.
4. Measure location along the length of the pipe to each bends, couplings, tees, crosses, and any other type of fittings.
  - (a) Start at the beginning of the new work.
  - (b) These measurements shall be taken prior to back filling.
  - (c) Measure depth of pipe and location from street line, property line or edge of easement.
5. Take pictures of installation
6. Backfilling can begin.



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### 4.6.4 Water Main into Service

1. After water main and all other appurtenances are installed then the Inspectors will contact the water quality group to operate the valves to allow the main to fill and air bled out of the main.
  - (a) Inspector will inform supervisor or call Water Quality Group.
  - (b) The customer/owner/developer will supply all material to fill and bleed air out of water main such as hoses, diffusers, erosion control, etc.
2. Inspectors must witness pressure tests.
3. After pressure test passes, Inspectors will contact the water quality group to operate the valves to flush water main and begin disinfection procedures according to Section 6.3 of these Guidelines and Policies.
  - (a) Inspector will inform supervisor or call Water Quality Group.
  - (b) The customer/owner/developer will supply all material to fill and bleed air out of water main such as hoses, diffusers, erosion control, etc.
4. The Water Quality Group will sample for Cl<sub>2</sub> residual, pH, and turbidity.
5. The Water Quality Group will call the lab to take bacteria samples.
6. The Lab will report to all Commission groups the bacteria results.
7. After two (2) consecutive bacteria tests passing the Water Quality Group will put the new water main in service by:
  - (a) Shutting all flush and sample sites.
  - (b) Allow the Installer/owner/developer to remove all flushing equipment.
  - (c) Open all water valves and notify all other Commission groups that the water main is in service.
8. Paving may begin.
9. Location ties shall be taken to all valves, hydrants, and other operable appurtenances by measuring the location of each water box.
  - (a) Start at the beginning of the new work.
  - (b) These measurements shall be taken when final paving is complete. Temporary ties may be required prior to finish paving.



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- (c) When possible, measure at least three ties from a permanent structure such as a building, including two from each end of the structure and one out from the structure and at least one other tie from another permanent structure such as another building or a hydrant. In addition, a tie from street line, property line or edge of easement will be taken.
10. After water main is put into service and the Inspectors and Customer Service are notified by the Water Quality Group, the Commission's Construction Crew and/or the Installer will begin to install individual water services to each home.

### Section 4.7 Inspections for Water Main Installation (by Commission)

#### 4.7.1 Layout

1. After a Work Order is received by the Inspectors from Customer Service then the layout can begin.
2. Inspectors shall lay out the center-line of the trench in the roadway and/or easement, and all other appurtenances, such as, but not limited to; water mains, valves, hydrants, air valves and/or air corps, and water services according to plan, memo, and any attachments.
3. The Commission's Construction Crew supervisor shall have the trench marked out after the centerline and other appurtenances are laid out by the Inspectors.
4. Construction cannot begin until the layout has been completed.
5. All questions to the Commission's Engineering and Technical Services.
6. Require sub grade and lot pins before any layout begins.
7. Layout, at a minimum, includes:
  - (a) Location of connection to existing facilities;
  - (b) Location of new main, valves, hydrants, air valve assemblies, and other appurtenances on the plan;
  - (c) Provide center line of water and/or sewer main;
  - (d) Provide offset stakes that will not get damaged during construction and;
  - (e) Provide line stakes at end of main.

#### 4.7.2 Inspection of Water Main Installation

1. Inspectors must inspect the installations daily prior to backfilling



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2. Inspection includes that the pipe is installed and located according to the plan and at the proper depth.
3. Use Ductile Iron Pipe Research Association (DIPRA) Installation Guide for Ductile Iron Pipe as a guide to inspect for properly install water pipe.
4. Measure location along the length of the pipe to each bends, couplings, tees, crosses, and any other type of fittings.
  - (a) Start at the beginning of the new work.
  - (b) These measurements shall be taken prior to back filling.
  - (c) Measure depth of pipe and location from street line, property line or edge of easement.
5. Take pictures of installation
6. Backfilling can begin.

### 4.7.3 Water Main into Service

1. After water main and all other appurtenances are installed then the Inspectors will contact the water quality group to operate the valves to allow the main to fill and air bled out of the main.
  - (a) Inspector will inform supervisor or call Water Quality Group.
  - (b) The customer/owner/developer will supply all material to fill and bleed air out of water main such as hoses, diffusers, erosion control, etc.
2. Inspectors must witness pressure tests.
3. After pressure test passes, Inspectors will contact the water quality group to operate the valves to flush water main and begin disinfection procedures according to Section 6.3 of these Guidelines and Policies.
  - (a) Inspector will inform supervisor or call Water Quality Group.
  - (b) The customer/owner/developer shall supply all material to fill and bleed air out of water main such as hoses, diffusers, erosion control, etc.
4. The Water Quality Group will sample for Cl2 residual, pH, and turbidity.
5. The Water Quality Group will call the lab to take bacteria samples.
6. The Lab will report to all Commission groups the bacteria results.





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7. After two (2) consecutive bacteria tests passing the Water Quality Group will put the new water main in service by:
  - (a) Shutting all flush and sample sites.
  - (b) Allow the Installer/owner/developer to remove all flushing equipment.
  - (c) Open all water valves and notify all other Commission groups that the water main is in service.
8. Paving may begin.
9. Location ties shall be taken to all valves, hydrants, and other operable appurtenances by measuring the location of each water box.
  - (a) Start at the beginning of the new work.
  - (b) These measurements shall be taken when final paving is complete. Temporary ties may be required prior to finish paving.
  - (c) When possible, measure at least three ties from a permanent structure such as a building, including two from each end of the structure and one out from the structure and at least one other tie from another permanent structure such as another building or a hydrant. In addition, a tie from street line, property line or edge of easement will be taken.
10. After water main is put into service and the Inspectors and Customer Service are notified by the Water Quality Group, the Commission's Construction Crew and/or the Installer will begin to install individual water services to each home.



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### CHAPTER 5 SAFETY

#### Section 5.1 General

1. All Commission employees, interns, contractors hired by the Commission, and visitors approved by the Commission are required to follow all applicable Commission Health and Safety policies, as well as, local, state and federal regulations, including but not limited to the Massachusetts Department of Labor Standards and Occupational Safety and Health Administration.
2. The Commission Guidelines and Policies do not supplant the Installer's obligation to comply with all applicable local, state, and federal regulations, including but not limited to, the Department of Labor Standards and Occupational Safety and Health Administration.
3. Construction site safety and compliance with applicable regulations is the responsibility of the Owner and Installer.

#### Section 5.2 Trenching/Excavation - Additional Requirements

1. In addition to OSHA CFR 1926 Subpart P and MA 520 CMR 14 (Jackie's Law), employees of the Springfield Water and Sewer Commission will not enter any trench or excavation greater than four feet without acceptable cave-in prevention system.
2. Should a contractor, Installer or Owner require the assistance of an SWSC employee inside a trench or excavation, the cave-in prevention system must meet Commission's four foot requirement.

#### Section 5.3 Underground Utility Location (DIG SAFE) Requirements:

1. Massachusetts state law requires anyone who digs to notify utility companies before starting to excavate. Digging can be dangerous and costly without knowing where underground facilities are located.
2. Before making any cuts or excavating below ground begins, the Commission Construction Crew, Installer or any other Person(s) excavating in the Commission's Service Area shall notify all utility companies by contacting DIG SAFE at 1-888-DIG SAFE and any Non-member utilities, in accordance with the Massachusetts Dig Safe Law, MGL Chapter 82, Sec. 40A – 40E, and 220 CMR 99.00.



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3. The Commission's Service Area is shown on the applicable Service Area Maps: Springfield Water Mains Service Area Map (M-1.0), Ludlow Water Mains Service Area Map (M-2.0), Water Transmission Mains Service Area Map (M-3.0 & 3.1), or Springfield Sewer Mains Service Area Map (M-4.0).
4. The following, but not limited to, list of utilities are not part of DIG SAFE, are in the Commission's Service Area, and must be notified separately for any construction activity in the Commission's Service Area:
  - (a) Springfield Fire Department – Alarm Division: 413-787-6410
  - (b) Springfield Park Department: 413-787-6440
  - (c) Ludlow Department of Public Works: 413-583-5625



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### CHAPTER 6 WATER MAINS AND APPURTANANCES

#### Section 6.1 Control of Work

##### 6.1.1 General

1. No work may begin without a Street Occupancy Permit from the Springfield Department of Public Works, a Dig Permit from the Town of Ludlow Department of Public Works, or the Publics Works Department having jurisdiction at the site to be excavated.
2. The Commission's Cross Connection Control requirements, as set forth in the Commission's Rules and Regulations, and in accordance with CHAPTER 10 of these Guidelines and Policies, and the Commission's Material Specifications must be followed at all times.
3. At all times, it is the responsibility of the Commission's Construction Crew or Installer to guarantee the sanitary and clean internal condition of all pipe and fittings and lubricants and materials that will come in contact with the drinking water. Contaminated materials may be rejected for use by the Commission. The use of temporary plugs while laying water mains is mandatory.
4. Failure to meet the requirements for cleanliness or the Material Specifications for materials may result in removal of the pipe or other components from the construction site and the rejection of its use by the Commission.
5. Distribution system pipe shall be at least 8-inches in diameter, thickness class 52 ductile iron pipe, cement lined, and asphaltic coated per AWWA Standards, unless otherwise approve by the Commission. 6-inch diameter may be allowed with the Commission's approval in accordance with Section 4.2.3 of these Guidelines and Policies. The pipe shall be in accordance with the Commission's Material Specifications unless otherwise approved by the Commission.
6. Pipe used for hydrant branches shall be at least 6-inches in diameter, shall be thickness class 52 ductile iron pipe, cement lined, and asphaltic coated per AWWA and shall be restrained the entire length of the branch. Pipe used for sprinkler lines shall be at least 6-inches in diameter, unless it can be documented that a different size line will meet design specifications and shall meet the above specifications.
7. When a conflict exists between the new or proposed water main and a sewer main or other utility requiring protection than the sewer main or other utility shall be encased in concrete and installed in accordance with the **Concrete Encasement Detail (S-03.0)**, unless otherwise approved by the Commission.



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### 6.1.2 Valve Operation

#### 1. Prohibition of Valve Operations

- (a) No existing transmission or distribution valves or hydrants may be operated by the Installer. It is a serious offense to tamper with the drinking water system and any violation will result in penalties as defined in the Commission's Rules and Regulations and removal from the Commission Approved Contractors list.
- (b) Only Commission employees or the Commission's designee may operate any valves connected to the Commission's transmission or distribution system.

#### 2. General

- (a) The Commission's Construction Crew shall locate and operate all valves as needed for any type of work involving the operation of valves.
- (b) Prior to operating valves customers in vicinity of job shall be notified to avoid service disruption and customer complaints.
- (c) The Commission's Construction Crew shall note all valves operated and report this information to the Commission's Customer Service office. At a minimum this information shall include the following:
  - Person's name doing the job.
  - The location/project name.
  - Date and time.
  - The valve/hydrant location(s) and number(s) being worked on.
  - The position (open or closed) of the valve(s) found, also note if the valve is inoperable.
  - Number of turns to open and to close the valve.
  - The final position (open or closed) of the valve(s) at the end of the job.
- (d) When the job is complete, all valves shall be returned to their normal position and this information shall be reported to the Commission's Customer Service office and properly recorded on the Foreman's Return and work order system.

3. Scheduled shutdowns, other than routine work including, but not limited to capital improvement projects, swabbing, flushing, water main replacement, valve repair and/or replacement require review and approval of the Executive Director, Chief Engineer, Director of Field Services, and/or Deputy Director of Field Service prior to any valves being operated. At a minimum the following shall be submitted:



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- (a) Reason for the scheduled shutdown.
  - (b) Estimated length of time the shutdown will take.
  - (c) Valve numbers and locations.
  - (d) A distribution or transmission map with the valves highlighted.
  - (e) Number of customers affected.
  - (f) Existing closed valves in the vicinity of the proposed scheduled shut down.
4. Valves shall be operated as follows:
- (a) Check for any potential hazards, i.e., traffic, pedestrians, construction, etc., and take the necessary safety precautions.
  - (b) Locate the valve using the Commission's Distribution Book and Commission valve ties. If the valve box is not visible use a metal locator to find the valve box.
    - **Caution:** Check the Distribution Book to verify that the valve can be operated safely, not shut off any customers, and not cause damage to any roadbeds, pavement, landscaping, etc. The valve could be an Air Valve Assembly, a drain valve, supply a dead-end water main, and/or supply a critical customer.
  - (c) Remove the valve box cover by lifting or prying it up with a pry-bar(s), or pick, and, if necessary, strike the lid with a hammer.
  - (d) Inspect the box to see if the box is in good condition and free of debris.
  - (e) If debris is found clean out the debris so the operating nut can be accessed.
  - (f) Visually inspect the grade of the valve box as compared to the surface grade. Make note of any adjustments that may be required on the Foremen's Return, or if possible, adjust valve box to match the surface grade.
  - (g) If possible, open a fire hydrant closest to the valve so that discolored water caused by operating valves is allowed discharge. Direct the discharged water flow towards a catch basin or in the downhill direction. Make sure the discharged water is not causing property damage or flooding.
  - (h) Lower the valve key onto the valve nut.
  - (i) Turn the key clockwise to the right (on most valves) to find out the position of the valve. If you can't turn the key any further to the right, the valve should be open.



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- **Note:** Some valves may be counter-clockwise to the left to open.
  - Check with Customer Service, check the Vueworks Data Base and/or the old Gate Card, or contact Supervisor for guidance.
- (j) Operate the valve to the "closed" position, by turning the valve nut counter-clockwise (to the left) in most areas. **Close the valve slowly.** Count the number of turns obtained and compare to the current Commission Valve Data Base, and/or the Gate Card. If the correct number of turns is not achieved, repeat the operation until the correct number is achieved or investigate to ensure the current Commission Valve Data Base, and/or the Gate Card is correct.
- (k) Place a Sonophone on the valve key and check for any hissing noise (indicating leaks at the valve seat).
- (l) A maximum leakage at any shut down should not exceed 100-gallons per minute (gpm). The Commission Construction Crew and/or Installer shall have pumps or other approved means of dewatering available to control leakage of 100-gpm.
- (m) Install a Tag-out device in the valve box. If the valve is to remain closed for construction or energy reduction purposes then the valve shall be Locked-out in accordance with Section 6.1.3 of these Guidelines and Policies.
- (n) When the valve is to be opened, remove the Tag-out device then the valve shall be slowly and fully opened by turning the valve nut clockwise (to the right), and then turn the valve counter-clockwise (to the left) one-half turn from the open position to relieve pressure from the stem, bonnet and packing.
- (o) Again, place the Sonophone on the valve key and check for any hissing noise (indicating leaks at the stuffing box or valve body).
- (p) If the valve was found closed, check the current Commission Valve Data Base, and/or the Gate Card, then check with a Supervisor to determine the position the valve should be left in. If the valve is to be opened check with Water Quality to determine if flushing is required prior to the valve being opened.

### 6.1.3 Valve Lock-out

1. All valves that remain in the closed position for construction or energy reduction purposes shall be locked out with a Lock-out/Tag-out device in accordance with OSHA CFR 1910.147 – Control of Hazardous Energy.
2. The Lock-out/Tag-out device shall have, at a minimum the work order number and Commission employee and phone number responsible for the valve being closed.



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3. The Lock-out/Tag-out shall not be removed unless the Commission employee or their supervisor responsible for the valve being closed approves the Lock-out/Tag-out device being removed, and the valve being opened.

### 6.1.4 Labor, Materials, and Equipment

1. The Installer shall furnish labor, materials, and equipment that is appropriate to accomplish quality work in an efficient and timely manner. Sufficient resources must be committed to the work to ensure a rate of progress that will enable completion within established timelines.
2. All equipment requiring special licenses shall be operated only by persons who possesses a current, valid license for that piece of equipment

### 6.1.5 Private Land

1. When the Commission Construction Crew or Installer have to enter private land and private residences in order to accomplish the work. The Commission Construction Crew or Installer shall plan the work to ensure the Owner or the Owner's authorized representative is on site to permit the Commission Construction Crew or Installer and his/her employee's access to the Premises.
2. The Commission Construction Crew or Installer must ensure that Premises are left neat and clean after job completion.
3. In all homes and businesses, the Commission Construction Crew or Installer shall take all necessary precautions to ensure that theft or damage does not occur during work activities.

### 6.1.6 Supervision

1. The Installer shall have, on site, at all times during the work activities, a full time competent Foreman who shall be in charge of the project. This Foreman shall be the agent for the Installer on site, and shall coordinate inspections, record keeping, future work, and other issues with the Field Inspector assigned by the Commission to inspect the work.
2. The Installer shall notify the Commission in writing whenever there is a change in Foremen.

### 6.1.7 Existing Underground Utilities and Structures

1. The Commission Construction Crew or Installer shall refer to Section 5.3 of these Guidelines and Policies for more information concerning DIG SAFE.





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2. The Commission Construction Crew or Installer shall determine the location or absence of all underground utilities, and plan and conduct his work operations to ensure that those utilities shall not be damaged.
3. The Commission Construction Crew or Installer shall assume full responsibility for the protection of all buildings, structures, and utilities, public or private, including poles, signs, and services to buildings, mail boxes, utilities, gas pipes, water pipes, hydrants, sewers, drains, and cables, whether on private or public property.
4. Any damage resulting from the Installer's operations shall be repaired at the Installer's expense.

### 6.1.8 Delivery, Storage, and Handling

1. New pipe, fittings, valves, hydrants, and other appurtenances shall be delivered to the construction site as close in time to installation as possible.
2. All pipe shall be shipped with lifts separated by work separators such that, pipe to pipe contact is prevented during the transit and/or storage of the pipe.
3. Care shall be taken during the loading, trucking, unloading and handling of all pipe, fittings, and other appurtenances so as not to damage the materials or surrounding area.
  - (a) Pipe, fittings, and other appurtenances shall not be dropped directly from the truck to the ground.
  - (b) The Commission's Construction Crew or Installer is responsible for any pipe, fittings, and other appurtenances damaged during delivery, handling or storage.
  - (c) A pipe clamp with protective coating is a preferred means to handle pipe, but forks may be used during the unloading process provided care is taken not to damage the pipe. Forks shall not be used in the interior of the pipe to handle pipe.
  - (d) All damaged materials will be removed from the site immediately.
4. All pipe, fittings, and other appurtenances shall be stored in a manner that prevents water on the ground (run-off or puddles), debris, and/or animals from entering the material and prevent damage to the material and/or others' property.
  - (a) Pipe may not be strung along the line of work unless approved by a Commission representative.



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- (b) Materials must be stored in such a manner that it does not obstruct driveways, sidewalks, etc.
  - (c) The Installer shall contact the Department of Public Works having jurisdiction to determine if it is permitted to string materials along the roadway of the work.
  - (d) Materials that have had water, debris, and/or animals will be removed from the site.
5. All pipe and fittings shall be carefully lowered into the trench piece by piece by means of a boom, straps, or other suitable tools or equipment, in such a manner as to prevent damage to materials and protective coatings or linings.
- (a) Under no circumstances shall chains be used, or material be dropped or dumped into trench.
  - (b) Use of forks to handle pipe at construction sites is not allowed. Unless approved by the Commission.

### Section 6.2 Product Installation

#### 6.2.1 Ductile Iron Water Main

1. The new or proposed water main shall be located in the street in accordance with **Utility Separation Detail (W-01.0)**.
2. Ductile iron water main shall be bedded and installed in accordance with the applicable **Trench Detail (W-02.0, W-02.1, W-02.2, W-02.3, or W-02.4)**.
3. All water mains shall be installed in accordance with DIPRA Installation Guide for Ductile Iron Pipe and these Guidelines and Policies.
4. All pipe, fittings, valves and appurtenances shall be wrapped in 8-mil Polyethylene Encasement (PE) and shall be installed as required by the Commission and in accordance with DIPRA Installation Guide for Ductile Iron Pipe and Section 6.2.2 these Guidelines and Policies.
5. Excavate trench to ensure sides of trench are stable. Slope trench walls or provide support in conformance with the CHAPTER 5 Safety of these Guidelines and Policies and the Commission's Health and Safety Policies.
6. Trenches must be kept free of excessive water during installation of pipe and fittings.
7. A visual inspection of the interior of each pipe length and fitting must be made before the pipe is installed. Any entry of contaminants, such as water and / or soil,



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into a pipe or fitting while in the trench must be reported to the Commission's Authorized Field Representative and an approved corrective action taken. All pipe and fittings with internal coatings will be thoroughly cured, not tacky to the touch, before installation.

8. Thoroughly clean the groove and bell socket and insert the gasket, making sure that it faces the proper direction and that it is correctly seated.
9. If pipe or fittings become contaminated by environmental water, trench water or soil, backfill material, trash or the like, the pipe or fittings shall not be used until the Commission Representative is notified and a reasonable technique for cleaning is approved. This could involve onsite use of hydraulically propelled foam pigs or swabs, followed by chlorination. The Commission reserves the right to reject contaminated pipe and fittings from use.
10. All cut-in pipe and fittings must be swabbed or sprayed with 1-5% or greater bleach solution immediately before installation but after inspection for internal cleanliness. The installed couplings, pipe, and/or fittings shall be disinfected according to Section 6.4.5 of these Guidelines and Policies.
11. All components to be cut-in to an existing water main shall be coated with petrolatum based primer and wrapped with prefabricated petrolatum coating in tape form designed to protect wet or dry irregularly shaped metal surfaces according to Section 6.2.28 of these Guidelines and Policies and the Commission's Material Specifications.
12. New or replacement water mains and/or water services installed within 200-feet of a Fuel Storage Tank (FST) and/or if the water main and/or water service is to traverse an area saturated with low molecular weight petroleum products (contaminated soils) it shall be installed with fluorocarbon gaskets, in accordance with the Commission's Material Specifications, and as follows:
  - (a) Fluorocarbon gaskets are required within the 200-foot radius from the FST or as required by the Commission.
  - (b) Fluorocarbon gaskets are required through the contaminated soil and 100-feet beyond the contaminated soil, on each side or as required by the Commission.
13. Only lubricants that meet the Commission's Material Specifications may be used in the installation of the pipe. Clean, disposable applicators shall be used for the application of the lubricant to the gaskets. Used lubricant shall be discarded after every job.
14. Packing materials and gaskets and lubricants shall be kept clean at all times.



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15. After cleaning dirt or foreign material from the plain end, apply lubricant supplied by the pipe manufacturer in accordance with their recommendations. The lubricant is supplied in sterile cans and every effort shall be made to keep it sterile.
16. Plain end must be beveled; square or sharp edges may damage or dislodge the gasket and cause a leak. The plain end of field cut pipe must be beveled approximately a ¼-inch and at a 30-degree angle with a heavy file, grinder or pipe saw to remove all sharp edges. Recoat all cut ends with bitumastic when used for push-on joint.
17. Push the plain end into the bell of the pipe. Keep the pipe straight while pushing. Make deflection after the joint is assembled.
18. Pipe can be pushed into the bell socket with a long bar, a pipe jack, lever puller or backhoe. The pipe supplier may provide a pipe jack or lever puller on a rental basis. A timber header will be used between the pipe and jack or backhoe bucket to avoid damage to the pipe.
19. Foreign material shall be prevented from entering the pipe while it is being placed in the trench. No debris, tools, clothing, or other material (or people) shall be placed in the pipe at any time.
20. All pipe and fittings in trenches will be protected from contamination entering the internal parts upon any length of delay of construction, at the end of every working day, and upon the threat of water in the trench. The open ends of all pipe and fittings must be plugged with a watertight seal at the end of every working day.
21. Temporary pipe plugs. At times when work is not in progress, the open end of the pipes shall be closed by means of a watertight plug or other means acceptable to Commission. When practical, the plug shall remain in place until the trench is pumped completely dry. Care must be taken to prevent pipe floatation should the trench fill with water.
22. Pipe placement. As each length of pipe is placed in the trench, the joint shall be assembled, and the pipe brought to correct line and grade. The pipe shall be placed on raised common fill about 18-inch behind the bell or the bedding shall be excavated 2-inches to 6-inches at the bell prior to backfilling, in accordance with the applicable **Trench Detail (W-02.0, W-02.1, W-02.2, W-02.3, or W-02.4)**.
23. When rock excavation is necessary, the rock shall be removed to provide at least 6-inches of clearance below and on each side of the pipe, valves, and fittings for pipe sizes 24-inch or smaller. For larger pipes, the clearance shall be at least 9-inches.



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- (a) When excavation is complete, a layer of appropriate backfill material, in accordance with the applicable **Trench Detail (W-02.0, W-02.1, W-02.2, W-02.3, or W-02.4)**, shall be placed on the bottom of the trench and compacted and leveled to provide proper depth of cover.
- (b) These clearances eliminate potential creation of stress points that could cause pipe failure.

24. Direction of bells: It is common practice to lay pipe with the bells facing the direction in which work is progressing.

25. Maximum cumulative (horizontal and vertical planes) pipe deflection is listed below:

Pipe Size (Diameter in inches)	Deflection Angle (in degrees)	Maximum Allowable Offset (in inches) *
3 – 12	4	15
14 & 16	3.2	12
18+	2.4	9

\* For 18-foot pipe lengths, measured at the end of the pipe.

- 26. Any deviation in joint deflection in excess of the above stated amount must be approved by the Commission representative.
- 27. All water mains shall be installed with a minimum cover of 5-feet. Any installation with less than 5-feet of cover shall require approval by the Commission representative. If insulation is required it shall be installed in accordance with Section 6.2.2 of these Guidelines and Policies.
- 28. When crossing other utilities, the Commission Construction Crew or Installer shall install the water main in accordance with **Utility Crossing Detail (S-03.0)**, unless otherwise approved by the Commission.
- 29. The installed pipe shall be disinfected according to Section 6.3 of these Guidelines and Policies.
- 30. Backfill to be installed in accordance with the applicable **Trench Detail (W-02.0, W-02.1, W-02.2, W-02.3, or W-02.4)**, and the following:



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- (a) The pipe embedment material shall be placed in 6-inch layers above top of pipe and hand compact to a point 12-inches, minimum, above the top of pipe.
  - (b) Materials placed in the trench from the pipe embedment materials shall be Common Borrow Fill, according to the Commission's Material Specifications and shall be mechanically compacted. Common Borrow Fill shall be free from large clods, rocks and cinders.
  - (c) Backfill shall be graded with the placement of suitable soil material, as determined by the Commission Representative, in 12-inch (maximum) layers compacted to 95% of the maximum density of the soil as determined by the Standard Proctor Test, AASHTO Designation T-99.
  - (d) Any backfill area that does not conform to the above to the compaction requirement shall be replaced and tests performed again.
31. Commission construction Crews and Installers shall restore or install pavement in accordance with CHAPTER 8 of these Guidelines and Policies, unless otherwise approved by the Commission.
32. Commission Construction Crews shall notify the Commission Construction Crew responsible for pavement restoration the amount of pavement to be installed at the end of each week.
33. Air Valve Assemblies and Air Corporations shall be installed at the following locations and as described, unless otherwise approved by the Commission's Engineering and Technical Services:
- (a) When required by the Commission's E&TS, a 1-inch air valve assembly or 1-inch air corporation shall be installed at the beginning of the water main installation to allow for disinfection of the water main. The air valve assembly shall be installed in accordance with **Air Valve Assembly Detail (W-03.0, W-03.1, or W-03.2)** in accordance with Section 6.2.2 of these Guidelines and Policies, unless otherwise approved by the Commission.
  - (b) An air valve assembly shall be installed at the end of each dead end main, unless otherwise approved by the Commission's E&TS. The size of the air valve assembly shall be a 2-inch corporation and 2-inch drilled IK with 2-inch brass pipe or as specified by the Commission representative. The air valve assembly shall be installed in accordance with **Air Valve Assembly Detail (W-03.0, W-03.1, or W-03.2)** and in accordance with Section 6.2.2 of these Guidelines and Policies, unless otherwise approved by the Commission. The dead end main shall be installed in accordance with **End of Main Detail (W-04.0 or W-04.1)**.



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- (c) An air valve assembly shall be installed at all high points on the pipeline and/or other locations approved by the Commission's E&TS. If a high point is created by the Commission's Construction Crew or Installer at a point other than those designated on the plans, the Commission's Construction Crew or Installer shall install a release valve at said high point. The air valve assembly shall be installed in accordance with **Air Valve Assembly Detail (W-03.0, W-03.1, or W-03.2)** and in accordance with Section 6.2.2 of these Guidelines and Policies, unless otherwise approved by the Commission.
- (d) At a minimum, a 1-inch air corporation shall be installed on each side of newly installed valves. After the water main is in service the Air Corporations shall be left shut, capped with a brass cap, and buried. The air corporation shall be installed in accordance Section 6.2.6 of these Guidelines and Policies, unless otherwise approved by the Commission.

### 6.2.2 Polyethylene Encasement

1. Install polyethylene (PE) encasement around ductile iron pipe in accordance with pipe manufacturer's recommendations, ANSI/ AWWA C105/A21.5, Method 'A' in section 2.15 of DIPRA's Installation Guide for Ductile Iron Pipe, and the following, unless otherwise approved by the Commission:
2. Method A requires one length of PE tube to be used for each length of pipe and is overlapped at each joint.
3. When lifting polyethylene-encased pipe, use a fabric-type sling or a suitably padded cable or chain to prevent damage to the polyethylene. Be careful not to damage the polyethylene when handling or jointing the pipe.
4. The section of PE tube shall be cut to length to overlap each joint by approximately 2-feet.
5. The pipe shall be clean of all foreign material such as dirt, clay, mud, or other materials. In wet, sloppy trench conditions, the pipe should be completely covered by the polyethylene tube before it is lowered into the trench.
6. Slip the PE tube around the spigot end of the pipe and bunch the PE tube in accordion fashion near the spigot end. Make sure to pull the PE tube back so that it clears the spigot end.
7. Lower the pipe in the trench. Make sure there is a shallow hole in the trench bottom at the joint location to ensure overlapping the PE encasement. Install the spigot end of the pipe into the bell of the already installed pipe.





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8. Move the cable to the bell end of the pipe to spread the tube over the entire barrel of the pipe. Push back both ends of the tube until they clear both pipe ends. Make sure the tube is centered on the pipe to provide a one-foot overlap at each end.
9. Overlap the tube end of the new pie with the tube end of the installed pipe. Secure the new tube end in place with tape.
10. Take up slack in the tube to make a snug, but not tight, fit. Circumferential wraps of tape or plastic tie straps should be placed at 2-foot intervals along the barrel of the pipe to help minimize the space between the polyethylene and the pipe. Wrap a piece of tape or plastic tie strap completely around the pipe at each end to seal the polyethylene, leaving ends free to overlap the adjoining sections of pipe. Seal ends of overlap by wrapping tape or plastic tie straps completely around the pipe at each end
11. A fabric type or padded sling shall be used when handling polyethylene encased pipe to prevent damage to the polyethylene encasement.
12. All seams in the polyethylene encasement shall be sealed completely with approved 2-inch wide plastic adhesive tape.
13. Extreme care shall be taken to ensure that all rips or tears in the polyethylene encasement are properly repaired with additional tape and film as described in ANSI/AWWA C105/A21.5
14. Extreme care shall be taken when backfilling to avoid damaging the polyethylene encasement.
15. Appurtenances:
  - (a) Pipe-shaped appurtenances such as bends, reducers, offsets, and other pipe-shaped appurtenances shall be covered in the same manner as the pipe.
  - (b) Odd-shaped appurtenances such as valves, tees, and crosses shall be covered with a flat sheet or split length of polyethylene tube by passing the sheet under and then over the appurtenance and bringing it together around the body of the appurtenance. Make seams by bringing the edges of the polyethylene together, folding over twice, and taping them down.
  - (c) Joints of pipe-shaped and odd-shaped appurtenances shall be overlapped as in the pipe installation above; then tape the polyethylene securely in place at valve stems and other penetrations. When bolted-type joints are used, care should always be taken to prevent bolts or other sharp edges of the joint configuration from penetrating the wrap.





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- (d) Water services, air corps, and air valve assemblies shall be tapped through the polyethylene-encasement of the Ductile Iron pipe, unless otherwise approved by the Commission. Tapping through the PE encasement involves wrapping two or three layers of polyethylene adhesive tape completely around the pipe to cover the area where the tapping machine and chain will be mounted. Then install the corporation stop directly through the tape and polyethylene. After the tap is made inspect the entire circumferential area for damage and make any necessary repairs. When tapping through the PE encasement is not possible an X-shaped cut in the polyethylene shall be made and the PE shall be temporarily folded back. After installing the appurtenance, tape the slack securely to the appurtenance and repair the cut and any other damaged areas in the polyethylene with tape.

### 6.2.3 Pre- Insulated Pipe

1. Pre-insulated Pipe Insulation for Water Main or Water Service Pipe installed with less than 5-feet of cover and shall be as follows, unless otherwise approved by the Commission's E&TS:
  - (a) Pre-insulated pipe, in accordance with the Commission's Material Specifications shall be provided when pipes are to be installed with less than 5-feet of cover. The insulated pipe system shall be installed wherever the depth of water pipe has less than 5'-0" of cover and above grade or across the bridge span.
  - (b) Insulated ductile iron water pipe shall be installed in accordance with the requirements of Section 6.2.1 and the following additional requirements.
  - (c) All insulated water pipe shall be handled with additional care to prevent damage to the protective jacket. Damaged jackets and insulation will be replaced at the Installers expense.
  - (d) Installation shall not take place when temperatures are below -30° F (-34° C).
  - (e) Bell and spigot joints shall be sealed using a single turn of 6-inch (150mm) wide butyl mastic tape or heat shrink wrap/closure seal in accordance with the Commission's Material Specifications.
  - (f) Insulation kits shall be used for the mechanical joints in accordance with the Commission's Material Specifications.

### 6.2.4 Field Applied Insulation for Pipe

1. Field Applied Insulation for Water Main or Water Service Pipe installed with less than 5-feet of cover and above grade or across bridge span(s) is typically a three



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part system that includes the insulation sections, an insulation jacket, and the seals and/or bands and shall be installed as follows, unless otherwise approved by the Commission's E&TS:

2. Field Applied Insulation for above grade and below grade pipes with less than 5-feet of cover shall be supplied in accordance with the Commission's Material Specifications.
3. Field Applied Insulation for above grade pipes shall be aluminum jacketed unless otherwise approved by the Commission.
4. Field Applied Insulation for pipes with less than 5-feet of cover shall be composite cold insulation wrap (CI Wrap) unless otherwise approved by the Commission.
5. The Field Applied Insulation system shall be installed wherever the depth of water pipe has less than 5'-0" of cover and above grade or across bridge span(s).
6. The insulation sections shall be installed as follows:
  - (a) Field Applied Insulation shall be applied in half sections of 3-foot lengths. The half sections are applied on an 18-inch stagger from top to bottom.
  - (b) Top and bottom halves are held onto pipe using ½-inch wide filament tape wrapped one and a half times around the circumference of insulation 9-inches on center.
7. The aluminum jacketing for above grade installations shall be installed as follows:
  - (a) Aluminum jacketing is applied to the insulation sections by wrapping pre-cut aluminum jacket around circumference of insulation so as to have overlap of jacket facing downward, creating a watershed and insuring water does not drain into the insulation.
  - (b) Stagger the circumferential seams so they do not fall in the same place as the insulation seams. The horizontal seams shall be placed at 2-o'clock and 4-o'clock so that they do not fall in the same place as the insulation seams add shed water.
  - (c) Each additional piece of jacket is then overlapped onto the proceeding pipe covering by a minimum of 2 inches.
  - (d) All seams on the aluminum jacket shall be sealed with self-adhesive CI Wrap.
  - (e) This jacketing is then held in place by fastening pre-cut stainless steel strapping and wing seals 12" on center, fastening with a tensioning tool. The tension shall be equally applied to each strap so as not to cause any seam separation.



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8. The CI Wrap jacketing for below grade installations shall be installed as follows:
  - (a) The insulation shall be free from any dust, dirt, or moisture to ensure adhesion of the CI Wrap.
  - (b) CI Wrap shall be cut to length. The desired length shall allow at least a 2-inch overlap on each end. All longitudinal and circumferential overlaps shall be a minimum of 2-inches.
  - (c) CI Wrap jacketing is applied to the insulation sections with a “cigarette wrap” which is wrapped longitudinally instead of spirally around the circumference of insulation so as to have overlap of jacket facing downward, creating a watershed and insuring water does not drain into the insulation.
  - (d) Place the CI Wrap such that the finished overlap will allow the water to drain off the Wrap and not into the insulation. Peel back 6-inch to 12-inches of the release liner taking care not to allow any of the adhesive to touch itself. Firmly press exposed edge of sheet into place and continue removing release liner and smoothing CI Wrap. Avoid wrinkles.
  - (e) Ensure complete contact at the laps and to insulation using a roller or firm pressure throughout installation. Stagger the laps of subsequent pieces.
  - (f) A 4-inch Butt-Strip shall be applied at each circumferential joint with 2-inches of overlap on each side of joint.
  - (g) At fittings, 4-inch CI Wrap shall be applied in a spiral wrap. All seams shall be overlapped by 50% (approximately 2-inches).
  - (h) Any damaged CI Wrap may be repaired with the Commission’s E&TS’s approval.
  - (i) Damaged CI Wrap shall be cut out and removed. A new piece of CI Wrap shall be cut with at least 2-inches of overlap on all four sides.
  - (j) CI Wrap cannot be exposed to sunlight longer than 14-days.
9. Styro-board may be allowed with prior E&TS approval
  - (a) Styro-board (blue), minimum R-value of 7 per inch thick, as used in normal construction of buildings, shall be placed 6 to 10 inches over the pipe with 8-inches being the preferred separation.
  - (b) For each additional foot of cover required 1-inch of insulation is required with a minimum of 2 inches. For a 5-foot desired bury and the pipe at 3-feet, 2-inches of insulation would be required.



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- (c) For 2-inch or less copper tube water service pipe, 2-foot wide insulation board shall be used.
- (d) For 6-inch or greater ductile iron water pipe, 4-foot wide insulation board shall be used.

### 6.2.5 Air Valve Assembly

1. Air Valve Assemblies shall be either one-inch or two-inch. The size and location required shall be determined by the Commission.
2. Tapered inlet ball type corporations, either one-inch or two-inch, with one-inch or two-inch CC thread on the inlet side and one-inch or two-inch female IP thread on the outlet side, shall be installed before the standard or one-piece air valve assembly is installed, unless otherwise approved by the Commission.
3. When tapping water mains with corporations tapping saddles shall be required.
4. The one-inch and two-inch corporations shall be tapped on top of the water main.
5. The standard air valve assembly acceptable to the Commission shall be installed as follows:
  - (a) One-inch or Two-inch 90-degree elbows: shall be female on both ends with One-inch or Two-inch IP thread. Three are required with two laid vertically and horizontally before the curb stop and one laid vertically after the curb stop.
  - (b) One-inch or Two-inch Ball Valve Curb Stop and Waste: shall be ball valve type with One-inch or Two-inch female IP thread on both ends. The One-inch or Two-inch Curb with a stop and waste hole shall be set on a concrete brick. The stop & waste hole shall be on the downstream side (away from water main).
  - (c) One-inch and/or Two-inch Nip: shall be male on both ends with One-inch or Two-inch IP thread. Minimum length shall be six-inches and maximum length shall be twelve-inches, unless otherwise approved by the Commission.
  - (d) One-inch or Two-inch Riser pipe: shall be male on both ends with One-inch or Two-inch IP thread. The length shall be from the last 90-degree elbow to four-to-six-inches below finished roadway. The riser pipe shall be set in a Valve Box top and cover and a bottom is not required.
  - (e) One-inch or Two-inch cap: shall be One-inch or Two-inch female IP thread. The caps shall be installed with Teflon tape and shall be hand tightened on to the One-inch or Two-inch Riser pipe.



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- (f) The standard air valve assembly components shall be installed in the following order after the Tapered inlet ball type corporation: 1) Nip, 2) 90-degree elbow (vertically), 3) Nip, 4) 90-degree elbow (horizontally), 5) Nip, 6) Ball Valve Curb Stop and Waste, 7) Nip, 8) 90-degree elbow (vertically), 9) Riser pipe, and 10) cap.
- (g) The air release valve shall be installed in accordance with **Air Valve Assembly Detail (W-03.0)**.
- (h) Boxes for Standard Air Valve Assemblies shall be installed as follows:
- Boxes for 1-inch air valves curb stops shall be the Commission's standard two-piece Buffalo style service box and shall be installed on concrete block or other Commission approved support.
  - Boxes for 2-inch air valves curb stops shall be the Commission's standard two-piece gate box and shall be installed on concrete block or other Commission approved support.
  - Boxes for 1-inch and 2-inch air valves brass riser pipe shall be the Commission's standard gate box top, only, and shall be set to finish grade in paved areas and set 2-inches below grade in non-paved areas.
  - Install valve box and cover in accordance with **Air Valve Assembly Detail (W-03.0)**
6. One-Piece Air Valve Assembly may be used with the Commission's approval.
- (a) The one-piece air valve assembly shall be installed onto the one-inch or two-inch corporations.
- The one-inch or two-inch corporations shall be brass 85-5-5-5, tapered inlet ball corporation, with one-inch or two-inch CC thread on the inlet side and one-inch or two-inch **male** IP thread on the outlet side. One is required for each assembly.
- (b) The one-piece air valve assembly shall be installed vertically plumb.
- (c) The air release valve shall be installed in accordance with **Air Valve Assembly Detail (W-03.1, or W-03.2)**
7. Boxes for One-Piece Air Valve Assemblies shall be installed as follows:
- (a) Boxes for 1-inch air valves shall be the Commission's standard two-piece gate box and shall be installed on concrete block or other Commission approved support.



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- (b) Boxes for 2-inch air valves shall be the Commission's standard three-piece gate box and shall be installed on concrete block or other Commission approved support.
- (c) Install valve box and cover in accordance with **Air Valve Assembly Detail (W-03.2)**

### 6.2.6 Air Corporation

1. Air corporations shall be one-inch and in accordance with the Commission's Material Specifications.
2. Tapered inlet ball type corporations shall be with one-inch CC thread on the inlet side and one-inch male IP thread on the outlet side and in accordance with the Commission's Material Specifications.
3. The one-inch corporations shall be tapped on top of the water main.
4. After the water main or water service pipe is in service and the air corporation is no longer needed it shall be left shut and capped with a 1-inch female IP threaded cap.

### 6.2.7 Ductile Iron Mechanical Joint Fittings

1. All tees, bends, crosses, and other fittings shall be ductile iron mechanical joint unless otherwise approved by the Commission.
2. All fittings shall be inspected prior to installation to ensure the gasket seats are free of excess coating. Excess coating, if present, shall be manually removed so as to ensure proper seal of gasket, however, all bare metallic surfaces created as the result of removing the excess coating shall be re-coated with similar material to prohibit corrosion.
3. All fittings shall be installed with retainer glands as in accordance with Mechanical Joint Restraint for Ductile Iron Fittings Section 6.2.21 of these Guidelines and Policies, unless otherwise approved by the Commission.
4. All fittings shall be placed, supported, and installed in strict accordance with the manufacturer's instructions and as directed by Commission.
5. All joint bolts shall be torqued using a calibrated torque wrench in accordance with the manufacturer's specifications. If manufacturer's specifications are not available tighten the bolts in accordance with Paragraph 6 of this Section.
6. Back up bends, tees, end caps, and other fittings in pipelines buried in ground with Class A concrete thrust blocks placed against undisturbed earth unless otherwise



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specified. A layer of 4 mil poly shall be placed between the concrete and the fitting. The concrete thrust block shall be installed in accordance with the End of Main Details (W-04.0 or W-04.1), Tee Detail (W-05.0 – 05.1), Thrust Block Behind Fitting Detail (W-14.0), and/or Hydrant Details (W-07.0, W-07.1, or W-07.2).

7. Unless otherwise specified, all mechanical joints fittings shall be installed with restrained joints as specified in the Commission’s Specifications. Grip rings will only be allowed with Commission approval.
8. Maximum cumulative (horizontal and vertical planes) deflection per joint shall not exceed the angles listed below:

Joint Size (in inches)	Deflection Angle (in degrees)
3 – 4	6.4
6	5.6
8 – 12	4.0
16	2.8
20	2.4
24	1.6

9. Any deviation in joint deflection in excess of the above stated amount must be approved by Commission.
10. The installed fittings shall be disinfected according to Disinfection Section of these Guidelines and Policies.

### 6.2.8 Ductile Iron Mechanical Joint Hydrant Anchoring Tees

1. Ductile iron mechanical joint hydrant anchoring tees shall be used to install all hydrants in the Commission’s distribution system unless otherwise approved by the Commission.
2. Ductile iron mechanical joint hydrant anchoring tees shall be installed with retainer glands in accordance with Section 6.2.7 Mechanical Joint Restraint for



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Ductile Iron Fittings of these Guidelines and Policies, unless otherwise approved by the Commission.

3. Mechanical joint gate valves shall be installed directly onto ductile iron mechanical joint hydrant anchoring tee.
4. Mechanical joint gate valves shall be installed in accordance with Section 6.2.9 Mechanical Joint Resilient Wedge Gate and Butterfly Valves of these Guidelines and Policies, unless otherwise approved by the Commission.

### 6.2.9 Mechanical Joint Resilient Wedge Gates and Butterfly Valves

1. All valves installed on water mains up to and including 12-inch diameter shall be resilient seat gate valves. All water mains larger than 16-inch diameter water mains may have either resilient seat gate valves or butterfly valves. Butterfly valves must be approved by the Commission.
  - Butterfly valves shall be installed with the operating nut on the short side of the street unless otherwise approved by the Commission.
2. Pressure class 250 valves are required for all installations and shall be in accordance with the Commission's Material Specifications, unless otherwise approved by the Commission.
3. Typically, valves are to be located at each intersection, in each direction on street line, and approximately every 500-feet on an un-interrupted length of water main, unless otherwise approved by the Commission.
  - (a) Three (3) Isolation valves shall be installed on each side of three-way intersections at each street line.
  - (b) Four (4) Isolation valves shall be installed on each side of four-way intersections at each street line.
  - (c) Isolation valves shall be installed every 500-feet on straight runs of water main.
  - (d) Isolation valves shall be the same size as the water main being installed.
  - (e) Isolation valves shall be gate valves up 12-inch in diameter. Isolation valves 16-inch and larger may be butterfly valves but require Commission approval prior to installation.
4. The valve body shall be set level such that the operator is plumb with the vertical plane which is perpendicular to the ground surface.
  - (a) Typically, valves are placed on oak blocking and oak wedges are used to adjust height of valve. Wedges are placed on each side of the valve and hammered





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under the valve to adjust the height. Care shall be taken not to damage the valve.

(b) When needed due to poor soil conditions concrete blocks may be required by the Commission.

1. The valve joints shall be assembled with retainer glands in accordance with Section 6.2.7 Mechanical Joint Restraint for Ductile Iron Fittings of these Guidelines and Policies, unless otherwise approved by the Commission.
2. After bolts are inserted and made finger tight, the nuts shall be tightened diametrically opposite, progressively, and uniformly around the coupling with a properly calibrated torque wrench. All bolts shall be tightened to the correct torque value using a calibrated torque wrench in accordance with the manufacturer's specifications.
3. Care shall be taken to ensure that the fusion-bonded epoxy coated exterior is not damaged. Any damaged areas shall be repaired by the Commission's Construction Crew or Installer in accordance with the manufacturer's recommendation at the sole expense of the Installer.
4. All valves shall be restrained on both sides by use of restrained joints in accordance with Tee Detail (W-05.0).
5. All valves shall be installed complete with valve box and cover. Install valve box and cover in accordance with Valve Box Detail (W-08.0).
6. The installed valves shall be disinfected according to Disinfection Section of these Guidelines and Policies.

### 6.2.10 Couplings

1. Pipe installations shall conform to, but not limited to, these Guidelines and Policies, and/or AWWA C219.
2. Standard range couplings, wide range couplings, and large diameter wide range couplings typically, shall be used to repair pipe that would connect new pipe to old pipe in accordance with the **Repair Pipe Detail (W-06.0)** or as otherwise approved by the Commission's Engineering and Technical Services.
3. Standard range couplings shall be installed only when connecting standard outside diameter pipe to standard outside diameter pipe in main line or service line repair.
4. Wide range couplings may be allowed only when connecting standard outside diameter pipe to oversize or pit cast pipe in main line or service line repair.



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5. Two bolt wide range couplings may be allowed only when connecting standard outside diameter pipe to oversize or pit cast pipe in main line or service line repair in emergencies and in installations where clearance is an issue.
6. Clean pipe ends for distance of 12-inch each side.
7. Use soapy water or non-toxic, NSF approved gasket lubricant on pipe.
8. The installed couplings shall be disinfected according to Section 6.4.5 of these Guidelines and Policies. All cut-in pipe and fittings must be swabbed or sprayed with 1-5% or greater bleach solution immediately before installation but after inspection for internal cleanliness.
9. Slip follower and gasket over each pipe to distance of 6 inches from end, place middle ring on pipe end until centered over joint. Use reference marks to determine exact center location.
10. Insert other pipe end into middle ring and bring the ring to the proper position in relation to pipe laid.
11. Press gaskets and followers into middle ring flares.
12. To prevent galling nuts shall be coated, inside and out, and bolts shall be coated along the full length of threads with an anti-seizing material such as provided by Henkel Technologies, Rocky Hill, Connecticut - product name: Loctite Nickel Anti-Seize Lubricant; Chesterton Technical Products, Stoneham, Massachusetts – product name: Chesterton 772 Premium Nickel Anti-Seize Compound; Permatex Inc. Hartford, Connecticut – product name: Permatex Nickel Anti-Seize Lubricant or equal product of another manufacturer. See the Commission’s Material Specifications for a full specification.
13. After bolts are inserted and made finger tight, the nuts may be tightened with an air wrench set on the lowest speed to prevent galling. The nuts shall be tightened diametrically opposite, progressively, and uniformly around the coupling. Final tightening shall be with a properly calibrated torque wrench. All coupling bolts shall be tightened to the correct torque value using a calibrated torque wrench in accordance with the manufacturer’s specifications.

### 6.2.11 Bell Joint Clamps

1. Bell Joint Clamps designed for sealing joints on cast iron and ductile iron pipes and in accordance with the Commission’s Material Specifications shall be used to seal leaking joints or as a preventative measure to help ensure joints do not leak in the future or as otherwise approved by the Commission’s Engineering and Technical Services.



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2. Bell joint clamps shall be installed according to the manufactures provided instructions and/or the following
3. Excavate to each joint and expose the full circumference of the joint.
4. The pipe surface adjacent to the joint shall be cleaned and the surface on the joint where the gasket will be in contact.
5. Check the pipe diameter to ensure the BJC is the proper size for the installation.
6. If applicable lubricate the gasket and wrap the gasket around the pipe. Seam of gasket should be at top of pipe.
7. Assemble the face plate or pipe half around the pipe.
8. Assemble back plate or bell ring around the back of the bell.
9. Push the assembled plates or ring together and hand tighten bolts. Make sure gasket is properly seated. Casting joints should be located at 3-o'clock and 9-o'clock.
10. Tighten bolts at joint halves first. Then tighten the bolts in 20 to 30-ft-lbs increments to the manufactures specified maximum – not to exceed 70-ft-lbs. Re-torque 15-minutes after to ensure the BJC is properly tightened.

### 6.2.12 Friction Clamps

1. Friction Clamps designed for restraint and in accordance with the Commission's Material Specifications shall be used to restrain pipe that would connect new pipe to old pipe in accordance with the **Installation or Cutting-In of Valve or Fitting Details (W-06.1, W-06.2, W-06.3, W-06.4, W-06.5 or W06.6)** or as otherwise approved by the Commission's Engineering and Technical Services.
2. Friction Clamps designed for restraint may be either a four-bolt socket clamp or a fabricated steel harness each used with threaded rods, nuts, and washers per the Commission's Material Specifications and in accordance with **Threaded Rod Detail (W-06.7) and Thrust Restraint to Mechanical Joint Detail (W-06.8)**.
3. Friction Clamps designed for restraint shall be installed only when restraint cannot be achieved by other means in main line or service line installation or repair.
4. Depending on the installation the number of socket clamps or fabricated steel harnesses, diameter and number of threaded rods required will vary.
  - (a) 4-bolt Socket Clamps require the following number and diameter of threaded rod and shall be according to the Commission's Material Specifications:



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- 6-inch – 10-inch diameter pipe requires two (2) ¾-inch threaded rods
- 12-inch diameter pipe requires two (2) 1-inch threaded rods
- 16-inch diameter pipe requires four (4) 1-inch threaded rods
- Larger than 16-inch shall be approved the Commission's Engineering and Technical Services.

(b) Fabricated steel harnesses shall be provided and installed according to the Manufacturer's directions and the Commission's Material Specifications:

5. Clean the pipe surface and make sure it is free from scale and irregularities for distance of 12-inches on each side of location of friction clamp. Ensure nothing will prevent the inside of the friction clamp from attaining full contact with the pipe.
6. Using the threaded rod as a positioning guide, place the friction clamp on the pipe with the lug side or washer side positioned opposite the direction of the joint to be restrained.
  - (a) Typically, the friction clamp will be installed about 2-feet to 4-feet away from fitting, valve, or coupling, unless otherwise approved by the Commission
  - (b) Threaded couplings may be used to connect threaded rod when longer lengths of rod or varying lengths of rod are required for difficult installations.
7. Position the friction clamp so that a minimum of 1-inch of the restraint rod will protrude past the lug or washer when installation is complete.
8. Make sure the lugs or washers and the bent eyebolts and washers from each end of the restraint are properly aligned so that the restraint rods run straight with the pipe.
9. After clamping bolts and nuts are inserted and made finger tight, the nuts shall be tightened evenly on each side of the friction clamp with a properly calibrated torque wrench to the following values:
  - (a) 4-bolt socket clamps shall be evenly tightened to the following torque amounts:
    - 5/8-inch bolts shall be tightened to 65-foot-pounds
    - ¾-inch and larger bolts shall be tightened to 75-foot-pounds.
  - (b) Fabricated steel harnesses shall be tightened according to the manufacturer's recommendations.



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10. Keep the spacing at the clamping pads equal between the mating friction clamp sections. Alternate between bolts until all bolts reach the recommended torque.
11. Install the restraint rods through the lugs or washers and the bent eyebolts and washers.
12. Rods shall be used in pairs.
13. Rods shall not be bent or formed.
14. Both rod nuts shall be hand tightened plus one-half revolution each.
15. Recheck clamping bolt torque on friction clamps prior to application of protective coatings and backfilling and re-tighten if necessary.
16. All components to be cut-in to an existing water main shall be coated with petrolatum based primer and wrapped with prefabricated petrolatum coating in tape form designed to protect wet or dry irregularly shaped metal surfaces according to Section 6.2.27 of these Guidelines and Policies and the Commission's Material Specifications.

### 6.2.13 Cut-in Fittings, Valves, Hydrants, Pipes, and Repairs -General

1. All components to be cut-in to an existing water main shall be new and meet the Commission's Material Specifications.
2. When applicable the cut-in components shall be assembled and installed according to the other relevant sections of these Guidelines and Policies.
3. The Commission Construction Crew or the Installer shall excavate and expose the pipe to be cut out.
4. The Commission shall shut all valves to isolate the pipe to be cut out. The Installer must coordinate with the Commission so that customers are properly notified.
5. Whenever possible the components to be cut-in shall be pre-assembled so that the laying length can be accurately measured.
6. All the joints for each new component, where applicable, shall be restrained with retainer glands. All components shall be properly restrained either by following these Guidelines and Policies or as directed by the Commission's Engineering and Technical Services.
7. Air Corporations and/or Air Valve Assemblies shall be installed on each side of any new or replacement valve as approved by the Commission.
8. The installed couplings shall be disinfected according to Section 6.4.5 of these Guidelines and Policies. All cut-in pipe and fittings must be swabbed or sprayed

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with 1-5% or greater bleach solution immediately before installation but after inspection for internal cleanliness.

9. All new cut-in components shall be pressure and leakage tested by filling the section of pipe according to Section 6.3 of these Guidelines and Policies and visually inspecting the new cut-in components prior to backfilling.
10. The pipes shall be properly backfilled and compacted according to Section 6.2.25 of these Guidelines and Policies.
11. The Commission's Engineering and Technical Services group would define the restraint required for the Commission's Construction Crew.
12. The Installer would have to hire an engineer to submit a design to the Commission's Engineering and Technical Services group for approval.
13. All components to be cut-in to an existing water main shall be coated with petrolatum based primer and wrapped with prefabricated petrolatum coating in tape form designed to protect wet or dry irregularly shaped metal surfaces according to Section 6.2.27 of these Guidelines and Policies and the Commission's Material Specifications.

### 6.2.14 Install Valves and Fittings at Dead-Ends for Main Extensions

1. When cutting-in a valve onto the end of a ductile iron or cast iron water main in order to extend a water main the installation shall be in accordance with the **Install Valve or Fitting at Dead End Water Main(s) Detail (W-06.1)**, unless otherwise approved by the Commission.
2. Comply with the General requirements in Section 6.2.13;
3. Typically, at dead end water mains up to 16-inch in diameter and with less than 76-PSI static pressure, mechanical joint restraint and at least two (2) 18-foot or 20-foot pipe lengths are required after a cut-in valve. All other diameters or higher pressures require the following:
  - (a) By Installer an engineer's design approved by the Commission's Engineering Technical Services.
  - (b) By Commission Construction Crew a design from Engineering and Technical Services.
4. The Commission's Engineering and Technical Services group shall be contacted to determine the type and length of pipe being extended.



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5. The pipe length required would be computed based on system pressure at the extension location, pipe diameter, and trench type.
6. When extending a ductile iron main the following shall be adhered to:
  - (a) The Commission has determined that the existing main being extended is 18-foot or 20-foot lengths.
  - (b) The cut-in valve shall be restrained with retainer glands to the end of the new and existing ductile iron water main.
7. When extending a cast iron main the following shall be adhered to:
  - (a) The Commission has determined that the existing main being extended is 18-foot or 20-foot lengths.
  - (b) The cut-in valve shall be restrained with retainer glands to the end of the new ductile iron water main.
  - (c) The cut-in valve shall be restrained with a follower gland to the end of the existing cast iron water main.
  - (d) One (1) friction clamp shall be installed on the existing cast iron pipe.
  - (e) The follower gland shall be restrained to the friction clamp with  $\frac{3}{4}$ -inch or 1-inch, 4140-alloy steel, grade B7 threaded rods, and grade B7 fasteners and associated hardware as required.
  - (f)  $\frac{3}{4}$ -inch or 1-inch, 4140-alloy steel, grade B7 threaded rods, and grade B7 fasteners and associated hardware shall be used. Rods are to be attached to the fittings with 90-degree bent eyebolts and to the clamps with lugs provided or cast iron or steel washers.
  - (g) 10-inch diameter and smaller pipe require two (2)  $\frac{3}{4}$ -inch threaded rods and associated hardware.
  - (h) 12-inch diameter pipe requires two (2) 1-inch threaded rods and associated hardware.
  - (i) 16-inch diameter pipe requires four (4) 1-inch threaded rods and associated hardware.
  - (j) All threaded rods and associated hardware shall be assembled with anti-seize lubricant applied according to the manufacturer's recommendations.



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- (k) All threaded rods and associated hardware shall be wrapped in a protective coating according to Section 6.2.27 of these Guidelines and Policies, prior to backfilling.
- (l) All larger diameters require review and approval by the Commission's Engineering and Technical Services group.

### 6.2.15 Cut-In to Existing Water Mains to Replace a Valve or Fitting

1. When cutting-in a valve or fitting into existing ductile iron or cast iron water mains to replace an existing valve or fitting all the joints for each new component shall be restrained accordance with the **Cutting Into Existing Water Main to Replace Valve or Fitting Detail (W-06.2)**, unless otherwise approved by the Commission.
2. Comply with the General requirements in Section 6.2.13, above.
3. The pipe to be cut into with a new fitting or valve shall be returned to its existing condition by the following means of joint restraint.
4. For existing cast iron pipe joint restraint using couplings and friction clamps shall be as follows:
  - (a) Each end of the cut-in valve or fitting shall have a short piece of ductile iron installed and restrained with retainer glands.
  - (b) The existing pipe to be cut out shall be cut so as not to be longer than a ½-inch of the assembled valve or fitting and two (2) pieces of ductile iron pipe.
  - (c) Typically, two (2) coupling and two (2) friction clamps are required and shall be installed in accordance with Section 6.2.10 and Section 6.2.11 of these Guidelines and Policies.
  - (d) Both couplings shall be slipped onto either the existing pipe or the new pieces.
  - (e) The valve or fitting and two (2) pieces of ductile iron pipe shall be installed in place of the cut out pipe and butted up against one (1) end of the existing pipe.
  - (f) The couplings shall be slipped into position so that the ends of the new pipe are in the middle of the couplings.
  - (g) The friction clamps shall be installed on the existing water main.
  - (h) The friction clamps shall be restrained to the new valve or fitting with stainless steel rods and associated hardware as required.





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- (i) The threaded rods and associated hardware shall be installed in accordance with Section 6.2.14 of these Guidelines and Policies.
5. For existing ductile iron pipe joint restraint using a MJ solid sleeve shall be as follows:
  - (a) One (1) end of the cut-in valve or fitting shall have a short piece of ductile iron installed and restrained with retainer glands.
  - (b) The existing pipe to be cut out shall be cut so as not to be excessively longer than the assembled valve or fitting and piece of ductile iron pipe.
  - (c) Typically, one MJ solid sleeve with two (2) retainer glands is required and shall be installed in accordance with Section 6.2.7 of these Guidelines and Policies and as follows:
    - (d) The solid sleeve shall be slipped into position so that the ends of the new pipe are in the middle of the solid sleeve.

### 6.2.16 Cut-In to Existing Water Mains Install Valve with Bell Facing Valve

1. When cutting-in a valve or fitting to water mains, such as cast iron, the bell of the next pipe is found, and the bell is facing the valve or fitting to be cut-in. The installation shall be in accordance with the **Cutting into Existing Main with Bell Facing Valve Detail (W-06.3)**, unless otherwise approved by the Commission.
2. Comply with the General requirements in Section 6.2.13;
3. The pipe to be cut into with a new fitting or valve shall be returned to its existing condition by the following means of joint restraint.
4. A short piece of ductile iron pipe shall be installed into the valve or fitting and restrained with a retainer gland.
5. For existing cast iron pipe joint restraint using a coupling, retainer gland, and a split ring clamp shall be as follows:
  - (a) A coupling shall be installed to connect the cast iron or other pipe to the new short piece of ductile iron pipe.
  - (b) An additional retainer gland shall be installed on the new short piece of ductile iron pipe.
    - This retainer gland may be omitted if the split ring clamp is restrained directly to the valve or fitting.



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- (c) One (1) split ring clamp shall be installed on the other side of the bell of the existing pipe.
  - (d) The additional retainer gland shall be restrained to the split ring clamp with stainless steel rods as required.
  - (e) The threaded rods and associated hardware shall be installed in accordance with Section 6.2.14 of these Guidelines and Policies.
  - (f) Two (2) new full lengths of ductile iron pipe shall be installed after the new valve. The first piece shall be restrained to the new valve with a retainer gland.
6. For existing cast iron pipe joint restraint using a MJ solid sleeve and a split ring clamp shall be as follows:
- (a) A MJ solid sleeve shall be installed to connect the cast iron or other pipe to the new short piece of ductile iron pipe.
  - (b) One (1) retainer gland and one (1) follower gland shall be installed on the solid sleeve. The retainer gland shall be installed on the new ductile iron pipe. The follower gland shall be installed on the existing cast iron or other pipe.
    - The retainer gland may be omitted if the split ring clamp is restrained directly to the valve or fitting.
  - (c) One (1) split ring clamp shall be installed on the other side of the bell of the existing pipe.
  - (d) The follower gland shall be restrained to the split ring clamp with stainless steel rods as required.
  - (e) The threaded rods and associated hardware shall be installed in accordance with Section 6.2.14 of these Guidelines and Policies.
  - (f) Two (2) new full lengths of ductile iron pipe shall be installed after the new valve. The first piece shall be restrained to the new valve with a retainer gland.

### 6.2.17 Cut-In to Existing Water Main to Install Valve with Bell Facing Away from Valve

1. When cutting-in a valve or fitting to water mains, such as cast iron, the bell of the next pipe is found, and the bell is facing away from the valve or fitting to be cut-in. The installation shall be in accordance with the **Cutting into Existing Water Mains with Bell Facing Away from Valve (W-06.4)**, unless otherwise approved by the Commission.
2. Comply with the General requirements in Section 6.2.13, above.



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3. The pipe to be cut into with a new fitting or valve shall be returned to its existing condition by the following means of joint restraint.
4. A short piece of ductile iron pipe shall be installed into the valve or fitting and restrained with a retainer gland.
5. For existing cast iron pipe joint restraint using a coupling, retainer gland, and a friction clamp shall be as follows:
  - (a) A coupling shall be installed to connect the cast iron or other pipe to the new short piece of ductile iron pipe.
  - (b) An additional retainer gland shall be installed on the new short piece of ductile iron pipe.
    - This retainer gland may be omitted if the split ring clamp is restrained directly to the valve or fitting.
  - (c) One (1) friction clamp shall be installed on the other side of the bell of the existing pipe.
  - (d) The additional retainer gland shall be restrained to the friction clamp with threaded rods as required.
  - (e) The threaded rods and associated hardware shall be installed in accordance with Section 6.2.14 of these Guidelines and Policies.
  - (f) Two (2) new full lengths of ductile iron pipe shall be installed after the new valve. The first piece shall be restrained to the new valve with a retainer gland.
6. For existing cast iron pipe joint restraint using a MJ solid sleeve and a split ring clamp shall be as follows:
  - (a) A MJ solid sleeve shall be installed to connect the cast iron or other pipe to the new short piece of ductile iron pipe.
  - (b) One (1) retainer gland and one (1) follower gland shall be installed on the solid sleeve. The retainer gland shall be installed on the new ductile iron pipe. The follower gland shall be installed on the existing cast iron or other pipe.
    - The retainer gland may be omitted if the split ring clamp is restrained directly to the valve or fitting.
  - (c) One (1) friction clamp shall be installed on the other side of the bell of the existing pipe.



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- (d) The follower gland shall be restrained to the friction clamp with threaded rods as required.
- (e) The threaded rods and associated hardware shall be installed in accordance with Section 6.2.14 of these Guidelines and Policies.
- (f) Two (2) new full lengths of ductile iron pipe shall be installed after the new valve. The first piece shall be restrained to the new valve with a retainer gland.

### 6.2.18 Cut-In to Existing Water Main to Install Valve with No Bell Found

1. When cutting-in a valve or fitting to existing water mains, such as cast iron, the bell of the next pipe is not found. The installation shall be in accordance with the **Cutting into Existing Water Main with No Bell Found (W-06.5)**, unless otherwise approved by the Commission.
2. Comply with the General requirements in Section 6.2.13;
3. Typically, at least one (1) MJ solid sleeve is required and shall be installed in accordance with Section 6.2.7 of these Guidelines and Policies and as follows:
  - (a) One (1) retainer gland and one (1) follower gland shall be installed on the solid sleeve. The retainer gland shall be installed on the ductile iron pipe. The follower gland shall be installed on the cast iron or other pipe.
  - (b) One (1) concrete thrust collar and one (1) friction clamp shall be installed on the existing pipe.
  - (c) The concrete thrust collar shall be installed in accordance with the **Concrete Thrust Collar Detail (W-06.6)**, unless otherwise approved by the Commission.
  - (d) The follower gland shall be restrained to the friction clamp with threaded rods as required.
  - (e) The threaded rods and associated hardware shall be installed in accordance with Section 6.2.14 of these Guidelines and Policies.
  - (f) Two (2) new full lengths of ductile iron pipe shall be installed after the new valve. The first piece shall be restrained to the new valve with a retainer gland.
  - (g) The Commission's Engineering and Technical Services group would define the restraint required for the Commission's Construction Crew.
  - (h) The Installer would have to hire an engineer to submit a design to the Commission's Engineering and Technical Services group for approval.



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4. or as otherwise approved by the Commission's Engineering and Technical Services.

### 6.2.19 Tapping Sleeves and Mechanical Joint Valve

1. Ductile iron tapping sleeves shall be used when taps onto water mains are to be size on size or as required by the Commission.
2. Stainless steel tapping sleeves will be allowed when the connecting pipe is a minimum of one size smaller than the main it is connecting to or as approved by the Commission.
3. Before ordering or installing a tapping sleeve confirm with the Commission's Engineering and Technical Services what type of tapping sleeve is required for each installation.
4. The Commission will make all taps, unless otherwise approved.
5. Install both stainless steel and ductile iron tapping sleeves in strict accordance with the manufacturer's instructions.
  - (a) Pressure test sleeve and valve with air at a minimum of 50 PSI prior to beginning tap.
  - (b) While the sleeve is under pressure from the air test liberally spray the tapping sleeve and valve with a soapy water solution.
  - (c) Make up all body bolts to torques specified by the manufacturer.
  - (d) The mechanical joint outlet of the valve shall be made up in accordance with the specifications regarding mechanical joints.
6. The tapping sleeve shall be installed under pressure while flow is maintained. The tapping operation shall be conducted by workers experienced in the procedure. The tapping machine shall be furnished by the Commission's Construction Crew or Installer.
7. The tap shall be made a minimum of three (3) feet from existing joints or fittings, unless otherwise approved by the Commission. Adequate support shall be provided under the sleeve and valve during the operation. Pipe bedding material shall be properly tamped and compacted around the work.
  - (a) A concrete block 4-inches thick or equal shall be placed under valves, unless otherwise approved by the Commission.



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8. Provide thrust blocking at the back of the tapping sleeve in accordance with the plans. The size and location of the thrust block shall be determined based on the application.
9. Install the tapping sleeve such that the flanged face of the sleeve is plumb with the vertical plane.
10. The coupon from the valve tap shall be supplied to Commission after the tap.
11. After completing the tap, the valve shall be flushed to ensure that the valve seat is clean.
12. The installed tapping sleeve and valves shall be disinfected according to Disinfection Section of these Guidelines and Policies.
13. If authorized, cutting of the existing pipe shall be done so that the cut is square and clean, without causing damage to the pipe lining. All pipe cutting shall be done by means of an approved type of power cutter. All cut edges shall be field beveled by use of a power grinder when necessary.
14. The tapping sleeves and valves shall be installed in accordance with Ductile Iron Tapping Sleeve Detail (W-09.0) and Stainless Steel Tapping Sleeve Detail (W-09.1).

### 6.2.20 Valve Boxes and Covers

1. Valve boxes shall be installed concentric to the operating nut and plumb with the vertical plane.
2. The belled base section shall be placed on standard concrete blocking (typically 4-inches X 2-2/3-inches X 8-inches) in such a way that no additional loading is transferred to the valve, unless otherwise approved by the Commission.
3. Longer valve box bottoms and/or tops will be specified as required for water mains at depths that exceed the limitations of the above specified valve box.
4. Valve boxes located in traveled ways shall be left flush with the pavement or gravel shoulder unless otherwise specified.
5. Valve boxes located in other non-paved areas shall be left flush with finish grade unless otherwise specified.
6. Valves and boxes shall be set with the stem vertical and valve box vertically centered over the operating nut.
7. The valve box shall be supported during backfilling and maintained in vertical alignment with the top section flush with finished grade.



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8. A concrete ring shall be placed around the top of each Valve Box, flush with finished grade, if designated by the Commission's Authorized Field Representative.
9. Install valve box and cover in accordance with **Valve Box Detail (W-08.0)**.

### 6.2.21 Mechanical Joint Restraint for Ductile Iron Fittings (Retainer Glands)

1. Retainer glands shall be installed as specified for ductile iron mechanical joint fittings.
2. Once gland is made up in accordance with paragraph 1, proceed to tighten.
3. Twist lugs until each one is in contact with the pipe before completing tightening.
4. Tighten heads in a diametric pattern until all heads have twisted off the nut.
5. Retainer glands may be used in place of follower glands on cast iron mains but under no circumstances shall retainer gland lugs be tightened and broken off when installed on cast iron mains.

### 6.2.22 Bolt-Thru Mechanical Joint Restraint (Foster Adapter)

1. The bolt-thru mechanical joint restraint may be used on 4-inch through 24-inch diameter joints with approval from the Commission.
2. The bolt-thru mechanical joint restraint may be used to restrain the following:
  - (a) Mechanical joint valves to mechanical joint tees and crosses
  - (b) Mechanical joint reducers and other mechanical joint fittings to mechanical joint tees and crosses
  - (c) Mechanical joint bends and other mechanical joint fittings to each other
3. The bolt-thru mechanical joint restraint may not fit on both the "branch" and the "run" of compact tees or crosses because longer bolts are required and may obstruct each other.
4. The bolt-thru mechanical joint restraint is not recommended for direct connection to hydrant shoes due to bolt clearance issues.

### 6.2.23 Grip Ring Pipe Retainer

1. Grip Ring Pie Retainer shall only be allowed with Commission approval.
2. Clean pipe to remove as much dirt and corrosion as possible from the surface.



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3. Slide the gland, Grip Ring, and M.J. gasket on to pipe end. Make sure the tapered side of the Grip Ring faces the gland.
4. Insert the pipe end into the M.J. fitting.
5. Slide the gasket into the M.J. bell pocket as far as possible. The gland (and Grip Ring) may be used to tap the gasket into place if required.
6. Slide the Grip Ring up the pipe until its face is against the M.J. gasket.
7. Slide the gland up the pipe until it engages the Grip Ring.
8. Install T-bolts in the M.J. fitting and gland. Tighten hand tight.
9. Using a torque wrench, tighten the nuts to 75-90 ft-lb. Care must be taken to assure that the flanges of the gland and M.J. fitting remain parallel. This can be done by alternating side-to-side while tightening. Wait 10 minutes and re-torque.

### 6.2.24 Fire Hydrant Installation

1. All fire hydrants are to be installed on a minimum 6-inch water main branch.
2. Hydrants shall be located approximately every 300-feet to 400-feet, on the same side of the street as the water main, on a property line, and as approved by the local Fire Department.
3. Hydrants are not to be placed at the end of the main in a cul-de-sac, but rather at or before the point of curvature (PC).
4. Public hydrants are connected directly to public water mains.
5. Public water mains are only found in street right of ways or easements given to the Commission by the property owner.
6. Private hydrants within a site shall be installed so as to protect the public water supply per DEP requirements, Commission requirements and the local Fire Department requirements. The Applicant's engineer will contact the Commission's Engineering and Technical Services for each such installation.
7. The Applicant's engineer must provide information to the Commission and local Fire Department with flow and demand requirements and available flow.
8. Private hydrants are owned, operated, and maintained by the property owner. It is encouraged to work with the Fire Department for any private hydrants to be part of the hydrant certification process.
  - (a) The Commission does not maintain, repair, or replace private hydrants.





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- (b) Private hydrants are required to be painted red with gray bonnets and nozzle caps.
9. No other connections are allowed onto a hydrant branch unless approved by the Commission and the local Fire Department.
10. All fire hydrants shall be installed with a mechanical joint (MJ) hydrant valve attached to a mechanical joint by anchor (swivel) tee off the water main in accordance with **Hydrant Details - Standard (W-07.0)**.
- (a) Hydrant valves may be mechanically restrained to a mechanical joint by mechanical joint tee off the water main in accordance with **Hydrant Details – Alternate 1 (W-07.1)**. This method requires Commission approval.
- A short piece ductile iron pipe, at least 18-inches long shall be mechanically restrained to both the MJ X MJ tee and hydrant valve.
- (b) Hydrant valves may be mechanically restrained to a mechanical joint by mechanical joint tee off the water main in accordance with **Hydrant Details – Alternate 2 (W-07.2)**. This method requires Commission approval.
- A bolt through mechanical joint adapter shall be mechanically restrained to both the MJ X MJ tee and hydrant valve.
11. Hydrant shall be installed vertically plumb.
12. The front body of the hydrant shall be set a minimum of 2-feet behind the curb when the sidewalk is set back from curb. If the sidewalk meets the curb the hydrant may be placed 1-foot in front of the property line or in the sidewalk if handicap access is not restricted. Placement 1-foot from the property line and all other locations shall be approved by the Commission.
13. The American Disabilities Act (ADA) requires a minimum of 36-inches of clearance around hydrants within sidewalks.
14. All hydrants must be installed with breakaway coupling located at least 2-inches above the finished grade surrounding the hydrant and not more than 6-inches above the finished grade surrounding the hydrant.
15. All hydrant bases shall be installed on a 16-inch by 8-inch by 4-inch concrete block and in ½ of a cubic yard of 1-1/2-inch crushed stone (about 2-1/2-feet by 2-1/2-feet by 2-1/2- feet) to allow for free draining of the hydrant. Make sure the drain holes of the hydrant are not blocked.
16. The installed hydrants shall be disinfected according to Section 6.4 of these Guidelines and Policies.



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17. Backfill around the hydrant from the ground surface to 1-foot above the top of the hydrant shoe shall be with select common borrow.

### 6.2.25 Fire Hydrant Relocation

1. All fire hydrants that are relocated shall be installed according Sections 6.2.13 and 6.2.24 of these Guidelines and Policies and the following:
  - (a) Hydrant branches shall be mechanically restrained with retainer glands or friction clamps and threaded rods according to Section 6.2.11 of these Guidelines and Policies, unless otherwise approved by the Commission.
  - (b) Intentionally left blank for future use

### 6.2.26 Fire Hydrants Replacement

1. All fire hydrants that are relocated shall be installed according Sections 6.2.13 and 6.2.24 of these Guidelines and Policies and the following:
  - (a) Hydrant branches shall be mechanically restrained with retainer glands or friction clamps and threaded rods according to Section 6.2.11 of these Guidelines and Policies, unless otherwise approved by the Commission.
  - (b) Intentionally left blank for future use

### 6.2.27 Fire Hydrant Operations

1. All hydrants shall be operated by Springfield Water and Sewer Commission employees or Springfield Fire Department. During Fire Flow Testing the Applicants personnel may operate a hydrant in accordance with this Section and Section 6.5 of the Guidelines and Policies.
2. Open the hydrant inspection program on the field computer and document hydrant asset information.
3. Visually inspect hydrant barrel and each section of hydrant using the hydrant inspection log as a guide; look for cracks on upper barrel, check the bottom, middle, top, front, back and both sides of hydrant. Also check nozzle caps, nozzle locks and threads. Remove caps and check threads. If threads are worn out and/or damaged, make note to have them replaced.
4. Visually inspect all bolts where upper and lower barrels are connected. If necessary, have any defective bolts replaced. For breakaway couplings, check for cracks and worn bolts or to see if the coupling is loose. Manually pull and push hydrant to check that it is secure. The Hydrant should not move.



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5. Remove one cap, set up spigot with ball valve on nozzle and slowly flow hydrant to prevent water quality issues. Allow hydrant to flow until clear. Open and close hydrant valve to check for smooth easy operation.
6. Perform maintenance on all parts including grease caps and Zerk fittings, gaskets, etc.
7. If the hydrant requires additional work outside the scope of this inspection, check with the working foreman to assign additional work orders to the hydrant. In some cases, repair duties may be performed on the spot or submitted to other crews. The following are examples requiring follow up work orders:
8. Intentionally left blank for future use

### 6.2.28 Protective Coatings

1. Protective Primer
  - (a) Wire brush and scrape the surface clean.
  - (b) Apply protective primer by brush, rag, or hand (glove). A thin film of primer to a minimum thickness of 2 mils (.002-inch) will be sufficient.
  - (c) On wet, cold or rusty surfaces, rub and press Protective Primer firmly onto these areas, displacing moisture and ensuring adhesion to the surface.
  - (d) After application of the primer, Protective Coating Tape shall be applied immediately.
2. Protective Coating Tape
  - (a) After application of the primer, Protective Coating Tape shall be applied immediately.
  - (b) Protective Coating Tape shall be spirally wrapped around the fitting, valve, or other appurtenance and hand molded to conform to the shape of the surfaces being coated.
  - (c) Protective Coating Tape shall be overlapped no less than 1-inch. When wet or other corrosive conditions exist, the overlap shall be 50% of the width.
  - (d) While wrapping all air shall be pressed out of the tape by hand and a smooth seam shall be made.
  - (e) After application of the Protective Coating Tape, Protective Coating Outer Wrap shall be applied immediately.



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### 3. Protective Coating Outer Wrap

- (a) After application of the Protective Coating Tape, Protective Coating Outer Wrap shall be applied immediately.
- (b) Protective Coating Outer Wrap shall be spirally wrapped around the fitting, valve, or other appurtenance and hand molded with sufficient tension to conform to the shape of the surfaces being coated.

### 6.2.29 Backfill

#### 1. Bank-run, Screened, and Structural Gravel Aggregate

- (a) The gravel aggregate shall be spread in layers of uniform thickness not exceeding 12-inch before compaction and moistened or allowed to dry as directed.
- (b) The gravel aggregate shall be thoroughly compacted by means of suitable power driven tampers or other power driven equipment.
- (c) Backfill shall be graded with the placement of suitable soil material, as determined by the Commission Representative, in 12-inch (maximum) layers compacted to 95% of the maximum density of the soil as determined by the Standard Proctor Test, AASHTO Designation T-99.

#### 2. Sand

- (a) The sand shall be spread in layers of uniform thickness not exceeding 8-inch before compaction and moistened or left in natural state as directed.
- (b) The sand shall be thoroughly compacted by means of suitable power driven tampers or other power driven compaction equipment.

#### 3. Common Borrow/Fill and Select Common Borrow/Fill

- (a) The common borrow and select common borrow fill shall be spread in layers of uniform thickness not exceeding 12-inch before compaction and moistened or allowed to dry as directed.
- (b) The common borrow and select common borrow fill shall be graded with the placement of material, as determined by the Commission Representative.
- (c) The common borrow gravel shall be thoroughly compacted by means of suitable power driven tampers or other power driven equipment.



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- (d) The common borrow and select common borrow fill shall be compacted to 95% of the maximum density of the soil as determined by the Standard Proctor Test, AASHTO Designation T-99.

### 4. Excavatable Flowable Fill

- (a) The Commission's Authorized Field Representative shall approve all fill procedures prior to placing excavatable flowable fill.
- (b) All pipes, bends, fittings, and other appurtenances shall be secured prior to the delivery of the excavatable flowable fill.
- (c) A piece of 4-mil poly minimum shall be placed between all pipes, bends, fittings, and other appurtenances and excavatable flowable fill.
- (d) When possible excavatable flowable fill shall be placed on a bed of compacted gravel fill.
- (e) Excavatable flowable fill shall be furnished and placed in a fluid condition on the secured pipes, bends, fittings, and other appurtenances.
- (f) Excavatable flowable fill exposed surfaces shall be protected from premature drying, wash by rain or running water, wind, mechanical injury, and excessive hot or cold temperature.

### 5. Non-Excavatable Flowable Fill

- (a) The Commission's Authorized Field Representative shall approve all fill procedures prior to placing non-excavatable flowable fill.
- (b) All pipes, bends, fittings, and other appurtenances shall be secured prior to the delivery of the non-excavatable flowable fill.
- (c) A piece of 4-mil poly shall be placed between all pipes, bends, fittings, and other appurtenances and non-excavatable flowable fill.
- (d) When possible non-excavatable flowable fill shall be placed on a bed of compacted gravel fill.
- (e) Non-excavatable flowable fill shall be furnished and placed in a fluid condition on the secured pipes, bends, fittings, and other appurtenances.
- (f) Non-excavatable flowable fill exposed surfaces shall be protected from premature drying, wash by rain or running water, wind, mechanical injury, and excessive hot or cold temperature.



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6. Concrete for Fill
  - (a) The Commission's Authorized Field Representative shall approve all fill procedures prior to placing concrete for fill.
  - (b) All pipes, bends, fittings, and other appurtenances shall be secured prior to the delivery of the concrete for fill.
  - (c) A piece of 4-mil minimum poly shall be placed between all pipes, bends, fittings, and other appurtenances and concrete fill.
  - (d) When possible concrete for fill shall be placed on a bed of compacted gravel fill.
  - (e) Concrete for fill shall be furnished and placed in a fluid condition on the secured pipes, bends, fittings, and other appurtenances.
  - (f) Concrete for fill, exposed surfaces, shall be protected from premature drying, wash by rain or running water, wind, mechanical injury, and excessive hot or cold temperature.

### Section 6.3 Temporary Bypass Mains

#### 6.3.1 General

1. Furnish all labor, materials, equipment and incidentals required to install and remove by-pass and temporary water pipe and fire hydrants of the sizes required to provide adequate service to all water consumers whose service will be interrupted by new water main installation and to fulfill fire service requirements.
2. The Commission's Construction Crew or Installer shall provide temporary water service to one and two family residences and to other water customers with small diameter services currently connected to mains to be shut off, in order to facilitate the work, by means of temporary hose connections.
3. The Commission's Construction Crew or Installer shall furnish all work and fittings and make all necessary connections required to supply the bypass pipes (including service) with water from hydrants or existing water mains. Procedures for connecting bypass pipes to existing water mains that are to remain in service are specified elsewhere in this section.
4. Typically, temporary water pipe is not allowed to be installed and/or in service from November 15 to April 15 to prevent freezing of water supply to Commission customers, unless otherwise approved by Engineering and Technical Services



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(E&TS). The Commission's Construction Crew or Installer may submit a plan to E&TS as defined in Section 6.3.2 that includes freeze protection.

### 6.3.2 Installation

1. Temporary water pipe shall not be installed without the prior approval of Engineering and Technical Services (E&TS).
2. E&TS may prepare or shall approve a bypass plan and sequence of work as indicated below:
  - (a) The plan shall be drawn on a clean set of project drawings or GIS plans. A sequence of work will be defined in a memo to the Commission's Construction Crew.
    - The plan shall address how pipe will be laid at catch basins, address how pipe will cross intersections, address how pipe will be laid at intersections to avoid contact with cars cutting turns sharply, provide the make and model of all valves to be utilized, provide the type of temporary water piping to be utilized, brass sampling tap locations and address pedestrian safety issues such as but not limited to the, American with Disabilities Act (ADA) compliance, and include a disinfection procedure as described herein.
    - The plan for temporary water pipe layout shall include 4-inch temporary water pipe on one side of the route and 2-inch temporary water pipe on the other side of the route.
    - If freeze protection is being proposed it shall include a minimum coverage of 3-feet of earth with a 6-inch straw layer over the earth over the pipe or other means to be approved by E&TS. No running water will be allowed as a means of freeze protection.
  - (b) The plan by the Installer shall be drawn on a clean set of project drawings or other approved plans and include the bullet points in paragraph (a) above. A sequence of work will be defined in a memo to E&TS.
3. The bypass pipes shall be supplied from connections made to hydrants or existing water mains that are to remain in service as specified elsewhere in this section. Each bypass piping section shall have a minimum of two (2) connections, unless otherwise approved by E&TS.
4. Temporary water pipe typically is laid in gutters, but during road reconstruction may be moved to back of walk.
  - (a) At street intersections, a straight line shall be cut in the existing bituminous paving and the temporary water pipe shall be laid in a shallow trench covered with temporary surfacing.



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- (b) At driveways, pipe crossings may either be provided by cold patch cover, a straight line shall be cut in the existing bituminous paving and the temporary water pipe shall be laid in a shallow trench covered with temporary surfacing or other approved method.
  - (c) At sidewalks, pipe crossings may either be provided by cold patch cover, a straight line shall be cut in the existing bituminous paving and the temporary water pipe shall be laid in a shallow trench covered with temporary surfacing or other approved method. ADA compliance shall be enforced.
5. Minimum ADA accessibility requires the following:
- (a) Typically, a 48-inch minimum width is required for new or temporary installations,
  - (b) Curb ramps shall be firm, stable, and have a non-slip surface. Curb ramps should not warp or buckle and should be made of materials strong enough to support the weight of pedestrians as well as motorized scooters and wheelchairs. Ramps should also be color contrasting and contain marked edges, so they are noticeable by pedestrians who have visual impairments. Furthermore, ramps should also have free draining surfaces with a maximum cross slope of 2 percent. Note that the cross slope for midblock crosswalks can match the running slope of the roadway up to a maximum of 5 percent,
  - (c) Curb ramp slope shall have a slope of 1:12 maximum for a rise of 6 inches,
  - (d) Curb ramp slope shall have a slope of 1:8 maximum for a rise of 3 inches,
  - (e) A slope steeper than 1:8 is not allowed, and
  - (f) When a ramp is installed parallel to the curb, a 48 inch by 48 inch platform should be provided at curb level to allow pedestrians to turn 90 degrees before descending the ramp.
6. At E&TS's discretion, hose may be allowed to come around bends, to cross driveways, to connect temporary water mains to existing hydrants, or to connect temporary water mains to existing water services. All hose shall comply with NSF 61 standards. No kinks, excessive bends, or other restrictions shall be allowed to any hose used on the temporary water pipe, temporary hydrants, or temporary water services.
7. Sanitary precautions shall be satisfactory to E&TS and shall meet all requirements of the public health authorities having jurisdiction. The installation shall be watertight. Care shall be exercised throughout to avoid any possible pollution of mains, house services, or the temporary water pipe. The interior of temporary





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water pipe, temporary hoses and any other connection pipe to convey water for potable use shall be flushed and disinfected prior to its use in accordance with AWWA C651 and in accordance with Section 6.4 of these Guidelines and Policies

8. All temporary pipes shall have valves installed that meet the approval of E&TS. A valve shall be provided at each hydrant connection and each tap hole connection. Main line valves shall be located no further than 500-feet apart when directed by the E&TS. Handles shall be removed from temporary hydrants. Main line temporary valves may require the handles be removed at the discretion of the SWSC.
9. Sample taps shall be furnished and installed on temporary water pipe in accordance with of these Guidelines and Policies.
10. Whether it is being installed, in service, or being removed, the amount of temporary water pipe kept on the job shall be the minimum that will allow the work to continue at a reasonable rate.
11. The Commission Construction Crew or Installer shall maintain the temporary water pipe during all emergencies on a 24 hour basis. The Installer shall provide the SWSC the name and phone number of their 24 hour emergency contact person. The 24 hour emergency contact person shall be located within 30 minutes traveling distance from the project site. The Installer's emergency staff shall have vehicles, equipment, tools, and parts to maintain the temporary water pipe if it is broken or out of service for any reason.

### 6.3.3 Temporary Connection to Existing Mains

1. At some locations, as directed or approved by the SWSC, it may be necessary to tap the existing water mains in order to supply the temporary water piping with water service.
2. The normal connection to an existing water main shall consist of a single 4-inch tap, with one (1) 4-inch hose feeding into a 4-inch temporary bypass pipe. A 4-inch valve shall be provided on the temporary water pipe near the taps.
3. An alternative connection to an existing water main may be allowed but requires approval E&TS and shall consist of a double 2-inch tap, with two 2-inch lines feeding into a 4-inch temporary bypass pipe. A 4-inch valve shall be provided on the temporary bypass pipe near the taps.
4. At locations, as approved or directed by E&TS, where connections for temporary water piping are to be made underground to the existing water mains with corporation stops or wet taps, the Commission Construction Crew or Installer shall make the necessary excavations at the locations and to the limits as necessary to



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uncover the existing underground water lines and permit the installation of corporations stops or wet taps thereto. The Commission Construction Crew or Installer shall furnish and install a shutoff valve at the connection to the existing water line; connect the temporary water piping to the shutoff valve and, where directed by E&TS, backfill the excavation and install temporary bituminous pavement. When the need for the temporary water service has ceased, the Commission Construction Crew or Installer shall re-excavate, where necessary cap the corporation stop or wet tap; disconnect and remove the water piping, shutoff valve, backfill the excavations; and provide the gravel base course and temporary and permanent pavements over the excavated and disturbed areas in accordance with the requirements specified and as directed.

### 6.3.4 Temporary Fire Hydrants

1. Where fire hydrants are by-passed, the Commission Construction Crew or Installer shall furnish, install, maintain and remove temporary hydrants. The temporary hydrant shall be placed within 25 feet and on the same side of the street as the hydrant to be out of service, unless otherwise directed by E&TS. Each temporary hydrant shall be installed on a 4-inch bypass line, and shall consist of a 4-inch branch, 4-inch valve, two (2) 90-degree bends (installed vertically), one 45-degree bend (installed vertically down) and 4-1/2-inch National Standard Thread (NST) nozzle or a 4-inch by 2-1/2-inch tee and two 2.5-inch nozzles, if approved by E&TS, for fire hose attachment. Nozzles shall be threaded for cap and grooved for fire hose attachment, using National Standard Thread.
2. Temporary hydrants shall be staked to the ground with a 1-inch diameter steel rebar approximately 4-feet long. The rebar shall driven into the ground a minimum of 2-feet. The temporary hydrant shall be clamped to the remaining rebar with at least two (2) steel hose clamps. Blocking shall be provided to raise hydrants above curbs when required.
3. Temporary hydrants shall meet the approval of the SWSC and the Fire Department. They shall be set in such a manner that the Fire Department will have no difficulty making a connection with a fire hose, where they will cause the least obstruction to vehicular and pedestrian traffic, and where they will be least likely to be damaged. Before permanently shutting off the water main that is to be replaced, the Commission Construction Crew or Installer shall test all temporary hydrants and valves to be sure that they are in proper working order.
4. The same type of temporary hydrant shall be utilized throughout the project.



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5. Once put into use, the temporary hydrants shall be maintained by the Commission Construction Crew or Installer until the existing hydrants and or new hydrants are restored to service.
6. Any existing hydrants that are out of service shall be “bagged” by the Commission Construction Crew or Installer and reported to the Fire Department as being out of service.

### 6.3.5 Temporary Water Service to Buildings

1. Temporary water service connections shall be made to the temporary water pipe with a tap of the appropriate size.
2. Temporary water service connections shall be made to sill cocks outside the buildings or to temporary connections at the meter inside the buildings, as may be required or directed.
3. The temporary hoses shall generally be laid up the side of driveways and shall be as inconspicuous as possible for their entire length.
4. In cases where access to the building water meter is not possible or where temporary service connection using hoses would not provide adequate supply capacity a temporary service connection shall be made to the existing service pipe in the street between the corporation cock at the main and the curb stop, or in the sidewalk area between the curb stop and the service shut off valves inside the building.
5. The Commission Construction Crew or Installer with the SWSC present shall connect each home to be out of service during water main replacement to the 2-inch or 4-inch temporary water piping after approval of the temporary piping for service by SWSC.
6. Commission Construction Crew or Installer shall flush and disinfect each individual temporary water service per SWSC’s Guidelines and Policies (separately bound).

### 6.3.6 Temporary Bypass System Sequence and Requirements

1. Commission Construction Crew or Installer shall connect onto the 4-1/2-inch pumper connections on existing and new hydrants at locations shown on the bypass plan.
2. Commission Construction Crew or Installer shall install temporary hydrants after each connection to new hydrants or existing hydrant used as part of the temporary bypass system.



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3. Commission Construction Crew or Installer shall install a 4-inch valve after each temporary hydrant.
4. Commission Construction Crew or Installer shall install temporary bypass piping, valves and fittings at the locations shown on the Contract Drawings and in accordance with the Contract Documents.
5. Commission Construction Crew or Installer shall bury 2-inch temporary water piping and any temporary building service piping at all road crossings in a trench at least 12-inches deep and in a 4-inch sleeve or method as approved by Engineer.
6. Commission Construction Crew or Installer may utilize asphalt ramps for 2-inch by-pass at driveways but shall bury 2-inch by-pass if deemed necessary by the SWSC at driveways to allow the homeowner to enter and leave the driveway without damaging vehicle or by-pass piping.
7. Commission Construction Crew or Installer shall bury 4-inch by-pass at all road crossings in a trench at least 12-inches deep and in a 6-inch sleeve or other method as approved method by the Engineer.
8. Commission Construction Crew or Installer shall bury 4-inch by-pass at all driveways as required to allow the homeowner to enter and leave the driveway without damaging vehicle or by-pass piping.
9. Commission Construction Crew or Installer shall provide a minimum 2-inch valves and/or taps as required to flush the temporary bypass piping, unless otherwise approved by E&TS.
10. Commission Construction Crew or Installer shall flush and disinfect entire by-pass system before connecting individual water in accordance with Section 6.4 of these Guidelines and Policies.
11. Commission Construction Crew or Installer shall provide all material (including, but not limited to pipe, valves, and fittings), labor, and equipment to perform above.
12. SWSC to provide bacteria sampling service.
13. The Commission Construction Crew or Installer shall connect, flush, and disinfect each individual temporary water service to each home to be out of service as described above.
14. The Commission Construction Crew or Installer shall maintain temporary water piping at all time. The Commission Construction Crew or Installer shall provide to the SWSC, the local DPW, local police department, and the local fire



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department a 24-hour contact person with cell phone number that can be available within 60-minutes of a pipe break or other safety issue.

15. Upon completion of the new replacement water main and services, the Commission Construction Crew or Installer shall remove all temporary water piping and restore site to original condition.



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### Section 6.4 Filling, Leakage testing, Disinfection, and Bacteria Testing of Water Mains

#### 6.4.1 General

All water mains and temporary water mains before being put into service shall be filled and leak tested in accordance with the latest version of AWWA standard C-600, and flushed, disinfected, and bacteria tested in accordance with the latest version of AWWA standard C-651 and the following:

#### 6.4.2 Filling of Pipe:

1. The new main or repaired main must always be separated from the active water system until the Filling, Pressure and Leak Test, Flushing, Disinfecting, and Testing is completed and approved.
2. The supply main, to which the new or repaired mains will obtain its fill water, will be flushed for 15 minutes prior to filling under the direction and upon approval of the Commission.
3. The fill water shall come from a potable source in one direction at a slow rate equivalent to a valve cracked open. In any event the maximum number of turns on any valve shall be five (5) ½-turns.
4. The pipe that is to be filled with water shall have all air expelled from the water main through hydrants, air valve assemblies located at the high points, services and blow-offs, located at the end of water mains. If temporary air corporations are installed by Commission's Construction Crew or Installer, they shall be capped with a threaded brass cap upon the successful completion of the pressure test.
5. All temporary air corporations used for flushing shall have a Commission style flushing device temporarily installed on it according to the Flushing Section of these Guidelines and Policies.
6. Once the new main or repaired main is filled with water see the Pressure and Leakage Section of this document.
7. Once the new main or repaired main passes the pressure and leakage tests see the Disinfection Section of this document.
8. Once disinfection has been achieved, see the Flushing Section of this document.

#### 6.4.3 Pressure and Leakage Testing

1. All water mains and fire services shall be subjected to pressure and leakage testing in accordance with the latest version of AWWA standard C-600. Allowable



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leakage for each section of water main tested shall be compared against the table attached at the end of this section in order to determine the acceptability of the test.

2. At a minimum the leak test shall be for two (2) hours at either 150-PSI or 1-1/2 times the working or static pressure, whichever is greater.
3. The Owner, Owner’s authorized representative, the Commission Approved Contractor, or the Commission’s designee shall hire a testing company who is acceptable to Commission to complete the required pressure and leakage test. The tester shall submit certified leakage testing results in writing to Commission for each section of main tested. The tester shall be approved by Commission prior to initiating the pressure test. Commission shall be notified a minimum of 24 hours in advance prior to any pressure and leakage testing. **Pressure and leakage testing must be completed in the presence of a Commission Authorized Field Representative unless otherwise arranged.**
4. If a section of main fails pressure and leakage testing, the Commission’s Construction Crew or Installer shall locate, uncover, and repair or replace the defective section of pipe, fitting, valve or joint at no additional expense to Commission. The Commission’s Construction Crew’s or Installer’s tester shall then conduct additional pressure and leakage testing until satisfactory test results are achieved.
5. Table for Allowable Leakage per 1000 ft. of Pipeline in gallons per hour\*

Average Test Pressure (in PSI)	NOMINAL PIPE DIAMETER (in inches)																
	3	4	6	8	10	12	14	16	18	24	30	36	42	48	54	60	64
450	0.48	0.64	0.96	1.27	1.59	1.91	2.23	2.55	2.87	3.82	4.78	5.73	6.69	7.64	8.60	9.56	10.19
400	0.45	0.60	0.90	1.20	1.50	1.80	2.10	2.40	2.70	3.60	4.50	5.41	6.31	7.21	8.11	9.01	9.61
350	0.42	0.56	0.84	1.12	1.40	1.69	1.97	2.25	2.53	3.37	4.21	5.06	5.90	6.74	7.58	8.43	8.99
300	0.39	0.52	0.78	1.04	1.30	1.56	1.82	2.08	2.34	3.12	3.90	4.68	5.46	6.24	7.02	7.80	8.32
275	0.37	0.50	0.75	1.00	1.24	1.49	1.74	1.99	2.24	2.99	3.73	4.48	5.23	5.98	6.72	7.47	7.97
250	0.36	0.47	0.71	0.95	1.19	1.42	1.66	1.90	2.14	2.85	3.56	4.27	4.99	5.70	6.41	7.12	7.60
225	0.34	0.45	0.68	0.90	1.13	1.35	1.58	1.80	2.03	2.70	3.38	4.05	4.73	5.41	6.08	6.76	7.21
200	0.32	0.42	0.64	0.85	1.06	1.27	1.49	1.70	1.91	2.55	3.19	3.82	4.46	5.10	5.73	6.37	6.80
175	0.30	0.40	0.60	0.79	0.99	1.19	1.39	1.59	1.79	2.38	2.98	3.58	4.17	4.77	5.36	5.96	6.36
150	0.28	0.37	0.55	0.74	0.92	1.10	1.29	1.47	1.66	2.21	2.76	3.31	3.86	4.41	4.97	5.52	5.88
125	0.25	0.34	0.50	0.67	0.84	1.01	1.18	1.34	1.51	2.01	2.52	3.02	3.53	4.03	4.53	5.04	5.37
100	0.23	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35	1.80	2.25	2.70	3.15	3.60	4.05	4.50	4.80

\* If the pipeline under test contains sections of various diameters, the allowable leakage will be the sum of the computed leakage for each size.



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### 6.4.4 Flushing

1. The Commission's Construction Crew or Installer shall conduct flushing operations using methods and procedures conforming to AWWA C651.
2. The Commission's Construction Crew or Installer shall flush the water main under the direction of Commission's Authorized Field Representative.
3. The Commission's Construction Crew or Installer shall notify all customers affected by the flushing 24-hours in advance of any flushing operation.
4. Flushing may be required during the late evening hours if it is determined that flushing will result in off colored water to the Commission's existing customers.
5. All flushing must be done using fire hydrants, air valve assemblies, Air Corporation, or end caps through a Commission approved flushing device.
6. The flushing device should be made up in accordance with the **Flushing Device Detail (W-10)**, unless another method to flush the water main or water service is approved by the Commission. Flushing devices may be provided by the Installer or rented from the Commission beginning July 1, 2008, at rates as set forth in the Commission's Rules and Regulations.
7. The flushing device shall be made up of the following components:
  - (a) The flushing devices shall be either 1-inch or 2-inch, whichever is required by the Commission.
  - (b) All components shall be brass and/or k-type copper.
  - (c) All threaded joints shall be assembled with Teflon tape sealant.
  - (d) The flushing device shall have a copper tube or brass riser/connector from the fire hydrant, air valve assembly, air-corporation, or end cap. The riser shall be 1-inch or 2-inch diameter.
  - (e) The riser shall connect to the brass tee with a brass copper tube service quick joint inlet by male iron pipe thread outlet. The tee shall be 1-inch or 2-inch diameter.
  - (f) One side of the tee shall be bushed down to  $\frac{3}{4}$ -inch with a brass bushing. This side of the tee shall be used for water quality sampling.
  - (g) A  $\frac{3}{4}$ -inch nip shall be used to connect a  $\frac{3}{4}$ -inch by  $\frac{1}{2}$ -inch brass reducer.
  - (h) A  $\frac{1}{2}$ -inch, chrome plated, and without threads brass globe spigot, shall be installed onto the reducer. Be sure the spigot is always pointing down.





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- (i) On the other side of the tee, which shall be used for flushing, it shall be either bushed down to  $\frac{3}{4}$ -inch or left at 2-inches.
  - (j) A  $\frac{3}{4}$ -inch or 2-inch brass ball valve shall be installed onto the  $\frac{3}{4}$ -inch bushing or 2-inch brass nip.
  - (k) A  $\frac{3}{4}$ -inch or 2-inch brass nip shall be installed onto the  $\frac{3}{4}$ -inch or 2-inch brass ball valve.
  - (l) A  $\frac{3}{4}$ -inch brass vacuum breaker with hose thread shall be installed onto the  $\frac{3}{4}$ -inch brass nip or a 2-inch Commission approved check valve shall be installed onto the 2-inch nip.
    - A check valve may be installed in place of the vacuum breaker.
  - (m) Proper support of the flushing device shall be provided.
8. Water that is flushed to the street or sewer must be collected in a controlled manner and not find access to nearby natural waterways. Hoses hooked up to hydrants to facilitate flushing and the control of drainage shall not be submerged or laid flat on the ground but must be air gapped at the discharge end.
9. The following is the approved procedure for flushing pipe.
- (a) The discharge hose shall be equivalent in diameter or greater to the discharge opening.
  - (b) The allowed flushing time in minutes for 500 feet of up to 8-inch pipe using a fire hydrant (preferred) or end cap with 2-inch or larger opening shall be as follows:
    - All flushing must follow flushing time requirements.
    - A wide-open flush (greater than to 250 gallons per minute) shall be a minimum of 15 minutes (a diffuser must be in place prior to beginning the flush).
    - A low flow flush (up to 250 gallons per minute) shall be a minimum of 30 minutes (a diffuser must be in place prior to beginning the flush).
    - Flushing may not extend for longer periods of time unchecked.
    - Contact the Water Quality Manager or the Commission's Engineering and Technical Services for assistance with flushing time requirements.
  - (c) After each period of flushing, a decision must be made to stop or continue for another designated period.



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(d) Disposal of water from the flushing of new mains must be pre-approved by the Commission.

- All newly installed hydrants shall also be flushed at this time.
- In most instances, a discharge of chlorinated water into a sewer main is acceptable provided a sewer manhole is available. If a catch basin, that is part of the Combined System, is available discharge of chlorinated water may be allowed.
- The sewer inlets or allowed catch basins to which the chlorinated water will be flushed must be identified and pre-approved for use.
- If a sewer main is not available, then de-chlorination of the discharge of chlorinated water must be in accordance with AWWA standard C651 prior to discharge.

10. By Commission's Construction Crew:

- (a) A Commission owned water meter and back flow preventer shall be installed on the fire hydrants, air valve assemblies, air corps, or end caps.
- (b) The begin reading and end reading shall be recorded and submitted to the Customer Service office of the Commission.

11. By Installer:

- (a) An Installer owned water meter or Commission owned that is rented from the Commission by the Installer, that reads in gallons and back flow preventer shall be installed on the fire hydrants, air valve assemblies, air corps, or end caps.
- (b) The begin reading and end reading shall be recorded and submitted to the Customer Service office of the Commission.

12. When flushing and scouring the pipe of debris, in the event the main became contaminated, cannot be done from a hydrant or any smaller hookup. Flushing to remove contamination must involve installing a blow-off at least 2/3 the size of the pipe being flushed.

13. All residual from the flushing must be cleaned up after the flushing process is complete.

### 6.4.5 Disinfection – General:

1. The Commission's Construction Crew or Installer shall conduct disinfection operations using methods and procedures conforming to AWWA Standard C651.



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2. Methods for the disinfection of pipe must be pre-approved by the Commission.
  - (a) The continuous feed method shall be used to disinfect new water main installations.
  - (b) The tablet method may be allowed to disinfect new water mains but shall be approved by the Commission.
  - (c) The slug method may be allowed to disinfect new water mains but shall be approved by the Commission.
  - (d) The swab method shall be used to disinfect repairs, replacement of valves, fittings, and/or hydrants.
  - (e) Any other method to disinfect new or repaired/replaced water mains shall be submitted to the Commission for review and approval prior to being used.
3. A free chlorine residual of at least 25-mg/L (ppm) must be established throughout the newly installed main prior to waiting 24-hours. The free chlorine residual of at least 25-mg/l (ppm) must be maintained for at least 24 hours.
4. Generally, flushing and sampling locations are located at the end of new main installations.
  - At least one sampling location should be at the beginning of the new installation.
  - Any new tie in longer than one pipe length requires at least one sampling location at the end of the new tie in.
  - Every 500-feet of the new main installation requires a least one sampling location.
5. Failure of the newly constructed main to meet the Commission's requirements for cleanliness and water quality could require flushing of the system, disinfection of the system, removal of system components, or other action as deemed necessary by the Commission to guarantee the protection of the existing drinking water system.
6. All costs associated with filling, pressure and leakage testing, flushing, and disinfecting the water main shall be borne by the Installer.

### 6.4.6 Disinfection – Continuous Feed Method:

7. This procedure for disinfection requires that the below amount of water be chlorinated outside the new water main, such as in a water truck, and then pumped into the main to displace the existing water in the main.



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Gallons of Chlorine Water Required to Fill 100 Feet of Pipe With 25 ppm of Chlorine According to Diameter of Pipe			
		Add the following amount of chlorine to the water:	
Pipe Diameter (Inches)	Water in Pipe (Gallons)	<u>5%Chlorine Solution</u>	<u>1%Chlorine Solution</u>
6	150	1 cup	1-½ quarts
8	260	1 pint	2-½ quarts
12	590	1-½ quarts	1-½ gallons
16	920	2 quarts	2-½ gallons

8. Making Chlorine Solutions:
  - (a) With HTH Granular Calcium Hypochlorite: add 1 pound of calcium hypochlorite to every 8-gallons of water to make a 1% solution.
  - (b) With liquid Sodium Hypochlorite: dilute according to the percent available chlorine on the container.
  - (c) For example, a 20% available chlorine solution would require 1 gallon in 19 gallons of water to get a 1% chlorine solution.
9. The chlorine water is fed in through a corporation near the valve for the supply.
10. The valve(s) connecting the new pipe to the existing system must be closed completely.
11. At the other end of the main, or at several ends, water is flushed at a low rate to allow the existing water to be displaced with the chlorine water.
12. It is good practice to test for chlorine at these flushing points to confirm that highly chlorinated water has made it through to all ends before the main is shut down.
13. This chlorinated water will then be allowed to sit inside the main for at least 24 hours before it is flushed out according to the Flushing section of this document.
14. Testing at the sampling location at the end of the main will be done until the flushed water contains at least 25 mg/L of chlorine (which could require increasing the injection rate of chlorine).
15. Once the proper amount of chlorine is produced all other sampling locations that were installed for the sanitary release must be flushed until chlorine is also



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detected at these points (flush one point at a time while maintaining chlorine injection).

16. When all sampling points have a proper level of chlorine, the main is shut down and the chlorine injection stopped.
17. This chlorinated water will then be allowed to sit inside the main for at least 24 hours before it is flushed out according to the Flushing section of this document.

### 6.4.7 Disinfection – Tablet Method

1. This procedure for disinfection is the application to each pipe length (see table) of an approved calcium hypochlorite tablet(s) using approved adhesives. The Commission approves the use of 5-7-gram calcium hypochlorite tablets (approximately 65% available chlorine by weight or 3.25-4.55 grams of available chlorine per tablet). These tablets shall be affixed using approved adhesive (Permatex Form A-Gasket No. 2 or Permatex Clear RTV Silicone Adhesive Sealant) to the top of each pipe length, internally. Marking of the pipe externally is a good practice to identify the locations of the tablets so that the pipe is installed correctly.
2. One chlorine tablet shall be placed in each fire hydrant branch.



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3. Minimum Number of Tablets for Each Pipe Length (18-20 feet) to obtain a 25 mg/L dose of Chlorine shall be as follows:

<u>Pipe Diameter (in inches)</u>	<u>Number of Tablets per Pipe Length (in inches)</u>
6	1
8	2
10	3
12	4
16	6
24	8

4. All tie-in pipe and fittings must be swabbed or sprayed with 1-5% or greater bleach solution immediately before installation but after inspection for internal cleanliness.
5. Free Chlorine Residual Sampling Procedure:
- (a) The Commission's Authorized Field Representative shall take an, initial free chlorine residual test immediately following the filling procedure or the tablet disinfection procedure. The initial free chlorine residual shall exceed 25 mg/L (Parts per Million (PPM)) at this time.
  - (b) The chlorinated water shall set in the main for 24 hours.
  - (c) At the end of the 24-hour period, a free chlorine residual shall be taken by the Commission's Authorized Field Representative from the main and it must exceed 10 mg/L (PPM) of free chlorine residual.
  - (d) If sufficient free chlorine is detected by the Commission's Authorized Field Representative, then the main will be considered ready for bacteria testing because the chlorine demand has been met.
  - (e) The chlorinated water shall be flushed from the main upon completion of the chlorination process and a bacteriological sample shall be taken from the main once the chlorine residual of the water being discharged from the main has dropped below 1.5 PPM.
  - (f) If sufficient free chlorine is not detected by the Commission's Authorized Field Representative, then the main will be considered to have failed without testing. Re-chlorination shall be required.



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6. After the flushing and disinfection of the new main, the water in the new main must sit without movement for at least 24 hours and there must result no negative impact on the water's quality as tested and determined by the Commission.
7. The Commission's Construction Crew or Installer must provide approved sampling access to the new main for the testing of the water. New mains exceeding 500 feet or tie-ins exceeding 50 feet in length must have multiple sampling locations.
8. Re-chlorination or additional disinfection requires the following the procedures set forth in the Disinfection – Chlorinated Water Supply Section of this document.
9. After the new main has been approved, the water main shall be flushed by approved means before installing the service connections. Refer to the procedures as set forth in Flushing Section of this document.
10. If the water main has been approved but has not been put into service for more than one week then the main shall be flushed weekly using approved means. Refer to the procedures as set forth in Flushing Section of this document.

### 6.4.8 Disinfection – Swab method

1. This procedure for disinfection is used when existing mains are dewatered and cut open for a repair.
2. If the trench cannot be dewatered, then liberal quantities of 1% solution of water and sodium hypochlorite (bleach) shall be applied to the trench areas.
3. The existing pipe shall be cleaned and swabbed or sprayed with bleach prior to the repair piece being put into place.
4. The repair piece and repair couplings shall be cleaned and swabbed or sprayed with bleach prior to the repair piece being put into place.
5. The Commission's Construction Crew or Installer shall flush the main as described in this section and/or until discolored water is eliminated.
6. The Commission's Construction Crew shall put the main into service.

### 6.4.9 Disinfection of Water Service Pipes and By-Pass Hoses

1. Disinfection of Water Service Pipes and Bypass Hoses provides an as needed method for disinfection of Water Services and a mandatory method for disinfection of By-Pass Hoses before being placed in service. The Commission shall determine when a Water Service Pipe shall be disinfected.



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- The intent is to provide a methodology and a minimum essential standard for disinfection of water services, 2-inches and smaller, that are new, replaced, or repaired and hoses used for By-Pass Connections and house tie-overs. This is an as needed procedure that may be used before any copper tube water service pipe is placed in service. This mandatory procedure shall be used before any hose is placed in service. This applies to any work of any nature being performed within the Commission's Water Transmission or Distribution System.
- When work on the job has proceeded to the point that all joints have been made, the service shall be flushed at full open until the water runs clear for a minimum of one (1) minute. The water meter must be removed during this flushing operation. The use of a discharge hose is normally necessary.
- Close the meter valve in the cellar. Close the curb stop at the main, Open the joint on the outlet side of the curb stop at the main. Pour the chlorine and water solution into the tubing that has been prepared according to the Chlorine Disinfection Table that follows.
- Add the amount of Household Bleach as indicated by the size and length of service to one (1) gallon of water. Strength will be approximately 300 mg/l or 300 PPM.
- Water Service Pipe Chlorine Disinfection Table

Diameter of Copper Tube Pipe	Approximate Length of Water Service			
	30FT.	60FT.	90FT.	120FT.
¾"	1 oz.	1 ½ oz.	2 ¼ oz.	3 oz.
1"	1 ½ oz.	2 ½ oz.	4 oz.	5 oz.
1 ¼"	2 oz.	4 oz.	6 oz.	8 oz.
1 ½"	3 oz.	5 ½ oz.	8 ½ oz.	11 oz.
2"	15 oz.	30 oz.	45 oz.	60 oz.

- Remake the connection. With the cellar valve closed, open the curb stop at the main. Open the Cellar valve just enough to get a stream the size of a pencil lead (less than 1/8 of an inch) flow. Let this run until the water smells of chlorine. Shut the cellar valve and wait 15 minutes. After 15 minutes flush very slowly open until all chlorine has been removed.





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8. At the conclusion of the disinfection process, pressure test at existing main pipe pressure. After inspecting the joint(s) and eliminating any observed leaks, backfilling may proceed.
9. **IMPORTANT REMINDER:** The most important and most basic factor to ensure that water of the highest quality is provided is to avoid contamination. This is accomplished by using good construction practices, which includes preventing dirt, water, and other contaminating materials from entering the service pipe.

### 6.4.10 Disinfection of By-Pass Hoses

1. Using the same principles of Service Disinfection above By-Pass hoses are also disinfected. A hose is flushed, dosed, filled, slowly flowed (1/8-inch) and then flushed clear.
2. Storage time and location may require an increase in dose rate and/or slow flow rate.
3. Hoses used for House tie-overs must be disinfected in the same manner as By-Pass Hoses.

### 6.4.11 Testing of the Water in the New or Repaired Main:

1. The Commission's Authorized Field Representative will communicate with the Commission lab for sampling arrangements needed to obtain all test results.
2. A representative of the Commission's lab will meet the Commission's Authorized Field Representative and Commission's Construction Crew or Installer at the scheduled times and places for sampling of the mains.
3. Primary water quality tests and secondary water quality tests shall be performed by the Commission prior to any Bacteria Samples being taken by the Commission. The Installer shall notify the Commission 24-hours in advance of the chlorine being flushed out of the main.
  - (a) The Commission will perform the primary water quality test for chlorine residual and chlorine demand. The free chlorine residual shall be equal to or greater than 0.03 mg/L, unless otherwise approved by the Commission. The chlorine demand shall be essentially satisfied by free chlorine residuals taken over a two (2) hour period.
  - (b) The Commission will perform the secondary water quality test for pH and turbidity. The pH shall be less than 9.0 units, unless otherwise approved by the Commission. The turbidity shall be less than 4.0 NTU, unless otherwise approved by the Commission. (All flushing protocols require continued flushing until turbidity values are below 4.0 NTU).



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- (c) Two (2) primary and two (2) secondary water quality tests will be run by Commission at no cost to the Contractor any additional tests required shall be at the Contractor's expense and at the amount established in the Commission's Rules and Regulations for Water / Sewer Pipe Inspection.
  - (d) Additional testing by the Commission as a result, of unacceptable water quality in the new main or repaired main, may incur monetary penalties as listed in the Commission's Rules & Regulations.
4. No Bacteria samples will be taken until the primary and secondary water quality tests have met the limits set forth above.
  5. Bacteria Samples from the disinfected main will be taken by Commission and will be run through the Commission lab. If a sample does not pass then the Installer shall perform additional flushing and disinfection operations until such time as a good bacteria test is achieved. Additional flushing and disinfection operations shall be run at the Installer's expense.
    - (a) Two (2) bacteriological tests will be run by Commission at no cost to the Installer any additional tests required shall be at the Installer's expense and at the amount established in the Commission's Rules and Regulations for Water / Sewer Pipe Inspection.
    - (b) Additional testing by the Commission because of unacceptable water quality in the new main or repaired main, may incur monetary penalties as listed in the Commission's Rules & Regulations.
  6. The Commission's Construction Crew or Installer shall supply suitable sampling taps at the end of the disinfected water main for the purpose of bacteriological testing. The Owner, Owner's authorized representative, Commission Approved Contractor, or Commission's designee shall cap these taps with a brass cap upon successful completion of the main disinfection.
  7. The Commission's Construction Crew or Installer shall make provisions for the sampling. This involves making a copper tube connection to a corporation for every 500 feet, at most, of new pipe (including significant branches) from the source of supply water or as the Commission's Authorized Field Representative allows. A sampling access point shall also exist within 2 feet of the end of the main and at the end of all tie-ins exceeding 50 feet in length. These copper sampling lines shall extend out of the trench to ground level, shall be briefly pre-flushed with chlorine solution (household bleach) and main water, and there will be no water in the trench at the level of the ferrule connection.



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8. It is at the discretion of the Springfield Water and Sewer Commission to decide what water quality testing will be done to approve the new water main for release. The water quality must meet all federal, state and Commission standards for water quality.
9. The Commission Representative will inform the Commission's Construction Crew or Installer if the bacterial testing has passed or failed.

### 6.4.12 What to do when Testing Fails:

1. Re-chlorination or additional disinfection requires loading the whole of the interior of the new water main and fittings with at least 25 ppm of free chlorine.
2. The water main shall sit stagnant for at least 24 hours.
3. The water main shall be flushed according to the Flushing Section.
4. The water main shall be left stagnant for at least 24 hours, and the testing of the water again for approval.

### 6.4.13 Who to Call with Questions:

For questions relating to filling, flushing, and disinfecting water mains, and other water quality related issues call the Water Quality Manager at the Commission's Customer Service number 413-310-3500.

## Section 6.5 Fire Flow Testing Procedures

### 6.5.1 General

1. The Commission does not perform Fire Flow Tests for private Persons nor provide Fire Flow Test data to private Persons.
2. Private Persons shall apply for a Fire Flow Test(s) in accordance with the Commission's Rules and Regulations and Section 4.1 of the Guidelines and Policies.
3. Commission staff shall be present and observe Fire Flow Test(s).
4. Applicant shall provide their own personnel and equipment, including equipment as specified in these Guidelines and Policies, for each Fire Flow Test(s) to be performed. The Applicant's personnel shall operate the hydrants and observe and record the Fire Flow Test(s) results.
5. The Applicant is responsible for any damage caused to the hydrant and/or property that water is discharged on to.

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6. The Commission will notify Customers at least 24-hours in advance of the scheduled Fire Flow Test. Customers to be notified shall be located along the length of the Fire Flow Test and at least 500-feet beyond the test on each side.

### 6.5.2 Office Planning Prior to Fire Flow Testing

1. Prior to performing the Fire Flow Test(s) the Applicant shall review the Commission distribution map(s) to determine which hydrants will be used to measure flow and which will be used to measure static and residual pressure. It is best to use hydrants that are at the same elevation or measure the differences in elevation in the field. The Fire Flow Test(s) usually involves two (2) fire hydrants. The first one is called the static and residual hydrant. The second one is called the flow hydrant.
2. Review, if available, previous Fire Flow Test data to estimate the flow and pressure that may be expected.

### 6.5.3 Field Fire Flow Test Procedures

1. In order to obtain valuable flow test data, flow and pressure readings need to be taken accurately and all necessary data recorded. Calibrated gauges are required and shall be checked regularly and recalibrated as necessary. Preprinted Fire Flow Test Form(s), attached in Section 15.1.9 of these Guidelines and Policies, are to be used to record the following information:
  - (a) Date, time of day, temperature, weather, and work order number,
  - (b) Static and residual hydrant number, manufacturer and model, street name, location, and main size,
  - (c) Static reading at the static and residual hydrant,
  - (d) Residual reading at the static and residual hydrant
  - (e) Flow hydrant number, manufacturer and model, street name, location, and main size,
  - (f) Pitot and/or residual pressure reading at the flow hydrant,
  - (g) Total Flow in gallons per minute (GPM) during test, estimated flow available in GPM at 20-PSI, length of time of flow in minutes, and total gallons flowed, and
  - (h) Name of observer(s) and Commission Inspector(s).



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2. Prior to beginning the Fire Flow Test, notify Customer Service that a Fire Flow Test is going to take place. Provide Customer Service with a location such as, an address or intersection and estimated duration of the Fire Flow Test(s).
3. Make sure provisions are made for minimizing interruption of traffic and for adequate drainage of water.
4. Locate the static and residual hydrant and do the following:
  - (a) Remove one of the 2-1/2-inch hydrant nozzle caps and open the hydrant slowly to the full open position to flush sediment out of the hydrant that could damage the gauge.
  - (b) When the flush water has cleared slowly close the hydrant and install a 2-1/2-inch hydrant nozzle cap equipped with a pressure gauge and air bleed valve.
  - (c) Slowly open the hydrant allowing water under pressure into the hydrant. Open the bleed valve until a steady stream of water is discharged and no air is present.
  - (d) Close the bleed valve and wait a minute or two until the pressure gauge has stabilized and read the gauge.
  - (e) This pressure reading is referred to as the static pressure. This represents the water pressure in the water main as measured at the elevation of the hydrant outlet. Record this reading on the Fire Flow Test Form.
5. Locate the flow hydrant(s) and do the following:
  - (a) Remove one of the 2-1/2-inch hydrant nozzle caps and measure the inside diameter to the nearest 1/16-inch. Typically, hydrants within the Commission's distribution system have a 2-1/2-inch inside diameter, but should be measured for each fire flow test.

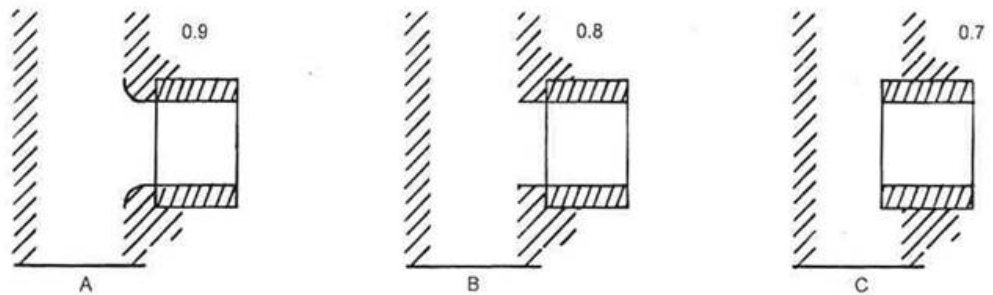


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(b) Determine the outlet nozzle coefficient (C).

- $C = 0.9$  when the outlet nozzle is smooth and well rounded, A below
- $C = 0.8$  when the outlet nozzle is square and sharp, B below
- $C = 0.7$  when the outlet nozzle is square, sharp and projecting into the barrel, C below
- Outlet nozzle Coefficients:



- Typically, new hydrants in the Commission distribution system have smooth and well rounded out let nozzles with a  $C = 0.9$ , but older hydrants need to be checked.

(c) If a pitot gauge is not going to be used or back-up flow data is required install a 2-1/2-inch hydrant nozzle cap equipped with a pressure gauge on the 2-1/2-inch nozzle not going to be used to flow water.

6. Conduct the Fire Flow Test as follows:

- (a) Station one (1) observer at the static and residual hydrant and one (1) observer at each hydrant to be flowed.
- (b) Open each flow hydrant slowly to the fully open position to create a steady flow of water from the outlet. Open one (1) hydrant at a time to avoid a pressure surge. In some cases, the resulting horizontal water flow from the hydrant(s) may be sufficiently disruptive to justify street closures.
- (c) When pressure at the static and residual hydrant has stabilized the observer signals the observer(s) at the flow hydrant(s) to take the readings. The pressure reading at the static and residual hydrant is taken the same time as the reading at the flow hydrant. The pressure reading at the static and residual hydrant while the flow hydrant(s) is discharging is called the residual pressure. The residual pressure records both the domestic and fire flows occurring in the water main.



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- (d) A pressure gauge installed on a pitot tube (pitot tube) is used to measure the velocity pressure of the stream discharging from the hydrant. All the air should be exhausted from the discharge before a pitot reading is taken. For an accurate pitot reading the pitot tube must be held in the center of the nozzle, with the axis of the pitot tube parallel to the direction of flow. The pitot tube should be held away from the end of the nozzle at a distance of about half the nozzle diameter (for a 2-1/2-inch nozzle about 1-1/4-inches).
- (e) The pressure gauge installed on the unused nozzle will provide a pressure reading similar to the pitot tube reading, but typically the flow results are more conservative.
- (f) Record the both the pitot tube reading (and/or the pressure gauge reading on the second nozzle) and the residual pressure reading at the static and residual hydrant on the Fire Flow Test Form.

### 7. Shut down the Fire Flow Test and observe the following:

- (a) The final step in the flow test involves shutting down the flow hydrant(s) slowly and taking another static pressure reading as a check on the previous reading.
- (b) The two readings must be similar. There are good reasons to double-check the static pressure. If the second static pressure reading falls very far below the first one recorded, it's possible that a water main broke during the test. Contact Customer Service at 413-787-6207 and report the low pressure and possible main break.
- (c) For reasonably accurate results the pressure drop between the static and residual pressures should at least 10- pounds per square inch (PSI). If the piping system is strong and the pressure drop is less than 10-PSI an additional flow hydrant should be added to the test and another fire flow test should be performed.
- (d) It is best for the observers to calculate the Fire Flow Test Results in the field, so that if results appear to be in error, the test can be repeated immediately.
- (e) To calculate Flow in gallons per minute (GPM) "Q" use the following equation, where the pitot pressure reading in PSI is "P", the hydrant nozzle diameter in inches is "D" and the hydrant coefficient is "C":
  - $Q = 29.83 * C * D^2 * \sqrt{P}$
  - Also see Fire Flow Discharge Tables attached in Sections 15.1.10, 15.1.11, and 15.1.12 of these Guidelines and Policies.



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(f) To calculate the Available Flow at 20-PSI in GPM “Q-20” use the following equation, where the sum of the actual flow(s) in GPM is “Q” from the previous equation for each flow hydrant, the static pressure in PSI is “S”, the residual pressure in PSI is “R”:

- $Q-20 = Q * ((S-20)^{.54} / (S-R)^{.54})$
- Also see Values for Pressure to the .54 Power Table attached in Section 15.1.13 of these Guidelines and Policies.

8. Cautions to observe during Fire Flow Testing are as follows:

- (a) Opening a hydrant rapidly can cause a negative pressure fluctuation. Hydrants should be opened slowly until fully opened.
- (b) Closing hydrants is more critical and must be done very slowly until after the flow has diminished to about 20-percent. Closing a hydrant too quickly could cause a pressure surge, or water hammer, this could cause a weakened main to fail.
- (c) Hydrants should be opened and closed one at a time to minimize the effect on the distribution system.
- (d) Hydrants must be opened fully because the drain-valve mechanism operates the main valve. A partially opened hydrant could force water through the drain outlets under pressure, eroding the thrust support behind the hydrant.
- (e) After the Fire Flow Test, the hydrant should be drained before the outlet nozzle cap(s) are tightened. If nozzle caps are tightened before the hydrant drains, water could remain in the hydrant barrel and freeze in the winter causing the hydrant to be out of service.
- (f) Readings taken on any gauge instrument should only be taken when the water is running clear because sediment could damage the instrument.





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### CHAPTER 7 WATER SERVICES

#### Section 7.1 Purpose

1. These procedures are established by the Commission in order to establish standard procedures for the replacement of unserviceable water services and for the installation of new water services. The goal in establishing these procedures is to achieve a completed installation that ensures the protection of water quality, a leak free connection, the use of high quality materials, a reliable service protected from freezing, and efficiently installed
2. Procedures for the issuance of the work order are covered in other sections of these “Guidelines and Policies” and in the “Rules and Regulations of the Commission”.

#### 7.1.1 General

1. All material shall be as specified in the Commission’s Material Specifications.
  - Water Services 2-inch and less shall be copper tube
  - Water Services 4-inch and larger shall be ductile iron
  - No 4-inch valves are allowed
2. The water meter shall be sized and provided by the Commission.
3. All water services shall be sized by the Owner or the Owner’s authorized representative.
4. Depth of cover: - The 2-inch or less copper tube water pipes shall be laid a minimum of 5 feet deep, a maximum of 6-feet deep unless otherwise approved by the Commission, on suitable bedding, and backfill with proper material. No large stone or debris will be acceptable in the trench.
5. Excavate trench to ensure sides of trench are stable. Slope trench walls or provide support in conformance with the CHAPTER 5 Safety of these Guidelines and Policies and the Commission’s Health and Safety Policies.
6. Utility Separation: - All water services shall be separated from other utilities and septic fields in accordance with the 310 Code of Massachusetts Regulations. Furthermore, the separation shall be in accordance with **Service Separation Detail (W-01.1)**.
  - (a) At a minimum, any water service shall be horizontally 10-feet from any sewer lateral and laid above/over any sewer main or lateral, unless otherwise approved by the Commission.



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- (b) At a minimum, all water services at a minimum shall be horizontally 4-feet from any other water service or other utility unless otherwise approved by the Commission.
7. In the absence of a recognized and/or approved industry standard for such hardware the Commission will be the final judge as to the acceptability of miscellaneous hardware used in the installation of water services.
  8. The installed water service pipe and/or replacement service shall be disinfected according to Disinfection Section of these Guidelines and Policies, unless otherwise approved by the Commission.
  9. During the Application process, a Proposed Site Plan must be submitted according to Section 4.2 of these Guidelines and Policies for review and approved by the Commission. This section describes the requirements for installing new and replacement Water Service Pipes in the location as defined on the approved plan.
  10. The type of joint referred to as Quick Joint is based on the Mueller 110 Compression Joint or an equivalent approved by the Commission.
  11. All copper tube water services must be visually inspected by a Commission inspector prior to backfilling. The corporation, curb valve and any couplings must be left exposed for inspection prior to backfilling.
  12. A leak test may be required and shall be at the Commission's discretion. The test shall be a static pressure test of the service and visually inspecting each joint along the service to ensure that there is no leakage according to Section 4.4 of these Guidelines and Policies, unless otherwise approved by the Commission.

### Section 7.2 Water Service - Two (2) Inch and Less

#### 7.2.1 Installation of New Water Service Pipes

This procedure is written for installation of three-quarter-inch ( $\frac{3}{4}$ " ) – NO LONGER ALLOWED, one-inch (1"), one-and-one-half-inch ( $1\frac{1}{2}$ " ) and two-inch (2") copper tube water service pipes. Sizes  $\frac{3}{4}$ -inch and 1-1/4-inch services have been eliminated and replaced with standard sizes 1-inch, 1-1/2-inch, and 2-inch. On occasion and as directed by the Commission, the eliminated  $\frac{3}{4}$  and 1-1/4-inch tubing sizes may be considered but shall be approved by the Commission prior to installation.

#### 7.2.2 Ball Type Corporation Stops

1. Ball Type Corporations Stops (corporations) shall be installed horizontally on all water services at the service tap into the water main in accordance with New



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**Water Service Installation Detail (W-11.0) and with a Buffalo style Arch pattern curb box, in accordance with Service Box Detail at the Tree-belt (W-12.0) and/or Service Box Detail at the Main (W-12.1).**

(a) Typically, corporations are installed by the Commission or the Commission's designee unless other arrangements are made with the Commission's Engineering and Technical Services (E&TS).

(b) The Owner or the Owner's authorized representative shall make arrangements with the Commission's E&TS after an Application for a water service has been filled out and signed by the Owner.

2. Corporations may be direct tapped into ductile iron water main as follows:

<u>Tap Size</u>	<u>Main Sizes which may be direct tapped</u>
1-inch	none
1-1/2-inch	none
2-inch	none

3. Corporations must be tapped through a tapping saddle.
4. A tapping machine shall be provided which will permit tapping mains under pressure, also a supply of combination drills and taps having Mueller threads.
5. The tapping machine shall be rigidly fastened to the pipe horizontal to the pipe axis as detailed on the Drawings. The length of travel of the tap should be so established that when the stop is inserted and tightened with a 14-inch wrench, not more than one to three threads shall be exposed on the outside. When a wet tapping machine is used, the corporation stop shall be inserted with the machine while it is still in place. Stops shall be tightened only sufficiently to give water tightness and care must be constantly exercised not to over tighten them. All Ball Type Corporations stops shall be set on a concrete brick.

### 7.2.3 Copper Tubing

1. Care shall be exercised in the placing and laying of copper tubing to be sure that the pipe does not have kinks or sharp bends and to assure against its being in contact with sharp stones or ledge which would cause damage to the pipe.
2. At least 6-inches of processed gravel shall be placed adjacent to and above the pipe, and no stone shall be placed over the pipe until the depth of backfill above the copper tube is in excess of 1-foot.
3. The use of soldered fittings underground prior to Commission meter is prohibited.



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4. No crimping tools may be used on copper tubing.
5. If copper becomes kinked or egg shaped in its installation, the use of that section of copper containing the kink or egg shape will be disallowed. Final decision as to the acceptability of a “kink” or a section of “egg shaped” pipe shall be made by Commission.
6. Copper tubing shall be installed with brass compression fittings according to the Water Service Installation Section of these Guidelines and Policies.
7. Copper tubing water services shall be bedded and installed in accordance with New Water Service Installation Detail (W-11.0) and/or Replacement Water Service Installation Detail (W-11.1).
8. Copper tubing water services installed with less than 18-inches of tubing beyond the wall or above the floor shall be reinstalled in its entirety by the Installer.

### 7.2.4 Ball Valve Curb Stops

1. 1-inch, 1-1/2-inch, and 2-inch curb stops shall be installed with a Buffalo style Arch pattern curb box, in accordance with **Service Box Detail at the Tree-belt (W-12.0) and/or Service Box Detail at the Main (W-12.1)**.
2. Curb stops shall be installed as close as practicable to 1’ of the edge of the municipal ROW within the municipal ROW. Under no circumstances is the curb stop to be installed beyond the municipal ROW or onto private property.
3. Curb stops shall be installed with the operator plumb and vertical.
4. Curb stops shall be set on a 2-inchx6-inchx12-inch piece of pressure treated blocking or a flat rock of similar dimensions.

### 7.2.5 Compression Couplings

1. Install straight Compression couplings to existing service connections of the sizes required in the locations designated by the plans, Commission’s Authorized Field Representative, or where required to extend or relocate the water service pipe. The manufacturer's recommended installation procedures shall be utilized while performing the work. Care shall be taken to ensure a watertight connection.
2. The compression coupling shall be centered over the connection point of the pipes being joined.
3. The coupling shall be tightened in accordance with the manufacturer’s recommendations. Do not over tighten the coupling.
4. No couplings are allowed before meter valves in building.



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### 7.2.6 Service Boxes

1. Service box bases shall be centered over the curb stop ball valve and shall be plumb and vertical in all directions. The box bottom shall be placed on the same blocking or flat surface as the curb stop.
2. Service box tops and bases shall have a minimum 6-inches of overlap.
3. Service box tops shall be painted florescent blue after installation.
4. Service boxes installed in tree-belts sidewalks, or driveways shall be installed flush with the existing finished grade and in accordance with **Service Box Detail at the Tree-belt (W-12.0)**.
5. Service boxes installed at the water main and typically in paved or non-paved roadways shall be set buried 24-inches below finished road grade and in accordance with **Service Box Detail at the Main (W-12.1)**.
  - Service boxes installed over 1-1/2 and 2-inch corporation shall have approximately 1/2-inch removed off the side closest to the water main by cutting or grinding in order to center the box over the valve.
6. Maintain a minimum of a 4' clearance in all directions from curb box to other utilities, structures, appurtenances or obstructions.

### Section 7.3 Installation of New Water Service Pipe

#### 7.3.1 Product Installation – New Water Service Pipe

1. All material shall be in accordance with the Commission's Material Specifications.
2. The actual new water service installation will be done in accordance with the **New Water Service Detail (W-11.0)**. This drawing is an integral component of the Service Installation Procedure.
3. The connection or tap at the water main will be made using a ball type corporation stop, which also serves as a curb stop when equipped with a tee head adapter.
4. The new copper tube shall be laid in a trench that has been excavated to a depth that will provide 5-feet and 6-inches of cover when final grading is established.
5. A second curb stop will be installed approximately 2-feet from the curbing or edge of road in the direction of the building.



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6. The Curb Box over the Corporation at the main will be set buried 24-inch below finished road grade and in accordance with **Service Box Detail at the Tree-belt (W-12.0)**.
  - (a) Water shall be turned on prior to back filling to note any leaks and to ensure it is on.
  - (b) The curb box base shall be placed on same blocking as curb stop
7. The Curb Box located between the curbing and the property line will be set to finished grade and accordance with **Service Box Detail at the Main (W-12.1)**. Before backfilling, all joints must be pressure tested using existing pressure in the main.
8. The meter valve in the cellar shall be a Ball Valve selected from one (1) of the following:
  - (a) When entering the building through the basement floor or slab a Ball Meter Valve - 90° Angle: 1-inch Quick joint x  $\frac{3}{4}$  or 1-inch meter swivel nut or Quick Joint x Elliptical flange in sizes 1  $\frac{1}{2}$ -inch and 2-inch. This is the normal valve used.
    - Note: this valve is a curb stop with a brass handle used as inside meter valve.
  - (b) When entering the building through a foundation wall typically, a Ball Meter Valve – straight is used but as described in the following selected cases:
    - 1-inch Quick joint x  $\frac{3}{4}$  or 1-inch meter swivel nut,
    - 1- $\frac{1}{2}$ -inch or 2-inch Quick Joint x Elliptical flange.
    - For 1-inch water services when necessary to keep the meter within 18-inches of the wall a Ball Meter Valve - 90° Angle: 1-inch Quick joint x  $\frac{3}{4}$  or 1-inch meter swivel nut may be used (same as 8. (a) above).
    - For 1-1/2-inch or 2-inch water services when necessary to keep the meter within 18-inches of the wall a 1-1/2-inch or 2-inch Quick Joint x 1-1/2-inch or 2-inch Female Iron Pipe (FIP) 90-degree elbow, and a 1-1/2-inch or 2-inch Male Iron Pipe (MIP) x 1-1/2-inch or 2-inch elliptical flange Ball Meter Valve – straight may be used for the meter valve.
  - (c) Ball Type Curb Stop: 1-inch Quick Joint x 1-inch FIP. This is most common in replacement service work.
    - Note: This is a Curb Stop with brass handle used as an inside cellar meter valve.



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9. The leak inspection shall be conducted in the trench at each joint by a competent work person.
10. Joints shall be “Bubble Tight”, i.e. DRY.
11. Before the meter is connected to the new service, the line shall be flushed clean at full pressure using the Ball Valve Curb Stop at the main in accordance with Section 4.4 of these Guidelines and Policies, unless otherwise approved by the Commission. The service may be disinfected at the discretion of the Commission in accordance with Section 6.4.9 of these Guidelines and Policies. The trench shall be backfilled, compacted and the road patched as necessary. Care must be taken to protect the tubing from being damaged by backfilling, and to ensure the curb boxes are plumb, set at the correct grade, and centered over the valve.
12. The entry point of the tubing through the foundation shall be patched both inside and outside using duct seal and mortar to prevent water entry.
13. For purposes of the record sketch water service card, a minimum of three (3) location ties will be taken along with other measurements. The service installation sketch and final service card shall indicate curb stop at main “buried 2-feet”; curb stop at edge of road shall indicate “set to finished grade”. The location of any fittings along the service line should be noted
14. Commission Construction Crews and Installers shall restore or install pavement in accordance with CHAPTER 8 of these Guidelines and Policies, unless otherwise approved by the Commission.
15. Commission Construction Crews shall notify the Commission Construction Crew responsible for pavement restoration the amount of pavement to be installed at the end of each week.

### Section 7.4 Replacement of Existing Water Service Pipe

#### 7.4.1 General

1. This section describes the requirements for replacing existing water service pipes in the same location that are no longer serviceable. Serviceability issues may be due to internal and/or external corrosion, poor flow, poor pressure, leaks, or any combination of these condition factors.
2. This procedure is written for replacement of ¾-inch, 1-inch, 1-1/4-inch, 1-1/2-inch, and 2-inch copper tube, brass, or iron Water Service Pipes. If the existing Water Service Pipe is ¾-inch and 1-1/4-inch it shall be replaced with standard sizes as directed by the Commission.

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3. The type joint referred to as Quick Joint is based on the Mueller 110 Compression Joint or an equivalent approved by the Commission. No soldered joints are allowed.
4. No joint repairs shall be installed inside a building. All joint repairs shall be outside the building.
5. An existing Water Service Pipe may be replaced in accordance with Section 7.3 of these Guidelines and Policies or may be pulled in accordance with this Section of these Guidelines and Policies. It is at the Commission's discretion which method shall be allowed on a case by case basis.
  - (a) Installer shall open cut all water services from main to home/building and replace Water Service Pipes in accordance with Section 7.3 of these Guidelines and Policies.
  - (b) Commission Construction Crews or Commission Approved Contractors hired by the Commission to replace water service may pull Water Service Pipes in accordance with this Section of these Guidelines and Policies.
6. All copper tube water services must be visually inspected by a Commission inspector prior to backfilling. The corporation, curb valve and any couplings must be left exposed for visual inspection when the water service is temporarily turned-on. The test shall involve pressuring the service with the water service turned-on and visually inspecting each joint along the service to ensure that there is no leakage. At the Commission's option a completed water service may be required to pass a leak test as described below.
7. A leak test is required before an existing or repaired 1-inch or greater Water Service Pipe may be reused and/or turned-on. No 3/4-inch Water Service Pipe may be reused.

### 7.4.2 Leak Testing – Existing Water Service Pipes

1. The leak test shall be performed by the Commission's operation staff.
2. The Customer or a Customer representative must be present to observe the leak test.
3. The existing water service must be able to be isolated from the shut-off valve at the main to the first meter valve. If a meter valve is installed on each side of the meter than each meter valves should be closed.
4. The meter shall be removed and a pressure gauge with a bleed valve shall be installed on the closed first meter valve.





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5. Open the first meter valve and bleed air out of existing water service into a 5-gallon bucket through the bleed valve. When all the air has been bled close the bleed valve. Check for leaks, if there are no leaks read the pressure gauge. If there are leaks at loose fittings the fittings must be tightened until there are no leaks and then the pressure gauge can be read.
6. Close the shut-off valve in the street. At this point the Water Service Pipe is at the same pressure as the Public Water Main and should remain so.
7. If the pressure gauge remains constant it indicates there are no leaks on the Customer's Water Service Pipe, and it may be reused.
8. If the pressure immediately drops or over a 5-minute period it continues to drop the Water Service pipe has a leak on it and must be replaced.
9. This test is conducted three (3) times during the service call to determine if the existing Water Service Pipe can be reused or if it must be replaced.
10. 2-inch brass Water Service Pipe may be repaired if the leak location can be determined in a timely manner and at the discretion of the Commission.
11. The Customer is notified at the completion of the leak test(s) whether the existing Water Service Pipe has passed or failed. If the Water Service Pipe has failed the Customer is asked to apply for a Replacement Water Service at the Commission's customer Service Office at 71 Colton Street Springfield MA.
  - (a) If the leak is not causing a safety issue and is located in the Customer's property, the Customer will be allowed five (5) workdays to apply for a replacement water service.
  - (b) If the leak is causing a safety issue and/or is located in the public right-of-way the customer shall immediately apply for a replacement water service or be subject to immediate Turn-off by the Commission.

### 7.4.3 Product Installation – Existing Water Service Pipe

1. All material shall be in accordance with the Commission's Material Specifications.
2. The actual water service replacement may be done in accordance with the **Replacement Water Service Detail (W-11.1)** (this drawing is an integral component of the water service replacement procedure) or the existing service may be abandoned in place. This decision is at the discretion of the Commission and will be decided on a case-by-case basis.



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3. Abandonment in place requires the existing corporation to be exposed, turned off, capped with a brass cap, and backfilled. Typically, this can be done in the same excavation as the new service connection.
4. Abandonment in place or replacement by open trench requires the installation of a new water service pipe in accordance with Section 7.3 of these Guidelines and Policies, unless otherwise approved by the Commission.
5. Replacement of the existing water service by pulling the old and new water service pipe shall be as follows:
6. Existing service replacement will be accomplished by excavating a safe hole that exposes the corporation stop and curb stop.
  - (a) The existing  $\frac{3}{4}$ -inch cc x 1-inch MIP Corporation Stop will be reused if and only if it is serviceable and free from leaks.
  - (b) The Mueller B101 Drilling and Tapping Machine (or equivalent type) can be used to replace a corporation stop under pressure when the stop is unserviceable or leaking.
7. The new copper tube shall be attached to the old pipe in the cellar.
8. From the street hole, the old pipe is pulled, and the new tubing follows.
9. The reconnection at the main is made using a Ball Valve Curb Stop 1-inch FIP x 1-inch Quick joint. Buffalo style curb boxes at the main will be removed, legally disposed of, and replaced with a new Buffalo box long. The Curb Box over the Curb Stop at the main will be set buried 2-feet below finished road grade.
10. When the existing curb stop is removed, the existing corporation stop must be cleaned in the opened position using a cleaning tool with a cutter of the appropriate size.
11. It is mandatory that a second hole be excavated over the new copper tubing approximately 2-feet from the curbing or edge of road in the direction of the building. In sub-division or on unimproved roads (dirt), the location will be indicated by the plans or the Commission's Authorized Field Representative.
  - (a) At this location, a second Ball Valve Curb Stop with Quick joint both ends will be cut in.
  - (b) The Buffalo Box over the Curb Stop at the main will be set buried 24-inch below finished road grade and in accordance with **Service Box Detail at the Main (W-12.1)**.



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- (c) The Buffalo Box located between the curbing and the property line will be set to finished grade and accordance with **Service Box Detail at the Tree-belt (W-12.0)**. Before backfilling, all joints must be pressure tested using existing pressure in the main.
- (d) For purposes of the record sketch water service card, a minimum of three (3) location ties will be taken along with other measurements.
- (e) Before backfilling, all joints must be pressure tested using existing pressure in the main. The leak inspection shall be conducted in the trench at each joint by a Commission Authorized Field Representative. Joints shall be “Bubble Tight”, i.e. DRY.
12. The installation of a curb stop at a point between the curbing (or edge of pavement) and the property line is MANDATORY. If this valve cannot be installed, this exception must be identified during the pre-job site visit.
- (a) A request for exception to this procedure must be written by the Owner, the Owner’s authorized representative, or the Commission’s designee who has conducted an onsite evaluation.
- (b) This request will be submitted to the Commission for evaluation and written approval or disapproval.
- (c) Five working days must be allowed for the Commission portion of the exception process.
13. The meter valve in the cellar shall be a Ball Valve selected from one (1) of the following:
- (a) Ball Type Curb Stop: 1-inch Quick Joint x 1-inch FIP. This is most common in replacement service work.
- Note: This is a Curb Stop with brass handle used as an inside cellar meter valve.
- (b) When entering the building through the basement floor or slab a Ball Meter Valve - 90° Angle: 1-inch Quick joint x ¾ or 1-inch meter swivel nut or Quick Joint x Elliptical flange in sizes 1 ½-inch and 2-inch. This is the normal valve used.
- (c) When entering the building through a foundation wall typically, a Ball Meter Valve – straight is used but as described in the following selected cases:
- 1-inch Quick joint x ¾ or 1-inch meter swivel nut,
  - 1-½-inch or 2-inch Quick Joint x Elliptical flange.



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- For 1-inch water services when necessary to keep the meter within 18-inches of the wall a Ball Meter Valve - 90° Angle: 1-inch Quick joint x  $\frac{3}{4}$  or 1-inch meter swivel nut may be used (same as 13. (a) above).
  - For 1-1/2-inch or 2-inch water services when necessary to keep the meter within 18-inches of the wall a 1-1/2-inch or 2-inch Quick Joint x 1-1/2-inch or 2-inch Female Iron Pipe (FIP) 90-degree elbow, 1-1/2-inch or 2-inch Ball Meter Valve – straight, and a 1-1/2-inch or 2-inch Male Iron Pipe (MIP) x 1-1/2-inch or 2-inch elliptical flange meter valve may be used.
14. The Quick type compression joint requires that the copper tubing be round not flattened. Copper tubing supplied in coils and transported to a job site can be expected to be partially flattened. This must be corrected by using a flaring tool or rounding tool of the appropriate size.
  15. Before the meter is connected to the new service, the line shall be flushed clean at full pressure using the Ball Valve Curb Stop at the main in accordance with Section 4.4 of these Guidelines and Policies, unless otherwise approved by the Commission. The service may be disinfected at the discretion of the Commission in accordance with Section 6.4.9 of these Guidelines and Policies. The trench shall be backfilled, compacted and the road patched as necessary. Care must be taken to protect the tubing from being damaged by backfilling, and to ensure the curb boxes are plumb, set at the correct grade, and centered over the valve.
  16. The entry point of the tubing through the foundation shall be patched both inside and outside using duct seal and mortar to prevent water entry.
  17. Both holes shall be backfilled, compacted and patched or restored as necessary. The entry point of the tubing will be patched in the cellar using duct seal to prevent water entry.
  18. For purposes of the record sketch water service card, a minimum of three (3) location ties will be taken along with other measurements. The service installation sketch and final service card shall indicate curb stop at main “buried 2-feet”; curb stop at edge of road shall indicate, “set to finished grade”. The location of any fittings along the service line should be noted
  19. Commission construction Crews and Installers shall restore or install pavement in accordance with CHAPTER 8 of these Guidelines and Policies, unless otherwise approved by the Commission.
  20. Commission Construction Crews shall notify the Commission Construction Crew responsible for pavement restoration the amount of pavement to be installed at the end of each week.



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### Section 7.5 Seasonal Water Services

#### 7.5.1 General

1. Seasonal water services are typically some type of irrigation system and requires a backflow preventer. This section will address 2-inch and smaller copper tube irrigation systems. All other seasonal water services or larger ductile iron water services shall be reviewed by the Commission.
2. Seasonal water services shall have a maintenance plan to protect the Commission's meter from freezing and approved by the Commission prior to the water service being turned on.
3. Seasonal water service shall be installed in accordance with Section 7.1, Section 7.2, Section 7.3, and/or Section 7.4 of these Guidelines and Policies and the following:

#### 7.5.2 Product Installation – Seasonal Water Services 2-inch and less

1. All material shall be in accordance with the Commission's Material Specifications.
2. The Seasonal Water Service installation will be done in accordance with the Seasonal Water Service Detail (W-17.0), Seasonal Water Service Base Detail (W17.1), and Seasonal Water Service Cover Detail (17.2). These drawings are an integral component of the Seasonal Service Installation Procedure.
3. The copper tube from the water main for a seasonal water service shall terminate on public property at a concrete pad and enclosure which shall be located on the public property.
4. The meter shall be installed before the backflow preventer.
5. The enclosures shall be set on concrete pads at least 54-inches long, 34-inches wide, and not more than 60-inches long, 50-inches wide and 6-inches thick with two (2) 3-inch sleeves for the water service pipe and sprinkler pipe to enter and exit or as otherwise approved by the SWSC during the submittal process. The sleeves shall be centered along length and be at least 6-inches to 12-inches from ends. The pad shall be placed on a base of at least 6-inches of ¾-inch crushed stone.
6. The enclosures shall be a minimum size of 48-inches long, 24-inches wide, and 32-inches high, a maximum of 54-inches long, 44-inches wide, and 38-inches high, or as otherwise approved by SWSC during the submittal process. Please note the enclosures submitted must fit on the pads and must enclose the complete meter and backflow preventer assembly described herein.

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7. On an existing water service to an island or greenspace the Installer shall provide and install the following:
  - (a) A drilled curb stop with a full length water service box shall be provided in the treebelt before the enclosure to allow the water service to drain prior to the winter.
  - (b) New copper tube from the curb stop into the enclosure.
  - (c) One (1) angle meter valve
  - (d) Two (2) meter couplings (meter spuds)
  - (e) Space for SWSC meter between meter couplings
  - (f) Convert to iron pipe thread and One 90-degree bend up
  - (g) One (1) testable vacuum breaker assembly or reduced pressure zone assembly – each includes two valves as part of the assembly
    - A testable Pressure Vacuum Breaker assembly (PVB) is allowed when the PVB can be installed at least 12 inches or greater above the highest sprinkler head. A PVB is designed to prevent only back-siphonage and is designed for use under static line pressure. A PVB is not allowed where back-pressure is possible. A Reduced Pressure Zone assembly (RPZ) is required when a PVB does not meet the installation requirements. A single spigot is allowed on the downstream side of a RPZ and on the downstream side of a PVB installed 12 inches below the PVB. (The highest sprinkler head and/or fixture shall be 12-inches or greater below the PVB. If it is less than 12-inches a RPZ is required.)
  - (h) One 90-degree bend with IP by Quick Joint ends
  - (i) Copper tube to sprinkler control box
8. On a new water service to an island or greenspace the Installer shall provide and install the following:
  - (a) The installer shall have a public water main tapped with a corporation, water service box 2-feet below finish pavement, and new copper tube from corporation to treebelt.
  - (b) A drilled curb stop with a full length water service box shall be provided in the treebelt before the enclosure to allow the water service to drain prior to the winter.



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- (c) New copper tube from the curb stop into the enclosure.
- (d) One (1) angle meter valve.
- (e) Two (2) meter couplings (meter spuds).
- (f) Space for SWSC meter between meter couplings.
- (g) Convert to iron pipe thread and one 90-degree bend up.
- (h) One (1) testable vacuum breaker assembly or reduced pressure zone assembly – each includes two valves as part of the assembly
  - A testable vacuum breaker is allowed when the highest sprinkler head and/or fixture is 12-inches or greater below the breaker. If it is less than 12-inches a RPZ is required
- (i) One 90-degree bend with IP by Quick Joint ends.
- (j) Copper tube to sprinkler control box.

### Section 7.6 Ductile Iron Water Services 4-inch and Larger

#### 7.6.1 General

1. During the Application process, a Proposed Site Plan must be submitted according to Section 4.2 of these Guidelines and Policies for review and approved by the Commission. This section describes the requirements for installing new water service pipes in the location as defined on the approved plan.
2. A Design Memo issued by the Commission's Engineering and Technical Services (E&TS) shall provide all requirements of the installation.
  - (a) The design memo and associated plans shall always be on site by the Installer(s).
3. New ductile iron water services 4-inch and larger shall be installed, flushed, leak tested, and disinfected in accordance with CHAPTER 6 of these Guidelines and Policies and the additional requirements of this section. In addition to the required Commission testing a fire service pipe shall meet the requirements of the Fire Department Flush Tests described below.
4. All material supplied shall be in accordance with the Commission's Material Specifications.





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5. A minimum of 18-inches of clearance is required from the wall(s) and the floor to the side and bottom of the pipe as of January 1<sup>st</sup>, 2014, unless otherwise approved by the Commission. Pipe shall not be installed more than 4-feet above the floor.
6. 5-feet of cover over the water service pipe is required, unless otherwise approved by the Commission.
7. All shut-off valves at the water main shall be 6-inch or larger. If a 4-inch ductile iron water service is required, the Installer shall provide a 6-inch connection and 6-inch shut-off valve and then reduce to 4-inch.
8. A stainless steel (SS) or ductile iron (DI) tapping sleeve, or a mechanical joint (MJ) tee is required on the main in front of the property to be served, unless otherwise approved by E&TS.
9. A 6-inch or larger tapping by MJ or MJ by MJ gate valve is required, unless otherwise approved by E&TS.
10. A 1-inch Air corporation or 1-inch Air valve Assembly for disinfecting the Water Service Pipe or fire Service Pipe is required after the gate valve at the main. The Commission shall determine if an Air Corporation or Air Valve Assembly is required.
11. All tees, bends, crosses, and other fittings shall be ductile iron mechanical joint unless otherwise approved by the Commission. If a reducer is required, it shall be DI MJ by MJ.
12. All pipe shall be DI, thickness class 52, cement lined, and polyethylene encased (underground only).
13. A companion flange(s) shall be temporarily bolted onto the flanged OS&Y gate valve(s). The companion flange(s) shall have a 2-inch threaded outlet. The threaded outlet shall be utilized for flushing, leak testing, and disinfection.
14. When the water service pipe is to be utilized for a fire service pipe the OS&Y gate valve is not required. The companion flange may be installed on the first flange through the wall or floor.
15. All joints outside/underground shall be MJ or push-on. The final 80-feet shall be fully restrained to the flange (F) connection(s) for the outside, spindle and yoke (OS&Y) gate valve(s), in accordance with Commission Material Specification - Joint Accessories.
16. All joints inside and/or above grade shall be flanged, in accordance with Commission Material Specification – Flanged Pipe. Flanged joints shall be joined





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with gaskets and stainless steel hardware in accordance with Commission Material Specification - Joint Accessories.

### 7.6.2 Main to Meter Vault or Basement

1. The Water Service Pipe from the main to the meter vault or basement shall be installed in accordance with Section 7.6.1, above and the following:
2. The Water Service Pipe for the Main to Meter Vault shall be installed in accordance with **Typical Ductile Iron Water Service through Foundation Wall Detail (W-13.4)**.
3. A DI MJ by MJ solid sleeve with restrainer glands or gasket joint restraint at the bell shall connect the F by plain end (PE) by minimum 6-foot long DI pipe to the DI pipe from the gate valve in the street.
4. The F by PE by minimum 6-foot pipe shall be additionally restrained in place with  $\frac{3}{4}$ -inch rods from the flange to the mechanical joint. All rods and other hardware shall be coated with petrolatum based primer and wrapped with prefabricated petrolatum coating in tape form designed to protect wet or dry irregularly shaped metal surfaces according to Section 6.2.28 of these Guidelines and Policies and the Commission's Material Specifications.
  - (b) Alternatively, if a mechanical joint solid sleeve is not used then the F by PE pipe shall be restrained in place with a steel socket clamp installed at the exterior of the meter vault wall and  $\frac{3}{4}$ -inch rods from the socket clamp to the flange. All socket clamps, rods, and other hardware shall be coated with petrolatum based primer and wrapped with prefabricated petrolatum coating in tape form designed to protect wet or dry irregularly shaped metal surfaces according to Section 6.2.28 of these Guidelines and Policies and the Commission's Material Specifications.
5. An F by F OS&Y gate valve shall be installed onto the flange through the wall.
  - (a) For Fire Services this valve is referred to as the building control valve and shall be in accordance with the Commission's Material Specifications.
  - (b) For Commercial and Industrial Water Services all the valves, fittings, strainers, pressure reducing valves, and check valves shall be that is in accordance with the Commission's Material Specifications.
6. Annular space through meter pit or basement wall may be filled with a link-seal or non-shrink grout/hydraulic cement.



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### 7.6.3 Main to Floor Slab

1. The Water Service Pipe from the main to the floor slab shall be installed in accordance with the Section 7.6.1, above and the following:
2. The Water Service Pipe for the Main to Floor Slab shall be installed in accordance with **Typical Ductile Iron Water Service through Concrete Floor Detail (W-13.5)**.
3. A minimum of 80-feet from the first flange on the 90-degree bend below the slab out toward the main shall be fully restrained.
4. The 90-degree bend below the slab shall be DI MJ by MJ and a thrust block shall be installed to undisturbed soil.
5. The 90-degree bend above the floor slab is required and it shall be DI F by F.
6. An F by PE DI pipe shall connect the two bends. The pipe shall be cut to ensure the proper cover and height of the flange.
7. The F by PE by minimum 6-foot pipe shall be additionally restrained in place with  $\frac{3}{4}$ -inch rods from the flange to the mechanical joint. All rods and other hardware shall be coated with petrolatum based primer and wrapped with prefabricated petrolatum coating in tape form designed to protect wet or dry irregularly shaped metal surfaces according to Section 6.2.28 of these Guidelines and Policies and the Commission's Material Specifications.
8. An F by F OS&Y gate valve shall be installed onto the flange of the 90-degree F by F bend.
  - (c) For Fire Services this valve is referred to as the building control valve and shall be in accordance with the Commission's Material Specifications.
  - (d) For Commercial and Industrial Water Services all the valves, fittings, strainers, pressure reducing valves, and check valves shall be that is in accordance with the Commission's Material Specifications.
9. Annular space through floor shall be filled with 4000-PSI concrete

### 7.6.4 Water Services that Require Bypass

1. The Water Service Pipe that require a bypass shall be installed in accordance with the Sections 7.6.1 and 7.6.2 or 7.6.3 above and the following:
2. The Water Service Pipe for Combination Water Services or Customers that cannot have the water supply interrupted for meter maintenance may have a bypass installed around the meter. The proposed bypass piping arrangement shall be

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submitted to the Commission's Engineering and Technical Services group for review and approval.

3. Typically, the bypass pipe may be one (1) pipe size smaller than the Water Service pipe.
4. A minimum of one (1) valve shall be installed on the bypass line.
5. For installations around a Meter Vault the bypass piping arrangement shall be installed in accordance with **Meter Vault Piping (W-13.0) and Large Meter Installation Detail (W-13.1)**.
6. For installations around a Meter in a building or basement the proposed bypass piping arrangement shall be submitted to the Commissions Engineering and Technical Services group for review and approval.

### 7.6.5 Fire Department Flush Test

1. The Springfield Fire Department requires a flush test on the fire service pipe to be performed by the Installer and observed by the Fire Department.
2. The Installer is responsible to schedule this test in addition to standard Commission testing requirements of flushing, leak testing, disinfection, and bacterial testing.
3. The Fire Department Flush may occur before the standard Commission testing.
4. The Fire Department may have additional requirements and should be contacted to ensure compliance.

## Section 7.7 Water Meters

### 7.7.1 General

1. All material shall be in accordance with the Commission's Material Specifications.
2. The Owner's licensed plumber shall install all piping, fittings, and restraint within the building.
3. Prior to any work on a meter, a jumper wire shall be installed to prevent potential electrocution when the meter is removed for replacement or service.
  - (a) The jumper shall be connected from the copper tube (CT) water service pipe to the house piping on the customer's side of the meter.



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4. Commission supplies and installs all meters and meter couplings (meter spuds) at its expense.
5. The cost of supplying and installing any fittings, valves or meter horns required for the meter installation and the actual installation shall be at the Owners expense in Rates set forth in the Commission's Rules and Regulations.
6. The Owner shall supply and install all backflow prevention devices with detector check meters, utilized for fire services or other uses according to CHAPTER 10 of these Guidelines and Policies, at their expense.

### 7.7.2 Product Installation – 5/8-inch to 2-inch Water Meter

1. The 5/8-inch to 2-inch Water Meters shall be installed in accordance with the Sections 7.7.1 above and the following:
2. The meter can only be installed in a warm (continually above 45° F), clean, dry and accessible location.
3. The meter and meter valves shall have at least 18-inches of clearance from floors, walls, and other obstructions and shall not be higher than 4-feet from the floor. The location provided for the meter shall be in accordance with **New Water Service Detail (W-11.0) or Replacement Water Service Detail (W-11.1)**.
4. Where meters are installed in buildings constructed on a slab on grade the service entrance shall be in accordance with **New Water Service Detail (W-11.0) or Replacement Water Service Detail (W-11.1)**. The meter and meter valves shall have at least 18-inches of clearance from floors, walls, and other obstructions and shall not be higher than 4-feet from the floor.
5. The meters shall be installed in a horizontal position, unless otherwise approved by the Commission.
6. Meter coupling (meter spuds) nuts shall be sealed to the meter at both ends of the meter in accordance with **Water Meter Sealing Detail (W-11.2)**, as follows:
  - (a) On the water main side of the meter; the meter shall be sealed with a wire that passes thru the meter coupling, the screw on the base plate, the meter cover, then to the meter coupling on the Customers side of the meter, and then back to the meter cover.
  - (b) The two ends shall be sealed by a Commission meter installer or meter reader only.
7. When the meter cannot be installed in a building, a plastic meter pit shall be provided by the Owner in accordance with either Water Detail - Plastic Meter Pit

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for 5/8-inch – 1-inch Meters (W-11.3) or Water Detail - Plastic Meter Pit for 1.5-inch – 2-inch Meters (W- 11.4).

- (a) The plastic meter pit shall be located on the Owner's property in a non-traffic area, unless otherwise approved by the Commission.
- (b) The plastic meter pit shall be HDPE or PVC plastic with an open bottom,
  - 5/8-inch or 1-inch meter requires a 20-inch minimum diameter either smooth or corrugated, as approved by the Commission
  - 1-1/2-inch or 2-inch requires a 36-inches minimum diameter corrugated
- (c) The plastic meter pit shall be set on concrete blocks and a base of at least 6-inches of ¾-inch crushed stone.
- (d) The top cover of the plastic meter pit shall be cast iron or ductile iron with a plastic inner lid and set flush to the existing grade.
- (e) A copper meter setter (meter horn) shall be installed in the Plastic Meter Pit.
  - The copper meter setter shall have male iron pipe (MIP) inlet and outlet.
  - The copper meter setter shall have two (2) Ball Meter Valves - 90° Angle. For 5/8-inch through 1-inch meters either a ¾ or 1-inch meter swivel nut and for 1-1/2-inch and 2-inch meters an Elliptical flange in sizes 1-½-inch and 2-inch.
  - The copper meter setter shall have K tube copper that shall be braced with PVC or copper tube.
- (f) Before the meter is connected to the copper meter setter, the line shall be flushed clean at full pressure using the Ball Valve Curb Stop at the main in accordance with Section 4.4 of these Guidelines and Policies, unless otherwise approved by the Commission. The service may be disinfected at the discretion of the Commission in accordance with Section 6.4.9 of these Guidelines and Policies. The trench shall be backfilled, compacted and the road patched as necessary. Care must be taken to protect the tubing from being damaged by backfilling, and to ensure the curb boxes are plumb, set at the correct grade, and centered over the valve.

### 7.7.3 Product Installation – 4-inch and Larger Water Meter

1. The meter can only be installed in a warm (continually above 45° F), clean, dry and accessible location.



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2. When the meter cannot be installed in a building a concrete meter pit shall be provided and installed in accordance with **Large Meter Vault Piping Detail (W-13.0)**, unless otherwise approved by the Commission.
3. Where meters are installed in meter Vaults, the meter shall be in accordance with accordance with **Large Meter Installation Detail (W-13.1)**, unless otherwise approved by the Commission.
4. The meter and meter valves shall have at least 18-inches of clearance from floors, walls, and other obstructions and shall not be higher than 4-feet from the floor. The location provided for the meter shall be in accordance with **Large Meter Vault Piping Detail (W-13.0) and Large Meter Installation Detail (W-13.1)**, unless otherwise approved by the Commission.
5. Where meters are installed in buildings constructed on a slab on grade the service entrance shall allow the meter and meter valves to have at least 18-inches of clearance from floors, walls, and other obstructions and shall not be higher than 4-feet from the floor.
6. The meters shall be installed in a horizontal position, unless otherwise approved by the Commission.
7. Only one (1) uni-flange is allowed and shall be installed on a plain end piece of pipe between the meter and the outlet OS&Y valve. All other connections shall be flanged connections, unless otherwise approved by the Commission.

### 7.7.4 Product Installation – Concrete Meter Vaults

1. Pre-cast Concrete Meter Vaults and all materials used in its construction and structures shall be constructed to the dimensions as specified herein, and in accordance with the Commission's Material Specifications, unless otherwise approved by the Commission.
2. Pre-cast Concrete Meter Vaults installed in the Commission's distribution system shall be provided in accordance with the Standard Meter Vault for Ductile Iron Water Service Pipe and Oversize Meter Vault for Ductile Iron Water Service Pipe Details (W-13.2 – 13.3), unless otherwise approved by the Commission.
3. Pre-cast Concrete Meter vaults may be either standard size at 10-feet long by 6-feet wide by 6-feet & 6-inches tall (inside dimensions) with 6-inch thick walls, floor, and roof or oversize at 12-feet long by 8-feet wide by 6-feet & 6-inches (inside dimensions) with 6-inch thick walls, floor, and roof in accordance with the Commission's Material Specifications. Before a meter vault is installed the developer shall submit the proposed meter vault to the Commissions Engineering and Technical Services group for review and approval.

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- (a) Standard Vault size may be used for 4-inch through 8-inch single supply Water Service, multiple supply Water Service, and single supply Combination Water Service.
  - (b) Oversize Vault may be used for any 8-inch through 12-inch single supply or multiple supply Water Service or Combination Water Service if it is determined during the review process more space is needed.
  - (c) All Fire Services shall be installed above grade in a heated enclosure or in a heated basement or building. Below grade vaults for Fire Services are not allowed.
4. Pre-cast Concrete Meter Vaults shall be installed on the Owner's property.
  5. Outside/exterior surfaces of Pre-cast Concrete Meter Vaults shall be painted with two coats of bituminous damp proofing at the rate of 30 to 60 sq ft per gallon, in accordance with manufacturer's instructions.
  6. Pre-cast Concrete Meter Pit bases shall be placed on a bed of 12-inches of crushed stone  $\frac{3}{4}$ -inch. Meter Pit base grades shall be set so that any required grade adjustment to bring the manhole frame and cover to final grade does not exceed 8-in.
  7. All work shall be protected at all times against flooding and/or flotation.
  8. Pre-cast Concrete Meter Vaults shall be set plumb with a 1/4-in maximum out of plumb tolerance allowed.
  9. Jointing of Pre-cast Concrete Meter Vaults shall be accomplished with butyl rubber joint sealant gasket in accordance with the Commission's Materials Specifications installed at the shiplap joints of each section, unless otherwise approved by the Commission.
    - (a) All installation surfaces shall be clean and dry.
    - (b) Apply one (1) continuous bead of sealant around the periphery of the joint by pressing the bead firmly into place. Remove backing paper as the installation progresses.
    - (c) Use of primer is required when temperatures are below 40-degrees F and/or the concrete is damp.
    - (d) Extremely wet conditions require the installation to have two (2) beads applied in the same manner as above.



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10. Joints shall be allowed to set for at least 14 hours before backfilling unless a shorter period is specifically approved by the Commission or its representative.
11. Holes required for handling in the concrete barrel sections shall be plugged with a non-shrinking grout, or concrete plugs in combination with non-shrinking grout. Finish flush on the inside.
12. Pre-cast Meter Vaults shall have a formed, tapered circular opening larger than the intended pipe size (outside diameter) in accordance with the **Large Meter Installation Detail (W-13.1)**.
13. Integrally cast knockout panels shall be provided at locations in accordance with the Standard Meter Vault for Ductile Iron Water Service Pipe (W-13.2) and Oversize Meter Vault for Ductile Iron Water Service Pipe Details (W-13.3). Sizes shall be adequate for intended pipe sizes. Knockout panels shall have no steel reinforcing.
14. When pre-formed hole are not provided the holes in Pre-cast Meter Vaults shall be cut to accommodate pipes prior to setting manhole sections in place to prevent jarring that may loosen the mortar joints.
15. Connections into the manhole shall be grout in place. The non-shrink grout shall be installed around the pipe connection where a formed, tapered circular opening is larger than the pipe outside diameter.
16. Backfill shall be laid and compacted carefully and evenly around Pre-cast Meter Vaults.
17. The Commission will visually inspect Pre-cast Meter Vaults after the backfill is in place. The inside of any leaking Pre-cast Meter Pit joint shall be caulked with lead wool or non-shrink grout to the satisfaction of the Commission or its representative.
18. All concrete work performed inside the Pre-cast Meter Pit shall be finished smooth and swept clean before acceptance by the Commission.

### 7.7.5 Product Installation - Manhole Frame and Cover:

1. Manhole frame and covers shall be installed in accordance with Large Meter Vault Piping Detail (W-13.0), Standard Meter Vault for Ductile Iron Water Service Pipe (W-13.2), and Oversize Meter Vault for Ductile Iron Water Service Pipe Details (W-13.3), unless otherwise approved by the Commission.
2. Pre-cast concrete grade rings and/or brick and non-shrink mortar shall be used to adjust manhole frame and cover to final grade.





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3. The inside and outside of pre-cast concrete grade rings and/or brick shall be sealed with hydraulic cement.
4. Under no circumstances shall barrel blocks be allowed.
5. Castings shall be set in non-shrink grout. Non-shrink grout shall be placed all around casting to 4-inches above flange.
6. Castings shall be thoroughly cleaned and subject to hammer inspection.
7. All brick and mortar dropped into manhole if the finished invert is built before the frame and covers are installed shall be cleaned and removed.

### **Section 7.8 Removal of Existing Materials and Parts from Customers Homes, Businesses and/or Underground Infrastructure**

#### **7.8.1 Ownership**

1. All service valves at the meter, service pipes, hydrants, and gate valves on the service pipes, and/or any other parts on the service pipes are solely the Customer's property.
2. Any service valves at the meter, service pipes, hydrants, gate valves on the service pipes, and/or any other parts on the service pipes that are removed from a customer's property, with the Customer's permission, shall become property of the Commission.
3. All service valves at the main and meters are solely the Water and Sewer Commission's property.
4. Any service valves at the main and meters that are removed from a Customer's property, shall remain property of the Commission.
5. Under no circumstances shall a Commission employee be allowed to keep any parts and/or materials removed from a home, business, or underground infrastructure during hours of employment and/or during the use of a Commission vehicle.

#### **7.8.2 Handling**

1. In the event that a customer service valve in the building is being replaced and/or repair is performed on the underground infrastructure, as part of the Commission's work, the Commission employee must ask the customer if they wish to keep the service valve other material or if they prefer the Commission to dispose of the parts and/or materials.



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2. Any service valves, service pipes, meters, main pipes, gate valves, hydrants, valve box, service box and any other parts or materials that the customer does not wish to keep must be returned to the Field Services Office at 71 Colton Street.
3. In the event that the customer request that the Commission dispose of the parts and/or materials, the employee must document the request and return all parts and/or materials to the Field Services Office at 71 Colton Street.
4. Under no circumstances, will any Commission employee be allowed to enter any recycling and/or scrap metal facility (junkyard, scrap metal, recycling, etc.) with a Commission vehicle without authorization from the Executive Director or his/her designee.

### Section 7.9 Terms of Warranty on Installation

#### 7.9.1 General -

1. The Owner will be held responsible for the repair of any service or main leaks up to one (1) year after the successful pressure testing and disinfection has been accepted by the Commission Engineering Services Department.
2. The Owner will have the opportunity to make repairs at his cost under the direction of Commission field inspector, or any leaks will be repaired by Commission and the cost of such repairs will be at the owner's expense.
3. The Owner will be responsible for the repair or correction of trench settlement. Commission retains the right to repair the settlement and the cost of repairs will be charged to the Owner.



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### CHAPTER 8 PAVEMENT

#### Section 8.1 General

1. Bituminous paving installed in the Commission's water distribution systems in Springfield and Ludlow and the sewer collection system in Springfield shall be in accordance with the following details:
  - (a) Paving repairs and/or installations in Ludlow that require flowable fill as backfill shall be installed in accordance with **Trench Backfilling – Method 1 for Ludlow Roadways Detail (W-02.1)**, unless otherwise approved by the Town of Ludlow Department of Public Works (DPW) and the Commission.
  - (b) Paving repairs and/or installations in Ludlow that require compacted common borrow fill as backfill shall be installed in accordance with **Trench Backfilling – Method 2 for Ludlow Roadways Detail (W-02.2)**, unless otherwise approved by the Town of Ludlow DPW and the Commission.
  - (c) Paving repairs and/or installations in Springfield on arterial streets shall be installed in accordance with **Trench Backfilling – Method for Arterial Streets in Springfield (W-02.3)**, unless otherwise approved by the City of Springfield Department of Public Works (DPW) and the Commission.
  - (d) Paving repairs and/or installations in Springfield on residential streets shall be installed in accordance with **Trench Backfilling – Method for Residential Streets in Springfield (W-02.4)**, unless otherwise approved by the City of Springfield DPW and the Commission.
2. Bituminous paving repairs and all materials used in the construction and structures shall be constructed to the dimensions shown on the Design Drawings, as specified herein, and in accordance with the Commission's Material Specifications, unless otherwise approved by the Commission.
3. Typically, temporary or binder coarse bituminous pavement shall be installed at the end of each work week on all Commission Construction Crew or Installer installed water main, sewer main, water service, and/or building sewer connection in Ludlow or Springfield, unless otherwise approved by the appropriate DPW and the Commission.
4. Approximately, 90-days after the last temporary or binder coarse of bituminous paving has been in place on a project the Commission Construction Crew or Installer shall mill the appropriate width and depth of existing paving and temporary or binder paving, unless otherwise approved by the appropriate DPW and the Commission.



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5. The mill surface shall be tack coated prior to the final pavement being installed.
6. The final paving or top coarse shall be installed the full width and depth of the milled area.
7. All water valve boxes, water services boxes, sewer manholes, and/or structures in the area of pavement installation shall be raised to finish grade prior to the installation of any paving, unless otherwise approved by the appropriate DPW and the Commission..

### Section 8.2 Springfield

#### 8.2.1 Permanent Bituminous Concrete Patch: Residential in Springfield: 3-inch Or Less in Depth

1. In addition to the General, requirements of this Section the work shall be performed in accordance with Springfield Department of Public Works Pavement Restoration Requirements.
2. Restoration work shall be scheduled and inspected in accordance with Springfield Department of Public Works Standard Procedures.
3. The Commission designated Inspector shall also be notified by written schedule submitted thru the Deputy Director of Field Services at the Commission Customer Field Service Building, 71 Colton St., Springfield MA, Fax Number is 413-787-7975.

#### 8.2.2 Permanent Bituminous Concrete Patch: Arterial in Springfield: More Than 3-inch in Depth, But Not Greater Than 6-inch in Depth

Items found in Section 8.2.1 of these Guidelines and Policies, numbered 1 thru 3 apply here.

### Section 8.3 Ludlow

#### 8.3.1 Permanent Bituminous Concrete Patch: Residential in Ludlow: 3-inch Or Less in Depth.

1. In addition to the General, requirements of this Section the work shall be performed in accordance with Ludlow Department of Public Works Pavement Restoration Requirements.
2. Restoration work shall be scheduled and inspected in accordance with Ludlow Department of Public Works Standard Procedures.



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3. The Commission designated Inspector shall also be notified by written schedule submitted thru the Deputy Director of Field Services at the Commission Customer Field Service Building, 71 Colton St., Springfield MA, Fax Number is 413-787-7975.

### **8.3.2 Permanent Bituminous Concrete Patch: Arterial in Ludlow: More Than 3-inch In Depth, But Not Greater Than 6-inch In Depth**

Items found in Section 8.3.1 of these Guidelines and Policies, numbered 1 thru 3 apply here.

### **8.3.3 Bituminous Concrete Sidewalk or Driveway Restorations: Type I, Surface Course**

1. Sidewalk and Driveway Bituminous surfaces that are disturbed shall be restored, full width, in kind, a minimum of one foot beyond the disturbed area.
2. After the sub-grade has been prepared, a foundation of gravel shall be placed upon it. After thorough mechanical compaction to at least 95% modified proctor density, the foundation of gravel shall at least 8-inch thick.
3. The bituminous concrete sidewalk or driveway surface shall be laid in 2 courses to a depth-after rolling of 3-inch. The bottom course shall be 1-½-inch and its surface after rolling shall be 1-½-inch below the parallel to the proposed grade of the finished surface. The top course shall be 1-½-inch thick after rolling.
4. The existing vertical surfaces of bituminous concrete shall be thoroughly cleaned, and tack coated before placing new, hot bituminous concrete.
5. After rolling the top course, the edges of the permanent bituminous concrete patch shall be sealed with liquid asphalt emulsion (AASHTO M140) and coated with sand.
6. Bituminous concrete mixtures shall be distributed by direct dumping, wheelbarrow, or other approved means into the area to be patched. It shall then be immediately distributed into place by means of shovels and raked into a uniformly loose layer to the full width required and of such depth that, when work is completed, it shall conform to the grade and surface contour required. An approved mechanical spreader may be used.
7. Surfaces shall be rolled with a self-propelled tandem roller with a mass of a minimum 3 tons. In places where a power roller cannot be used, compaction shall be obtained by mechanical rammers or by hand tampers.
8. Where walls, curbing or other suitable permanent supports are not present, or where an approved mechanical spreader is not used, satisfactory forms shall be



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installed to assist in securing proper alignment and adequate compaction of the base and surface courses.

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### Section 8.4 Water Valve Box and Service Box Adjustment and Replacement

#### 8.4.1 General

This Policy is intended to be used, by either the Springfield Department of Public Works or the Ludlow Department of Publics Works for paving improvement projects within the respective City or Town boundaries.

The following section should be included as a bid alternate in a contract bid document. The following section includes six (6) items the Commission would be responsible for paying for, at its sole discretion.

If the Commission were not to choose to use the bid alternate it would then adjust or replace the valve and services boxes with its own employees.

#### 8.4.2 Commission Valve and Service Box Adjustment and Replacement Policy

The Contractor shall notify in writing the Springfield Water and Sewer Commission for field location of water mains and valves. All valves shall be operated by Springfield Water and Sewer Commission employees only. Springfield Water and Sewer Commission personnel shall inspect all work on water mains and valves. All gate and service boxes are property of the Springfield Water and Sewer Commission.

The Springfield Water and Sewer Commission shall identify all structures, which are to remain, be raised or lowered, removed and reset, or removed and replaced with new structure.

Work done by a Contractor shall include the locating and recording in a field book of all Springfield Water and Sewer Commission valves lowered or removed during construction. This book shall be available to the Resident Engineer and become property of the Springfield Water and Sewer Commission.

The Contractor shall be held responsible for the protection of all castings. The Contractor at his expense shall replace any water boxes damaged in any manner during the progress of construction with new castings.

No water box shall remain exposed without suitable maintenance for the safety of the traveling public.

Before final payment is made, the Springfield Water and Sewer Commission will inspect all work to ensure that all boxes are centered over the appurtenance that they supply access to, and that they are straight and clean.

The Contractor shall exercise diligence and care using standard construction methods to complete all related items. If during the course of normal contractual work leaks,



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cracks, or any other damage to any Water and Sewer Commission lines, services or appurtenances is found, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards and be paid for under an extra work order. The Contractor, Springfield Department of Public Works or Ludlow Department of Public Works (Department of Public Works), and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary and cost of such repair or replacement will be on a time and material payment, using the Massachusetts Standard Specifications for Highways and Bridges for extra work.

If during the course of normal contractual work the contractor causes leaks, cracks, breakage, or any other damage to any Water and Sewer Commission lines, services or appurtenances, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's Guidelines and Policies and Material Specifications at the contractor's expense. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary prior to the repair or replacement taking place.

The provision in no way shall excuse the Contractor from careless acts, negligence or inappropriate construction methods, which cause damage to any Springfield Water and Sewer Commission property.

### **ITEM 1    GATE BOX REMOVED AND RESET    EA**

Cost of these items shall include, but not be limited to, removing the existing gate box top, gate box bottom, and gate box cover by excavating to expose the structures, carefully removing the structures, resetting the undamaged structures, and backfilling the structures with excavatable flowable fill to within 6 inches of the corporation or gate level, and placing of a 6 inch thick concrete collar (4,000 psi minimum) around the box to all patch edges.

The Contractor shall exercise diligence and care using standard construction methods to complete all related items. If during the course of normal contractual work leaks, cracks, or any other damage to any Water and Sewer Commission lines, services or appurtenances is found, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards and be paid for under an extra work order. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary and cost of such repair or replacement will be on a time and material payment, using the Massachusetts Standard Specifications for Highways and Bridges for extra work.

If during the course of normal contractual work the contractor causes leaks, cracks, breakage, or any other damage to any Water and Sewer Commission lines, services or appurtenances, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards at the contractor's expense. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall





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agree on any repair or replacement necessary prior to the repair or replacement taking place.

The provision in no way shall excuse the Contractor from careless acts, negligence or inappropriate construction methods, which cause damage to any Springfield Water and Sewer Commission property.

### **ITEM 1a**                      **GATE BOX ADJUST**                      **EA**

Cost of these items shall include, but limited to, removing the existing material around the existing box top to a depth of 6” below the existing grade. Pry up the box top to the proposed finish grade. Pour a concrete collar (4,000 psi minimum mix) around the adjusted box top and up to the flange of the box top and finish the collar to all patch edges.

The Contractor shall exercise diligence and care using standard construction methods to complete all related items. If during the course of normal contractual work leaks, cracks, or any other damage to any Water and Sewer Commission lines, services or appurtenances is found, the Contractor shall repair or replace to the Springfield Water and Sewer Commission’s standards and be paid for under an extra work order. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary and cost of such repair or replacement will be on a time and material payment, using the Massachusetts Standard Specifications for Highways and Bridges for extra work.

If during the course of normal contractual work the contractor causes leaks, cracks, breakage, or any other damage to any Water and Sewer Commission lines, services or appurtenances, the Contractor shall repair or replace to the Springfield Water and Sewer Commission’s standards at the contractors expense. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary prior to the repair or replacement taking place.

The provision in no way shall excuse the Contractor from careless acts, negligence or inappropriate construction methods, which cause damage to any Springfield Water and Sewer Commission property.

### **ITEM 2**                      **GATE BOX REMOVED AND STACKED**                      **EA**

Cost of these items shall include, but not be limited to, removing the existing gate box top, gate box bottom, and gate box cover by excavating to expose the structures, and carefully removing the structures.

All removed and stacked gate boxes shall be brought to a location determined by the Springfield Water and Sewer Commission. If the Springfield Water and Sewer



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Commission determines that the removed materials are not suitable, the Contractor shall discard the removed materials properly. All related costs to discard this material will be included in this item.

The Contractor shall exercise diligence and care using standard construction methods to complete all related items. If during the course of normal contractual work leaks, cracks, or any other damage to any Water and Sewer Commission lines, services or appurtenances is found, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards and be paid for under an extra work order. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary and cost of such repair or replacement will be on a time and material payment, using the Massachusetts Standard Specifications for Highways and Bridges for extra work.

If during the course of normal contractual work the contractor causes leaks, cracks, breakage, or any other damage to any Water and Sewer Commission lines, services or appurtenances, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards at the contractors expense. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary prior to the repair or replacement taking place.

The provision in no way shall excuse the Contractor from careless acts, negligence or inappropriate construction methods, which cause damage to any Springfield Water and Sewer Commission property.

### **ITEM 3                      NEW GATE BOX INSTALLED                      EA**

Cost of these items shall include, but not be limited, supplying the valve box that meets the Springfield Water and Sewer Commission's Specifications. Valve boxes shall be installed concentric to the operating nut and plumb with the vertical plane. The belled base section shall be placed on blocking in such a way that no additional loading is transferred to the valve. Longer valve box bottoms and/or tops will be specified as required for water mains at depths that exceed the limitations of the above specified valve box. Valve boxes located in traveled ways shall be left flush with the pavement or gravel shoulder unless otherwise specified. Valve boxes located in other non-paved areas shall be left flush with finish grade unless otherwise specified. Valves and boxes shall be set with the stem vertical and valve box vertically centered over the operating nut. The valve box shall be supported during backfilling and maintained in vertical alignment with the top section flush with finished grade. The Valve Box shall be flush with finished grade, and backfill the structures with excavatable flowable fill to within 6 inches of the corporation or gate level, and placing of a 6 inch thick concrete collar (4,000 psi minimum) around the box to all patch edges.



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The Contractor shall exercise diligence and care using standard construction methods to complete all related items. If during the course of normal contractual work leaks, cracks, or any other damage to any Water and Sewer Commission lines, services or appurtenances is found, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards and be paid for under an extra work order. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary and cost of such repair or replacement will be on a time and material payment, using the Massachusetts Standard Specifications for Highways and Bridges for extra work.

If during the course of normal contractual work the contractor causes leaks, cracks, breakage, or any other damage to any Water and Sewer Commission lines, services or appurtenances, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards at the contractors expense. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary prior to the repair or replacement taking place.

These provisions in no way shall excuse the Contractor from careless acts, negligence or inappropriate construction methods, which cause damage to any Springfield Water and Sewer Commission property.

### **ITEM 3a**                      **NEW GATE BOX TOP INSTALLED**                      **EA**

SWSC will supply the casting needed for this Item. Cost of these items shall include, but not be limited to valve boxes installed concentric to the operating nut and plumb with the vertical plane. Valve boxes located in traveled ways shall be left flush with the pavement or gravel shoulder unless otherwise specified. Valve boxes located in other non-paved areas shall be left flush with finish grade unless otherwise specified. Valves and boxes shall be set with the stem vertical and valve box vertically centered over the operating nut. The valve box shall be supported during backfilling and maintained in vertical alignment with the top section flush with finished grade. The Valve Box shall be flush with finished grade, and backfill the structures with excavatable flowable fill to within 6 inches of the corporation or gate level, and placing of a 6 inch thick concrete collar (4,000 psi minimum) around the box to all patch edges.

The Contractor shall exercise diligence and care using standard construction methods to complete all related items. If during the course of normal contractual work leaks, cracks, or any other damage to any Water and Sewer Commission lines, services or appurtenances is found, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards and be paid for under an extra work order. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary and cost of such repair



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or replacement will be on a time and material payment, using the Massachusetts Standard Specifications for Highways and Bridges for extra work.

If during the course of normal contractual work the contractor causes leaks, cracks, breakage, or any other damage to any Water and Sewer Commission lines, services or appurtenances, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards at the contractors expense. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary prior to the repair or replacement taking place.

The provision in no way shall excuse the Contractor from careless acts, negligence or inappropriate construction methods, which cause damage to any Springfield Water and Sewer Commission property.

### **ITEM 4          NEW SERVICE BOX INSTALLED          EA**

Cost of these items shall include, but not be limited, supplying the service box that meets the Springfield Water and Sewer Commission's Specifications. Service box bases shall be centered over the curb stop ball valve and shall be plumb and vertical in all directions. The box bottom shall be placed on the same blocking or flat surface as the curb stop. Service boxes located in other non-paved areas shall be left flush with finish grade unless otherwise specified. The service box shall be supported during backfilling and maintained in vertical alignment with the top section flush with finished grade. The service box shall be flush with finished grade, and backfill the structures with excavatable flowable fill to within 6 inches of the corporation or gate level, and placing of a 6 inch thick concrete collar (4,000 psi minimum) around the box to all patch edges.

The Contractor shall exercise diligence and care using standard construction methods to complete all related items. If during the course of normal contractual work leaks, cracks, or any other damage to any Water and Sewer Commission lines, services or appurtenances is found, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards and be paid for under an extra work order. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary and cost of such repair or replacement will be on a time and material payment, using the Massachusetts Standard Specifications for Highways and Bridges for extra work.

If during the course of normal contractual work the contractor causes leaks, cracks, breakage, or any other damage to any Water and Sewer Commission lines, services or appurtenances, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards at the contractors expense. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall



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agree on any repair or replacement necessary prior to the repair or replacement taking place.

The provision in no way shall excuse the Contractor from careless acts, negligence or inappropriate construction methods, which cause damage to any Springfield Water and Sewer Commission property.

### **ITEM 4a NEW SERVICE BOX TOP INSTALLED EA**

SWSC will supply the casting needed for this Item. Cost of these items shall include, but not be limited to service boxes centered over the curb stop ball valve and shall be plumb and vertical in all directions. Service boxes located in other non-paved areas shall be left flush with finish grade unless otherwise specified. The service box shall be supported during backfilling and maintained in vertical alignment with the top section flush with finished grade. The service box shall be flush with finished grade, and backfill the structures with excavatable flowable fill to within 6 inches of the corporation or gate level, and placing of a 6 inch thick concrete collar (4,000 psi minimum) around the box to all patch edges.

The Contractor shall exercise diligence and care using standard construction methods to complete all related items. If during the course of normal contractual work leaks, cracks, or any other damage to any Water and Sewer Commission lines, services or appurtenances is found, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards and be paid for under an extra work order. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary and cost of such repair or replacement will be on a time and material payment, using the Massachusetts Standard Specifications for Highways and Bridges for extra work.

If during the course of normal contractual work the contractor causes leaks, cracks, breakage, or any other damage to any Water and Sewer Commission lines, services or appurtenances, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards at the contractors expense. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary prior to the repair or replacement taking place.

The provision in no way shall excuse the Contractor from careless acts, negligence or inappropriate construction methods, which cause damage to any Springfield Water and Sewer Commission property.

### **ITEM 5 SERVICE BOX REMOVED AND RESET EA**

Cost of these items shall include, but not be limited to, removing the existing service box top, service box bottom, and service box cover by excavating to expose the



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structures, and carefully removing the structures, resetting the undamaged structures, and backfilling the structures with excavatable flowable fill to within 6 inches of the corporation or gate level, and placing of a 6 inch thick concrete collar (4,000 psi minimum) around the box to all patch edges.

The Contractor shall exercise diligence and care using standard construction methods to complete all related items. If during the course of normal contractual work leaks, cracks, or any other damage to any Water and Sewer Commission lines, services or appurtenances is found, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards and be paid for under an extra work order. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary and cost of such repair or replacement will be on a time and material payment, using the Massachusetts Standard Specifications for Highways and Bridges for extra work.

If during the course of normal contractual work the contractor causes leaks, cracks, breakage, or any other damage to any Water and Sewer Commission lines, services or appurtenances, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards at the contractors expense. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary prior to the repair or replacement taking place.

The provision in no way shall excuse the Contractor from careless acts, negligence or inappropriate construction methods, which cause damage to any Springfield Water and Sewer Commission property.

### **ITEM 5a**                      **SERVICE BOX ADJUST**                      **EA**

Cost of these items shall include, but limited to, removing the existing material around the existing box top to a depth of 6" below the existing grade. Pry up the box top to the proposed finish grade. Pour a concrete collar (4,000 psi minimum mix) around the adjusted box top and up to the flange of the box top and finish the collar to all patch edges.

The Contractor shall exercise diligence and care using standard construction methods to complete all related items. If during the course of normal contractual work leaks, cracks, or any other damage to any Water and Sewer Commission lines, services or appurtenances is found, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards and be paid for under an extra work order. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary and cost of such repair or replacement will be on a time and material payment, using the Massachusetts Standard Specifications for Highways and Bridges for extra work.





# Springfield Water and Sewer Commission

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If during the course of normal contractual work the contractor causes leaks, cracks, breakage, or any other damage to any Water and Sewer Commission lines, services or appurtenances, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards at the contractors expense. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary prior to the repair or replacement taking place.

The provision in no way shall excuse the Contractor from careless acts, negligence or inappropriate construction methods, which cause damage to any Springfield Water and Sewer Commission property.

### **ITEM6 SERVICE BOX REMOVED AND STACKED EA**

Cost of these items shall include, but not be limited to, removing the existing service box top, service box bottom, and service box cover by excavating to expose the structures, and carefully removing the structures.

All removed and stacked service boxes shall be brought to a location determined by the Springfield Water and Sewer Commission. If the Springfield Water and Sewer Commission determines that the removed materials are not suitable, the Contractor shall discard the removed materials properly. All related costs to discard this material will be included in this item.

The Contractor shall exercise diligence and care using standard construction methods to complete all related items. If during the course of normal contractual work leaks, cracks, or any other damage to any Water and Sewer Commission lines, services or appurtenances is found, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards and be paid for under an extra work order. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary and cost of such repair or replacement will be on a time and material payment, using the Massachusetts Standard Specifications for Highways and Bridges for extra work.

If during the course of normal contractual work the contractor causes leaks, cracks, breakage, or any other damage to any Water and Sewer Commission lines, services or appurtenances, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards at the contractors expense. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary prior to the repair or replacement taking place.

The provision in no way shall excuse the Contractor from careless acts, negligence or inappropriate construction methods, which cause damage to any Springfield Water and Sewer Commission property.



# Springfield Water and Sewer Commission

## Guidelines and Policies

Please provide quote to perform each of the above items below:

<b>ITEM 1</b>	<b>GATE BOX REMOVED AND RESET</b>	<b>\$</b>	<b>EA</b>
<b>ITEM 1a</b>	<b>GATE BOX ADJUST</b>	<b>\$</b>	<b>EA</b>
<b>ITEM 2</b>	<b>GATE BOX REMOVED AND STACKED</b>	<b>\$</b>	<b>EA</b>
<b>ITEM 3</b>	<b>NEW GATE BOX INSTALLED</b>	<b>\$</b>	<b>EA</b>
<b>ITEM 3a</b>	<b>NEW GATE BOX TOP INSTALLED</b>	<b>\$</b>	<b>EA</b>
<b>ITEM 4</b>	<b>NEW SERVICE BOX INSTALLED</b>	<b>\$</b>	<b>EA</b>
<b>ITEM 4a</b>	<b>NEW SERVICE BOX TOP INSTALLED</b>	<b>\$</b>	<b>EA</b>
<b>ITEM 5</b>	<b>SERVICE BOX REMOVED AND RESET</b>	<b>\$</b>	<b>EA</b>
<b>ITEM 5a</b>	<b>SERVICE BOX ADJUST</b>	<b>\$</b>	<b>EA</b>
<b>ITEM 6</b>	<b>SERVICE BOX REMOVED AND STACKED</b>	<b>\$</b>	<b>EA</b>

Last Modified: 04/09/2025 at 10:39AM EDT





# Springfield Water and Sewer Commission

## Guidelines and Policies

### Section 8.5 Sewer Manhole Frame and Cover Adjustment and Replacement

#### 8.5.1 General

This Policy is intended to be used, by the Springfield Department of Public Works for paving improvement projects within the City boundaries.

The following section should be included as a bid alternate in a contract bid document. The following section includes three (3) items the Commission would be responsible for paying for at its sole discretion.

If the Commission were not to choose to use the bid alternate it would then adjust or replace the manhole frame and covers with its own employees.

#### 8.5.2 Commission Sewer Manhole Frame and Cover Adjustment and Replacement Policy

The Contractor shall notify in writing the Springfield Water and Sewer Commission for field location of Sewer Manhole Frames and Covers. Springfield Water and Sewer Commission personnel shall inspect all work on Sewer Manhole Frames and Covers. All Sewer Manhole Frames and Covers are property of the Springfield Water and Sewer Commission.

The Springfield Water and Sewer Commission shall identify all structures which are to remain, be raised or lowered, removed and reset, or removed and replaced with new structure.

Work done by a Contractor shall include the locating and recording in a field book of all Springfield Water and Sewer Commission valves lowered or removed during construction. This book shall be available to the Resident Engineer and become property of the Springfield Water and Sewer Commission.

The Contractor shall be held responsible for the protection of all castings. The Contractor at his expense shall replace any water boxes damaged in any manner during the progress of construction with new castings.

No Sewer Manhole Frames and Covers shall remain exposed without suitable maintenance for the safety of the traveling public.

Before final payment is made, the Springfield Water and Sewer Commission will inspect all work to ensure that all Sewer Manhole Frames and Covers are centered over the appurtenance that they supply access to, that they are straight and clean, and are set to finish grade.

The Contractor shall exercise diligence and care using standard construction methods to complete all related items. If during the course of normal contractual work leaks,



# Springfield Water and Sewer Commission

## Guidelines and Policies

cracks, or any other damage to any Water and Sewer Commission lines, services or appurtenances is found, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards and be paid for under an extra work order. The Contractor, Springfield Department of Public Works (Department of Public Works), and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary and cost of such repair or replacement will be on a time and material payment, using the Massachusetts Standard Specifications for Highways and Bridges for extra work.

If during the course of normal contractual work the contractor causes leaks, cracks, breakage, or any other damage to any Water and Sewer Commission lines, services or appurtenances, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's Guidelines and Policies and Material Specifications at the contractors expense. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary prior to the repair or replacement taking place.

The provision in no way shall excuse the Contractor from careless acts, negligence or inappropriate construction methods, which cause damage to any Springfield Water and Sewer Commission property.

### **ITEM 7 SEWER MANHOLE FRAME AND COVER REMOVED AND RESET EA**

Cost of these items shall include, but not be limited to, removing the existing sewer manhole frame and cover by excavating to expose the structures, carefully removing the structures, storing and securing the frame and cover, maintaining the manhole during milling operations, resetting the undamaged structures with the appropriate courses of leveling bricks and mortar, sealing the leveling courses with hydraulic cement, and backfilling the structures with 4-inches of non-shrink grout above the flange of the structure. Invert table must be cleaned of all bricks chips and mortar before payment will be made.

The Contractor shall exercise diligence and care using standard construction methods to complete all related items. If during the course of normal contractual work leaks, cracks, or any other damage to any Water and Sewer Commission lines, services or appurtenances is found, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards and be paid for under an extra work order. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary and cost of such repair or replacement will be on a time and material payment, using the Massachusetts Standard Specifications for Highways and Bridges for extra work.

If during the course of normal contractual work the contractor causes leaks, cracks, breakage, or any other damage to any Water and Sewer Commission lines, services or appurtenances, the Contractor shall repair or replace to the Springfield Water and



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Sewer Commission's standards at the contractors expense. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary prior to the repair or replacement taking place.

The provision in no way shall excuse the Contractor from careless acts, negligence or inappropriate construction methods, which cause damage to any Springfield Water and Sewer Commission property.

### **ITEM 8 SEWER MANHOLE FRAME AND COVER REMOVED AND STACKED EA**

Cost of these items shall include, but not be limited to, removing the existing sewer manhole frame and cover by excavating to expose the structures, carefully removing the structures, and maintaining the structure during milling operations.

All removed and stacked sewer manhole frames and covers shall be brought to a location determined by the Springfield Water and Sewer Commission. If the Springfield Water and Sewer Commission determines that the removed materials are not suitable, the Contractor shall discard the removed materials properly. All related costs to discard this material will be included in this item.

The Contractor shall exercise diligence and care using standard construction methods to complete all related items. If during the course of normal contractual work leaks, cracks, or any other damage to any Water and Sewer Commission lines, services or appurtenances is found, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards and be paid for under an extra work order. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary and cost of such repair or replacement will be on a time and material payment, using the Massachusetts Standard Specifications for Highways and Bridges for extra work.

If during the course of normal contractual work the contractor causes leaks, cracks, breakage, or any other damage to any Water and Sewer Commission lines, services or appurtenances, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards at the contractors expense. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary prior to the repair or replacement taking place.

The provision in no way shall excuse the Contractor from careless acts, negligence or inappropriate construction methods, which cause damage to any Springfield Water and Sewer Commission property.

### **ITEM 9 SEWER MANHOLE FRAME AND COVER INSTALLED EA**



# Springfield Water and Sewer Commission

## Guidelines and Policies

Cost of these items shall include, but not be limited, supplying the new sewer manhole frame and cover that meets the Springfield Water and Sewer Commission's Specifications. Sewer manhole frames and covers shall be installed and set with the appropriate courses of leveling bricks and mortar, sealing the leveling courses with hydraulic cement, and backfilling the structures with 4-inches of non-shrink grout above the flange of the sewer manhole frame and cover. Sewer manhole frames and covers located in traveled ways shall be left flush with the pavement or gravel shoulder unless otherwise specified. Sewer manhole frames and covers located in other non-paved areas shall be left flush with finish grade unless otherwise specified. Invert table must be cleaned of all bricks chips and mortar before payment will be made.

The Contractor shall exercise diligence and care using standard construction methods to complete all related items. If during the course of normal contractual work leaks, cracks, or any other damage to any Water and Sewer Commission lines, services or appurtenances is found, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards and be paid for under an extra work order. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary and cost of such repair or replacement will be on a time and material payment, using the Massachusetts Standard Specifications for Highways and Bridges for extra work.

If during the course of normal contractual work the contractor causes leaks, cracks, breakage, or any other damage to any Water and Sewer Commission lines, services or appurtenances, the Contractor shall repair or replace to the Springfield Water and Sewer Commission's standards at the contractors expense. The Contractor, Department of Public Works, and Springfield Water and Sewer Commission shall agree on any repair or replacement necessary prior to the repair or replacement taking place.

The provision in no way shall excuse the Contractor from careless acts, negligence or inappropriate construction methods, which cause damage to any Springfield Water and Sewer Commission property.

Please provide quote to perform each of the above items below:

<b>ITEM 7</b>	<b>SEWER MANHOLE FRAME AND COVER</b>		
	<b>REMOVED AND RESET</b>	<b>\$</b>	<b>EA</b>
<b>ITEM 8</b>	<b>SEWER MANHOLE FRAME AND COVER</b>		
	<b>REMOVED AND STACKED</b>	<b>\$</b>	<b>EA</b>
<b>ITEM 9</b>	<b>SEWER MANHOLE FRAME AND COVER INSTALLED</b>	<b>\$</b>	<b>EA</b>

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# Springfield Water and Sewer Commission

## Guidelines and Policies

### CHAPTER 9 WATER PUMP STATIONS

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# Springfield Water and Sewer Commission

## Guidelines and Policies

### CHAPTER 10 CROSS CONNECTION DEVICES

#### Section 10.1 General

1. Cross Connection Devices provided to the Springfield Water and Sewer Commission or Installers shall be manufactured, tested, inspected and delivered in full compliance with the Commission's Material Specifications.
2. The Cross Connection Devices shall conform to AWWA C-510 (most current revision) Standard for Double Check Valve Backflow Prevention Assembly and/or AWWA C-511 (most current revision) Standard for Reduced Pressure Principle Backflow Preventer.
  - (a) Devices are the back flow preventer only.
  - (b) Assemblies are from the manufacturer and include two isolation valves and the back flow preventer.
3. The Commission will determine the degree of hazard and type of back flow preventer required. The Owner shall hire a professional engineer to determine the size and flow capacity of the backflow preventer. The engineer or a fire suppression firm shall design the back flow preventer installation in accordance with the design engineer's requirements and these Guidelines and Policies.
4. Depending on the degree of health hazard the acceptable types of back flow prevention devices that may be installed for backflow prevention shall include air gap separation, reduced pressure zone backflow preventers, double check valve assemblies, atmospheric or pressure vacuum breakers, backflow preventers with intermediate atmospheric vents, and barometric loops.
  - (a) Degree of health hazard shall be as set forth in Massachusetts Drinking Water Regulations 310 CMR 22.22.
  - (b) List of locations that require approved BFP devices installed at the meter along with in plant protection at the point of use shall be as follows:
    - Nuclear reactors or other facilities where radioactive materials are used;
    - Sewage treatment plants and sewage pumping stations;
    - Piers, docks, marinas, shipyards;
    - Chemical plants;
    - Metal plating industries;
    - Hospitals, mortuaries, medical clinics, dental offices and clinics;



# Springfield Water and Sewer Commission

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- Laboratories, except when the Massachusetts Department of Environmental Protection (MDEP) or its Designee has made a specific determination that no health hazard exists on the premises and;
  - Other types of facilities as determined in writing by the MDEP or its Designee.
5. If continuous Water Service is necessary, two approved Backflow Prevention Devices shall be installed in a parallel installation, so that Water Service will not be interrupted during testing and maintenance operations.
    -
  6. Backflow Prevention Devices and assemblies shall be installed in a horizontal position at least three (3) to four (4) feet above the floor, eighteen (18) inches from any wall, ceiling, or other device and with clear access to the BFP device without any obstructions.
  7. Tightly closing shut off valves end shall be installed at each end of the BFP device, unless otherwise approved by the Commission.
  8. All metered installations such as, but not limited to, process plants, Commercial Customers, Industrial Customers and/or Combination services require the following connections:
    - (a) Less than 2-inch services shall have a Commission meter valve in accordance within accordance with the **New or Replacement Service Details (W-11.0 and 11.1)**
    - (b) 4-inch and larger assemblies after the flange entering the building shall have a building control valve that is a flange by flange (F x F) outside spindle and yoke (OS&Y) gate valve that is in accordance with the Commission's Material Specifications.
    - (c) 4-inch and larger services shall have a F x F and OS&Y gate valves on the inlet and outlet sides of the meter, pressure reducing valve, and the BFP device in accordance with the **Typical Ductile Iron Commercial and Industrial Service Details through Foundation Wall or Floor Details (W-13.14 or 13.15)**.
    - (d) The device shall have F x F connections on the inlet and outlet side of the device.
    - (e) The inlet and outlet sides of the device shall have F x F OS&Y gate valves on each side.
  9. Fire suppression systems shall have assemblies installed as follows:



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## Guidelines and Policies

- (a) Less than 2-inch shall have a Commission meter valve in accordance with the **New or Replacement Service Details (W-11.0 and 11.1)** and after the meter valve may have the device or assembly with ball valves or butterfly valves.
  - (b) Less than 2-inch the assembly valves and device may have threaded connections.
  - (c) 4-inch and larger assemblies after the flange entering the building shall have a building control valve that is an F x F OS&Y gate valve in accordance with the **Typical Ductile Iron Fire Service Details through Foundation Wall or Floor Details (W-13.11 or 13.12)**.
  - (d) An assembly or device with inlet and outlet shut-off valves shall be installed downstream of the building control valve.
  - (e) 4-inch and larger valves and devices may have all flange or grooved (Victaulic) connections, or some combination of both.
  - (f) All shut off valves for the device shall have tamper switches and open close indicators.
10. For all flange connections the connection hardware shall be 304 stainless steel which includes the bolt, nut, and two flat washers.
  11. For grooved connections, the hardware may be heat-treated plated carbon steel, track head meeting the physical and chemical requirements of ASTM A-449 and physical requirements of ASTM A-183.
  12. When the device or assembly is provided with a drain, the drain shall exit facility and shall not be connected to sewer.
  13. Metered Services and Fire Services shall be tested in accordance with Section 4.5.4 of these Guidelines and Policies.
  14. After testing is complete and the approved device or assembly is onsite and ready to install then the blank flange and ball valve used for testing may be removed and the shut-off valves and device or assembly may be installed.
  15. The Backflow Prevention Devices shall be protected from freezing, flooding, mechanical damage, vandalism, shall be easily accessible, and shall not have any stored goods, merchandise, materials, refuse, or installed equipment in a manner that will obstruct testing, inspection, and maintenance purposes unless otherwise approved by the Commission.





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16. Installation of a Backflow prevention device below grade in a pit or chamber is prohibited unless approved by the Commission and installed as provided in 310 CMR 22.22.
- (a) It is preferable that all Back Flow Prevention Devices be installed above grade, in buildings according to this Section of the Commission's Guidelines and Policies.
  - (b) When a Back Flow Prevention Device cannot be installed inside a building then it shall be installed above grade, in a heated enclosure in accordance with the **Typical Ductile Iron Fire Service Detail in a Hot Box (W-13.13)**.
  - (c) For seasonal services such as irrigation systems the enclosure may be unheated provided there is a maintenance plan to prevent the meter from freezing.
  - (d) Enclosures shall be set on concrete pads
    - 2-inch and smaller copper tube services the concrete pad shall be 5-feet long, 3-feet wide, and 6-inches thick with 3-inch sleeves on each end centered on the pad and 6-inches from each end.
    - For 4-inch and larger ductile iron water services or fire services
    - For 4-inch and larger ductile iron water services the pad shall be 6-inches larger than the required enclosure and as thick as the manufacturer requires.
    - All pads shall have the top surface at least 2-inch above finish grade and sloped outwards.
    - The enclosure shall be anchored to the pad with a minimum of four (4) 3/8-inch by 5-inch L anchors.
  - (e) Enclosures shall be provided in accordance with the SWSC's Material Specifications.

## Section 10.2 Acceptance of Backflow Preventers

### 10.2.1 Turn-ons

1. Water Services or Fire Services, other than Residential, shall not be Turned-on until they are inspected by the Commissions Cross Control Inspectors in accordance with Section 4.5 of these Guidelines and Policies, unless otherwise approved in writing by the Cross Connection Inspector.
2. Water Services and Fire Services shall only be Turned-on by a Commission employee after the Cross Connection Inspector has approved the Backflow Preventer.

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# Springfield Water and Sewer Commission

## Guidelines and Policies

### CHAPTER 11 SEWER MAINS AND APPURTENANCES

#### Section 11.1 Control of Work

##### 11.1.1 General

1. Failure to meet the requirements of these Guidelines and Policies and/or the Material Specifications for materials may result in removal of the pipe, fittings, and/or appurtenances from the construction site and the rejection of its use by the Commission.
2. The new or proposed sanitary sewer main shall be located in the street in accordance with **Utility Separation Detail (W-01.0)**.
3. The new or proposed sanitary sewer main shall be bedded and installed in accordance with the **Trench Detail (S-01.0)**.
4. Collection system sewer pipe shall be at least 8-inches in diameter, shall be Polyvinyl Chloride (PVC) Gravity Pipe as specified in the Commission's Material Specifications unless otherwise approved by the Commission's Engineering and Technical Services.
5. Pipe used for building sewer pipe shall be at least 6-inches in diameter, shall be PVC Gravity Pipe as specified in the Commission's Material Specifications unless otherwise approved by the Commission's Engineering and Technical Services.
6. All pipe furnished shall be either in 13-foot, 18-foot, or 20-foot lengths, unless otherwise approved by the Commission.
7. All pipe and fittings furnished shall be clearly marked on the outside indicating name, manufacturer, nominal diameter, ASTM, schedule, and/or pipe or pressure class designation.
8. Typical collection system sewer pipe and building sewer pipe installations shall be as follows, unless otherwise approved by the Commission:
  - (a) Collection system sewer pipe and building sewer pipe with less than 4-feet of cover shall be insulated cement lined thickness class 52 ductile iron pipe, bitumastic coated inside and out and as specified in the Commission's Material Specifications. Commission approval is required prior to the installation of sewer main with less than 4-feet of cover.
  - (b) Collection system sewer pipe and building sewer pipe 4-feet to 15-feet of cover: shall be PVC standard dimension ration (SDR) 35 minimum, with a minimum pipe stiffness of 46 PSI. Pipe up to 15-inches in diameter shall



# Springfield Water and Sewer Commission

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conform to ASTM 3034 and pipe 18-inches in diameter or larger shall conform to ASTM F679, and as specified in the Commission's Material Specifications, unless otherwise approved by the Commission.

- (c) Collection system sewer pipe and building sewer pipe deeper than 15-feet, but less than 30-feet deep: shall be PVC SDR 26 thick wall minimum, with a minimum pipe stiffness of 115 PSI. Pipe up to 15-inches in diameter shall conform to ASTM 3034 and pipe 18-inches in diameter or larger shall conform to ASTM F679, and as specified in the Commission's Material Specifications, unless otherwise approved by the Commission.
  - (d) Collection system sewer pipe and building sewer pipe deeper than 30-feet: shall be approved by the Commission prior to installation.
9. Other pipes for Collection system sewer pipe and building sewer pipe installation that are acceptable to the Commission, but must be approved for use, are as follows:
- (a) Ductile Iron Pipe (DIP) as specified in the Commission's Material Specifications for water main installation and in CHAPTER 6 of these guidelines and Policies.
  - (b) Reinforced Concrete Pipe (RCP) as specified in the Commission's Material Specifications.
  - (c) High Density Polyethylene Pipe (HDPEP) as specified in the Commission's Material Specifications.
10. All pipes for collection system sewer pipe and building sewer pipe installation shall be the same material from manhole to manhole and/or building to main.
11. All pipes shall be laid at the grade, depth, and as indicated on the approved plans. Inspections cannot take place unless a set of approved plans are at the construction site.
12. Manholes shall be in accordance with Pre-cast Concrete Sewer Manhole and Pipe Connection Details (S 02.0, S-02.1, S-02.2, S-02.3, S-02.4, and S-02.5).
13. When new or proposed sanitary sewer main or other utility crosses a water main or other utility requiring protection, the main shall be encased in concrete and installed in accordance with the Utility Crossing Detail (S-03.0), unless otherwise approved by the Commission.
14. Commission Construction Crews and Installers shall restore or install pavement in accordance with CHAPTER 8 of these Guidelines and Policies, unless otherwise approved by the Commission.



# Springfield Water and Sewer Commission

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15. Commission Construction Crews shall notify the Commission Construction Crew responsible for pavement restoration the amount of pavement to be installed at the end of each week.

### 11.1.2 Labor, Materials, and Equipment

1. The Installer shall furnish labor, materials, and equipment that is appropriate to accomplish quality work in an efficient and timely manner. Sufficient resources must be committed to the work to ensure a rate of progress that will enable completion within established timelines.
2. All equipment requiring special licenses shall be operated only by persons who possesses a current, valid license for that piece of equipment

### 11.1.3 Private Land

1. The Commission Construction Crew or Installer will have to enter private land and private residences in order to accomplish the work. The Commission Construction Crew or Installer shall plan the work to ensure the Owner or the Owner's authorized representative is on site to permit the Commission Construction Crew or Installer and his/her employee's access to the premises.
2. The Commission Construction Crew or Installer must ensure that premises are left neat and clean after job completion.
3. In most homes and businesses, the Commission Construction Crew or Installer must take all necessary precautions to ensure that theft or damage does not occur during work activities.

### 11.1.4 Supervision

1. The Installer shall have, on site, at all times during the work activities, a full time competent Foreman who shall be in charge of the project. This Foreman shall be the agent for the Installer on site, and shall coordinate inspections, record keeping, future work, and other issues with the Field Inspector assigned by the Commission to okay and inspect the work.
2. The Installer shall notify the Commission in writing whenever there is a change in Foremen.

### 11.1.5 Existing Underground Utilities and Structures

1. The Commission Construction Crew or Installer shall refer to Section 5.3 of these Guidelines and Policies for more information concerning DIG SAFE.



# Springfield Water and Sewer Commission

## Guidelines and Policies

2. The Commission Construction Crew or Installer shall determine the location or absence of all underground utilities, and plan and conduct his work operations to ensure that those utilities shall not be damaged.
3. The Commission Construction Crew or Installer shall assume full responsibility for the protection of all buildings, structures, and utilities, public or private, including poles, signs, and services to buildings, mail boxes, utilities, gas pipes, water pipes, hydrants, sewers, drains, and cables, whether on private or public property.
4. Any damage resulting from the Installer's operations shall be repaired at the Installer's expense.

### 11.1.6 Delivery, Storage, and Handling

1. New pipe, fittings, and other appurtenances shall be delivered to the construction site as close in time to installation as possible.
2. All pipe shall be shipped with lifts separated by work separators such that, pipe to pipe contact is prevented during the transit and/or storage of the pipe.
3. Care shall be taken during the loading, trucking, unloading and handling of all pipe, fittings, and other appurtenances so as not to damage the materials or surrounding area.
  - (a) Pipe, fittings, and other appurtenances shall not be dropped directly from the truck to the ground.
  - (b) The Commission's Construction Crew or Installer is responsible for any pipe, fittings, and other appurtenances damaged during delivery, handling or storage.
  - (c) A pipe clamp with protective coating is a preferred means to handle pipe, but forks may be used during the unloading process provided care is taken not to damage the pipe. Forks shall not be used in the interior of the pipe to handle pipe.
  - (d) All damaged materials will be removed from the site immediately.
4. All pipe, fittings, and other appurtenances shall be stored in a manner that prevents water on the ground and / or animals from entering the material and prevent damage to the material and / or others' property.
5. All pipe and fittings shall be carefully lowered into the trench piece by piece by means of a boom, straps, or other suitable tools or equipment, in such a manner as to prevent damage to materials and protective coatings or linings.



# Springfield Water and Sewer Commission

## Guidelines and Policies

- (a) Under no circumstances shall chains be used or material be dropped or dumped into trench.
  - (b) Use of forks to handle pipe at construction sites is not allowed,
6. Pipe may not be strung along the line of work unless approved by a Commission representative. Materials must be stored in such a manner that it does not obstruct driveways, sidewalks, etc.
7. All pipe, fittings, and other appurtenances shall be stored in a manner that prevents water on the ground (run-off or puddles), debris, and/or animals from entering the material and prevent damage to the material and/or others' property.
- (a) Pipe may not be strung along the line of work unless approved by a Commission representative.
  - (b) Materials must be stored in such a manner that it does not obstruct driveways, sidewalks, etc.
  - (c) The Installer shall contact the Department of Public Works having jurisdiction to determine if it is permitted to string materials along the roadway of the work.
  - (d) Materials that have had water, debris, and/or animals will be removed from the site.
8. All pipe and fittings shall be carefully lowered into the trench piece by piece by means of a boom, straps, or other suitable tools or equipment, in such a manner as to prevent damage to materials and protective coatings or linings.
- (a) Under no circumstances shall chains be used, or material be dropped or dumped into trench.
  - (b) Use of forks to handle pipe at construction sites is not allowed. Unless approved by the Commission.

### 11.1.7 Trenching

1. Excavate trench to ensure sides of trench are stable. Slope trench walls or provide support in conformance with the CHAPTER 5 Safety of these Guidelines and Policies and the Commission's Health and Safety Policies.
2. Do not lay or embed pipe in standing or running water. At all times, prevent runoff and/or surface water from entering trench.
3. When ground water is present in the work area, dewater trench area to maintain stability of existing trench and imported materials. The water level shall be

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maintained below pipe bedding and foundation of the trench to provide a stable trench bottom. Use, as appropriate, sump pumps, well points, deep wells, geofabrics, perforated under-drains, or stone blankets of sufficient thickness to remove and control water in the trench. Maintain and control water in the trench before, during, and after the pipe installation, until the embedment is installed and sufficient backfill has been placed to prevent flotation of the pipe.

4. Where trench walls are stable, or support is provided the minimum trench width shall be no greater than needed to perform the work properly and safely. The space between the trench wall and pipe shall be wider than the compaction equipment to be used in the pipe zone. Minimum trench width shall be the greater of: (1) 16-inches plus the diameter of the pipe installed or (2) the pipe diameter times 1.25 plus 12-inches.
5. When supports, such as those required in CHAPTER 5 of these Guidelines and Policies, are used then support of the pipe and embedment shall be maintained throughout the installation. The support shall be kept tight to against the trench wall to ensure the trench wall does not wash out.
6. When required by the Commission trench support shall be left in place but shall be cut off a minimum of 4-feet below finish grade.
7. Movable trench wall supports shall not disturb the installed pipe and its embedment when being moved. Embedment shall be compacted before trench wall supports are moved. When trench wall supports are moved finish placing and compacting embedment.

### Section 11.2 Product Installation - Polyvinyl Chloride (PVC) Sewer Pipe

1. Pipe installations shall conform to, but not limited to, these Guidelines and Policies, ASTM D2321, ASTM 3034, AWWA C-900, and AWWA C-905.
2. Comply with Section 11.1 of these Guidelines and Policies, the following shall be adhered to.

#### 11.2.1 Laying Polyvinyl Chloride (PVC) Sewer Pipe

1. Pipe and materials shall be provided with all necessary equipment and incidentals required to install and test PVC pipe and fittings for sewer conveyance uses.
2. PVC Pipe is not intended to be continuously stored in direct sunlight. The Contractor shall be responsible for providing an area, close to the area of work, to protect the PVC Pipe from damage due to direct sunlight exposure.



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3. Pipe shall be laid in accordance with **Trench Detail for Sewer Pipe (S-01.0)**.
4. Pipe and fittings shall be carefully cleaned with a dry cloth to remove all sand, mud, clay, oil, and/or ice to be left clean and dry. Every precaution shall be taken to prevent all foreign material from entering the pipe while it is being placed in the trench.
5. At times when pipe laying is not in progress, the open ends of the pipes shall be closed by a watertight plug or other means approved by the Commission's Authorized Field Representative. If water is in the trench, the seal shall remain in place until the trench is pumped dry. No pipe shall be laid in water or when, in the opinion of the Commission's Authorized Field Representative trench conditions are unsuitable.
6. Proper implements, tools, and facilities satisfactory to the Commission's Authorized Field Representative shall be provided and used by the Installer and/or the Commission's Construction Crew for the safe and convenient prosecution of the work.
7. All pipes shall be laid at the grade, depth, and as indicated on the approved Site Plans.
8. Pipe and fittings shall be placed in the trench with the invert conforming to the elevations, slope, and depth as indicated on the approved Site Plans. Bell holes shall be provided in the bedding to ensure uniform pipe support.
9. All pipe ends shall be marked to indicate the insertion stop position.
10. Push spigot into bell after properly applying lubricant according to jointing procedures below.

### 11.2.2 Jointing Polyvinyl Chloride (PVC) Sewer Pipe

1. Pipe shall be carefully jointed in conformity with the best practice and the detailed instructions of manufacturer.
2. All pipe ends shall be thoroughly cleaned prior to and during the jointing operation.
3. All joints shall be made with proper lubrication as specified by the manufacturer of the pipe.

### 11.2.3 Bedding and Backfilling Polyvinyl Chloride (PVC) Sewer Pipe

1. Pipe embedment and backfill shall be in accordance with **Trench Detail for Sewer Pipe (S-01.0)**.





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2. Pipe Bedding Material shall meet Class I ASTM D2321 embedment material that shall be  $\frac{3}{4}$ -inch crushed stone, according to the Commission's Material Specifications.
3. The pipe embedment material in the pipe zone shall be placed by hand and compacted under and around the pipe.
4. The pipe embedment material shall be placed in 6-inch layers above top of pipe and hand compact to a point 12-inches, minimum, above the top of pipe.
5. Materials placed in the Backfill Zone from the pipe embedment materials in the Pipe Zone shall be Common Borrow Fill, according to the Commission's Material Specifications and shall be mechanically compacted. Common Borrow Fill shall be free from large clods, rocks, and cinders.
6. Backfill shall be graded with the placement of suitable soil material, as determined by the Commission Representative, in 12-inch (maximum) layers compacted to 95% of the maximum density of the soil as determined by the Standard Proctor Test, AASHTO Designation T-99.
7. Any backfill area that does not conform to the above to the compaction requirement shall require the installation of ductile iron pipe, according to the Commission's Material Specifications, from manhole to manhole for sewer mains and along the entire service line run for Building Lateral Sewers.

### 11.2.4 Testing Polyvinyl Chloride (PVC) Sewer Pipe

1. The testing requirements for testing PVC sewer pipe are stated in the project specifications. Each Engineer will specify the type of tests required. The test could vary from a ball and cleaning test, a visual test, a leakage test, a low-pressure air test, infiltration or exfiltration test, or a pipe deflection test. Each test has its own specific methods. Testing is generally done between two consecutive manholes.
2. When testing, it is very important to make sure that the lines are clean. The ball test will usually accomplish this by flushing an appropriate size cleaning ball through the line.
3. Simple visual lamping with mirrors and lights can be used for visual tests, or a closed circuit television can also be used.
4. Leakage tests for sewer pipe shall be an air test in accordance with the following and the Standard Method for Pressure Testing Gravity Sewer Lines Form, attached in Section 0 of these Guidelines and Policies.



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- (a) It is extremely important that all branch connections be capped and secured before this type of test is attempted. Isolate the section of the sewer line to be tested by inflatable stoppers or other suitable test plugs.
  - (b) Plug or cap the ends of all branches, laterals, tees, wyes, and stubs to be included in the test to prevent air leakage. All plugs and caps shall be securely braced to prevent blow-out. One of the plugs or caps should have an inlet tap or other provision for connecting a hose to a portable air control source.
  - (c) Connect the air hose to the inlet tap and portable air control source. The air equipment shall consist of necessary valves and pressure gauges to control an oil-free air source and the rate at which air flows into the test section to enable monitoring of the air pressure within the test section.
  - (d) Air testing sewer line can be done with very low pressure. At no time will the air pressure exceed 5 PSI, unless otherwise approved by the Commission. Slowly introduce air into the section of pipe to be tested, until the air pressure is raised to approximately 4 psi and the test pipe section has stabilized. Disconnect the air supply and decrease the pressure to 3.5 psi before starting the test. Determine the time for a drop of 1 psi (3.5 psi to 2.5 psi), and compare this interval to the minimum specified pressure drop time from the following table to decide if the rate of air loss is within the allowable limits.
  - (e) Upon completion of the test, open the bleeder valve and allow all air to escape. Plugs should not be removed until all air pressure in the tested section has been reduced to atmospheric pressure.
5. Leakage tests may be infiltration and ex-filtration testing but shall be at the discretion of the Commission. Leakage will not exceed fifty gallons per inch of external pipe diameter per mile of pipe per day. Other requirements regarding level of water must be met to accomplish this kind of testing.
  6. Proper placement and compaction of the backfill material in the embedment zone of the pipe in the installation process is the key to maintaining minimum deflection.
  7. Deflection tests shall be taken at the discretion of the Commission with a proper size mandrel or sewer ball that is put through the pipe on a go or no-go basis. Again, it must be emphasized that to ensure accurate testing, the lines must be thoroughly cleaned prior to testing.
  8. In deflection testing, the maximum allowable pipe deflection (which is reducing the vertical inside diameter) is 7 1/2%.



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9. Other specific testing details may be found in the ASTM D-2321 Specification on the Standard Recommended Practice for Underground Installations of PVC Sewer Pipe, or in the PVC pipe installation chapter of the Handbook of PVC Pipe Design and Construction Manual published by the Uni-Bell Plastic Pipe Association.

### Section 11.3 Product Installation – Ductile Iron (DI) Pipe and Fittings

1. Pipe installations shall conform to, but not limited to, these Guidelines and Policies, ASTM A746-03, AWWA C-104, AWWA C-110, AWWA C150, AWWA C-151, and/or AWWA C153.
2. Comply with Section 11.1 of these Guidelines and Policies and the following shall be adhered to.

#### 11.3.1 Laying and Jointing Ductile Iron (DI) Pipe

1. No deflection at the joints is allowed.
2. Accept for the deflection requirement above, all new or proposed DI sanitary sewer main shall be installed in accordance with Section 6.2.1 of these Guidelines and Policies, unless otherwise approved by the Commission.

#### 11.3.2 Installing Ductile Iron (DI) Fittings

1. Restraint for push on joint pipe shall be "Locked-type" joints manufactured by the pipe and fitting manufacturer that utilize restraint independent of the joint gasket. Restraint for mechanical joint pipe shall use retainer glands for restraining joint. All restrained joints shall be suitable for the specified conditions and shall be as recommended by the manufacturer. The required lengths of restrained joints shall be as specified by the Commission.
2. Fittings shall have, as a minimum, the same pressure rating of a connecting pipe.
3. Closures shall be made with mechanical joint ductile iron solid sleeves and shall be located in straight runs of pipe at minimum cover outside the limits of restrained joint sections. Location of closures shall be as directed by the Commission.
4. In addition to the above, all new or proposed DI sanitary sewer fittings shall be installed in accordance with Section 6.2.7 of these Guidelines and Policies, unless otherwise approved by the Commission.



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### 11.3.3 Installing Couplings for use with Ductile Iron (DI) Pipe

All sleeve type couplings used in the installation or repair of new, existing, or proposed DI sanitary sewer main shall be installed in accordance with Section 6.2.10 of these Guidelines and Policies, unless otherwise approved by the Commission.

### 11.3.4 Bedding and Backfilling Ductile Iron (DI) Pipe and Fittings

All new or proposed DI sanitary sewer main shall be bedded and backfilled in accordance with Section 6.2.1 and Section 11.2.3 of these Guidelines and Policies, unless otherwise approved by the Commission.

### 11.3.5 Testing Ductile Iron (DI) Pipe and Fittings

All new or proposed DI sanitary sewer main shall be tested in accordance with Section 11.2.4 of these Guidelines and Policies, unless otherwise approved by the Commission.

## Section 11.4 Sanitary Sewer Manholes

### 11.4.1 General

1. Manholes installed in the Commission's collection system shall be in accordance with the following details:
  - (a) Pre-cast Concrete Sewer Manhole shall be installed in accordance with **Pre-cast Concrete Sewer Manhole Detail (S-02.0)**.
  - (b) Pre-cast Concrete Sewer Manhole Pipe Connections shall be installed in accordance with **Pre-cast Concrete Sewer Manhole Pipe Connections Detail (S-02.1)**.
  - (c) End of sewer mains shall terminate in a manhole. End of sewer mains shall be installed in accordance with **Pre-cast Concrete Sewer Manhole Detail (S-02.0)**, **Pre-cast Concrete Sewer Manhole Pipe Connections Detail (S-02.1)**, and **End of Sewer Main Detail (S-02.2)**.
  - (d) Connections to manholes requiring an external connection shall be installed in accordance with **External Drop Manhole Detail (S-02.3)**.
  - (e) Connections to manholes requiring an internal connection shall be installed in accordance with **Internal Drop Manhole Detail (S-02.4)**.
2. Pre-cast Concrete Manholes and all materials used in its construction and structures shall be constructed to the dimensions shown on the Design Drawings,



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as specified herein, and in accordance with the Commission's Material Specifications, unless otherwise approved by the Commission.

3. Pre-cast Manholes shall be provided in 4-foot, 5-foot, and 6-foot diameter in accordance with the Commission's Material Specifications. All other diameters must be approved by the Commission.
  - (a) The minimum diameter manhole allowed is 4-feet.



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(b) The maximum pipe diameter allowed is defined in the following table.

Diameter (feet)	Wall Thickness (inches)	Base Thickness (inches)	Max Pipe* (RCP) Diameter Allowed (inches)	Max Pipe* (DI/PVC) Diameter Allowed (inches)
4	5	6	18	24
5	6	8	30	36
6	7	8	36	48

\* Pipe diameter may vary depending on number of penetrations.

(c) Internal drop manholes, installed along sanitary sewer mains, shall be at least 6-feet in diameter.

(d) Internal drop manholes, installed for Building Sewer Connections, typically are not allowed, but may be considered on a case-by-case basis if other connection options are not feasible.

4. Pre-cast Concrete Manholes shall be at no more than 300-feet apart and at all changes in diameter, material, slope, and direction.

### 11.4.2 Pre-cast Concrete Manholes

1. Surfaces of Pre-cast Concrete Manholes and structures shall be painted with two coats of bituminous damp proofing at the rate of 30 to 60 sq ft per gallon, in accordance with manufacturer's instructions.
2. Pre-cast Concrete Manholes bases shall be placed on a bed of 12-inches of crushed stone  $\frac{3}{4}$ -inch. Manhole base grades shall be set so that any required grade adjustment to bring the manhole frame and cover to final grade does not exceed 8-in.
3. All work shall be protected at all times against flooding and/or flotation. Cast-in-place bases, if required, shall be constructed in accordance with the manufacturer's recommendations.
4. Pre-cast Concrete Manholes concrete barrel sections and structures shall be set plumb with a 1/4-in maximum out of plumb tolerance allowed. The inside of any leaking barrel section joint shall be caulked with lead wool or non-shrink grout to the satisfaction of the Commission or its representative.



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5. Jointing of Pre-cast Concrete Manholes sections and structures sections shall be accomplished with butyl rubber joint sealant gasket in accordance with the Commission's Materials Specifications installed at the bell and spigot joints of each section, unless otherwise approved by the Commission.
  - (a) All installation surfaces shall be clean and dry.
  - (b) Apply one (1) continuous bead of sealant around the periphery of the joint by pressing the bead firmly into place. Remove backing paper as the installation progresses.
  - (c) Use of primer is required when temperatures are below 40-degrees F and/or the concrete is damp.
  - (d) Extremely wet conditions require the installation to have two (2) beads applied in the same manner as above.
6. Seal tongue and groove joints of pre-cast manhole sections with rubber O-ring gasket installed per the manufacturer's instructions in a recessed groove.
7. The outside and inside joint of tongue and groove manhole sections shall be filled with non-shrink mortar and finished flush with the adjoining surfaces.
8. Joints shall be allowed to set for at least 14 hours before backfilling unless a shorter period is specifically approved by the Commission or its representative.
9. Holes required for handling in the concrete barrel sections shall be plugged with a non-shrinking grout, or concrete plugs in combination with non-shrinking grout. Finish flush on the inside.
10. Holes in pre-cast sections shall be cut to accommodate pipes prior to setting manhole sections in place to prevent jarring that may loosen the mortar joints.
11. Pre-cast manhole sections shall have a formed, tapered circular opening larger than the intended pipe size (outside diameter).
12. Integrally cast knockout panels shall be provided at locations where indicated by the Commission or shown on Design Drawings. Sizes shall be adequate for intended pipe sizes. Knockout panels shall have no steel reinforcing.
13. Backfill shall be laid and compacted carefully and evenly around manhole sections.
14. The Commission will visually inspect manholes for possible leaks before backfilling of manholes is allowed. All joints shall be sealed satisfactorily for the Commission.



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15. Connections into the manhole shall be in accordance with **Pre-cast Concrete Sewer Pipe Connection Details (S-02.1)** and the following:
  - (a) Flexible sleeve - Integrally cast sleeve in pre-cast manhole section or install sleeve in a formed or cored opening. Fasten pipe in sleeve with stainless steel clamp(s). Coat stainless steel clamp(s) with bituminous material to protect from corrosion.
  - (b) Grout in place - Grout around the pipe connection where a formed, tapered circular opening is larger than the pipe outside diameter.

### 11.4.3 Testing Pre-cast Concrete Manholes

1. Each manhole shall be tested for leakage. An exfiltration test or a vacuum test may be used.
2. The exfiltration test is as follows:
  - (a) Assemble manhole in place; fill and point all lifting holes and exterior joints within 6-feet of the ground surface with an approved non-shrinking mortar. Test prior to placing the shelf and invert and before filling and pointing the horizontal joints below 6-feet of depth. Lower ground water table below bottom of the manhole for the duration of the test. Plug all pipes and other openings into the manhole and brace to prevent blow out
  - (b) Fill manhole with water to the top of the cone section. If the excavation has not been backfilled and no water is observed moving down the surface of the manhole, then the manhole is satisfactorily watertight.
  - (c) If the manhole fails the initial test, necessary repairs shall be made with a non-shrink grout. Retesting as described below shall proceed until a satisfactory test is obtained.
3. The vacuum test in shall be accordance with the following and the Standard Method for Concrete Sewer Manhole Vacuum Test Form, attached in Section 15.1.7 of these Guidelines and Policies.
  - (a) After a manhole has been constructed, and before the frame and cover have been installed, the Contractor shall conduct a Manhole Acceptance Test using the following vacuum test procedure:
    - (b) Plug all lift holes with an approved non-shrink grout.
    - (c) Plug all pipes entering the manhole, taking care to securely brace the plug from being drawn into the manhole.





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- (d) The test head shall be placed at the inside of the top of the concrete cone section and the seal inflated in accordance with manufacturer's recommendations.
  - (e) Draw a vacuum of 10-inches of mercury (Hg) and shut off the vacuum pump. With the valves closed, the time shall be measured for the vacuum to drop to 9-inches. Use the following table to determine minimum test times for various manhole diameters and depths.
  - (f) If the manhole fails the initial test, necessary repairs shall be made with a non-shrink grout. Retesting shall proceed until a satisfactory test is obtained.
4. If the manhole excavation has been backfilled before the test, or if the test results, as described above are unsatisfactory to the Commission or its representative, then continue with the test as follows:
- (a) A period of time shall be permitted to allow for absorption. Following this period, refill manhole to the top of the cone, and allow at least 8-hours to pass. At the end of the test period, refill the manhole to the top of the cone again, measuring the volume of water added. Extrapolate the refill amount to a 24-hour leakage rate. The leakage for each manhole shall not exceed one gallon per vertical foot for a 24-hour period. If the manhole fails this requirement, but the leakage does not exceed three gallons per vertical foot per day, repairs by manufacturer recommended methods shall be made and as directed by the Commission. A retest shall follow. If leakage due to a defective section of joint exceeds three gallons per vertical foot per day, the manhole shall be rejected, replaced, and retested.
  - (b) No adjustment in the leakage allowance will be permitted for unknown causes such as leaking plugs, absorptions, etc. It will be assumed that all loss of water during the test is a result of leaks through the joints or through the concrete.
5. An infiltration test may be substituted for an exfiltration test if the ground water table is above the highest joint in the manhole. If there is no leakage into the manhole as determined by the Commission or its representative, the manhole will be considered water-tight. If the Commission is not satisfied, testing shall be performed as described above.
6. All new Pre-cast Concrete Manholes shall be thoroughly cleaned of all silt, debris, and foreign matter of any kind, prior to final inspections.

### 11.4.4 Brick Masonry:

1. In all manholes, the invert channel within the structure shall be an inverted arch with bricks laid as stretchers and on edge and so constructed as to conform in shape to the lower half of the pipe.



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2. In manholes, an arch shall be constructed over the inlet and outlet pipes with bricks laid as headers and on edge.
3. The shelf in the manholes shall consist of bricks laid flat and the top of the shelf shall be at the elevation of the top of the pipe, in accordance with **Pre-cast Concrete Sewer Manhole Detail (S-02.0)**, and shall be sloped toward the channel.

### 11.4.5 Manhole Frame and Cover:

1. Manhole frame and covers shall be installed in accordance with **Pre-cast Concrete Sewer Manhole Detail (S-02.0)**.
2. Pre-cast concrete grade rings and/or brick and non-shrink mortar shall be used to adjust manhole frame and cover to final grade.
3. The inside and outside of pre-cast concrete grade rings and/or brick shall be sealed with hydraulic cement.
4. Under no circumstances shall barrel blocks be allowed.
5. Castings shall be set in non-shrink grout. Non-shrink grout shall be placed all around casting to 4-inches above flange.
6. Castings shall be thoroughly cleaned and subject to hammer inspection.

## Section 11.5 Repair of Sewer Mains and Building Sewer Connections

1. Sewer Mains and Building Sewer Connections shall be repaired in accordance with **Building Sewer Connection and Sewer Main Repair Detail (S-04.0)**, unless otherwise approved by the Commission.
2. Sewer Mains and Building Sewer Connections repairs and all materials used in its construction and structures shall be constructed to the dimensions shown on the Design Drawings, as specified herein, and in accordance with the Commission's Material Specifications, unless otherwise approved by the Commission.



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### CHAPTER 12 BUILDING SEWER CONNECTIONS

#### 12.1.1 General

1. Typically, Building Sewer Connections installed in the Commission's collection system shall be connected to sewer mains and in accordance with the following details, unless otherwise approved by the Commission:
  - (a) Building Sewer Connections to be connected to an existing sewer main shall be installed in accordance with **Existing Sewer Main to Building Sewer Connection Detail (S-04.0)**.
  - (b) Building Sewer Connections to be connected to a new sewer main shall be installed in accordance with **New Sewer Main to Building Sewer Connection Detail (S-04.1)**.
  - (c) Building Sewer Connections longer than 100-feet require a clean out that shall be installed in accordance with **Clean Out with Sweep Detail (S-04.2)**.
  - (d) Building Sewer Connections to sewer mains 12-feet deep or greater require a chimney that shall be installed in accordance with **Building Sewer Connection with Chimney Detail (S-04.3)**.
  - (e) Building Sewer Connections that conflict with the location of a new or existing utility require an offset that shall be installed in accordance with **Building Sewer Connection to Sewer Main with Conflicts Detail (S-04.4)**.
2. The Commission may allow Building Sewer Connections that require an external drop connection into a Sanitary Sewer Manhole with prior approval from the Commission' E&TS and the following:
  - (a) Building Sewer Connections that require connection to a manhole shall be installed in accordance with **External Drop Manhole Detail (S-02.3)**, unless otherwise approved by the Commission.
  - (b) Building Sewer Connections that require an external drop manhole connection shall be installed in accordance with Section 11.4, unless otherwise approved by the Commission.
3. The Commission may allow Building Sewer Connections by an internal drop connection into a Sanitary Sewer manhole with prior approval from the Commission's E&TS and the following:
  - (a) Building Sewer Connections that require an internal drop connection, typically are not allowed, but may be considered on a case-by-case basis, and only if the other connection options are not feasible.

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- (b) Building Sewer Connections that require an internal drop connection shall be installed in accordance with **Internal Drop Manhole Detail (S-02.4)**, unless otherwise approved by the Commission.
  - (c) Building Sewer Connections that require an internal drop connection shall be installed in accordance with Section 11.4, unless otherwise approved by the Commission.
4. Building Sewer Connections and all materials used in its construction and structures shall be constructed to the dimensions shown on the Design Drawings, as specified herein, and in accordance with the Commission's Material Specifications, unless otherwise approved by the Commission.

### 12.1.2 Building Sewer Connections

1. Pipe used for building sewer pipe shall be at least 6-inches in diameter, shall be PVC Gravity Pipe as specified in the Commission's Material Specifications unless otherwise approved by the Commission's Engineering and Technical Services.
  - (a) All Building Sewer Connections shall be installed in accordance with these Guidelines and Policies and in accordance with the Massachusetts State Plumbing Code.
  - (b) When a conflict in minimum diameters exists these Guidelines and Policies shall govern.
2. Building Sewer Pipes running from the main sewer line to the building being serviced are installed in the same manner as the main line using proper installation procedures.
3. If main line full wyes have been installed, put the correct bend into the outlet of the wye and lay the service line to the building, making the connection at that point.
4. It is extremely important when making the connection to the main that proper bedding and compaction is done at the point of connection to prevent any movement, collapse, or deflection.
5. If the full wye has not been installed in the line, a saddle type wye must be installed on the pipe to gain entry for the service line. Care must be exercised when preparing the main line for this saddle.
6. The saddle wye has a unique centering ring feature. A template is provided which is placed on the main line and a hole cut to the exact size.



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7. When the hole is completed, use care to clean, making sure that no rough edges remain.
8. Stainless steel galvanized straps will be used to secure the wye in position after the solvent has been applied to the saddle and the pipe.
9. The fitting or bend needed to make the correct position of the service line can then be placed and the service line laid to the unit.
10. Typically, horizontal deflection on the Building Sewer Pipe shall not exceed 45-degrees.
  - (a) Each single 45-degree horizontal bend shall require a clean out up stream of the bend.
  - (b) Any combination of lesser bends that creates horizontal deflection(s) greater than 45-degrees shall require a clean out up stream of the bends for each 45-degrees of deflection.
11. The same method of carefully trenching, placing, and backfilling done on the main lines shall be in practice on the service lines.
12. Commission construction Crews and Installers shall restore or install pavement in accordance with CHAPTER 8 of these Guidelines and Policies, unless otherwise approved by the Commission.
13. Commission Construction Crews shall notify the Commission Construction Crew responsible for pavement restoration the amount of pavement to be installed at the end of each week.



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### CHAPTER 13 SEWER PUMP STATIONS

#### Section 13.1 **SUBMERSIBLE SEWAGE PUMP STATIONS**

##### 13.1.1 General

1. The submersible pumping station shall be provided in accordance with the Commission's Material Specifications, unless otherwise approved by the Commission.
2. All materials, equipment and incidentals required to install wastewater pumping stations shall be provided with all related interior piping and electrical works as specified herein and in accordance with the **Pre-cast Wet Well and Valve Vault Detail (S-06.0)**, unless otherwise approved by the Commission.
3. The Installer shall coordinate his/her operations and those of the supplier of the pumping station such that the site is excavated, and the stations materials delivered and installed in accordance with the manufacturer's recommendations.

##### 13.1.2 Pump Station Chambers – Wet Well and Valve Vault

1. The underground pump station chambers shall be of reinforced concrete construction, in accordance with the Commission's Material Specifications and provided in accordance with the **Pre-cast Wet Well and Valve Vault Detail (S-06.0)**, unless otherwise approved by the Commission.
2. The underground pump station chambers shall be installed as recommended by the manufacturer and/or as detailed by the design engineer.
3. Pre-cast concrete base shall be installed as recommended by the manufacturer and/or as detailed by the design engineer.
4. The valve vault shall be designed with a minimum internal vertical clearance of 7-feet.

##### 13.1.3 Pump Station Controls and Ancillary Equipment

1. The Pumps Station Controls and Ancillary Equipment shall be in accordance with the Commission's Material Specifications and provided in accordance with the **Pre-cast Wet Well and Valve Vault Detail (S-06.0)**, unless otherwise approved by the Commission.
2. Pumps Station Controls and Ancillary Equipment shall be installed as recommended by the manufacturer and/or detailed by the design engineer.



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### 13.1.4 Pump Station Control Panels

1. The Pumps Station Control Panels shall be in accordance with the Commission's Material Specifications and provided in accordance with the **Pre-cast Wet Well and Valve Vault Detail (S-06.0)**, unless otherwise approved by the Commission.
2. Pumps Station Control Panels shall be installed as recommended by the manufacturer and/or detailed by the design engineer.

### 13.1.5 Pump Station Communication System

1. The pump station shall be equipped with radio contact and SCADA system for relay of alarms and monitoring signals to pump station operator.
2. Radio/SCADA systems must be compatible with the Springfield Water and Sewer Commission Operator's system, namely United Water (UW). Contact UW at (413) 732-0293 for coordination of design/procurement of communications equipment.

### 13.1.6 Pump Station Piping and Valves

1. The Pump Station Piping and Valves shall be in accordance with the Commission's Material Specifications and provided in accordance with the **Pre-cast Wet Well and Valve Vault Detail (S-06.0)**, unless otherwise approved by the Commission.
2. Pump Station Piping and Valves shall be installed as recommended by the manufacturer and/or as detailed by the design engineer.
3. Ductile iron (DI) pipe shall be used for sewer pump station piping and shall be in accordance with the **Pre-cast Wet Well and Valve Vault Detail (S-06.0)** and as specified herein, unless otherwise approved by the Commission.

### 13.1.7 Pressure Gauges

1. The Pump Station Pressure Gauges shall be in accordance with the Commission's Material Specifications and provided in accordance with the **Pre-cast Wet Well and Valve Vault Detail (S-06.0)**, unless otherwise approved by the Commission.
2. Pump Station Pressure Gauges shall be installed as recommended by the manufacturer and/or as detailed by the design engineer.
3. Pump Station Pressure Gauges shall be installed in tapped holes provided in the discharge pipes located in the valve vault, upstream of each check valve.
4. Tapped holes shall be 1/4-inch NPT.

13.226

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# Springfield Water and Sewer Commission

## Guidelines and Policies

### 13.1.8 Vent

1. The Pump Station Vents shall be in accordance with the Commission's Material Specifications and provided in accordance with the **Pre-cast Wet Well and Valve Vault Detail (S-06.0)**, unless otherwise approved by the Commission.
2. Pump Station Vents shall be installed as recommended by the manufacturer and/or as detailed by the design engineer.
3. Pump Station Vents shall be located in the top section of the wet well with the inlet facing down and at least 3-feet above finish grade.

### 13.1.9 Emergency Power Generation

1. The Pump Station Emergency Power Generation shall be in accordance with the Commission's Material Specifications unless otherwise approved by the Commission.
2. Pump Station Vents shall be installed as recommended by the manufacturer and/or as detailed by the design engineer.
3. Pump station shall be equipped with a stand-by emergency power generation source.
4. The power generator housing shall consist of a concrete structure. Prefabricated housing units may be proposed for the Commission's consideration.
5. Type of fuel, storage capacity, and storage location shall be approved by the City of Springfield Fire Department.

### 13.1.10 Pump Station Site

1. Pump station site shall be protected by means suitable to prevent access to pump station structures, electric panels, fuel tank, etc.
2. At minimum, the site shall be enclosed by an 8-foot fence (6-feet of fence and 2-feet of barbed wire).
3. Adequate lighting shall be included in the design to ensure safety to operators at all access points to the station structures.
4. Site layout shall meet all City of Springfield zoning requirements.
5. Site layout shall include a minimum 10-foot width paved access ways to pump station entrance, vaults, generator building access doors, fuel tank, and other locations, if any, as directed by the Commission.





# Springfield Water and Sewer Commission

## Guidelines and Policies

6. Minimum clearance for fuel tank shall be in accordance with the City of Springfield Fire Department requirements and/or directive.
7. Signage shall conform to the Springfield Water and Sewer Commission requirements.

### **13.1.11 Submittals**

Submittals shall be in accordance with Section 4.1 of these Guidelines and Policies and in accordance with the Commission's Material Specifications.



# Springfield Water and Sewer Commission

## Guidelines and Policies

### CHAPTER 14 LOW PRESSURE SEWER PUMP STATIONS

#### Section 14.1 Low Pressure Sanitary Sewer (LPSS) Systems

##### 14.1.1 Low Pressure Sanitary Sewer – General

1. The LPSS main is the portion of the LPSS system collecting sewer service laterals and shall be located within the public right of way or within an easement granted, and formalized with the registry of deeds, to the Springfield Water and Sewer Commission (Commission).
2. LPSS mains shall include the LPSS main pipe, flushing cleanout manholes, main valves, service tees, and connection to an outlet manhole discharging to the existing gravity sewer system.
3. LPSS systems shall be designed by the project owner's professionally licensed consulting engineer and approved by the Commission.
4. All LPSS main installs shall be reviewed and inspected by the Commission.
5. Upon project completion, inspection, testing, acceptance, and the warranty period the Commission assumes ownership and operation of the LPSS main.
6. LPSS system layout shall be such that there is no vertical high point requiring an air relief valve.
7. All materials used for the pressure portion of these systems must be pressure rated at a minimum of 160 psi operating pressure and suitable for the wastewater environment and resistant to corrosion.
8. All metal components shall be 316 stainless steel and hardware shall be 304 stainless steel unless otherwise specified herein or approved by the Commission.

##### 14.1.2 Low Pressure Sanitary Sewer – Mains < 3 inch Diameter

1. LPSS pipe shall be provided in accordance with the Commission's Material Specifications and installed in accordance with the **Low Pressure Sanitary Sewer Pipe Trench Detail (S-09.2)**, and these Guidelines and Policies, unless otherwise approved by the Commission.
2. LPSS mains shall be installed in straight segments such that there are no horizontal alignment deviations. If a horizontal alignment change is required, a flushing manhole shall be installed at the horizontal alignment change in accordance with the **Low Pressure Sanitary Sewer Main Inline Flushing Detail (S-09.4)**, unless otherwise approved by the Commission.



# Springfield Water and Sewer Commission

## Guidelines and Policies

3. The discharge point of LPSS system shall be to a manhole on the exiting gravity wastewater collection system and may require replacement or upgrade of the Commission's exiting collection system, by the LPSS project owner, as determined by the Commission. The connection to the discharge point manhole shall be cored at same elevation as spring line of effluent gravity sewer pipe and a minimum of 2 inch annular space between LPSS. The cored hole shall be sealed watertight in accordance with the **Precast Concrete Sewer Pipe Connections Detail (S-02.1)**, unless otherwise approved by the Commission. The brick invert and shelf of manhole shall be configured /modified to channel flows from LPSS main toward gravity pipe.
4. The LPSS main shall have a service lateral tee and corporation stop installed along the frontage of each and every property it passes by regardless of who owns the property or property level of development. No additional future service taps or tee installations will be allowed along the main which are not part of the original system design, unless allowed by the Executive Director.
5. LPSS mains shall be hydrostatically tested at one and a half times the maximum designed operating pressure. No pressure drop will be allowed for the 2 hour test duration.
6. Minimum bury depth shall be 6 inches below the average frost depth (48 inch) for a total of 54 inches. Pipe that is not installed at least 54 inches deep must be insulated. Pre-insulated pipe shall be required if insulated segments exceed 40 feet in length. Insulated segments under 40 feet in length may utilize field applied insulation.
7. Pipe shall be stored on clean, level ground to prevent undue scratching or gouging of the pipe. If the pipe must be stacked for storage, such stacking should be in accordance with the pipe manufacturer's recommendations. The pipe should be handled in such a manner that it is not damaged by being dragged over sharp objects or cut by chokers or lifting equipment.
8. Segments of pipe having cuts or gouges in excess of 10 percent of the wall thickness of the pipe shall be cut out and removed. The undamaged portions of the pipe shall be rejoined using the butt fusion joining method. Sections of polyethylene pipe should be joined into continuous lengths on the job site above ground. The joining method shall be the butt-fusion method and shall be performed in strict accordance with the pipe manufacturer's recommendations. The butt-fusion equipment used in the joining procedure shall be capable of meeting all conditions recommended by the pipe manufacturer, including, but not limited to, fusion temperature, alignment, and fusion pressure.



# Springfield Water and Sewer Commission

## Guidelines and Policies

9. Fused segments of pipe shall be handled so as to avoid damage to the pipe. When lifting fused sections of pipe, chains or cable-type chokers should be avoided. Nylon slings are preferred. Spreader bars should be used when lifting long, fused sections. Care should be exercised to avoid cutting or gouging the pipe.
10. Assemble the compression fittings according to the fitting manufacturer's recommendations.
11. The trench and trench bottom should be constructed in accordance with ASTM D 2321. Embedment materials should be Class I, Class II or Class III materials as defined in ASTM D 2321. Bedding of the pipe should be performed in accordance with ASTM D 2321. Compaction should be as specified in ASTM D 2321.
12. Haunching and initial backfill should be as specified in ASTM D 2321 using Class I, Class II or Class III materials. In cases where a compaction of 85 percent Standard Proctor Density is not attainable, the Commission may wish to increase the SDR of the pipe to provide adequate stiffness. ASTM D 2321 sections titled "Minimum Cover for Load Application," "Use of Compaction Equipment" and "Removal of Trench Protection" shall apply, unless directed otherwise by the Commission.

### 14.1.3 Low Pressure Sewer System – Valves

1. Valves shall be sized to match LPSS main pipe diameter and shall be 316 stainless steel fully ported quarter turn ball valves, with a corrosion resistant handle and installed inside flushing manholes.

### 14.1.4 Inline Flushing Structure

1. The LPSS main shall include an inline flushing structure at every 500 feet of LPSS main installed and at all horizontal alignment changes. Flushing structures shall be located within the right of way and accessible by SWSC crews. Flushing structures shall not be within a driveway or in a location that would be impeded by snow storage.
2. All fittings and valves shall be restrained to the base of the structure using 3/4 inch 304 stainless steel rods set 3 inches into the base with anchoring epoxy, 304 stainless steel hardware, and 1/8 inch thick by 1 ½ inch thick anchor straps. Horizontal bends shall also be restrained with blocking/concrete against the interior walls of the structure.
3. Inline flushing structures shall be installed in accordance with the Low Pressure Sanitary Sewer Main Inline Flushing Structure Detail (S-09.4).



# Springfield Water and Sewer Commission

## Guidelines and Policies

### 14.1.5 Terminal Flushing Structure

1. The LPSS main shall include a terminal flushing structure at the lowest elevation end of each LPSS main line to flush out the pipe as needed for maintenance. Flushing structures shall be located within the right of way and accessible by SWSC crews. It shall not be within a driveway or in a location that would be impeded by snow storage.
2. All valves and fittings within the terminal flushing structure shall be restrained at every 18 inches minimum to the base of the structure using  $\frac{3}{4}$  inch 304 stainless steel rods set 3 inches into the base with anchoring epoxy, 304 stainless steel hardware, and  $\frac{1}{8}$  inch thick by  $1\frac{1}{2}$  inch thick anchor straps. The terminus of LPSS main pipe shall also be restrained with blocking/concrete against the interior wall of the structure.
3. Terminal flushing structures shall be installed in accordance with the **Low Pressure Sanitary Sewer Terminal Flushing Structure Detail (S-09.5)**.

### 14.1.6 Detectable Warning Tape

1. Detectable warning tape shall be installed 12-18 inches below grade to allow use of a metal detector for future field location during Dig Safe mark out. Detectable warning tape is required for all pressure sewer main installations.

## Section 14.2 Low Pressure Sanitary Sewer Services

### 14.2.1 Low Pressure Sanitary Sewer Services – General

1. LPSS service laterals are owned, operated, and maintained by the property Owner. This includes all service and maintenance of the grinder pump unit, service piping, electrical equipment, control system, and appurtenances.
2. A LPSS service lateral is the portion of the LPSS system between the LPSS or gravity sewer main and the building. The LPSS service lateral shall include gravity piping from the building to the sewage grinder pump/wetwell unit, sewage grinder pump/wetwell unit, low pressure service piping from the sewage grinder pump/wetwell unit, to the low pressure sewer main, lateral valve and lateral check valve, service valve at the service tee along the low pressure sewer main.
3. LPSS service laterals with grinder pumps in commercial, industrial, and dense residential complex applications shall be designed and specified by the project's professionally licensed Engineer of Record and approved by SWSC.



# Springfield Water and Sewer Commission

## Guidelines and Policies

4. LPSS service laterals with grinder pumps in low density residential applications, with up to two dwelling units, may be installed per the project owner's sewage grinder pump station's manufacturer and as approved by the SWSC.
5. LPSS service laterals shall be installed in accordance with the **LPSS Service Lateral Detail (S-09.3)**.
6. All LPSS service lateral installs shall be reviewed and inspected by SWSC.
7. It is the Owner's responsibility to not abuse the LPSS system by avoiding the disposal of materials which should not be introduced into a grinder pump system. These include but are not limited to: hazardous chemicals, flammable materials, gasoline, fats oils and grease, metal, sand, wood, cloth, cat litter, paint, sanitary products, floss, cleaning wipes, gravel, seafood shells, and syringes. Owner shall review their grinder pump system owner's manual for further information and details.
8. LPSS service laterals shall be hydrostatically tested at one and a half times the maximum system designed operating pressure. No pressure drop will be allowed for the 2 hour test duration.
9. All metal components shall be 316 stainless steel and hardware shall be 304 stainless steel unless otherwise specified herein or approved by the SWSC.

### 14.2.2 Low Pressure Sanitary Sewer Services – Laterals < 3 inch Diameter

1. Pipe and fitting material shall be one of the following SDR-21 PVC, Sch 40 PVC, or SDR-11 HDPE. Final determination of the type and size is the responsibility of the project owner's consulting engineer (MA P.E.) or the sewage grinder pump station's manufacturer and must be approved by the SWSC.
2. LPSS service laterals shall be hydrostatically tested at one and a half times the maximum system designed operating pressure. No pressure drop will be allowed for the 2 hour test duration.
3. Minimum bury depth shall be 6 inches below the average frost depth (48 inch) for a total of 54 inches. Pre-insulated pipe shall be required if insulated segments exceed 40 feet in length. Insulated segments under 40 feet in length may utilize field applied insulation.

### 14.2.3 Detectable Warning Tape

1. Detectable warning tape shall be installed 12-18 inches below grade to allow use of a metal detector for future field location during Dig Safe mark out. Detectable warning tape is required for all non-metal pressure sewer installations.



# Springfield Water and Sewer Commission

## Guidelines and Policies

### 14.2.4 LPSS Service Lateral Curb Stop and Check Valve Assembly

1. A 304 or 316 stainless steel curb stop/check valve assembly shall be located 2 feet from face of curb and within the public right of way. The curb stop shall have an integral IK operating nut and be fully ported. The check valve shall have a flapper hinge which seats completely at low back pressure. The assembly shall be specifically designed for use with HDPE and PVC pressure sewer piping with female NPT at each end.

### 14.2.5 LPSS Service Lateral Valve Box

1. Installed over the Curb Stop/Check Valve Assembly shall be a buffalo style service box. The service box shall be heavy cast iron extension (adjustable) type, slide style, with arch pattern base and a recessed cover. The arch pattern base shall accommodate a curb stop matching size of lateral pipe.
2. LPSS service lateral valve box shall be installed in accordance with the Low Pressure Sanitary Service / Main Valve Box in Non-paved Areas Detail (S-09.1).

## Section 14.3 Sewage Grinder Pump Station

### 14.3.1 Sewage Grinder Pump Station – General

1. This section is intended to establish the minimum criteria and requirements for private grinder pump stations installation on private property for sewer service for a location which cannot be served by gravity sewer.
2. The Owner is responsible for the design, procurement, delivery, installation, and maintenance of grinder pump station units.
3. Grinder pump stations shall conform to all state, federal, and local regulations, and meet accepted standards for plumbing equipment for use near residences. It shall be free from noise, odor, or health hazards, and shall have been tested by an independent laboratory to certify its capability to perform as specified in either individual or low pressure sewer system applications. As evidence of compliance with this requirement, the grinder pump shall bear the National Sanitation Foundation seal.
4. Sewage grinder pump stations and appurtenances are private structures that are to be owned, operated, and maintained by the property Owner.
5. The grinder pump station supplier, or manufacturer, and project Engineer of Record shall participate in the installation and start-up testing of the grinder pump station.



# Springfield Water and Sewer Commission

## Guidelines and Policies

6. The grinder pump station shall be installed on the Owner's property.

Last Modified: 04/09/2025 at 10:39AM EDT





**Springfield Water and Sewer Commission**  
**Guidelines and Policies**

**CHAPTER 15**      **FORMS**



# Springfield Water and Sewer Commission

## Guidelines and Policies

### 15.1.1 Commission Approved Contractor - Application Form

1. Date Application Submitted: \_\_\_\_\_
2. Type of Work to be Performed by Applicant:     Water     Sewer     Both
3. Application Fee must be submitted with this completed application. This fee is non-refundable. The fee may be paid with a check or money order.  
Application Fee:     \$250.00                      Received by: \_\_\_\_\_  
Renewal Fee:         \$100.00                      Received by: \_\_\_\_\_
4. Applicant's Company Name: \_\_\_\_\_

Owner: \_\_\_\_\_

Business Address: \_\_\_\_\_

\_\_\_\_\_

Office Contact: \_\_\_\_\_

Telephone Number: \_\_\_\_\_

Fax Number: \_\_\_\_\_

Email Address: \_\_\_\_\_

5. Applicant's Responsible Supervisors:

Name

Cellular Phone Number

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

15.237



# Springfield Water and Sewer Commission

## Guidelines and Policies

6. Please provide a narrative description of the following:

A. A brief company history indicating the Applicant has been in business for five (5) years installing and repairing water and/or sewer facilities.

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B. Briefly, discuss the Applicant's procedure and equipment for pressure testing water and sewer mains that indicate the Applicant's company has the proper equipment and method of work to successfully pressure test said mains and services in projects. Hiring of a subcontractor to perform the pressure test is allowed provided specific information about the subcontractor, such as Name, Company, Company's core business, address, phone number, name of responsible supervisor is submitted.

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# Springfield Water and Sewer Commission

## Guidelines and Policies

- C. Briefly, discuss the Applicant's procedure and equipment for disinfecting water mains and services that indicate the Applicant's company has the proper equipment and method of work to successfully disinfect said mains and services in projects. Hiring of a subcontractor to perform the disinfecting is allowed provided specific information about the subcontractor, such as Name, Company, Company's core business, address, phone number, name of responsible supervisor is submitted. (Required for water work only)

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- D. List any applicable licenses (MA Master or Journeyman Plumber or Drinking Water Operator – Distribution 2 or higher License)

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- E. Proof of Required Bonding

Bonding Company \_\_\_\_\_

Telephone Number \_\_\_\_\_

Contact Person \_\_\_\_\_

- If the Applicant does not have MA Master/Journeyman Plumber License or a Drinking Water Operator – Distribution 2 or higher License the Bond Amount shall be \$10,000.00

15.239



# Springfield Water and Sewer Commission

## Guidelines and Policies

- If the Applicant does have MA Master/Journeyman Plumber License or a Drinking Water Operator – Distribution 2 or higher License the Bond Amount shall be \$7,500.00
- If the Applicant does have both a MA Master/Journeyman Plumber License and a Drinking Water Operator – Distribution 2 or higher License the Bond Amount shall be \$5,000.00

### F. Proof of Required Insurance

Insurance Company \_\_\_\_\_

Telephone Number \_\_\_\_\_

Contact Person \_\_\_\_\_

- Workmen’s Compensation, Employer’s Liability Insurance, and Occupational Disease Insurance:
- Comprehensive General Liability Insurance: in an amount of not less than \$250,000.00 for bodily injury insurance and accidental death insurance for each occurrence and not less than \$100,000.00 for property damage insurance
- Automobile Public Liability Insurance in an amount of not less than \$250,000.00 for bodily injury insurance and accidental death insurance for each occurrence and not less than \$100,000.00 for property damage insurance.

### G. Sign and date the form titled “Indemnity” attached in the Form Section of these Guidelines and Policies.



# Springfield Water and Sewer Commission

## Guidelines and Policies

7. The Applicant shall provide references which shall list a minimum of five (5) Municipal projects that the Applicant has performed on Public Water Systems and/or Public Sewer, in the last five (5) years. The intent is to permit the Commission to contact parties for whom the Applicant has done Water System and/or Sewer System work in the immediate past. Start with your last or current project, detailing the immediate past five (5) projects. The reference is to include:

A. Most recent or current project:

Municipal Project: \_\_\_\_\_

Description of services provided: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Date the work was performed and date the work was completed: \_\_\_\_\_

Point of Contact and Desk Top Telephone:

\_\_\_\_\_

Address:

\_\_\_\_\_

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# Springfield Water and Sewer Commission

## Guidelines and Policies

B. Next recent or current project:

Municipal Project: \_\_\_\_\_

Description of services provided: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Date the work was performed and date the work was completed: \_\_\_\_\_

Point of Contact and Desk Top Telephone:

\_\_\_\_\_

Address:

\_\_\_\_\_

C. Next recent or current project:

Municipal Project: \_\_\_\_\_

Description of services provided: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Date the work was performed and date the work was completed: \_\_\_\_\_

Point of Contact and Desk Top Telephone:

\_\_\_\_\_

Address:

\_\_\_\_\_



# Springfield Water and Sewer Commission

## Guidelines and Policies

D. Next recent or current project:

Municipal Project: \_\_\_\_\_

Description of services provided: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Date the work was performed and date the work was completed: \_\_\_\_\_

Point of Contact and Desk Top Telephone:

\_\_\_\_\_

Address:

\_\_\_\_\_

E. Next recent or current project:

Municipal Project: \_\_\_\_\_

Description of services provided: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Date the work was performed and date the work was completed: \_\_\_\_\_

Point of Contact and Desk Top Telephone:

\_\_\_\_\_

Address:

\_\_\_\_\_





# Springfield Water and Sewer Commission

## Guidelines and Policies

### 15.1.2 Approved Contractor Safety Assurance Form

By signing this form, your company agrees to the following:

1. To abide by MGL Chapter 82 Sections 40 thru 40D also known as the Dig Safe Law.
2. The Commission is now part of DIG SAFE. Call 811 for mark out of Commission Facilities.
3. To abide by MGL Chapter 82A Section 1 also known as “Jackie’s’ Law”.
4. To have all equipment operators licensed by the MA Department of Public Safety.
5. To ensure that ALL employees of the Company engaged in excavations have read and are familiar with Federal Safety Standards promulgated by OSHA on excavations: 29 CFR 1926, Subpart P “Excavations”.

Failure to comply with the above requirements may result in the removal from the Commission Approved Contractor List.

Contractor Name: \_\_\_\_\_  
(PRINT FULL NAME)

Contractor Signature: \_\_\_\_\_ Date \_\_\_\_\_



# Springfield Water and Sewer Commission

## Guidelines and Policies

### 15.1.3 Indemnity Form

The Commission Approved Contractor (Installer) shall save and hold harmless, indemnify, and defend the Springfield Water & Sewer Commission, its directors, officers, agents and employees from and against the following:

1. Any Liability, claim, suit, cost, loss, expense, fine, or damage of any kind allegedly suffered, incurred or threatened, either directly or through a third party, arising from the construction or installation of the Work including personal injury; death; property damage; inverse condemnation; patent and/or copyright infringement; damages arising from disputes as to licensing fees or the ownership of any land associated with the matters covered by this Agreement, any and all damages arising from the imposition of regulatory fines imposed for the violation of local ordinances, administrative regulations, or the like, in connection with the Work; or any combination of these, and regardless of whether or not such liability, claim, suit, cost, loss, expense, fine, or damage was unforeseeable at any time before acceptance of the improvements as completed, and including the defense of any suit(s), or other proceeding(s) concerning same.
2. The indemnification shall extend to and include any act or omission (negligent or no negligent) in connection with the matters covered by this Permit and attributable to the Owner, contractor, subcontractor, material supplier, or any officer, agent or employee of one or more of them, including, but not limited to, actions related to the construction, testing and connection of the Work and the ownership or use of real property.
3. Non-conditions: The covenants set forth in this Section are not conditioned or dependent on whether or not the Springfield Water & Sewer Commission has prepared, supplied, accepted, or approved any plan(s) or specification(s) in connection with this Work or has insurance or other indemnification covering any of these matters.

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Contractor's Signature

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Date



# Springfield Water and Sewer Commission

## Guidelines and Policies

### 15.1.4 License Agreement Form

See next five (5) pages.



# Springfield Water and Sewer Commission

## Guidelines and Policies

### LICENSE AGREEMENT SANITARY SEWER MAIN EXTENSION AND/OR WATER MAIN EXTENSION

Revised October 3, 2007

Agreement made this \_\_\_\_\_ day of \_\_\_\_\_ 2008 by and between the SPRINGFIELD WATER AND SEWER COMMISSION (hereinafter referred to as the "COMMISSION"), a body politic incorporate and political subdivision of the Commonwealth of Massachusetts, with its offices at the 250 M St. Ext., Agawam, MA 01001, and

\_\_\_\_\_ (herein after referred to as "OWNER").

WHEREAS, the Owner has applied to the Commission for permission to construct the following;

- \_\_\_\_\_ length in feet of 8-inch diameter Sanitary Sewer Main,
- \_\_\_\_\_ length in feet of 10-inch diameter Sanitary Sewer Main,
- \_\_\_\_\_ length in feet of 12-inch diameter Sanitary Sewer Main,
- \_\_\_\_\_ length in feet of    -inch diameter Sanitary Sewer Main,

and associated structures, as shown on the Plan and Profile entitled:

“ \_\_\_\_\_ ”

Scale: 1 inch =     feet                      Date: \_\_\_\_\_, 200   , revision    ,

Prepared by: \_\_\_\_\_,

\_\_\_\_\_ said Plan and Profile being on file with the Commission.

WHEREAS, the Owner has applied to the Commission for permission to construct the following,

- \_\_\_\_\_ length in feet of 6-inch diameter Water Main,
- \_\_\_\_\_ length in feet of 8-inch diameter Water Main,
- \_\_\_\_\_ length in feet of 12-inch diameter Water Main,
- \_\_\_\_\_ length in feet of    -inch diameter Water Main,
- \_\_\_\_\_ tons of asphalt for paving restoration,

and associated structures, as shown on the Plan and Profile entitled:

“ \_\_\_\_\_ ”

Scale: 1 inch =     feet                      Date: \_\_\_\_\_, 200   , revision    ,

Prepared by: \_\_\_\_\_,

\_\_\_\_\_ said Plan and Profile being on file with the Commission.

15.247



# Springfield Water and Sewer Commission

## Guidelines and Policies

NOW, THEREFORE, in consideration of the grant of this license, the Owner agrees that the installation works shall comply with the Commission's latest version of the Rules and Regulations, Guidelines, Policies, and Specifications; and also meet the following key requirements:

1. To install said work in accordance with the approved Plans reviewed by the Commission.
2. To hire a Commission Approved Contractor(s) to install said work.
3. To notify the Commission a minimum of forty-eight (48) hours prior to commencing any activity, which requires Commission inspections and/or assistance.
4. To ensure all work requiring inspection gets inspected by a representative of the Commission.
5. To begin the installation of sewer and/or water pipe(s) called for on said Plans and Specifications, no later than two calendar years from date of Commission approval of said plans and specifications.
6. To indemnify, defend, and hold harmless the Commission, and all of its officers, agents and/or employees against all suits, claims or liability of every name and nature, for/or on account of any injuries to persons or damage to property arising out of, or in consequence of, any acts of the Owner in the performance of the work covered by this Agreement, whether by it/themselves, or its/their employees and/or sub-contractors, in respect of such injuries or damages sustained during the performance of, prior to the completion and acceptance of the installation, damage to property due to the Owner's construction means and methods, and restoration of property impacted by the Owner's performance of the work covered by this Agreement.
7. By entering into this License Agreement, the Commission makes no representation and grants no privileges or permits to the Owner to enter any private way for the purpose of installing said sanitary sewer and/or water main.
8. Any easements required for the construction, and / or continued operation of water and/or sewer main extensions shall be secured by the Owner, reviewed, and approved as to form and extents by the Commission as part of the License Agreement. Any easements through private property shall be in the name of the Owner during the construction and warranty period. Easements shall be recorded at the Hampden County Registry of deeds. After all mains are approved by the Commission, have completed the warranty period, and have been accepted by the Commission, shall be deeded to the Commission by the Owner. That deed shall be recorded in the Hampden County Registry of Deeds.



# Springfield Water and Sewer Commission

## Guidelines and Policies

9. The following shall apply with respect to both water and/or sewer main extensions:
- (a) A main is approved for use, when the installation of a Public Water Main and/or Public Sewer main has been properly installed, completed, and passed all required inspections and tests according to the Commission’s Guidelines and Policies.
  - (b) A main is accepted, and become property of the Commission, only after the main installation of a Public Water Main and/or Public Sewer main has been approved for use, the warranty period has ended, and the Commission has received the “As-Built” plans in according with the Commission’s Guidelines and Policies and any other required certification.
10. To furnish surety for Performance/Payment Bond and Maintenance Bond in the form of a Bond, Letter of Credit, or other Commission approved financial guarantee, made payable to the Springfield Water and Sewer Commission,

Description of Surety

Performance / Payment Bond (during construction period until all mains approved), in the amount of \_\_\_\_\_ dollars.

Bond No.                    –                    Company.  
\_\_\_\_\_  
(Bond Number & Surety Company)

Description of Surety

Maintenance Bond (after construction period from time of all main approvals until end of warranty period – one-year minimum), in the amount of \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ dollars.

+  
\_\_\_\_\_  
(Bond Number & Surety Company)

**NOTE: Originals of sureties shall be attached as part of this License Agreement for the Commission.**



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# Springfield Water and Sewer Commission

## Guidelines and Policies

11. Building sewer connection and sanitary main testing shall proceed as per the Commission's Guidelines and Policies, with key tasks summarized as follows:
- (a) The sanitary main shall be extended from the existing or proposed sanitary manhole at the existing public collection system. The connection between public and private systems shall be plugged until approved by the Commission. Sanitary Wyes for Building Sewer Connections shall be installed integral with the main line construction.
  - (b) Sanitary building sewer connections shall be stubbed out to street line, capped, braced, and marked at grade level so that all required testing procedures may occur. No Building Sewer Connections may be completed and tied into a service location until the sewer has passed all testing requirements and main is approved in writing by the Commission.
  - (c) Upon completion of the sanitary sewer and service stubs, said sewer shall be tested for infiltration-exfiltration (pressure test).
  - (d) A closed circuit television inspection of the sewer main shall be completed after the successful completion of the infiltration-exfiltration testing. Documentation of the results shall be submitted to the Commission by the Owner.
  - (e) Upon successful completion of all requirements above and as stated in the Commission's Rules and Regulations, Guidelines, and Policies, the sanitary main extension shall be approved for final connection with Building Sewer Connections. No service connections will be allowed to homes / buildings until the sanitary main is approved for use in writing by the Commission
12. Water main testing shall proceed as per the Commission's Guidelines and Policies, with key tasks summarized as follows.
- (a) Upon completion of the water main installation, said water main shall be tested for leaks (pressure test) prior to approval by the Commission.
  - (b) Upon successful completion of the leakage test, the water main shall be disinfected with liquid chlorine, flushed, and shall successfully pass two consecutive bacterial tests prior to approval of the water main by the Commission.
  - (c) Upon successful completion of all requirements above and as stated in the Commission's Rules and Regulations, Guidelines and Policies, the water main extension shall be approved for final connection with Water Services to buildings.



# Springfield Water and Sewer Commission

## Guidelines and Policies

13. In the event of a failure of water and/or sewer mains under any required testing, the Owner shall direct their contractor to remove and reinstall defective pipes and/or other system components and retest. All installation, repairs, and retesting shall take place at the Owner's expense.
14. If the Owner, or its contractor(s), fails to take needed prompt or corrective action during installation of the sewer and/or water pipe (in the opinion of the Executive Director of the Commission or authorized designees), the Commission shall make all repairs necessary or cause the same to be made. The cost for such repairs shall be paid by the Owner.
15. Upon successful completion of all sewer and water main testing requirements and approval of the water and sewer mains by the Commission, a minimum one year warranty period shall commence. If during the warranty period, defects become apparent, the Owner shall direct their contractor to effect repairs and replacements of defective pipes and other system components. Repairs and re-testing shall be required at the discretion of the Commission. The one year warranty period shall restart at the time of the completion of those repairs.

IN WITNESS WHEREOF, the Springfield Water and Sewer Commission and Owner have executed this Agreement on the day and year first above written.

### SPRINGFIELD WATER AND SEWER COMMISSION:

_____	_____
<b>Owner Signature</b>	<b>Executive Director Signature</b>
_____	_____
<b>Print Name and Title</b>	<b>Print Name</b>
_____	_____
<b>Print Date</b>	<b>Print Date</b>
_____	<u>250 M Street Extension, Agawam, MA 01001</u>
<b>Print Address</b>	<b>Print Address</b>
_____	<u>413-787-6256</u>
<b>Print Telephone Number</b>	<b>Print Telephone Number</b>

Attachments: Performance / Payment Bond – By Owner  
Maintenance Bond – By Owner



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# Springfield Water and Sewer Commission

## Guidelines and Policies

### 15.1.5 Inspection Form

Intentionally left blank for future use



# Springfield Water and Sewer Commission

## Guidelines and Policies

### 15.1.6 Standard Method for Pressure Testing Gravity Sewer Lines Form

Location \_\_\_\_\_  
 Test Date \_\_\_\_\_  
 Installed By \_\_\_\_\_  
 Test Performed By \_\_\_\_\_  
 Inspector \_\_\_\_\_

### ASTM Standard Method for Pressure Testing Gravity Sewer Lines

- a. Isolate the section of the sewer line to be tested by inflatable stoppers or other suitable test plugs.
- b. Plug or cap the ends of all branches, laterals, tees, wyes, and stubs to be included in the test to prevent air leakage. All plugs and caps shall be securely braced to prevent blow-out. One of the plugs or caps should have an inlet tap or other provision for connecting a hose to a portable air control source.
- c. Connect the air hose to the inlet tap and portable air control source. The air equipment shall consist of necessary valves and pressure gauges to control an oil-free air source and the rate at which air flows into the test section to enable monitoring of the air pressure within the test section.
- d. Slowly introduce air into the section of pipe to be tested, until the air pressure is raised to approximately 4 psi and the test pipe section has stabilized. Disconnect the air supply and decrease the pressure to 3.5 psi before starting the test. Determine the time for a drop of 1 psi (3.5 psi to 2.5 psi), and compare this interval to the minimum specified pressure drop time from the following table to decide if the rate of air loss is within the allowable limits.
- e. Upon completion of the test, open the bleeder valve and allow all air to escape. Plugs should not be removed until all air pressure in the tested section has been reduced to atmospheric pressure.

Pipe Dia. (in.)	Minimum Time (min:sec)	Length for Min. Time (ft.)	Time for Various Length (sec)	Specification Time for Length (L) Shown (in min:sec)							
				100ft.	150ft	200ft	250ft	300ft	350ft	400ft	450ft
4	3:46	597	0.380L	3:46	3:46	3:46	3:46	3:46	3:46	3:46	3:46
6	5:40	398	0.854L	5:40	5:40	5:40	5:40	5:40	5:40	5:42	6:24
8	7:34	298	1.520L	7:34	7:34	7:34	7:34	7:36	8:52	10:08	11:24
10	9:26	239	2.374L	9:26	9:26	9:26	9:53	11:52	13:51	15:49	17:48
12	11:20	199	3.418L	11:20	11:20	11:24	14:15	17:05	19:56	22:47	25:38
15	14:10	159	5.342L	14:10	14:10	17:48	22:15	26:42	31:09	35:36	40:04
18	17:00	133	7.692L	17:00	19:13	25:38	32:03	38:27	44:52	51:16	57:41
21	19:50	114	10.470L	19:50	26:10	34:54	43:37	52:21	61:00	69:48	78:31
24	22:40	99	13.674L	22:47	34:11	45:34	56:58	68:22	79:46	91:10	102:33

#### Test Information

Diameter of Test Section (in inches) \_\_\_\_\_ Length of Test Section (in feet) \_\_\_\_\_  
 Allowable time for drop to 2.5 psi \_\_\_\_\_  
 Actual time for drop to 2.5 psi \_\_\_\_\_

#### Test Results

**Passed** (actual time > allowable time) \_\_\_\_\_ **Failed** (allowable time > actual time) \_\_\_\_\_



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# Springfield Water and Sewer Commission

## Guidelines and Policies

### 15.1.7 Standard Method for Sewer Manhole Vacuum Test Form

Location \_\_\_\_\_  
Test Date \_\_\_\_\_  
Installed By \_\_\_\_\_  
Test Performed By \_\_\_\_\_  
Manhole Tested \_\_\_\_\_  
Inspector \_\_\_\_\_

### ASTM Standard Method for Concrete Sewer Manhole Vacuum Test

After a manhole has been constructed, and before the frame and cover have been installed, the Contractor shall conduct a Manhole Acceptance Test using the following vacuum test procedure:

Plug all lift holes with an approved non-shrink grout.

Plug all pipes entering the manhole, taking care to securely brace the plug from being drawn into the manhole.

The test head shall be placed at the inside of the top of the concrete cone section and the seal inflated in accordance with manufacturer's recommendations.

Draw a vacuum of 10 inches of mercury (Hg) and shut off the vacuum pump. With the valves closed, the time shall be measured for the vacuum to drop to 9 inches. Use the following table to determine minimum test times for various manhole diameters and depths.

If the manhole fails the initial test, necessary repairs shall be made with a non-shrink grout. Retesting shall proceed until a satisfactory test is obtained.

Depth (in Feet)	Diameter (in Inches)								
	30	33	36	42	48	54	60	66	72
8	11	12	14	17	20	23	26	29	33
10	14	15	18	21	25	29	33	36	41
12	17	18	21	25	30	35	39	43	49
14	20	21	25	30	35	41	46	51	57
16	22	24	39	34	40	46	52	58	67
18	25	27	32	38	45	52	59	65	73
20	28	30	35	42	50	53	65	72	81
22	31	33	39	46	55	64	72	79	89
24	33	36	42	51	59	64	78	87	97
26	36	39	46	55	64	75	85	94	105
28	39	42	49	59	69	81	91	101	113
30	42	45	53	63	74	87	98	108	121

### Test Information

Depth of Manhole (in feet & inches) \_\_\_\_\_ Diameter of Manhole (in inches) \_\_\_\_\_  
Allowable time for drop to 9-inches of Hg \_\_\_\_\_  
Actual time for drop to 9-inches of Hg \_\_\_\_\_

### Test Results

**Passed** (actual time > allowable time) \_\_\_\_\_ **Failed** (allowable time > actual time) \_\_\_\_\_

15.254 \_\_\_\_\_



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# Springfield Water and Sewer Commission

## Guidelines and Policies

### 15.1.8 Application for Crossing Water Transmission Mains

**Applicant Name:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Address:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Telephone Number:** \_\_\_\_\_ **Fax Number:** \_\_\_\_\_

**Cellular Number:** \_\_\_\_\_ **Other Number:** \_\_\_\_\_

**Project Engineer Name:** \_\_\_\_\_

**Address:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Telephone Number:** \_\_\_\_\_ **Fax Number:** \_\_\_\_\_

**Cellular Number:** \_\_\_\_\_ **Other Number:** \_\_\_\_\_

**Address:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Location of Project:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Type of Crossing:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

15.255



# Springfield Water and Sewer Commission

## Guidelines and Policies

Other Alternatives Reviewed: \_\_\_\_\_

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<b>Attachments:</b>	<b><u>Yes</u></b>	<b><u>No</u></b>
Signed/Stamped Plans:	_____	_____
Location Maps:	_____	_____
Project Description:	_____	_____
Material Specifications:	_____	_____
Permitting Requirements:	_____	_____
Other:	_____	_____

**By Commission:**

**Reviewer's Name:** \_\_\_\_\_ **Date:** \_\_\_\_\_

	<b><u>Yes</u></b>	<b><u>No</u></b>
Crossing less than 18-inches below Grade (\$1,500)	_____	_____
Crossing greater than 18-inches below Grade (\$5000)	_____	_____
Crossing Under Transmission Main (\$10,000)	_____	_____

**Reviewer's Comments:** \_\_\_\_\_

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# Springfield Water and Sewer Commission

## Guidelines and Policies

### 15.1.9 Fire Flow Test Form

<b>STATIC &amp; RESIDUAL HYDRANT:</b>		
<b>HYD#:</b>	<b>TYPE:</b>	<b>MAIN SIZE:</b>
<b>STREET NAME</b>		
<b>LOCATION</b>		
<b>PRESSURE</b>	<b>GAUGE</b>	<b>OBSERVER</b>
<b>STATIC</b>		
<b>RESIDUAL</b>		

<b>DATE</b> _____
<b>TIME</b> _____
<b>TEMP.</b> _____
<b>WEATHER</b> _____
<b>WO #</b> _____

**FLOW HYDRANT(S):**

HYDRANT NUMBER, TYPE, STREET NAME, AND LOCATION	MAIN SIZE IN INCHES	GAUGE NUMBER	NOZZLE SIZE IN INCHES	NUMBER OF NOZZLES	NOZZLE COEFFICIENT (0.9, 0.8, OR 0.7)	PITO READING OR PRESSURE IN PSI	FLOW IN GPMS	OBSERVER

**FIRE FLOW TEST RESULTS**

**FLOW DURING TEST** \_\_\_\_\_ in GPM      **TIME FLOWED** \_\_\_\_\_ in minutes  
**AVAILABLE @ 20 PSI** \_\_\_\_\_ in GPM      **TOTAL FLOWED** \_\_\_\_\_ in gallons

**REMARKS:** \_\_\_\_\_

**SPRINGFIELD WATER & SEWER INSPECTOR:** \_\_\_\_\_



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# Springfield Water and Sewer Commission

## Guidelines and Policies

### 15.1.10 Fire Flow Discharge Table – Coefficient of Nozzle (C) = 0.9

Note: all discharges in Gallons per Minute (GPM) and all flows rounded to nearest GPM

Diameter of Nozzle	<u>2-3/8-inch</u>	<u>2-7/16-inch</u>	<u>2-1/2-inch</u>	<u>2-9/16-inch</u>	<u>2-5/8-inch</u>	<u>4-1/2-inch</u>
Pitot Gauge reading in PSI	2.375	2.4375	2.5	2.5625	2.625	4.5
1	151	160	168	176	185	544
2	214	226	237	249	262	769
3	262	276	291	305	320	942
4	303	319	336	353	370	1087
5	339	357	375	394	414	1216
6	371	391	411	432	453	1332
7	401	422	444	466	489	1438
8	428	451	475	499	523	1538
9	454	479	503	529	555	1631
10	479	504	531	557	585	1719
11	502	529	557	585	614	1803
12	525	553	581	611	641	1883
13	546	575	605	636	667	1960
14	567	597	628	660	692	2034
15	587	618	650	683	716	2106
16	606	638	671	705	740	2175
17	624	658	692	727	763	2242
18	642	677	712	748	785	2307
19	660	695	731	768	806	2370
20	677	713	750	788	827	2431
22	710	748	787	827	868	2550
24	742	781	822	864	906	2663
26	772	813	856	899	943	2772
28	801	844	888	933	979	2877
30	829	874	919	966	1013	2978
32	857	902	949	997	1046	3075
34	883	930	978	1028	1079	3170
36	909	957	1007	1058	1110	3262
38	934	983	1034	1087	1140	3351
40	958	1009	1061	1115	1170	3438
42	981	1034	1087	1142	1199	3523
44	1004	1058	1113	1169	1227	3606
46	1027	1082	1138	1196	1255	3687
48	1049	1105	1163	1221	1282	3767
50	1071	1128	1186	1247	1308	3844
52	1092	1150	1210	1271	1334	3920

**C=0.09**

15.258



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# Springfield Water and Sewer Commission

## Guidelines and Policies

Diameter of Nozzle	<u>2-3/8-inch</u>	<u>2-7/16-inch</u>	<u>2-1/2-inch</u>	<u>2-9/16-inch</u>	<u>2-5/8-inch</u>	<u>4-1/2-inch</u>
<b>Pitot Gauge reading in PSI</b>	2.375	2.4375	2.5	2.5625	2.625	4.5
54	1113	1172	1233	1295	1359	3995
56	1133	1194	1256	1319	1384	4068
58	1153	1215	1278	1343	1409	4140
60	1173	1236	1300	1366	1433	4211
62	1192	1256	1321	1388	1457	4281
64	1211	1276	1342	1410	1480	4349
66	1230	1296	1363	1432	1503	4417
68	1249	1315	1384	1454	1525	4483
70	1267	1335	1404	1475	1548	4549
72	1285	1353	1424	1496	1570	4613
74	1303	1372	1443	1516	1591	4677
76	1320	1391	1463	1537	1613	4739
78	1337	1409	1482	1557	1634	4801
80	1354	1427	1501	1577	1655	4863
82	1371	1444	1519	1596	1675	4923
84	1388	1462	1538	1616	1695	4983
86	1404	1479	1556	1635	1716	5042
88	1421	1496	1574	1654	1735	5100
90	1437	1513	1592	1672	1755	5158
92	1453	1530	1609	1691	1774	5215
94	1468	1546	1627	1709	1794	5271
96	1484	1563	1644	1727	1813	5327
98	1499	1579	1661	1745	1831	5382
100	1514	1595	1678	1763	1850	5437
102	1529	1611	1695	1780	1868	5491
104	1544	1627	1711	1798	1887	5544
106	1559	1642	1728	1815	1905	5597
108	1574	1658	1744	1832	1922	5650
110	1588	1673	1760	1849	1940	5702
112	1603	1688	1776	1866	1958	5753
114	1617	1703	1792	1882	1975	5805
116	1631	1718	1807	1899	1992	5855
118	1645	1733	1823	1915	2010	5906
120	1659	1747	1838	1931	2026	5955
122	1673	1762	1853	1947	2043	6005
124	1686	1776	1868	1963	2060	6054
126	1700	1790	1883	1979	2077	6102
128	1713	1805	1898	1994	2093	6151
130	1727	1819	1913	2010	2109	6199

C = 0.9



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# Springfield Water and Sewer Commission

## Guidelines and Policies

Diameter of Nozzle	<u>2-3/8-inch</u>	<u>2-7/16-inch</u>	<u>2-1/2-inch</u>	<u>2-9/16-inch</u>	<u>2-5/8-inch</u>	<u>4-1/2-inch</u>
Pitot Gauge reading in PSI	2.375	2.4375	2.5	2.5625	2.625	4.5
132	1740	1833	1928	2025	2125	6246
134	1753	1846	1942	2041	2141	6293
136	1766	1860	1957	2056	2157	6340
138	1779	1874	1971	2071	2173	6386
140	1792	1887	1985	2086	2189	6433
142	1805	1901	1999	2101	2204	6478
144	1817	1914	2014	2115	2220	6524
146	1830	1927	2027	2130	2235	6569
148	1842	1941	2041	2145	2251	6614
150	1855	1954	2055	2159	2266	6658
152	1867	1967	2069	2173	2281	6703
154	1879	1979	2082	2188	2296	6747
156	1891	1992	2096	2202	2311	6790
158	1903	2005	2109	2216	2325	6834
160	1916	2018	2122	2230	2340	6877



# Springfield Water and Sewer Commission

## Guidelines and Policies

### 15.1.11 Fire Flow Discharge Table – Coefficient of Nozzle = 0.8

Note: all discharges in Gallons per Minute (GPM) and all flows rounded to nearest GPM

Diameter of Nozzle	<u>2-3/8-inch</u>	<u>2-7/16-inch</u>	<u>2-1/2-inch</u>	<u>2-9/16-inch</u>	<u>2-5/8-inch</u>	<u>4-1/2-inch</u>
Pitot Gauge reading in PSI	2.375	2.4375	2.5	2.5625	2.625	4.5
1	135	142	149	157	164	483
2	190	201	211	222	233	683
3	233	246	258	271	285	837
4	269	284	298	313	329	966
5	301	317	334	350	368	1081
6	330	347	365	384	403	1184
7	356	375	395	415	435	1279
8	381	401	422	443	465	1367
9	404	425	447	470	493	1450
10	426	448	472	496	520	1528
11	446	470	495	520	545	1603
12	466	491	517	543	570	1674
13	485	511	538	565	593	1742
14	504	531	558	586	615	1808
15	521	549	578	607	637	1872
16	538	567	597	627	658	1933
17	555	585	615	646	678	1992
18	571	602	633	665	698	2050
19	587	618	650	683	717	2106
20	602	634	667	701	735	2161
22	631	665	700	735	771	2267
24	659	695	731	768	806	2367
26	686	723	761	799	838	2464
28	712	750	789	829	870	2557
30	737	777	817	858	901	2647
32	761	802	844	886	930	2734
34	785	827	870	914	959	2818
36	808	851	895	940	987	2899
38	830	874	919	966	1014	2979
40	851	897	943	991	1040	3056
42	872	919	967	1016	1066	3132
44	893	941	989	1039	1091	3205
46	913	962	1012	1063	1115	3278
48	933	982	1033	1086	1139	3348
50	952	1003	1055	1108	1163	3417
52	971	1022	1076	1130	1186	3485

C = 0.8

15.261



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# Springfield Water and Sewer Commission

## Guidelines and Policies

Diameter of Nozzle	<u>2-3/8-inch</u>	<u>2-7/16-inch</u>	<u>2-1/2-inch</u>	<u>2-9/16-inch</u>	<u>2-5/8-inch</u>	<u>4-1/2-inch</u>
Pitot Gauge reading in PSI	2.375	2.4375	2.5	2.5625	2.625	4.5
54	989	1042	1096	1152	1208	3551
56	1007	1061	1116	1173	1231	3616
58	1025	1080	1136	1193	1252	3680
60	1043	1098	1155	1214	1274	3743
62	1060	1116	1174	1234	1295	3805
64	1077	1134	1193	1254	1316	3866
66	1094	1152	1212	1273	1336	3926
68	1110	1169	1230	1292	1356	3985
70	1126	1186	1248	1311	1376	4043
72	1142	1203	1266	1330	1395	4100
74	1158	1220	1283	1348	1415	4157
76	1173	1236	1300	1366	1434	4213
78	1189	1252	1317	1384	1452	4268
80	1204	1268	1334	1402	1471	4322
82	1219	1284	1351	1419	1489	4376
84	1234	1299	1367	1436	1507	4429
86	1248	1315	1383	1453	1525	4481
88	1263	1330	1399	1470	1543	4533
90	1277	1345	1415	1487	1560	4584
92	1291	1360	1431	1503	1577	4635
94	1305	1375	1446	1519	1594	4685
96	1319	1389	1461	1535	1611	4735
98	1333	1404	1477	1551	1628	4784
100	1346	1418	1492	1567	1644	4832
102	1359	1432	1506	1583	1661	4881
104	1373	1446	1521	1598	1677	4928
106	1386	1460	1536	1613	1693	4975
108	1399	1473	1550	1628	1709	5022
110	1412	1487	1564	1643	1725	5068
112	1425	1501	1578	1658	1740	5114
114	1437	1514	1592	1673	1756	5160
116	1450	1527	1606	1688	1771	5205
118	1462	1540	1620	1702	1786	5249
120	1475	1553	1634	1717	1801	5294
122	1487	1566	1647	1731	1816	5338
124	1499	1579	1661	1745	1831	5381
126	1511	1592	1674	1759	1846	5424
128	1523	1604	1687	1773	1860	5467
130	1535	1617	1701	1787	1875	5510

C = 0.8

15.262



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# Springfield Water and Sewer Commission

## Guidelines and Policies

Diameter of Nozzle	<u>2-3/8-inch</u>	<u>2-7/16-inch</u>	<u>2-1/2-inch</u>	<u>2-9/16-inch</u>	<u>2-5/8-inch</u>	<u>4-1/2-inch</u>
Pitot Gauge reading in PSI	2.375	2.4375	2.5	2.5625	2.625	4.5
132	1547	1629	1714	1800	1889	5552
134	1558	1641	1727	1814	1904	5594
136	1570	1653	1739	1827	1918	5636
138	1581	1666	1752	1841	1932	5677
140	1593	1678	1765	1854	1946	5718
142	1604	1690	1777	1867	1960	5759
144	1615	1701	1790	1880	1973	5799
146	1626	1713	1802	1893	1987	5839
148	1638	1725	1814	1906	2000	5879
150	1649	1737	1827	1919	2014	5919
152	1660	1748	1839	1932	2027	5958
154	1670	1760	1851	1945	2041	5997
156	1681	1771	1863	1957	2054	6036
158	1692	1782	1875	1970	2067	6074
160	1703	1793	1887	1982	2080	6113

C = 0.8

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# Springfield Water and Sewer Commission

## Guidelines and Policies

### 15.1.12 Fire Flow Discharge Table – Coefficient of Nozzle = 0.7

Note: all discharges in Gallons per Minute (GPM) and all flows rounded to nearest GPM

Diameter of Nozzle	<u>2-3/8-inch</u>	<u>2-7/16-inch</u>	<u>2-1/2-inch</u>	<u>2-9/16-inch</u>	<u>2-5/8-inch</u>	<u>4-1/2-inch</u>
Pitot Gauge reading in PSI	2.375	2.4375	2.5	2.5625	2.625	4.5
1	118	124	131	137	144	423
2	167	175	185	194	203	598
3	204	215	226	237	249	732
4	236	248	261	274	288	846
5	263	277	292	307	322	945
6	289	304	320	336	352	1036
7	312	328	345	363	381	1119
8	333	351	369	388	407	1196
9	353	372	392	411	432	1269
10	372	392	413	434	455	1337
11	391	411	433	455	477	1402
12	408	430	452	475	498	1465
13	425	447	471	494	519	1525
14	441	464	488	513	538	1582
15	456	480	505	531	557	1638
16	471	496	522	548	576	1691
17	486	512	538	565	593	1743
18	500	526	554	582	610	1794
19	513	541	569	598	627	1843
20	527	555	584	613	643	1891
22	552	582	612	643	675	1983
24	577	608	639	672	705	2071
26	601	633	665	699	734	2156
28	623	656	691	726	761	2237
30	645	680	715	751	788	2316
32	666	702	738	776	814	2392
34	687	723	761	800	839	2466
36	707	744	783	823	863	2537
38	726	765	804	845	887	2607
40	745	785	825	867	910	2674
42	763	804	846	889	932	2740
44	781	823	866	910	954	2805
46	799	841	885	930	976	2868
48	816	860	904	950	997	2930
50	833	877	923	970	1017	2990
52	849	895	941	989	1038	3049
54	866	912	959	1008	1057	3107

C = 0.7

15.264



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# Springfield Water and Sewer Commission

## Guidelines and Policies

Diameter of Nozzle	<u>2-3/8-inch</u>	<u>2-7/16-inch</u>	<u>2-1/2-inch</u>	<u>2-9/16-inch</u>	<u>2-5/8-inch</u>	<u>4-1/2-inch</u>
<b>Pitot Gauge reading in PSI</b>	2.375	2.4375	2.5	2.5625	2.625	4.5
56	881	928	977	1026	1077	3164
58	897	945	994	1044	1096	3220
60	912	961	1011	1062	1115	3275
62	927	977	1028	1080	1133	3329
64	942	993	1044	1097	1151	3383
66	957	1008	1060	1114	1169	3435
68	971	1023	1076	1131	1186	3487
70	985	1038	1092	1147	1204	3538
72	999	1053	1107	1163	1221	3588
74	1013	1067	1123	1179	1238	3637
76	1027	1082	1138	1195	1254	3686
78	1040	1096	1153	1211	1271	3734
80	1053	1110	1167	1226	1287	3782
82	1067	1123	1182	1242	1303	3829
84	1079	1137	1196	1257	1319	3875
86	1092	1151	1210	1272	1334	3921
88	1105	1164	1224	1286	1350	3967
90	1117	1177	1238	1301	1365	4011
92	1130	1190	1252	1315	1380	4056
94	1142	1203	1265	1329	1395	4100
96	1154	1216	1279	1343	1410	4143
98	1166	1228	1292	1357	1424	4186
100	1178	1241	1305	1371	1439	4228
102	1190	1253	1318	1385	1453	4270
104	1201	1265	1331	1398	1467	4312
106	1213	1277	1344	1412	1481	4353
108	1224	1289	1356	1425	1495	4394
110	1235	1301	1369	1438	1509	4435
112	1246	1313	1381	1451	1523	4475
114	1258	1325	1393	1464	1536	4515
116	1269	1336	1406	1477	1550	4554
118	1279	1348	1418	1489	1563	4593
120	1290	1359	1430	1502	1576	4632
122	1301	1370	1441	1514	1589	4670
124	1312	1382	1453	1527	1602	4709
126	1322	1393	1465	1539	1615	4746
128	1333	1404	1477	1551	1628	4784
130	1343	1415	1488	1563	1641	4821
132	1353	1425	1499	1575	1653	4858

C = 0.7



# Springfield Water and Sewer Commission

## Guidelines and Policies

Diameter of Nozzle	<u>2-3/8-inch</u>	<u>2-7/16-inch</u>	<u>2-1/2-inch</u>	<u>2-9/16-inch</u>	<u>2-5/8-inch</u>	<u>4-1/2-inch</u>
<b>Pitot Gauge reading in PSI</b>	2.375	2.4375	2.5	2.5625	2.625	4.5
134	1363	1436	1511	1587	1666	4895
136	1374	1447	1522	1599	1678	4931
138	1384	1457	1533	1611	1690	4967
140	1394	1468	1544	1622	1702	5003
142	1404	1478	1555	1634	1715	5039
144	1413	1489	1566	1645	1727	5074
146	1423	1499	1577	1657	1739	5109
148	1433	1509	1588	1668	1750	5144
150	1443	1519	1598	1679	1762	5179
152	1452	1530	1609	1690	1774	5213
154	1462	1540	1620	1702	1786	5247
156	1471	1550	1630	1713	1797	5281
158	1480	1559	1640	1723	1809	5315
160	1490	1569	1651	1734	1820	5349

C = 0.7



# Springfield Water and Sewer Commission

## Guidelines and Policies

### 15.1.13 Values for Pressures Raised to the .54 Power

PSI	PSI RAISED TO THE .54 POWER	PSI	PSI RAISED TO THE .54 POWER	PSI	PSI RAISED TO THE .54 POWER	PSI	PSI RAISED TO THE .54 POWER
1	1.00	41	7.43	81	10.73	121	13.33
2	1.45	42	7.53	82	10.80	122	13.39
3	1.81	43	7.62	83	10.87	123	13.44
4	2.11	44	7.72	84	10.94	124	13.50
5	2.38	45	7.81	85	11.01	125	13.56
6	2.63	46	7.90	86	11.08	126	13.62
7	2.86	47	8.00	87	11.15	127	13.68
8	3.07	48	8.09	88	11.22	128	13.74
9	3.28	49	8.18	89	11.29	129	13.79
10	3.47	50	8.27	90	11.36	130	13.85
11	3.65	51	8.36	91	11.43	131	13.91
12	3.83	52	8.45	92	11.49	132	13.97
13	4.00	53	8.53	93	11.56	133	14.02
14	4.16	54	8.62	94	11.63	134	14.08
15	4.32	55	8.71	95	11.69	135	14.14
16	4.47	56	8.79	96	11.76	136	14.19
17	4.62	57	8.88	97	11.83	137	14.25
18	4.76	58	8.96	98	11.89	138	14.31
19	4.90	59	9.04	99	11.96	139	14.36
20	5.04	60	9.12	100	12.02	140	14.42
21	5.18	61	9.21	101	12.09	141	14.47
22	5.31	62	9.29	102	12.15	142	14.53
23	5.44	63	9.37	103	12.22	143	14.58
24	5.56	64	9.45	104	12.28	144	14.64
25	5.69	65	9.53	105	12.34	145	14.69
26	5.81	66	9.61	106	12.41	146	14.75
27	5.93	67	9.68	107	12.47	147	14.80
28	6.05	68	9.76	108	12.53	148	14.86
29	6.16	69	9.84	109	12.60	149	14.91
30	6.28	70	9.92	110	12.66	150	14.97
31	6.39	71	9.99	111	12.72	151	15.02
32	6.50	72	10.07	112	12.78	152	15.07
33	6.61	73	10.14	113	12.84	153	15.13
34	6.71	74	10.22	114	12.90	154	15.18
35	6.82	75	10.29	115	12.97	155	15.23
36	6.92	76	10.37	116	13.03	156	15.29
37	7.03	77	10.44	117	13.09	157	15.34
38	7.13	78	10.51	118	13.15	158	15.39
39	7.23	79	10.59	119	13.21	159	15.44
40	7.33	80	10.66	120	13.27	160	15.50

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# Springfield Water and Sewer Commission

## Guidelines and Policies

### CHAPTER 16 CROSSING COMMISSION TRANSMISSION MAINS, EASEMENTS, OR PROPERTY

#### 16.1.1 Description of Commission Transmission Mains

The following general descriptions of the three Transmission Mains are as follows:

1. BETWEEN WEST PARISH FILTRATION PLANT AND PROVIN MOUNTAIN:
  - (a) 42” Lock Bar Riveted Steel pipe, seven miles long, (1909) either 3/8” or 5/16” plate. Cement lined in 1960.
  - (b) 51 5/8” Welded Steel pipe [12,500 feet], fabricated from smaller sizes with Dresser Coupling Joints (1943) generally less than 1” wall thickness. Remainder of this main is 48” Welded Steel pipe [25,900 feet] with Dresser Coupling Joints (1948)
  - (c) 60” Lock Joint Prestressed Cylinder Pipe [39,000 feet] (1963) with 6” concrete wall.
2. BETWEEN PROVIN MOUNTAIN AND SPRINGFIELD:
  - (a) 42” Lock Bar Riveted Steel pipe five miles long through Agawam and West Springfield (1909) either 3/8” or 5/16” plate. Cement lined in 1960.
  - (b) 48” [2.5-miles] and 54” [3.4-miles] of Vianini Pre-Stressed Concrete Cylinder with push-on joints and about 6” wall thickness installed 2014 and [0.3-miles] of Electrically Welded Steel pipe with riveted girth generally less than 1” wall thickness installed in 1928 and C&L in 2014. The Right of Way through Agawam is owned by the Commission.
  - (c) 60” Lock Joint Prestressed Cylinder Pipe five miles long through Agawam and West Springfield (1957) with 6” concrete wall. The right of way for this Main is generally thirty feet.

#### 16.1.2 Application Procedure for Crossing Commission Transmission Mains

1. The Applicant should contact the Commission’s Engineering and Technical Services indicating the location and general nature of the proposed crossing. This initial contact should include why this crossing is needed and should discuss what other locations or alternatives have been investigated which would be possible without the necessity of crossing the Commission’s transmission mains, easements, or property.



# Springfield Water and Sewer Commission

## Guidelines and Policies

2. In the event that the Applicant wishes to pursue the proposal, the Applicant will be required to complete the Application for Crossing Commission Transmission Mains, Easements, or Property, attached in Section 15.1.8 of these Guidelines and Policies. Payment of the application fee does not ensure that the proposed project will be approved by the Commission.
3. The following information will be required by the Application for Crossing Transmission Mains, Easements, and Property:
  - (a) Nature of the request including type of utility crossing, whether above or below the grade of the Transmission Main(s), type of material, sizes, and other pertinent information.
  - (b) Location maps, preferably Assessors Maps and USGS topographic maps, indicating the property in question for the crossing.
  - (c) Plan and profile, if available, showing relationship between Transmission Main(s) and proposed crossing and details of access to and use of Commission Property or easement and how said property or easement and transmissions main(s) shall be protected.
  - (d) Names, addresses, telephone and fax numbers of Applicant and Project Engineer.
  - (e) Discussion why Commission property or easements must be crossed and what other alternatives have been investigated by the Applicant which do not include crossing of the Commission's Transmission Mains.

### 16.1.3 Submittals Required to Crossing Commission Transmission Mains

1. The Applicant for Crossing of Commission Transmission Mains, Easements, or Property must submit a Proposed Site Plan(s) for review, comments, and potential approval by the Commission.
2. The Commission reviews Proposed Site Plan(s) and other plan(s), as appropriate to determine compliance with Commission Rules and Regulations, the Guidelines and Policies, and the Commission's Material Specifications.
3. The Applicant's engineer may contact the Commission for copies of records of existing water and sewer mains and services.
4. The Commission needs one (1) Proposed Site Plan for draft review and comment and after the draft is approved, five (5) Final Site Plans shall be submitted.



# Springfield Water and Sewer Commission

## Guidelines and Policies

5. A License Agreement(s), according to the Commission's Rules and Regulations shall be submitted after the Final Site Plan has been approved and before access or construction can begin.
6. The Commission, at its discretion, may require additional design requirements based on site conditions, capacity issues, existing infrastructure materials, and/or other unknown conditions.
7. No work or access shall commence prior to, or without, the written approval of the Commission. All approvals are solely at the discretion of the Commission.

### 16.1.4 Minimum Design Standards Required to Cross Commission Transmission Mains

1. Applicants will be required to dig test pits, witnessed by Commission Inspectors, to determine the actual location and depths of main(s).
2. Soil borings may also be required to determine the actual site conditions. Crossings, which involve all three of the Commission's Transmission Mains, shall be held to a higher standard to maintain structural integrity due to the potential for more catastrophic consequences of any failures.
3. Because of the Commission's requirement for clearance between the Transmission Mains and any other utility piping (as specified below) and because of the generally shallow cover (3-feet to 6-feet) over the Mains, the following requirements assume that all crossings are below the Transmission Mains. In certain site-specific locations, crossings may be technically possible above the Transmission Mains and would be reviewed by the Commission subject to the applicable requirements below; as well as, any other limitations pertinent to that site. The requirements listed below assume that all crossings are to be jacked; however, micro tunneling can be a viable option for Applicants to consider in some situations.
  - (a) Prior to the commencement of work, the contractor will be required to hire an experienced civil/geotechnical engineer to design the entire jacking operation, to include the dewatering design of the jacking and receiving pits, the steel sleeve, the jacks, the loads on the reaction box and the installation schedule. This design shall be submitted to the Commission on a stamped plan prior to the commencement of work.
  - (b) The Commission shall require that the following requirements be incorporated into bidding specifications and construction plans as appropriate:
  - (c) The Commission shall require all crossings to be jacked or micro tunneled under the water Transmission Mains.



# Springfield Water and Sewer Commission

## Guidelines and Policies

- (d) All sewer and water pipes shall be installed in a steel casting sleeve jacked beneath the water Transmission Mains. The contractor shall be required to perform any additional test pits as required at both sides of the casing sleeve to ensure familiarity with the soil and to determine the actual horizontal and vertical control and to locate any additional utilities which might be in the area. Based on the test pit results, the contractor shall adjust the alignment of the sleeve in the field to avoid any interference with the existing water lines or other utilities. The contractor shall determine the maximum clearance possible between the top of the steel sleeve and the actual bottom of the existing water Transmission Mains. Any potential field adjustments shall be reported to the Commission prior to commencing with the jacking operation.
- (e) The Commission requires a minimum of two (2) feet clearance between the top of the steel casing and the bottom of a Transmission Main. The Commission would prefer that any jacking under all three mains be conducted on the side of the main with the least amount of clearance.
- (f) Specifications for the work should include requiring the contractor to install sufficient dewatering wells to lower the groundwater at least two feet below the invert of the jacked sleeve. Observation wells need to be included to ensure that this is accomplished. It is important to ensure that materials are not washed into the proposed steel sleeve during installation. This could result in voids, ultimate settlement of the water mains, and potential rupture.
- (g) Before any work is begun within the limits of jacking, the contractor shall have assembled all material, tools and equipment which will be required. The Commission, local DPW, Town or City Engineers, abutters, and other interested parties shall be notified at least 72 hours, excluding weekends and holidays, prior to jacking so that representatives can be present during the jacking operation. When the contractor has started the jacking operation, the contractor will proceed in a continuous operation without stopping until the casing sleeve installation is complete.
- (h) Steel sleeve shall meet or exceed ASTM A252 Grade 2 and welded with AWS D1.1 Standards. The steel in the pipe must meet or exceed 35,000 psi minimum yield strength, and 60,000 psi minimum tensile strength. Pipe shall be in 20' 0" lengths beveled for welding and square end cut. Contractor shall submit pipe manufacturer certification to the Commission for review.
- (i) Sewer pipe shall meet requirements of AWWA C151 (Hub type) and gasket material shall meet AWWA C111 (Similar to American Fastite Joint pipe). Contractor shall submit to the Commission for review.
- (j) The contractor must use extreme caution when working around the existing Transmission Mains. Transmission Mains shall be protected from possible



# Springfield Water and Sewer Commission

## Guidelines and Policies

damage from contractors equipment. Crossing the mains with equipment is to be minimized and only with one inch, or greater, thick steel construction plates with a minimum size of 8' by 10' or other approved means of distributing loads shall be used to prevent heavy loads being placed directly on the pipelines. Extra heavy equipment may require removable concrete pads over the Main(s) as may be required by the Commission's Engineer. Any such crossing areas shall not be construed as a "construction highway" to other areas of the project.

- (k) The Applicant shall obtain from the appropriate local community Public Works Director or Engineer assurance that the proposed sewer or water main is sized to meet reasonably expected future demands. The purpose of this requirement is to ensure that another crossing of the Transmission Mains in the immediate area will not be required because of additional growth or subsequent subdivisions.
- (l) No construction, temporary work or grade changes shall be permitted on Commission property or easements unless and until a License Agreement is executed between the Commission and the Applicant.
- (m) Gravity sewers crossing under the Transmission Mains shall have concrete manhole structures constructed at the terminus of each end of the steel casing sleeve with suitable joint sealants and connections as designed by a Registered Professional Engineer. Suitable seals shall be provided around the pipes inside the manholes to prevent any liquids from "piping" around the casing sleeve under the Transmission Mains from the manhole. It is the preference that these manholes be constructed outside the property line or easement boundary where practical.
- (n) Gravity sewer lines may be shimmed to final plan grade and elevation by use of pressure treated lumber secured to the ductile iron pipe on four sides with steel bands. Flowable grout fill in a continuous pour shall be injected into the steel casing to fill all voids between the steel casing and the sewer pipe.
- (o) The Commission would prefer that pressurized sewers and water pipes not cross over, or under, its Transmission Mains due to the accelerated damages possible in the event of failure. The Commission reserves the right to institute stricter controls for these utility types.
- (p) Water mains crossing under the Transmission Mains shall have suitable valves located adjacent to the Commission's property line or easement boundary to allow for prompt shutdown in any future emergency. The intent is to lessen the flow from a third parties water main leak or rupture as promptly as possible to avoid total undermining of the Transmission Mains and catastrophic failure. Flowable grout fill in a continuous pour shall be injected into the steel casing to fill all voids between the steel casing and the ductile iron water pipe.



# Springfield Water and Sewer Commission

## Guidelines and Policies

- (q) In the event that rock or other obstructions hinder the advancement of the casing, the auger shall be removed and a manual attempt to remove the obstruction will be made. If it is determined that it is either unwise or impossible to remove an obstruction, the casing shall be filled with concrete grout and abandoned.
- (r) These guidelines have neither been approved by the Commissioners nor should they be construed as amending or altering the Policy adopted by the Commissioners relative to this issue. These guidelines are meant to provide additional initial guidance to prospective Applicants and indicate the types of specific requirements which will be incorporated into any approvals for such crossings, including any Plans and Specifications developed by Project Applicants' Engineer(s). All parties to any crossing shall note that all approvals for crossings are made at the sole discretion of the Commission.
- (s) Upon receipt of the formal request for access as outlined in the "Procedure" section of the Commission Policy, the Commission will furnish location plan of Transmission Main(s) in question with approximate depth(s).

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# Springfield Water and Sewer Commission

## Guidelines and Policies

17.274

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Guidelines and Policies, Version 4: November 1, 2020



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## SWSC WATER AND SEWER STANDARD DETAILS

Last Modified: 04/09/2025 at 10:39AM EDT



# **SPRINGFIELD WATER AND SEWER COMMISSION**



## **STANDARD DETAILS**

**Version 4 – November 1, 2020  
Revised: August 12, 2021**

William E. Leonard, Commissioner  
Vanessa Otero, Commissioner  
Daniel Rodriguez, Commissioner





# Springfield Water and Sewer Commission

## Standard Detail Drawings

### WATER DETAILS

1. (W-01.0) UTILITY SEPERATION DETAIL
2. (W-02.0) NON-PAVED AREA TRENCH DETAIL
3. (W-02.1) TRENCH BACKFILLING-METHOD 1 FOR LUDLOW ROADWAYS
4. (W-02.2) TRENCH BACKFILLING-METHOD 2 FOR LUDLOW ROADWAYS
5. (W-02.3) TRENCH BACKFILLING-METHOD FOR ARTERIAL STREETS IN SPRINGFIELD
6. (W-02.4) TRENCH BACKFILLING-METHOD FOR RESIDENTIAL STREETS IN SPRINGFIELD
7. (W-02.5) TEMPORARY TRENCH BACKFILLING METHOD FOR ALL STREETS IN SPRINGFIELD AND LUDLOW EXCEPT ARTERIAL STREETS IN SPRINGFIELD
8. (W-02.6) TEMPORARY TRENCH BACKFILLING METHOD FOR ARTERIAL STREETS IN SPRINGFIELD
9. (W-03.0) STANDARD AIR VALVE ASSEMBLY DETAIL
10. (W-03.1) AIR VALVE ONE PIECE ASSEMBLY DETAIL 1
11. (W-03.2) AIR VALVE ONE PIECE ASSEMBLY DETAIL 2
12. (W-04.0) END OF MAIN
13. (W-04.1) END OF MAIN DETAIL
14. (W-05.0) STANDARD TEE INSTALLATION
15. (W-05.1) ALTERNATE 1 TEE INSTALLATION
16. (W-06.0) REPAIR TO EXISTING WATER MAINS
17. (W-06.1) INSTALL VALVE OR FITTING AT A DEAD END OF A WATER MAIN



# Springfield Water and Sewer Commission

## Standard Detail Drawings

18. (W-06.2) CUTTING-INTO EXISTING WATER MAIN TO REPLACE VALVE OR FITTING
19. (W-06.3) CUTTING-INTO EXISTING WATER MAIN WITH BELL FACING VALVE
20. (W-06.4) CUTTING-INTO EXISTING WATER MAIN WITH BELL FACING AWAY FROM VALVE
21. (W-06.5) CUTTING-INTO EXISTING WATER MAIN WITH NO BELL FOUND
22. (W-06.6) CONCRETE THRUST COLLAR
23. (W-06.7) SOCKET CLAMP DETAIL
24. (W-06.8) THREADED ROD DETAIL AND CONNECTION TO MJ DETAIL
25. (W-07.0) STANDARD FIRE HYDRANT ASSEMBLY
26. (W-07.1) ALTERNATE 1 FIRE HYDRANT ASSEMBLY
27. (W-07.2) ALTERNATE 2 FIRE HYDRANT ASSEMBLY
28. (W-07.3) RELOCATION OF FIRE HYDRANT ASSEMBLY (STRAIGHT BACK)
29. (W-08.0) VALVE BOX
30. (W-08.1) REPLACE, RAISE, OR RESET VALVE BOX
31. (W-08.2) RAISE VALVE BOX WITH RISER
32. (W-09.0) DUCTILE IRON TAPPING SLEEVE
33. (W-09.1) STAINLESS STEEL TAPPING SLEEVE
34. (W-10.0) FLUSHING DEVICE
35. (W-11.0) NEW WATER SERVICE
36. (W-11.1) REPLACEMENT WATER SERVICE
37. (W-11.2) WATER METER SEALING DETAIL
38. (W-11.3) PLASTIC METER PIT FOR 5/8" – 1" METERS



# Springfield Water and Sewer Commission

## Standard Detail Drawings

39. (W-11.4) PLASTIC METER PIT FOR 1-1/2" – 2" METERS
40. (W-11.5) TYPICAL YARD HYDRANT
41. (W-12.0) TYPICAL SERVICE BOX DETAIL IN PAVED AREAS
42. (W-12.1) TYPICAL SERVICE BOX DETAIL IN NON-PAVED AREAS
43. (W-12.2) REPLACE, RAISE, OR RESET SERVICE BOX DETAIL
44. (W-12.3) RAISE SERVICE BOX WITH RISER DETAIL
45. (W-13.0) METER VAULT PIPING
46. (W-13.1) LARGE METER INSTALLATION
47. (W-13.2) STANDARD METER PIT FOR DUCTILE IRON WATER SERVICE PIPE
48. (W-13.3) OVERSIZE METER PIT FOR DUCTILE IRON WATER SERVICE PIPE
49. (W-13.4) TYPICAL DUCTILE IRON WATER SERVICE DETAIL THROUGH FOUNDATION WALL
50. (W-13.5) TYPICAL DUCTILE IRON WATER SERVICE DETAIL THROUGH CONCRETE FLOOR
51. (W-13.6) 32 X 8-INCH FRAME ONLY
52. (W-13.7) 32-INCH STANDARD WATER COVER
53. (W-13.8) 24-INCH REPLACEMENT WATER COVER
54. (W-13.9) 26-INCH REPLACEMENT WATER COVER
55. (W-13.10) 32-INCH COMPOSITE LOCKING COVER
56. (W-13.11) TYPICAL DUCTILE IRON FIRE SERVICE DETAIL THROUGH FOUNDATION WALL
57. (W-13.12) TYPICAL DUCTILE IRON FIRE SERVICE DETAIL THROUGH CONCRETE FLOOR
58. (W-13.13) TYPICAL DUCTILE IRON FIRE SERVICE DETAIL IN A HOT BOX



# Springfield Water and Sewer Commission

## Standard Detail Drawings

- 59. (W-13.14) TYPICAL DIP COMMERCIAL & INDUSTRIAL SERVICE DETAIL THROUGH FOUNDATION WALL
- 60. (W-13.15) TYPICAL DIP COMMERCIAL & INDUSTRIAL SERVICE DETAIL THROUGH CONCRETE FLOOR
- 61. (W-14.0) THRUST BLOCK BEHIND FITTING
- 62. (W-14.1) THRUST BLOCKS
- 63. (W-15.0) RELATION OF VERTICAL DATUMS TO SPRINGFIELD CITY BASE DETAIL
- 64. (W-16.0) RECORD SKETCH DETAIL
- 65. (W-16.1) WATER SERVICE CARD DETAIL
- 66. (W-17.0) SEASONAL WATER SERVICE DETAIL
- 67. (W-17.1) SEASONAL WATER SERVICE BASE DETAIL
- 68. (W-17.2) SEASONAL WATER SERVICE COVER DETAIL

### SEWER DETAILS

- 69. (S-01.0) TRENCH DETAIL FOR SEWER PIPES
- 70. (S-02.0) PRECAST CONCRETE SEWER MANHOLE
- 71. (S-02.1) PRECAST CONCRETE SEWER PIPE CONNECTIONS
- 72. (S-02.2) END OF SEWER MAIN
- 73. (S-02.3) EXTERIOR DROP MANHOLE
- 74. (S-02.4) INTERIOR DROP MANHOLE
- 75. (S-02.51) 24-INCH X 4-INCH FRAME ONLY
- 76. (S-02.52) 24-INCH X 6-INCH FRAME ONLY
- 77. (S-02.53) 24-INCH X 8-INCH FRAME ONLY
- 78. (S-02.54) 26-INCH X 6-INCH FRAME ONLY
- 79. (S-02.55) 32-INCH X 6-INCH FRAME ONLY



# Springfield Water and Sewer Commission

## Standard Detail Drawings

- |      |           |  |
|------|-----------|--|
| 80.  | (S-02.56) | 32-INCH X 8 INCH FRAME ONLY  |
| 81.  | (S-02.61) | 24-INCH STANDARD SEWER COVER   |
| 82.  | (S-02.62) | 32-INCH STANDARD SEWER COVER   |
| 83.  | (S-02.63) | 26-INCH REPLACEMENT SEWER COVER  |
| 84.  | (S-02.64) | 30-INCH REPLACEMENT SEWER COVER  |
| 85.  | (S-02.65) | 24-INCH COMPOSITE LOCKING COVER  |
| 86.  | (S-02.66) | 32-INCH COMPOSITE LOCKING COVER  |
| 87.  | (S-03.0)  | UTILITY CROSSING DETAIL  |
| 88.  | (S-04.0)  | EXISTING SEWER MAIN TO BUILDING CONNECTION                             |
| 89.  | (S-04.1)  | NEW SEWER MAIN TO BUILDING CONNECTION                                  |
| 90.  | (S-04.2)  | CLEAN OUT WITH SWEEP   |
| 91.  | (S-04.3)  | SEWER SERVICE CONNECTION WITH CHIMNEY GREATER THAN 12 FT DEEP          |
| 92.  | (S-04.4)  | BUILDING CONNECTION TO SEWER MAIN WITH CONFLICTS                       |
| 93.  | (S-05.0)  | BUILDING AND MAINLINE SEWER REPAIR                                     |
| 94.  | (S-06.0)  | WETWELL AND VALVE VAULT PRECAST  |
| 95.  | (S-08.0)  | STANDARD EXTERNAL GREASE INTERCEPTOR                                   |
| 96.  | (S-09.1)  | LOW PRESSURE SANITARY SERVICE/MAIN 2-1/2" VALVE BOX IN NON-PAVED AREAS |
| 97.  | (S-09.2)  | LOW PRESSURE SANITARY SEWER PIPE TRENCH DETAIL                         |
| 98.  | (S-09.3)  | LPSS SERVICE LATERAL DETAIL  |
| 99.  | (S-09.4)  | LOW PRESSURE SANITARY SEWER MAIN INLINE FLUSHING STRUCTURE DETAIL      |
| 100. | (S-09.5)  | LOW PRESSURE SANITARY SEWER MAIN TERMINAL FLUSHING STRUCTURE DETAIL    |





# Springfield Water and Sewer Commission

## Standard Detail Drawings

### MAP DETAILS

- 101. (M-01.0) SPRINGFIELD WATER MAINS SERVICE AREA MAP
- 102. (M-02.0) LUDLOW WATER MAINS SERVICE AREA MAP
- 103. (M-03.0) WATER TRANSMISSION MAINS SERVICE AREA MAP COBBLE MOUNTAIN TO PROVIN MOUNTAIN
- 104. (M-03.1) WATER TRANSMISSION MAINS SERVICE AREA MAP PROVIN MOUNTAIN TO SPRINGFIELD
- 105. M-04.0) SPRINGFIELD SEWER MAINS SERVICE AREA MAP

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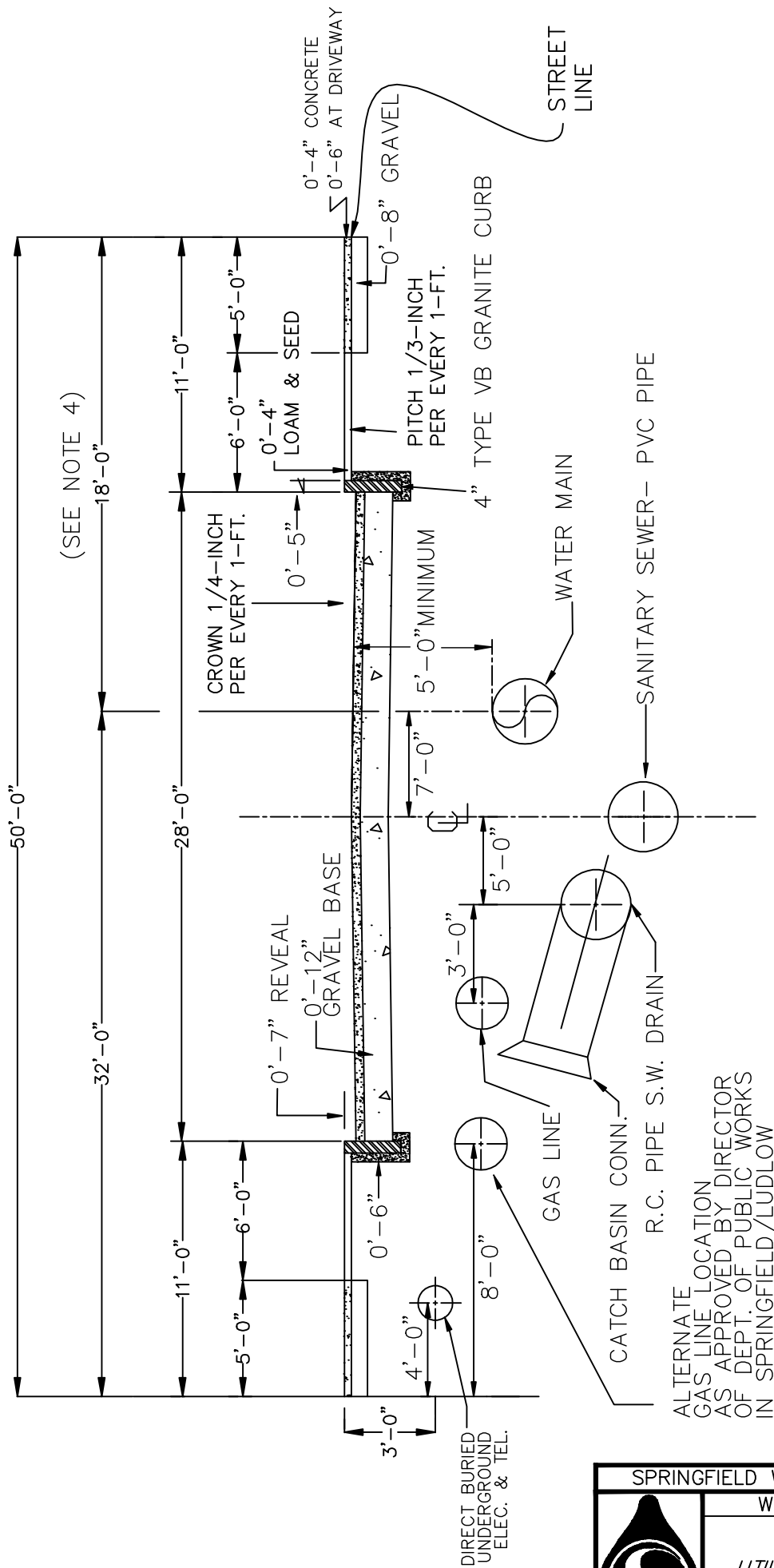


# Springfield Water and Sewer Commission

## Standard Detail Drawings

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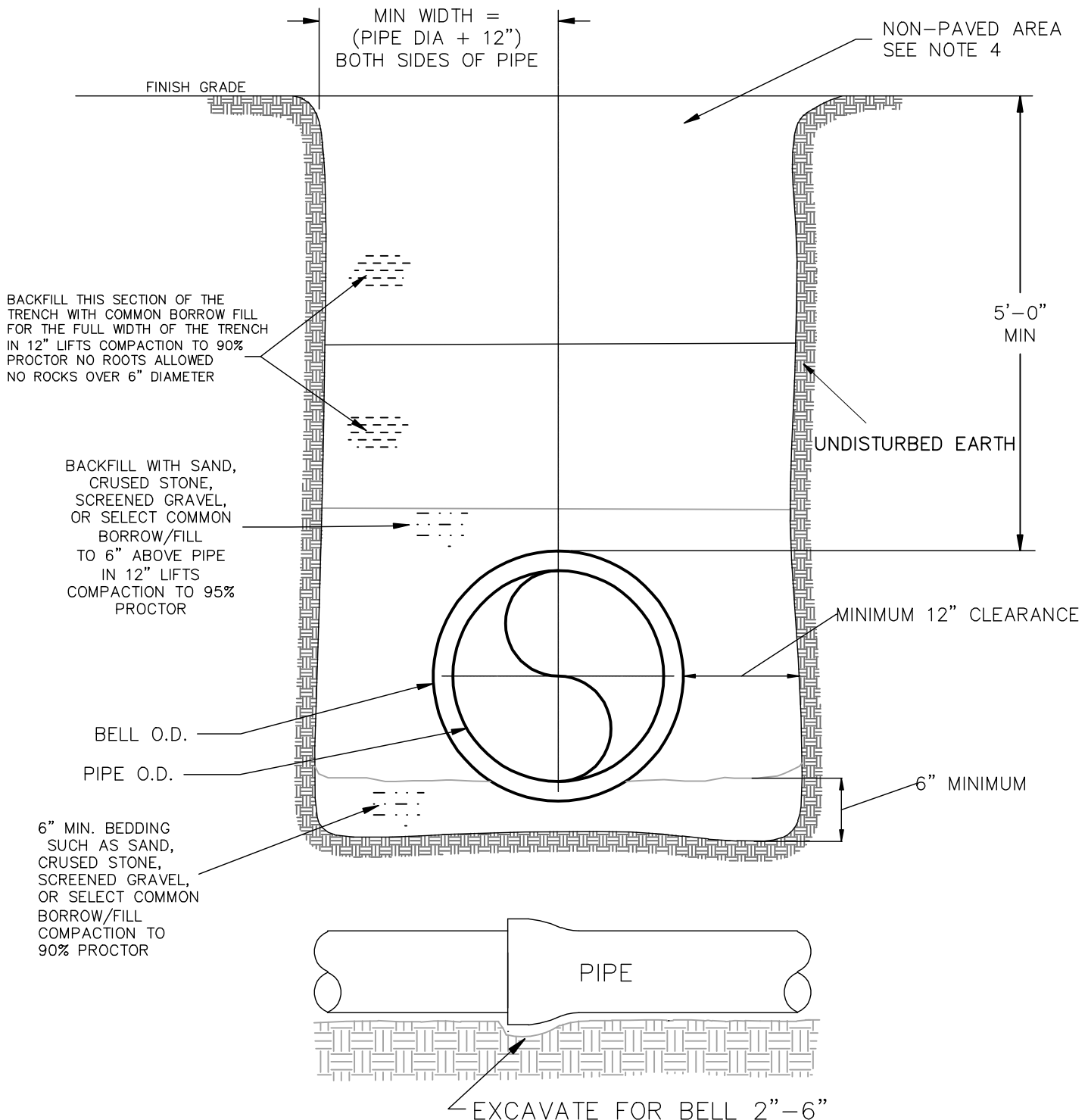
(SEE NOTE 4)

ALTERNATE  
GAS LINE LOCATION  
AS APPROVED BY DIRECTOR  
OF DEPT. OF PUBLIC WORKS  
IN SPRINGFIELD/LUDLOW

- NOTES:**
1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
  2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
  3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.
  4. ON 50-FOOT WIDE STREETS WATER MAINS SHALL BE INSTALLED 18-FEET FROM THE NORTH OR EAST STREET LINE, ALL OTHER WIDTHS REQUIRE ENGINEERING & TECHNICAL SERVICES APPROVAL.

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-01.0	REV. DATE
	<i>UTILITY SEPERATION DETAIL</i>	4/1/08 MAB
SCALE: NTS		

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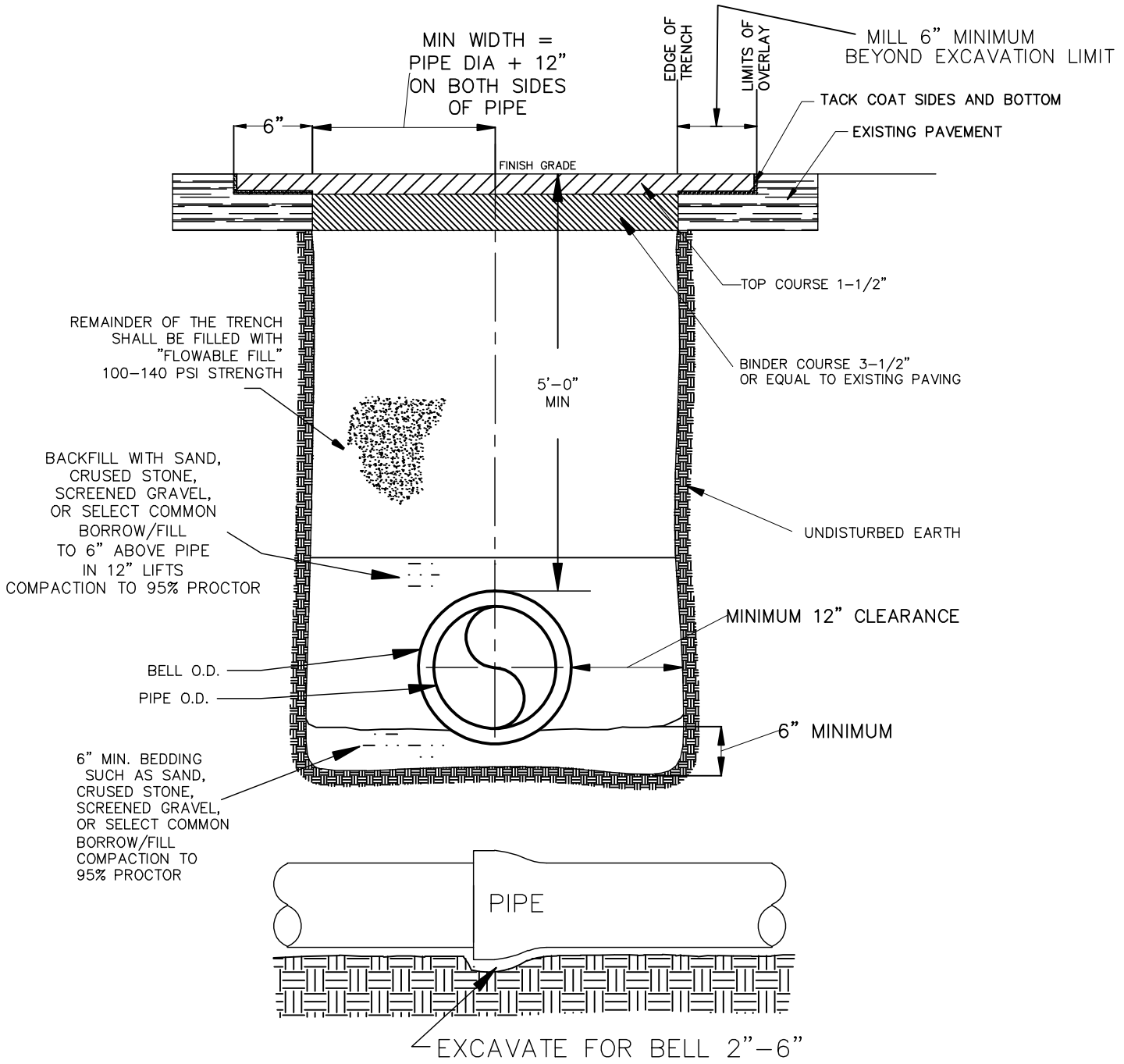


	EXISTING PAVEMENT		EXCAVATED AND REPLACED WITH BINDER COURSE
	STRUCTURAL GRAVEL		FLOWABLE FILL
	BEDDING SAND		COMMON BORROW
	MILLED AND REPLACED WITH TOP COURSE		TACK COAT
	UNDISTURBED EARTH		

- NOTES:**
1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
  2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
  3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.
  4. REQUIREMENTS FOR SUBBASE AND BASE MATERIAL TYPE ARE TO BE IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN PAVED AREAS.
  5. REQUIREMENTS FOR GRAVEL, LOAM AND/OR SEED ARE TO BE IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN NON-PAVED AREAS.
  6. FOR LOCATION OF WATER MAINS SEE DTAIL (W-01.0).

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-02.0	REV. DATE
	<u>NON-PAVED AREA</u>	4/1/08 MAB
	<u>TRENCH DETAIL</u>	
	SCALE: NTS	

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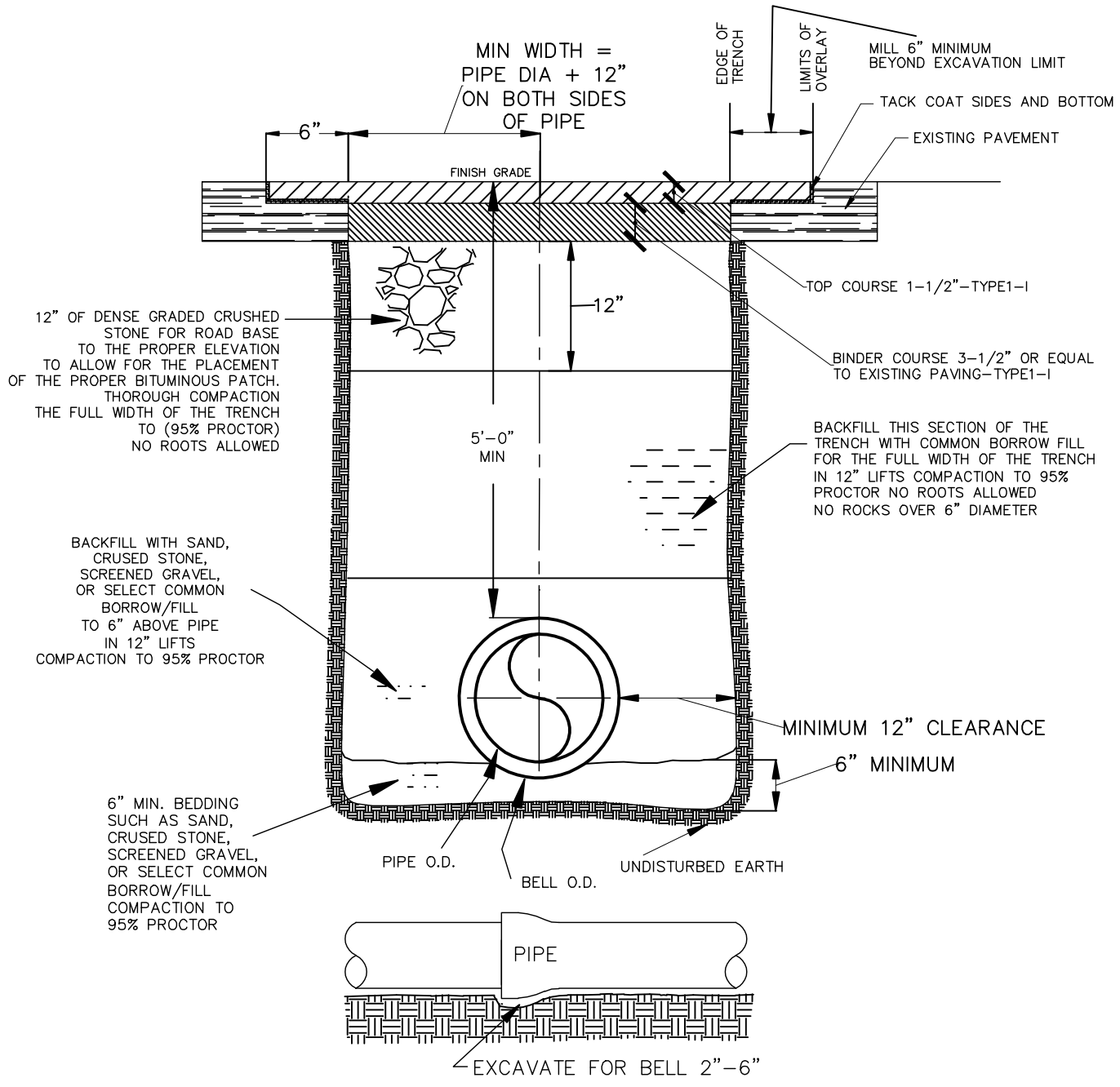
**NOTES:**

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2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.
4. REQUIREMENTS FOR SUBBASE AND BASE MATERIAL TYPE ARE TO BE IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN PAVED AREAS.
5. FOR LOCATION OF WATER MAINS SEE DETAIL (W-01.0).
6. REQUIREMENTS FOR GRAVEL, LOAM AND/OR SEED ARE TO BE IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN NON-PAVED AREAS.
7. REPLACE WITH SAME DEPTH OF ASPHALT OR MINIMUM 5-INCHES.
8. ALL MATERIALS USED TO MEET MASS. STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES.
9. SAW CUT EDGE OF UTILITY PATCH IF NO MILLING IS REQUIRED.
10. MILL TO REMOVE TOP COURSE.
11. LEAVE 12-INCH MINIMUM LIP BETWEEN EDGE OF TOP AND EDGE OF BINDER COURSE.
12. AFTER TRENCH WORK IS COMPLETED, FILL AROUND PIPE TO BOTTOM WITH GRADED GRAVEL FILL AND COMPACT IN 6-INCH LIFTS.
13. REPLACE LAYERS OF BINDER AND DEEP BASE.
14. TACK AREA OF MILLING 1 GALLON PER 25 SQUARE YARDS.
15. REPLACE TOP COURSE.
16. SEAL EDGES OF UTILITY PATCH WITH HOT POURED RUBERIZED ASPHALT SEALANT.

	EXISTING PAVEMENT		EXCAVATED AND REPLACED WITH BINDER COURSE
	STRUCTURAL GRAVEL		FLOWABLE FILL
	BEDDING SAND		COMMON BORROW
	MILLED AND REPLACED WITH TOP COURSE		TACK COAT
	UNDISTURBED EARTH		

<b>SPRINGFIELD WATER AND SEWER COMMISSION</b>		
	WATER DETAIL W-02.1	REV. DATE
	<i>TRENCH BACKFILLING—METHOD 1</i>	4/1/08 MAB
	<i>FOR LUDLOW ROADWAYS</i>	
	SCALE: NTS	

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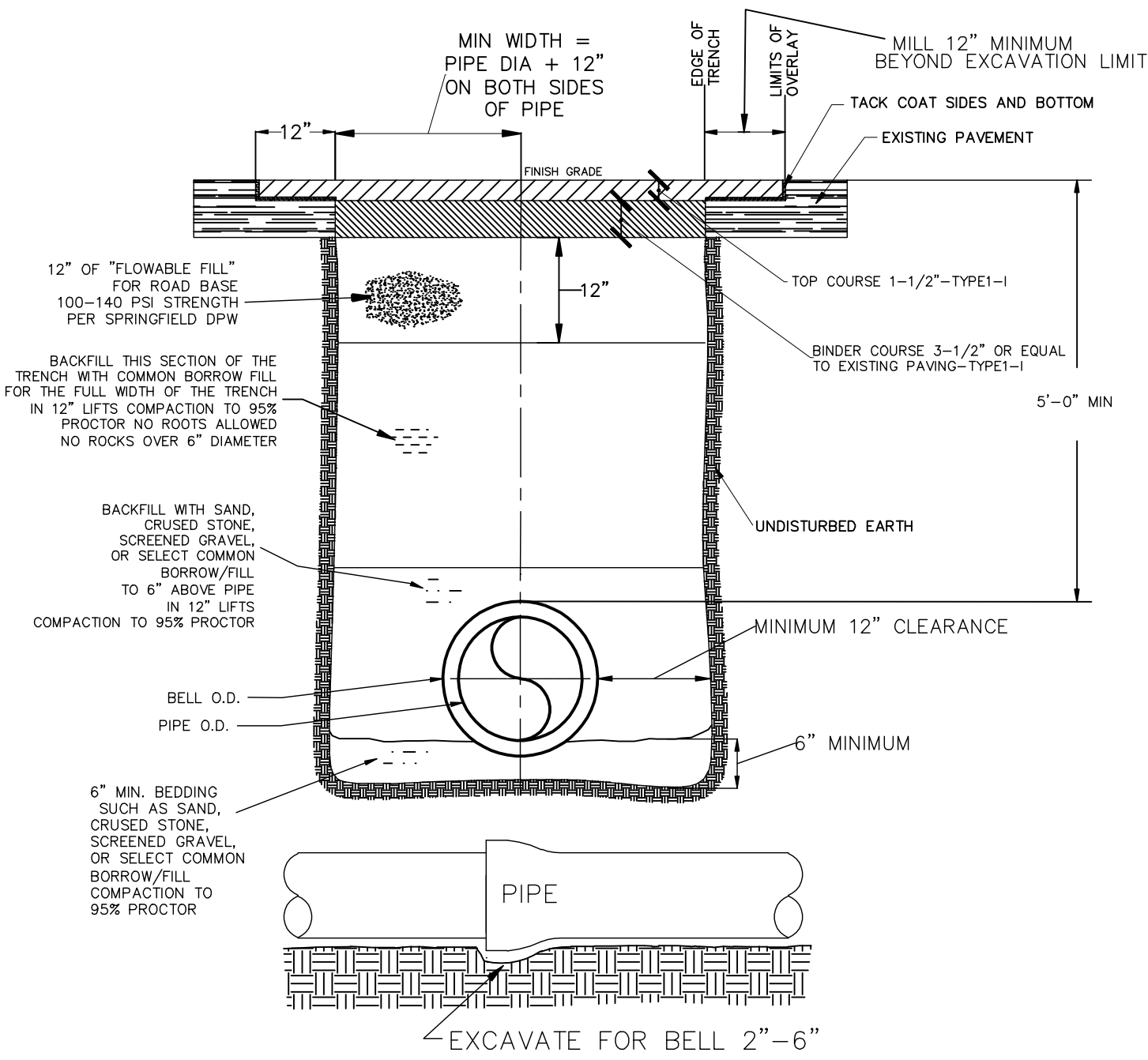
**NOTES:**

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. TO FINISH GRADE.
4. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.
5. REQUIREMENTS FOR SUBBASE AND BASE MATERIAL TYPE ARE TO BE IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN PAVED AREAS.
6. FOR LOCATION OF WATER MAINS SEE DETAIL (W-01.0).
7. REQUIREMENTS FOR GRAVEL, LOAM AND/OR SEED ARE TO BE IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN NON-PAVED AREAS.
8. REPLACE WITH SAME DEPTH OF ASPHALT OR MINIMUM 5-INCHES.
9. ALL MATERIALS USED TO MEET MASS. STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES.
10. SAW CUT EDGE OF UTILITY PATCH IF NO MILLING IS REQUIRED.
11. MILL TO REMOVE TOP COURSE.
12. LEAVE 12-INCH MINIMUM LIP BETWEEN EDGE OF TOP AND EDGE OF BINDER COURSE.
13. AFTER TRENCH WORK IS COMPLETED, FILL AROUND PIPE TO BOTTOM WITH GRADED GRAVEL FILL AND COMPACT IN 6-INCH LIFTS.
14. REPLACE LAYERS OF BINDER AND DEEP BASE.
15. TACK AREA OF MILLING 1 GALLON PER 25 SQUARE YARDS.
16. REPLACE TOP COURSE.
17. SEAL EDGES OF UTILITY PATCH WITH HOT POURED RUBERIZED ASPHALT SEALANT.

	EXISTING PAVEMENT		EXCAVATED AND REPLACED WITH BINDER COURSE
	DENSE GRADED CRUSHED STONE		COMMON BORROW
	BEDDING SAND		TACK COAT
	MILLED AND REPLACED WITH TOP COURSE		UNDISTURBED EARTH

<b>SPRINGFIELD WATER AND SEWER COMMISSION</b>		
	WATER DETAIL W-02.2	REV. DATE
		4/1/08 MAB
	<i>TRENCH BACKFILLING—METHOD 2 FOR LUDLOW ROADWAYS</i>	6/18/08 MAB
	SCALE: NTS	

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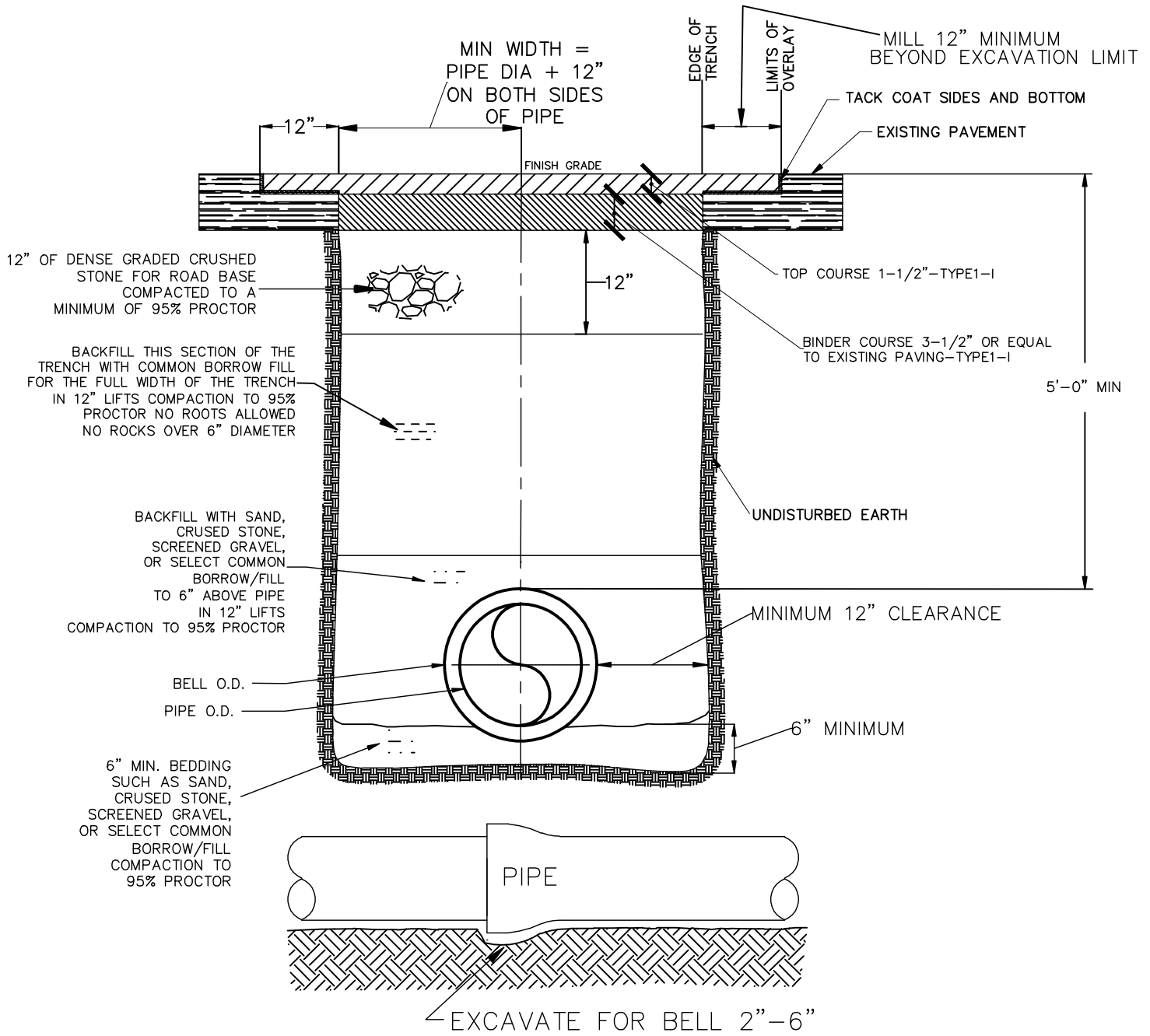
**NOTES:**

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2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. TO FINISH GRADE.
4. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.
5. REQUIREMENTS FOR SUBBASE AND BASE MATERIAL TYPE ARE TO BE IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN PAVED AREAS.
6. FOR LOCATION OF WATER MAINS SEE DETAIL (W-01.0).
7. REQUIREMENTS FOR GRAVEL, LOAM AND/OR SEED ARE TO BE IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN NON-PAVED AREAS.
8. REPLACE WITH SAME DEPTH OF ASPHALT OR MINIMUM 5-INCHES.
9. ALL MATERIALS USED TO MEET MASS. STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES.
10. SAW CUT EDGE OF UTILITY PATCH IF NO MILLING IS REQUIRED.
11. MILL TO REMOVE TOP COURSE.
12. LEAVE 12-INCH MINIMUM LIP BETWEEN EDGE OF TOP AND EDGE OF BINDER COURSE.
13. AFTER TRENCH WORK IS COMPLETED, FILL AROUND PIPE TO BOTTOM WITH GRADED GRAVEL FILL AND COMPACT IN 6-INCH LIFTS.
14. REPLACE LAYERS OF BINDER AND DEEP BASE.
15. TACK AREA OF MILLING 1 GALLON PER 25 SQUARE YARDS.
16. REPLACE TOP COURSE.
17. SEAL EDGES OF UTILITY PATCH WITH HOT POURED RUBERIZED ASPHALT SEALANT.

	EXISTING PAVEMENT		EXCAVATED AND REPLACED WITH BINDER COURSE
	BEDDING SAND		FLOWABLE FILL
	MILLED AND REPLACED WITH TOP COURSE		COMMON BORROW
	UNDISTURBED EARTH		TACK COAT

<b>SPRINGFIELD WATER AND SEWER COMMISSION</b>		
	WATER DETAIL W-02.3	REV. DATE
	<i>TRENCH BACKFILLING—METHOD</i>	4/1/08 MAB
	<i>FOR ARTERIAL STREETS</i>	6/18/08 MAB
	<i>IN SPRINGFIELD</i>	
SCALE: NTS		

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**NOTES:**

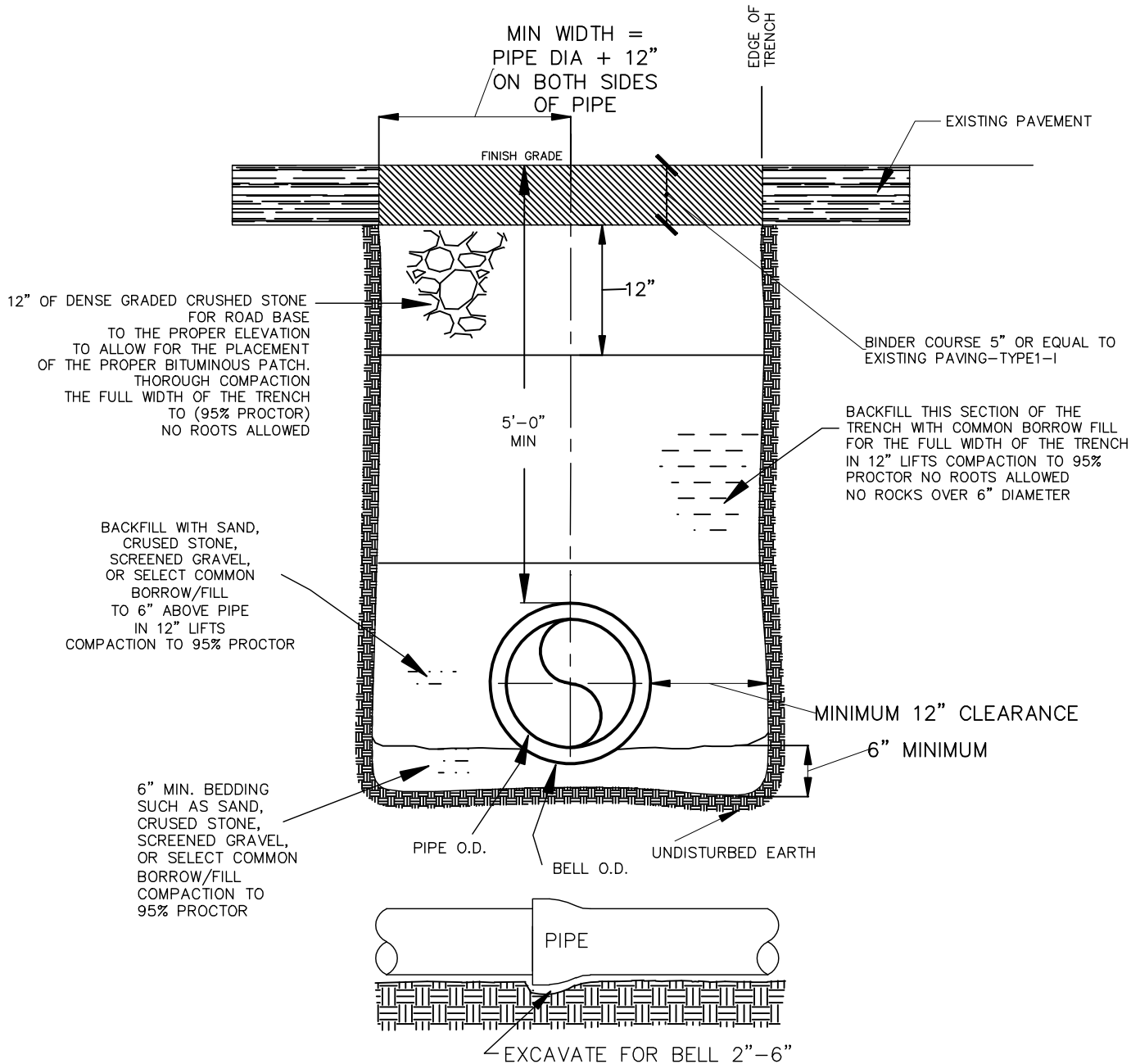
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2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. TO FINISH GRADE.
4. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.
5. REQUIREMENTS FOR SUBBASE AND BASE MATERIAL TYPE ARE TO BE IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN PAVED AREAS.
6. FOR LOCATION OF WATER MAINS SEE DETAIL (W-01.0).
7. REQUIREMENTS FOR GRAVEL, LOAM AND/OR SEED ARE TO BE IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN NON-PAVED AREAS.
8. REPLACE WITH SAME DEPTH OF ASPHALT OR MINIMUM 5-INCHES.
9. ALL MATERIALS USED TO MEET MASS. STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES.
10. SAW CUT EDGE OF UTILITY PATCH IF NO MILLING IS REQUIRED.
11. MILL TO REMOVE TOP COURSE.
12. LEAVE 12-INCH MINIMUM LIP BETWEEN EDGE OF TOP AND EDGE OF BINDER COURSE.
13. AFTER TRENCH WORK IS COMPLETED, FILL AROUND PIPE TO BOTTOM WITH GRADED GRAVEL FILL AND COMPACT IN 6-INCH LIFTS.
14. REPLACE LAYERS OF BINDER AND DEEP BASE.
15. TACK AREA OF MILLING 1 GALLON PER 25 SQUARE YARDS.
16. REPLACE TOP COURSE.
17. SEAL EDGES OF UTILITY PATCH WITH HOT POURED RUBERIZED ASPHALT SEALANT.

	EXISTING PAVEMENT		EXCAVATED AND REPLACED WITH BINDER COURSE
	DENSE GRADED CRUSHED STONE		COMMON BORROW
	BEDDING SAND		TACK COAT
	MILLED AND REPLACED WITH TOP COURSE		UNDISTURBED EARTH

<b>SPRINGFIELD WATER AND SEWER COMMISSION</b>		
	WATER DETAIL W-02.4	REV. DATE
	<i>TRENCH BACKFILLING—METHOD FOR RESIDENTIAL STREETS IN SPRINGFIELD</i>	4/1/08 MAB
	SCALE: NTS	6/18/08 MAB



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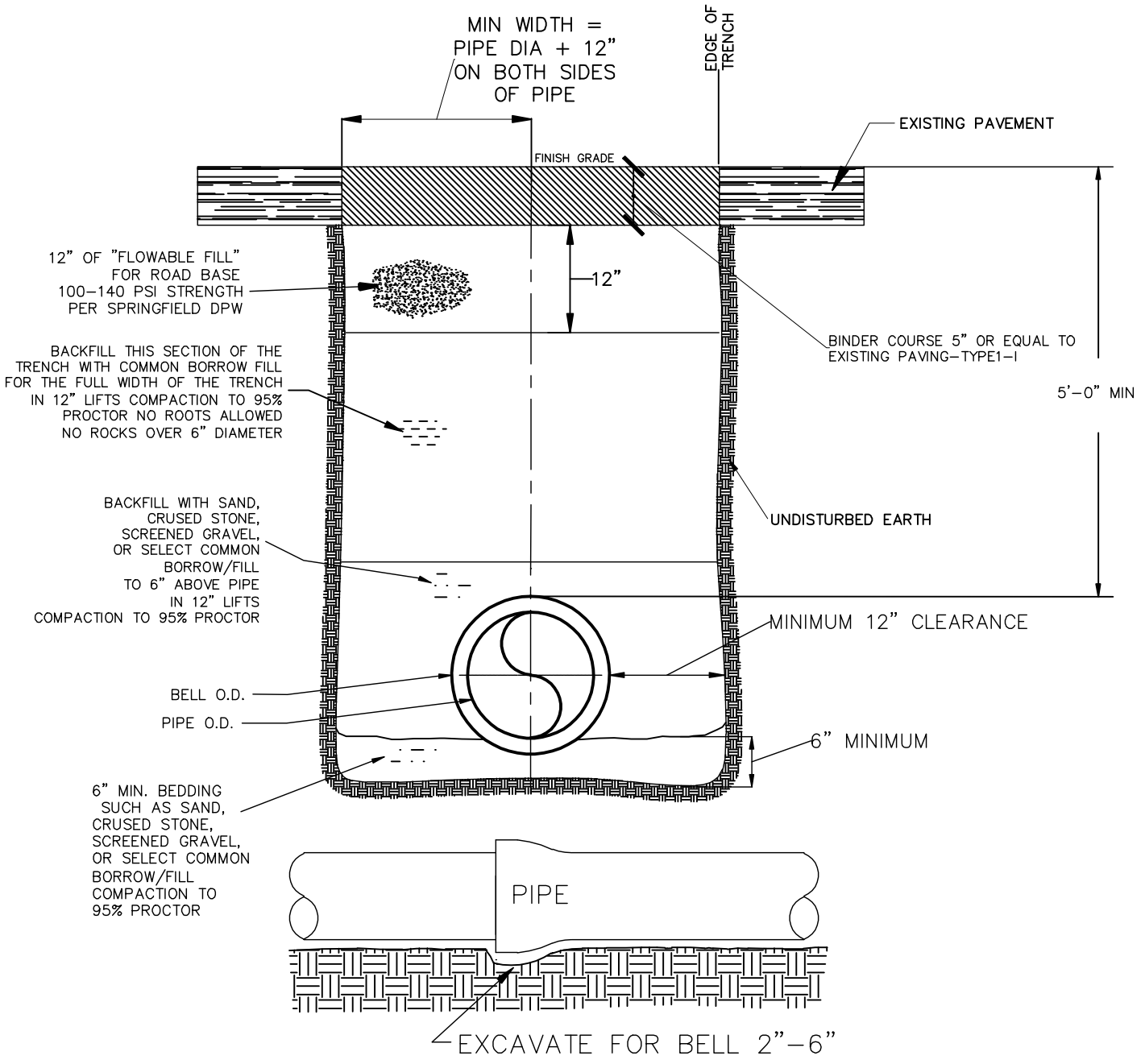
**NOTES:**

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
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3. TO FINISH GRADE.
4. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.
5. REQUIREMENTS FOR SUBBASE AND BASE MATERIAL TYPE ARE TO BE IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN PAVED AREAS.
6. FOR LOCATION OF WATER MAINS SEE DETAIL (W-01.0).
7. REQUIREMENTS FOR GRAVEL, LOAM AND/OR SEED ARE TO BE IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN NON-PAVED AREAS.
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11. MILL TO REMOVE TOP COURSE.
12. LEAVE 12-INCH MINIMUM LIP BETWEEN EDGE OF TOP AND EDGE OF BINDER COURSE.
13. AFTER TRENCH WORK IS COMPLETED, FILL AROUND PIPE TO BOTTOM WITH GRADED GRAVEL FILL AND COMPACT IN 6-INCH LIFTS.
14. REPLACE LAYERS OF BINDER AND DEEP BASE.
15. TACK AREA OF MILLING 1 GALLON PER 25 SQUARE YARDS.
16. REPLACE TOP COURSE.
17. SEAL EDGES OF UTILITY PATCH WITH HOT POURED RUBERIZED ASPHALT SEALANT.

	EXISTING PAVEMENT		EXCAVATED AND REPLACED WITH BINDER COURSE
	DENSE GRADED CRUSHED STONE		COMMON BORROW
	BEDDING SAND		UNDISTURBED EARTH

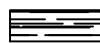

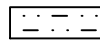



<b>SPRINGFIELD WATER AND SEWER COMMISSION</b>		
	WATER DETAIL W-02.5	REV. DATE
	TEMPORARY TRENCH BACKFILLING-METHOD FOR ALL STREETS IN SPRINGFIELD & LUDLOW ACCEPT SPRINGFIELD ARTERIALS	6/18/08 MAB
	SCALE: NTS	


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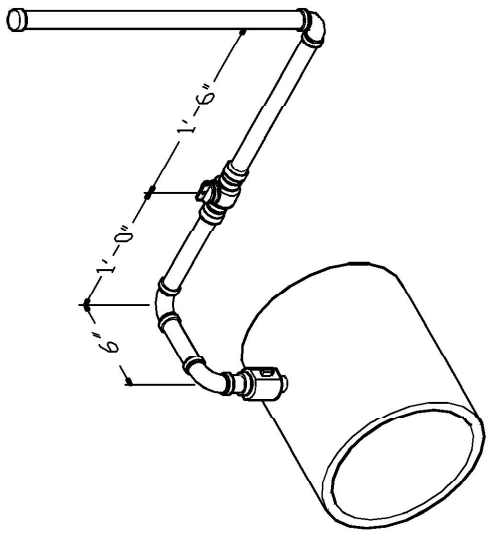
**NOTES:**

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. TO FINISH GRADE.
4. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.
5. REQUIREMENTS FOR SUBBASE AND BASE MATERIAL TYPE ARE TO BE IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN PAVED AREAS.
6. FOR LOCATION OF WATER MAINS SEE DETAIL (W-01.0).
7. REQUIREMENTS FOR GRAVEL, LOAM AND/OR SEED ARE TO BE IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN NON-PAVED AREAS.
8. REPLACE WITH SAME DEPTH OF ASPHALT OR MINIMUM 5-INCHES.
9. ALL MATERIALS USED TO MEET MASS. STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES.
10. SAW CUT EDGE OF UTILITY PATCH IF NO MILLING IS REQUIRED.
11. MILL TO REMOVE TOP COURSE.
12. LEAVE 12-INCH MINIMUM LIP BETWEEN EDGE OF TOP AND EDGE OF BINDER COURSE.
13. AFTER TRENCH WORK IS COMPLETED, FILL AROUND PIPE TO BOTTOM WITH GRADED GRAVEL FILL AND COMPACT IN 6-INCH LIFTS.
14. REPLACE LAYERS OF BINDER AND DEEP BASE.
15. TACK AREA OF MILLING 1 GALLON PER 25 SQUARE YARDS.
16. REPLACE TOP COURSE.
17. SEAL EDGES OF UTILITY PATCH WITH HOT POURED RUBERIZED ASPHALT SEALANT.

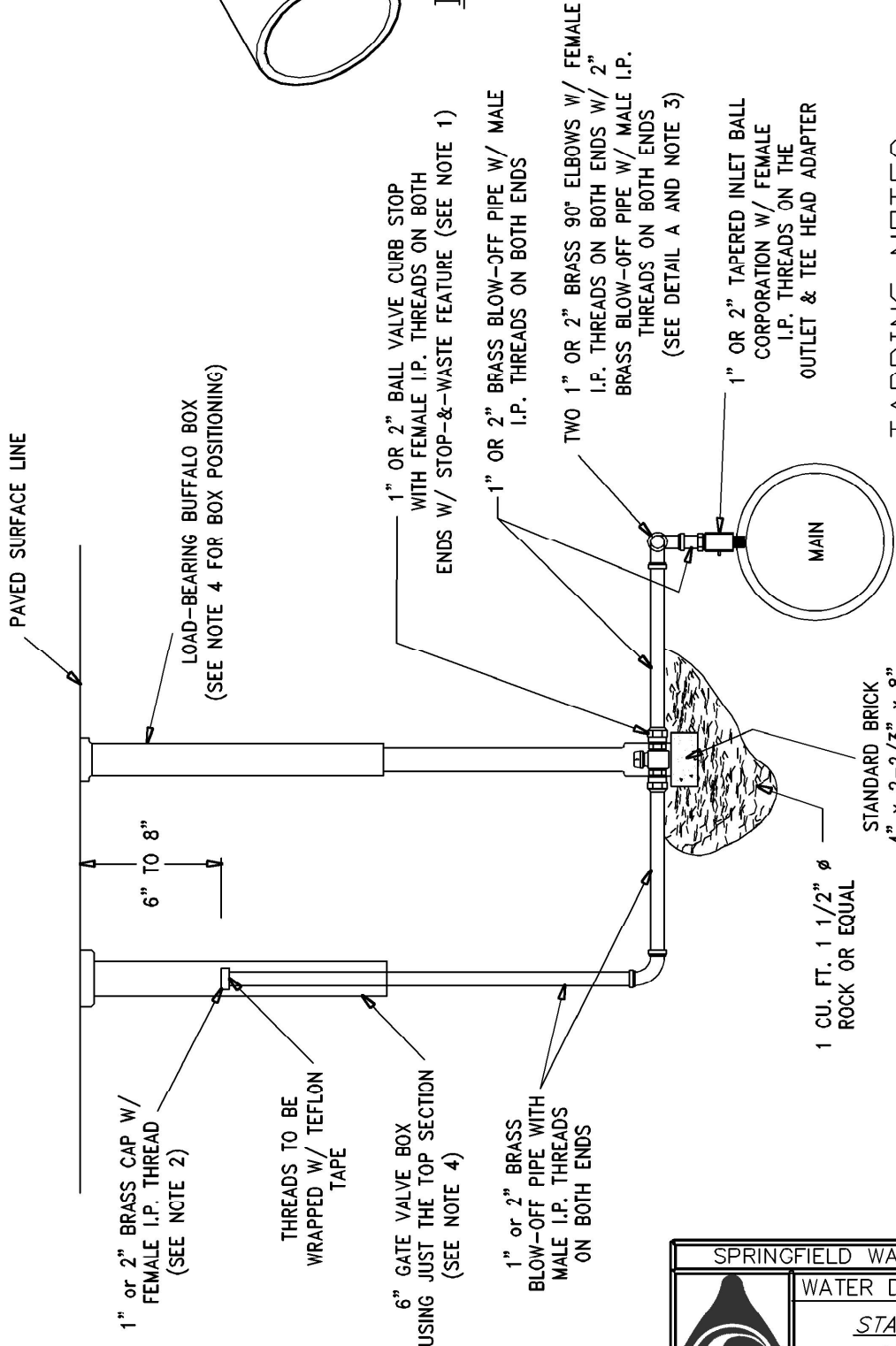
	EXISTING PAVEMENT		EXCAVATED AND REPLACED WITH BINDER COURSE
	BEDDING SAND		FLOWABLE FILL
	UNDISTURBED EARTH		COMMON BORROW

<b>SPRINGFIELD WATER AND SEWER COMMISSION</b>		
	WATER DETAIL W-02.6	REV. DATE
	<u>TEMPORARY TRENCH BACKFILLING-METHOD FOR ALL ARTERIAL STREETS IN SPRINGFIELD</u>	
	SCALE: NTS	
	6/18/08 MAB	

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DETAIL A



PAVED SURFACE LINE

LOAD-BEARING BUFFALO BOX  
(SEE NOTE 4 FOR BOX POSITIONING)

1" or 2" BRASS CAP W/  
FEMALE I.P. THREAD  
(SEE NOTE 2)

THREADS TO BE  
WRAPPED W/ TEFLON  
TAPE

6" GATE VALVE BOX  
USING JUST THE TOP SECTION  
(SEE NOTE 4)

1" or 2" BRASS  
BLOW-OFF PIPE WITH  
MALE I.P. THREADS  
ON BOTH ENDS

1" OR 2" BALL VALVE CURB STOP  
WITH FEMALE I.P. THREADS ON BOTH  
ENDS W/ STOP-&-WASTE FEATURE (SEE NOTE 1)

1" OR 2" BRASS BLOW-OFF PIPE W/ MALE  
I.P. THREADS ON BOTH ENDS

TWO 1" OR 2" BRASS 90° ELBOWS W/ FEMALE  
I.P. THREADS ON BOTH ENDS W/ 2"  
BRASS BLOW-OFF PIPE W/ MALE I.P.  
THREADS ON BOTH ENDS  
(SEE DETAIL A AND NOTE 3)

1" OR 2" TAPERED INLET BALL  
CORPORATION W/ FEMALE  
I.P. THREADS ON THE  
OUTLET & TEE HEAD ADAPTER

1 CU. FT. 1 1/2" Ø  
ROCK OR EQUAL

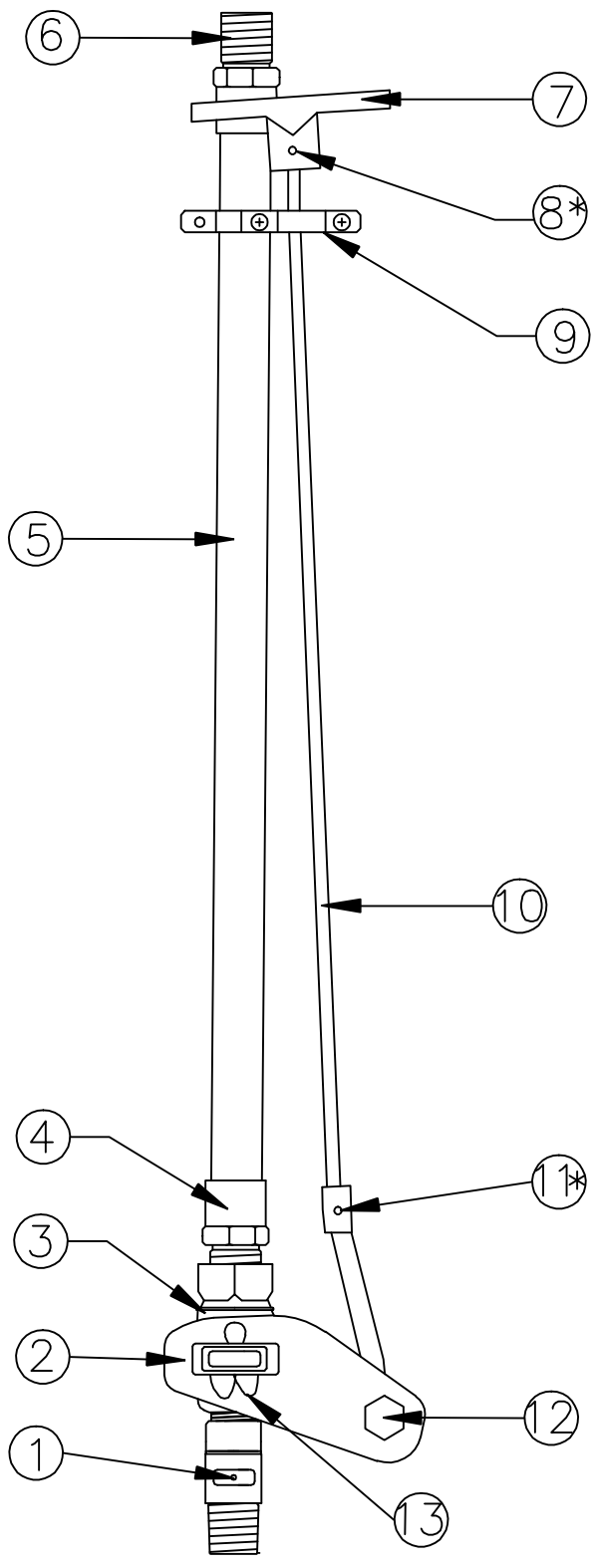
STANDARD BRICK  
4" x 2-2/3" x 8"

MAIN

TAPPING NOTES:  
FOR 1"=USE DIRECT TAPPING  
FOR 2"=MUST USE SWSC SADDLE

- NOTES:**
1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
  2. INSTALL STOP-&-WASTE W/ DRAIN HOLE ON THE DOWNSTREAM SIDE (AWAY FROM WATER MAIN).
  3. CAP IS TO BE INSTALLED HAND TIGHT.
  4. SWING ELBOWS ALLOW FOR PIPE MOVEMENT.
  5. VALVE BOX AND BUFFALO BOX ARE TO BE SET TO GRADE IN PAVEMENT AND BURIED 6" BELOW GRADE IN UNPAVED ROADS. RISER PIPE TO BE SET 2" BELOW VALVE BOX TOP IN UNPAVED ROADS.

	SPRINGFIELD WATER AND SEWER COMMISSION WATER DETAIL W-03.0	REV. DATE 4/1/08 MAB
	STANDARD AIR VALVE ASSEMBLY DETAIL	SCALE: NTS



NO.	DESCRIPTION
1	BALL TYPE COPORATION: USE (Mueller B25008) OR APPROVED EQUAL. AWWA/CC X Male Iron Pipe (IP) Threads
2	LOWER OPERATING LEVER: Cast or Stamped Brass to Spec.
3	BALL TYPE CURB STOP: FOR 1" AIR VALVE: USE (FORD B11-444SW) OR APPROVED EQUAL. FOR 2" AIR VALVE: USE (FORD B11-777SW) OR APPROVED EQUAL. Female Iron Pipe (IP) Threads Both Ends and Stop and Waste on the Riser Side of Stop.
4	LOWER MALE ADAPTER: Copper (Domestic)
5	RISER: Copper Type L (Domestic)
6	UPPER MALE ADAPTER: Copper (Domestic)
7	T-HANDLE: Cast Brass
8*	OPERATING ROD T-HANDLE SECUREMENT: Stainless Steel Roll Pin
9	ROD TO RISER CONNECTION: Split Ring (By Size of Riser), Attached to 1/2" Split Ring by Coated 3/8"-16 x 1 1/4" Set Screw and Stainless Steel 3/8" Spacer Nut
10	OPERATING ROD: Brass Round (CDA 360, ASTM B-16)
11*	LOWER MECHANISM SECUREMENT: Stainless Steel Roll Pin
12	3/8" x 1/2" STAINLESS STEEL BOLT: With Nylock Safety Nut
13	LOWER LEVEL TO VALVE COTTER PIN: Marine Type Brass

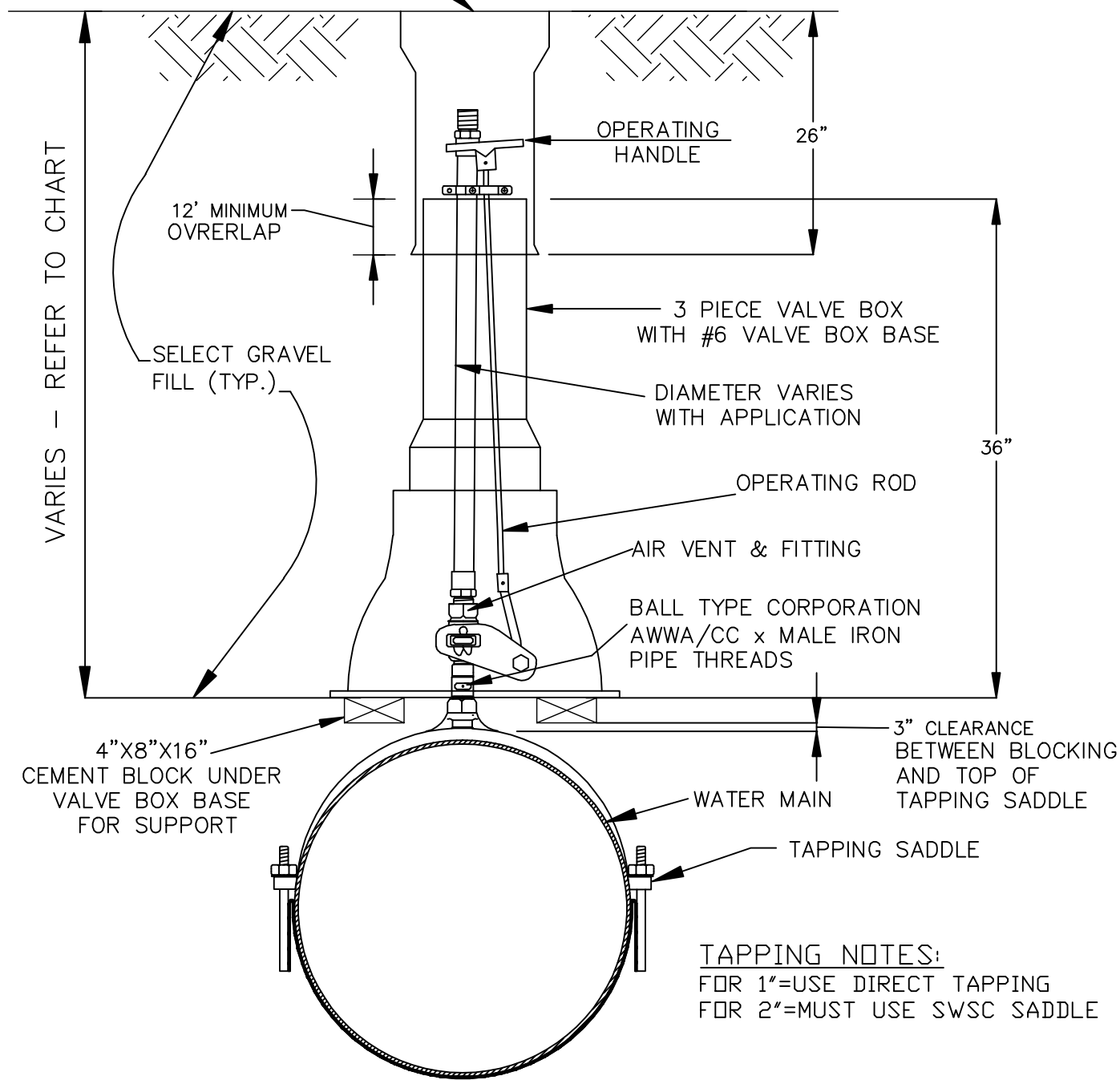
NOTE:  
\* - VISUALLY OBSTRUCTED

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\*USE OF THIS DEVICE REQUIRES  
APPROVAL BY THE SWSC PRIOR  
TO INSTALLATION

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-03.1	REV. DATE
	<i>AIR VALVE</i>	4/1/08 MAB
	<i>ONE PIECE ASSEMBLY DETAIL</i>	
	SCALE: NTS	

TOP OF BOX FLUSH WITH FINISH PAVEMENT



VARIES - REFER TO CHART

12' MINIMUM OVRERLAP

SELECT GRAVEL FILL (TYP.)

OPERATING HANDLE

26"

3 PIECE VALVE BOX WITH #6 VALVE BOX BASE

DIAMETER VARIES WITH APPLICATION

OPERATING ROD

AIR VENT & FITTING

BALL TYPE CORPORATION AWWA/CC x MALE IRON PIPE THREADS

36"

4"x8"x16" CEMENT BLOCK UNDER VALVE BOX BASE FOR SUPPORT

3" CLEARANCE BETWEEN BLOCKING AND TOP OF TAPPING SADDLE

WATER MAIN

TAPPING SADDLE

**TAPPING NOTES:**  
FOR 1"=USE DIRECT TAPPING  
FOR 2"=MUST USE SWSC SADDLE

\*USE OF THIS DEVICE REQUIRES APPROVAL BY THE SWSC PRIOR TO INSTALLATION

VALVE DIAMETER	PIPE LENGTH	REQUIRED COVER
1"	30"	4.0'
1"	36"	4.5'
1"	42"	5.0'
2"	30"	4.0'
2"	36"	4.5'
2"	42"	5.0'
CUSTOM	CUSTOM	AS REQUIRED BY ENGINEER

**NOTES:**

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND OLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-03.2	REV. DATE
	<i>AIR VALVE</i>	4/1/08 MAB
	<i>ONE PIECE ASSEMBLY DETAIL</i>	
	SCALE: NTS	

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UNDISTURBED EARTH

GRAVEL COMPACTED  
BACK TO UNDISTURBED  
EARTH

4 MIL POLY BETWEEN  
CONCRETE AND FITTING  
IF POURED THRUST BLOCK

MECHANICAL JOINT CAP  
WITH RETAINER GLAND

(1) FULL LENGTH OF PIPE

EDGE OF TRENCH

16' MIN

EDGE OF TRENCH

MIN 3'x3'x3' PRE CAST CONCRETE  
THRUST BLOCK MAY BE USED WITH  
SWSC APPROVAL OR CONCRETE  
THRUST BLOCK POURED AGAINST  
UNDISTURBED EARTH - SIZE TO BE  
BASED ON SIZE OF FITTING AND  
PRESSURE IN WATER MAIN  
(SEE DETAIL W-14.1)

MECHANICAL JOINT  
RESILIENT SEAT GATE  
VALVE WITH BOX TO SURFACE  
(OPEN RIGHT, LEAVE IN CLOSED POSITION)

RETAINER GLANDS

AIR RELEASE VALVE LOCATION  
INSTALL PER SWSC SPECS  
(SEE DETAIL W-03.0)

2.0'

1'-0"


(1) FULL LENGTH OF PIPE

0'-6"

1'-6"

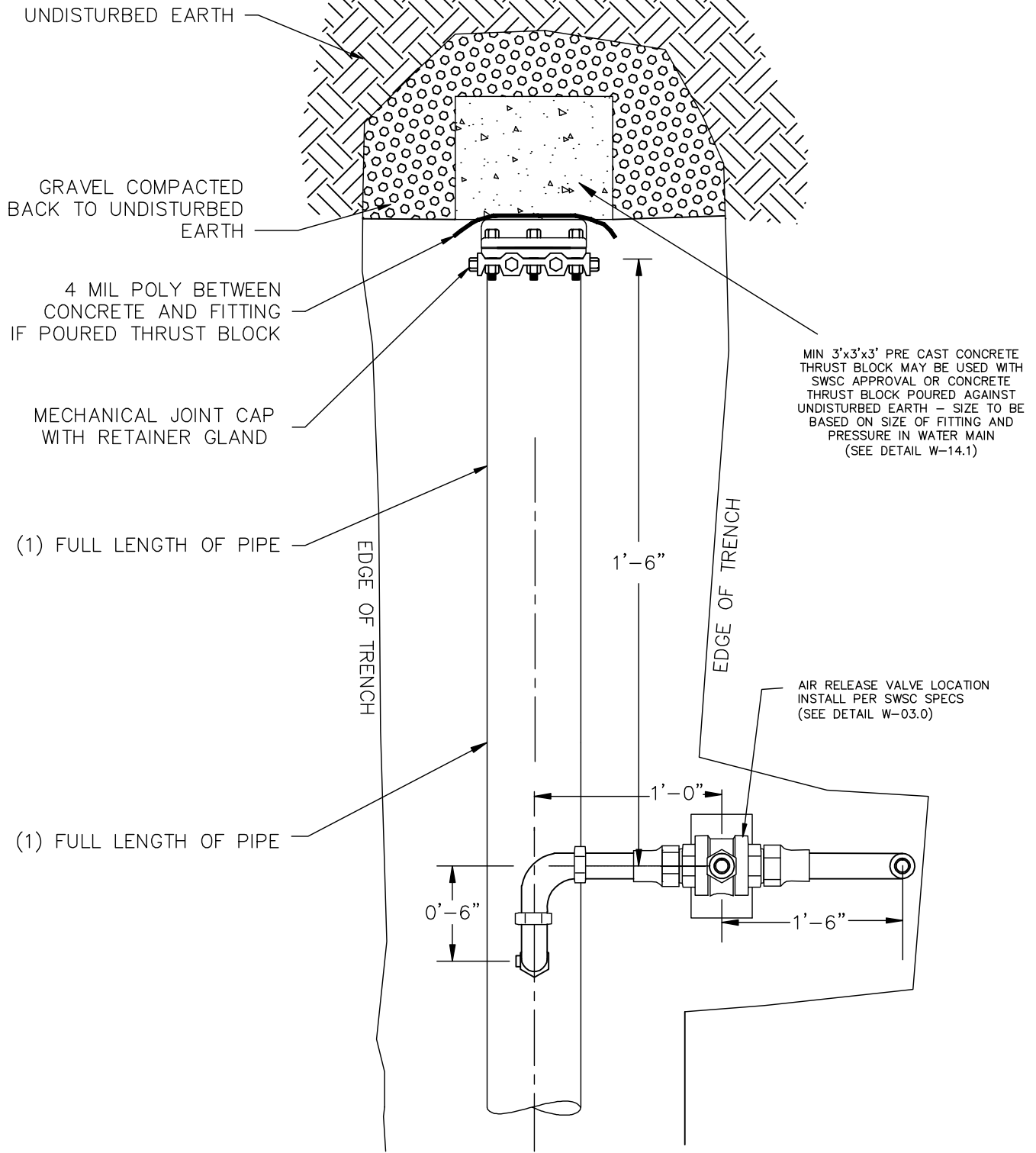
**NOTES:**

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-04.0	REV. DATE
	<i>END OF MAIN</i>	4/1/08 MAB
	SCALE: NTS	


Last Modified: 04/09/2025 at 10:39AM EDT

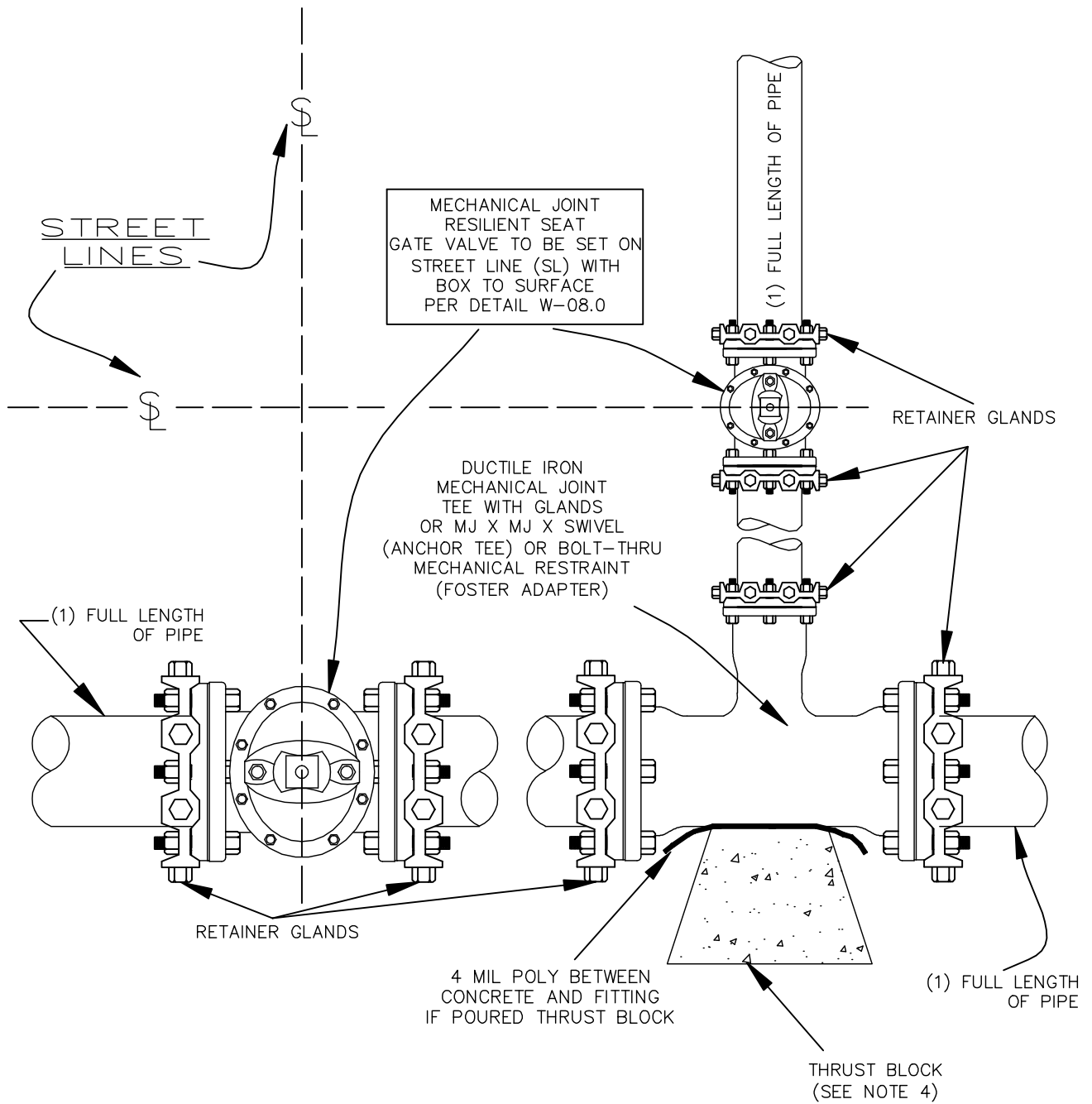
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**NOTES:**

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-04.1	REV. DATE
	<i>END OF MAIN DETAIL</i>	4/1/08 MAB
	SCALE: NTS	

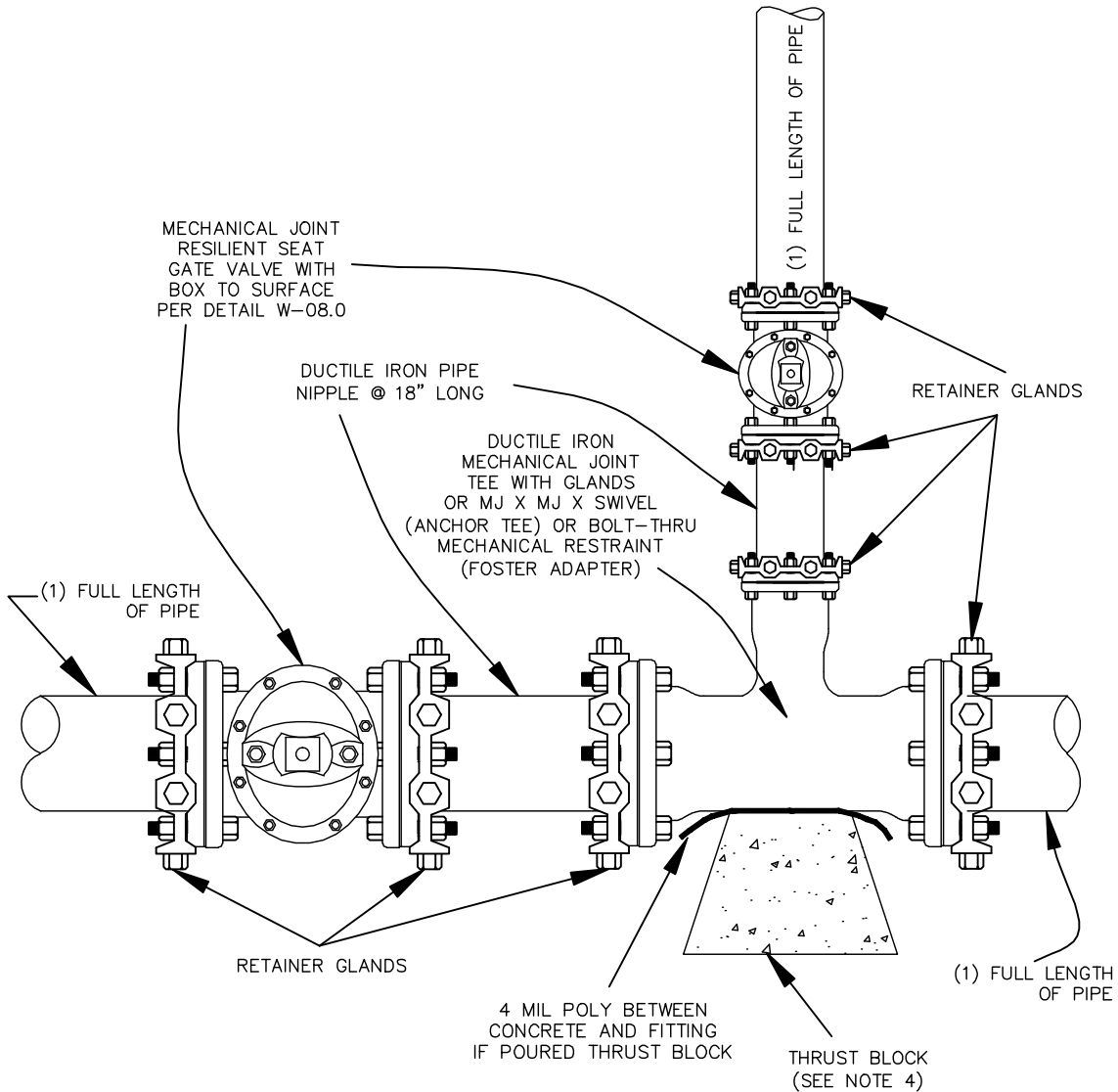


**NOTES:**

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL PIPE SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.
4. MIN 3'x3'x3' PRE CAST CONCRETE THRUST BLOCK MAY BE USED WITH SWSC APPROVAL OR CONCRETE THRUST BLOCK POURED AGAINST UNDISTURBED EARTH - SIZE TO BE BASED ON SIZE OF FITTING AND PRESSURE IN WATER MAIN SEE DETAIL (W-14.1).
5. THE MECHANICAL JOINTS OF THE PIPES BETWEEN THE VALVES AND THE FITTINGS SHALL BE RESTRAINED VIA RETAINER GLANDS. IF MORE THAN ONE SECTION IS USED, RETAINER GLAND RESTRAINTS SHALL BE USED AT ALL CONNECTIONS. (SEE DETAIL ABOVE).
6. FOR RESTRAINT METHODS OTHER THAN RETAINER GLAND SEE DETAILS (W-06.1 THRU W-06.6).

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-05.0	REV. DATE
	<i>STANDARD TEE INSTALLATION</i>	4/1/08 MAB
	SCALE: NTS	



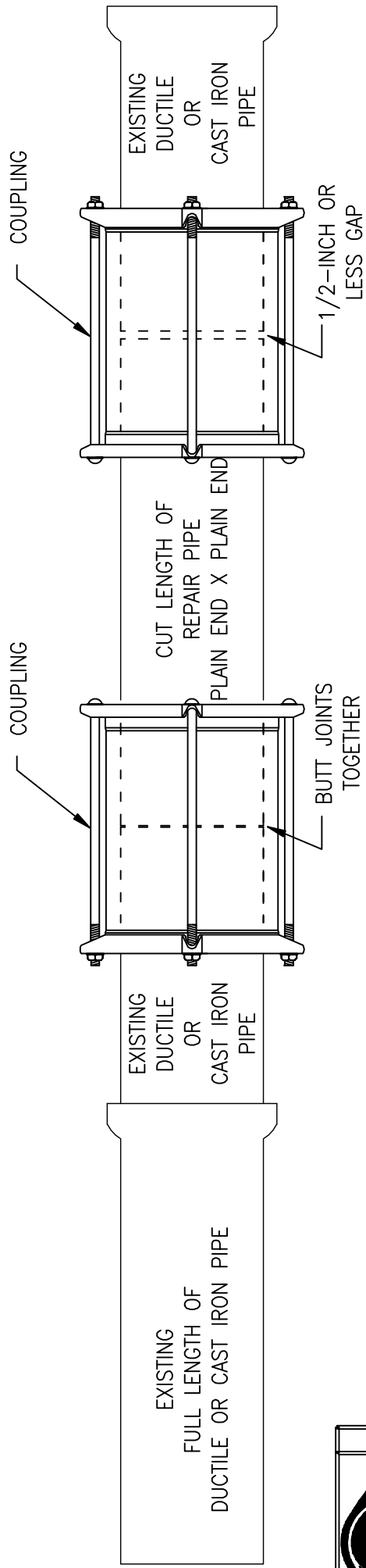


**NOTES:**

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL PIPE SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.
4. MIN 3'x3'x3' PRE CAST CONCRETE THRUST BLOCK MAY BE USED WITH SWSC APPROVAL OR CONCRETE THRUST BLOCK POURED AGAINST UNDISTURBED EARTH - SIZE TO BE BASED ON SIZE OF FITTING AND PRESSURE IN WATER MAIN SEE DETAIL (W-14.1).
5. THE MECHANICAL JOINTS OF THE PIPES BETWEEN THE VALVES AND THE FITTINGS SHALL BE RESTRAINED VIA RETAINER GLANDS. IF MORE THAN ONE SECTION IS USED, RETAINER GLAND RESTRAINTS SHALL BE USED AT ALL CONNECTIONS. (SEE DETAIL ABOVE).
6. FOR RESTRAINT METHODS OTHER THAN RETAINER GLAND SEE DETAILS (W-06.1 THRU W-06.6).


**THIS DETAIL MUST  
BE APPROVED FOR  
USE BY THE  
S.W.S.C BEFORE IT  
CAN BE INSTALLED**

<b>SPRINGFIELD WATER AND SEWER COMMISSION</b>		
	WATER DETAIL W-05.1	REV. DATE
	<i>ALTERNATE 1</i>	4/1/08 MAB
	<i>TEE INSTALLATION</i>	
	SCALE: NTS	

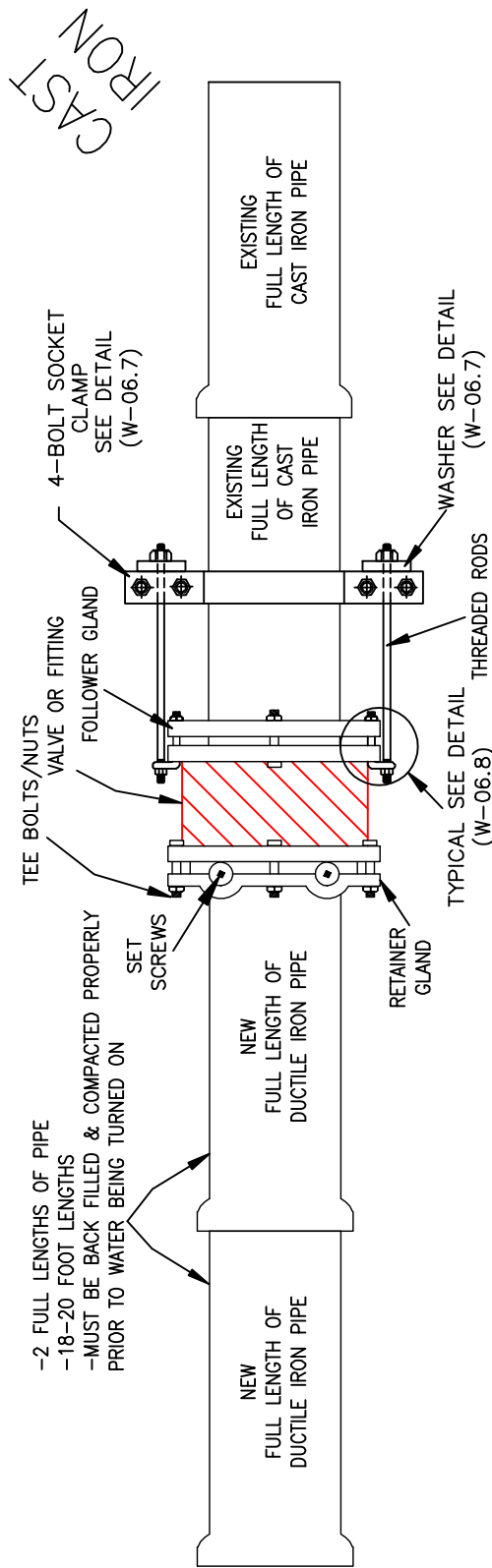
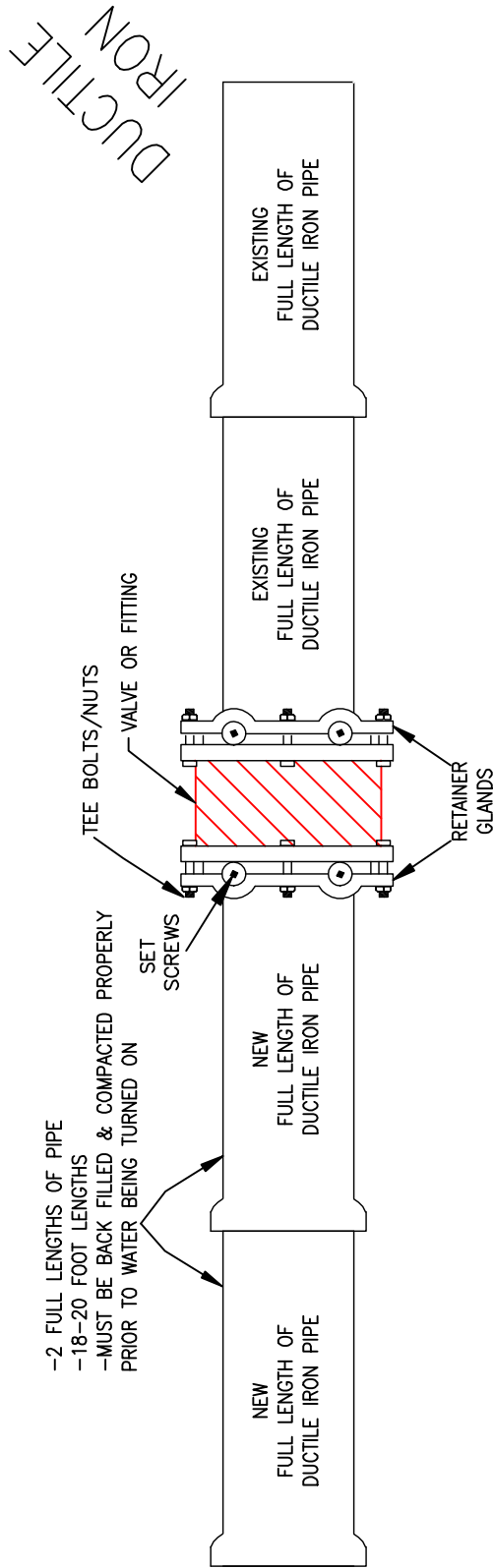


**NOTES:**

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.
4. THESE METHODS SHALL BE USED UNLESS OTHERWISE APPROVED BY ENGINEERING AND TECHNICAL SERVICES DEPARTMENT.
5. WHEN REPAIRING NEAR A VALVE OR A FITTING USE AN APPROVED METHOD OR CALL ENGINEERING AND TECHNICAL SERVICES (ET&S).

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-06.0	REV. DATE
	REPAIR TO EXISTING WATER MAINS	4/1/08 MAB
SCALE: NTS		

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**NOTES:**

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. NUMBER OF THREADED RODS IS BASED ON MAXIMUM PRESSURE OF 150 P.S.I IN MAIN.
3. THREADED RODS ARE TO BE FABRICATED FROM 4140 B-7 ALLOY STEEL.
4. STEEL THREADED RODS SHALL HAVE A YIELD STRESS OF NOT LESS THAN 105,000 P.S.I.
5. EYE-BOLTS SHALL HAVE A MINIMUM TENSILE STRENGTH OF 50,000 P.S.I EACH.
6. RESTRAINT FOR 20 INCHES AND LARGER PIPES MUST BE DESIGNED ON A CASE-BY-CASE BASIS AND APPROVED BY ENGINEERING & TECHNICAL SERVICES (ET&S).
7. ALL COMPONENTS TO BE PROTECTIVE COATED WITH PROTECTIVE COATINGS AND TAPE.

SPRINGFIELD WATER AND SEWER COMMISSION

WATER DETAIL W-06.1

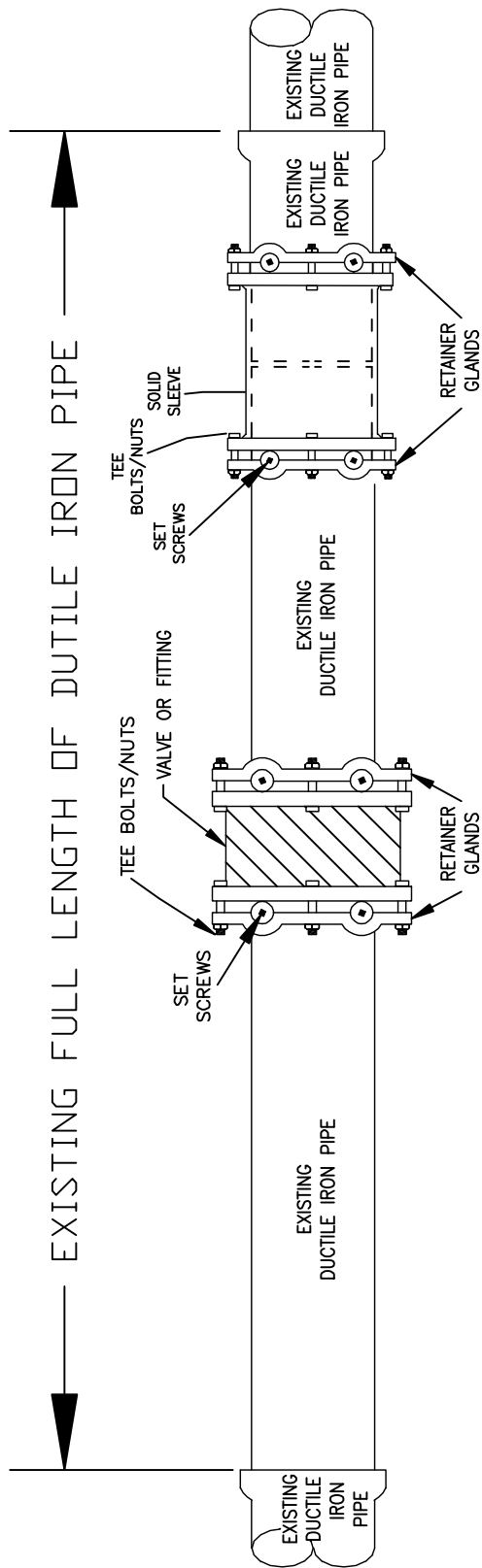
REV. DATE

4/1/08 MAB

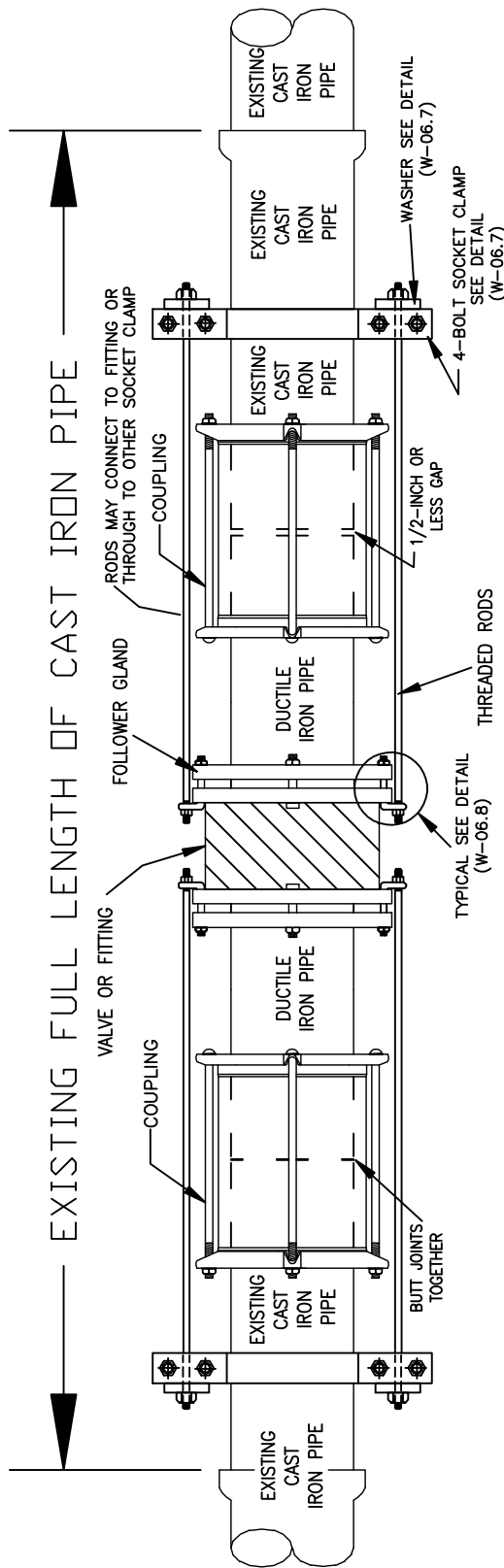
INSTALL VALVE OR FITTING  
AT A DEAD END  
OF A WATER MAIN



SCALE: NTS



EXISTING FULL LENGTH OF DUCTILE IRON PIPE



EXISTING FULL LENGTH OF CAST IRON PIPE

**NOTES:**

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. NUMBER OF THREADED RODS IS BASED ON MAXIMUM PRESSURE OF 150 P.S.I. IN MAIN.
3. THREADED RODS ARE TO BE FABRICATED FROM 4140 B-7 ALLOY STEEL.
4. STEEL THREADED RODS SHALL HAVE A YIELD STRESS OF NOT LESS THAN 105,000 P.S.I.
5. EYE-BOLTS SHALL HAVE A MINIMUM TENSILE STRENGTH OF 50,000 P.S.I. EACH.
6. RESTRAINT FOR 20 INCHES AND LARGER PIPES MUST BE DESIGNED ON A CASE-BY-CASE BASIS AND APPROVED BY ENGINEERING & TECHNICAL SERVICES (ET&S).
7. ALL COMPONENTS TO BE PROTECTIVE COATED WITH PROTECTIVE COATINGS AND TAPE.

SPRINGFIELD WATER AND SEWER COMMISSION

WATER DETAIL W-06.2

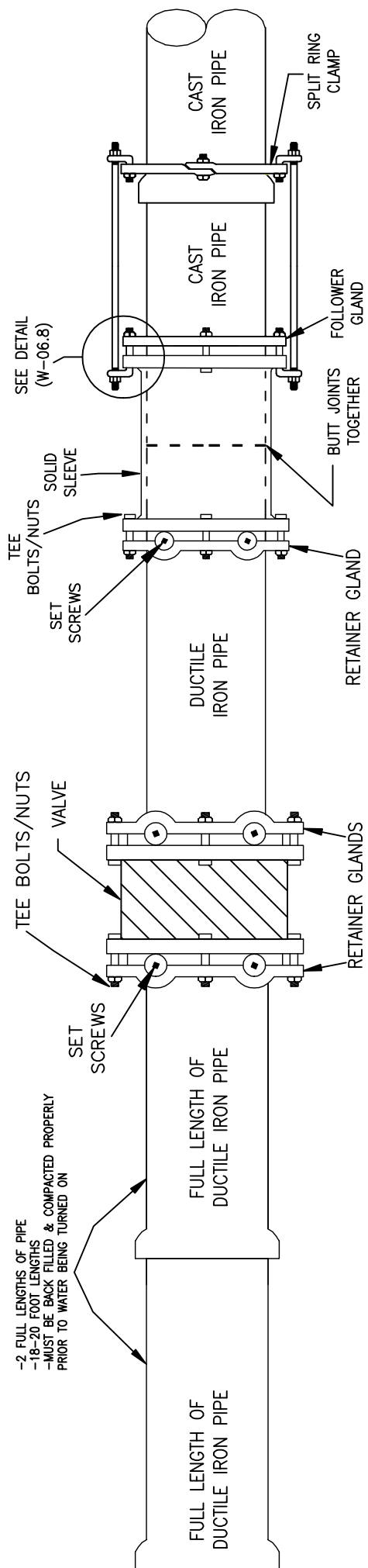
REV. DATE

4/1/08 MAB

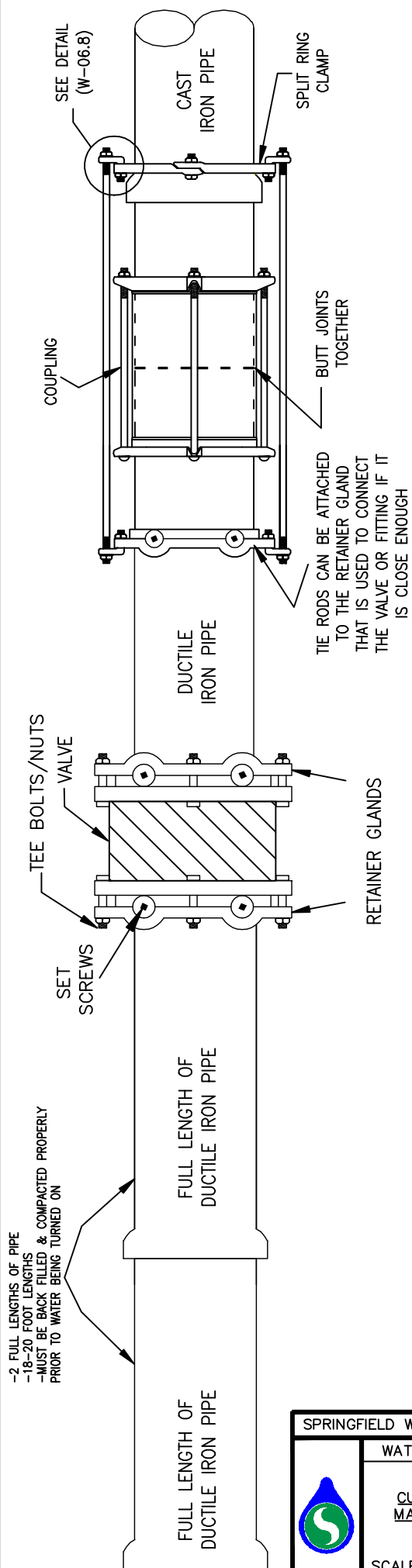


CUTTING-INTO EXISTING  
WATER MAIN TO REPLACE  
VALVE OR FITTING

SCALE: NTS




-2 FULL LENGTHS OF PIPE  
-18-20 FOOT LENGTHS  
-MUST BE BACK FILLED & COMPACTED PROPERLY  
PRIOR TO WATER BEING TURNED ON

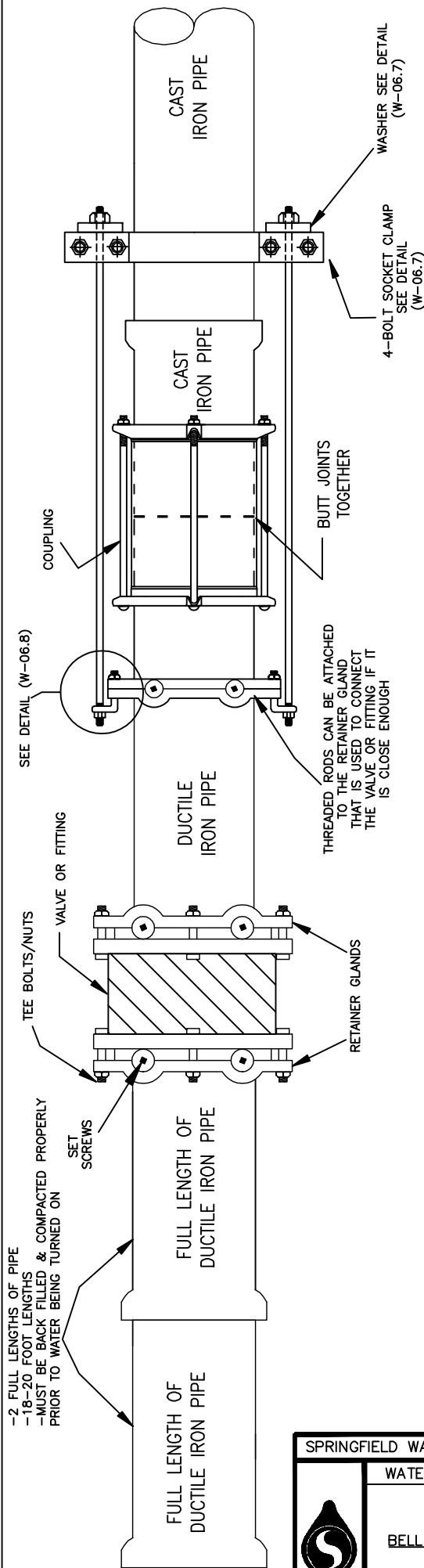
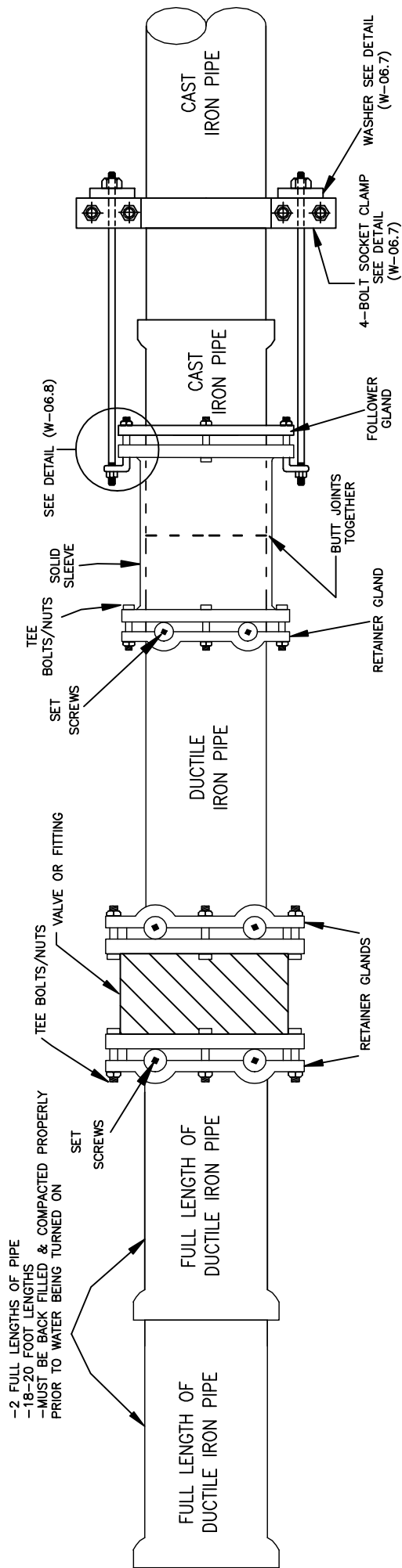


-2 FULL LENGTHS OF PIPE  
-18-20 FOOT LENGTHS  
-MUST BE BACK FILLED & COMPACTED PROPERLY  
PRIOR TO WATER BEING TURNED ON

**NOTES:**


1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. NUMBER OF THREADED RODS IS BASED ON MAXIMUM PRESSURE OF 150 P.S.I. IN MAIN.
3. THREADED RODS ARE TO BE FABRICATED FROM 4140 B-7 ALLOY STEEL.
4. STEEL THREADED RODS SHALL HAVE A YIELD STRESS OF NOT LESS THAN 105,000 P.S.I.
5. EYE-BOLTS SHALL HAVE A MINIMUM TENSILE STRENGTH OF 50,000 P.S.I. EACH.
6. RESTRAINT FOR 20 INCHES AND LARGER PIPES MUST BE DESIGNED ON A CASE-BY-CASE BASIS AND APPROVED BY ENGINEERING & TECHNICAL SERVICES (ET&S).
7. ALL COMPONENTS TO BE PROTECTIVE COATED WITH PROTECTIVE COATINGS AND TAPE.

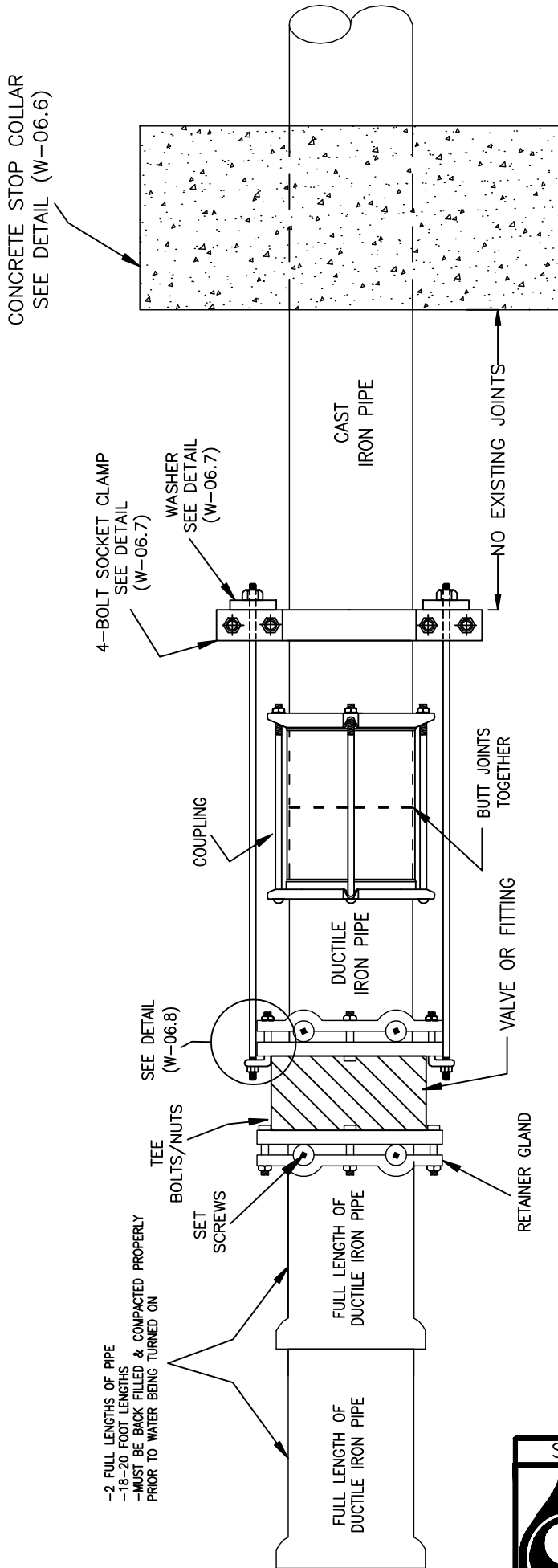
SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-06.3	REV. DATE
	CUTTING INTO EXISTING WATER MAIN WITH BELL FACING VALVE	
SCALE: NTS		



**NOTES:**


1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. NUMBER OF THREADED RODS IS BASED ON MAXIMUM PRESSURE OF 150 P.S.I. IN MAIN.
3. THREADED RODS ARE TO BE FABRICATED FROM 4140 B-7 ALLOY STEEL.
4. STEEL THREADED RODS SHALL HAVE A YIELD STRESS OF NOT LESS THAN 105,000 P.S.I.
5. EYE-BOLTS SHALL HAVE A MINIMUM TENSILE STRENGTH OF 50,000 P.S.I. EACH.
6. RESTRAINT FOR 20 INCHES AND LARGER PIPES MUST BE DESIGNED ON A CASE-BY-CASE BASIS AND APPROVED BY ENGINEERING & TECHNICAL SERVICES (ET&S).
7. ALL COMPONENTS TO BE PROTECTIVE COATED WITH PROTECTIVE COATINGS AND TAPE.

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-06.4	REV. DATE
	CUTTING-INTO EXISTING WATER MAIN WITH BELL FACING AWAY FROM VALVE	4/1/08 MAB
SCALE: NTS		

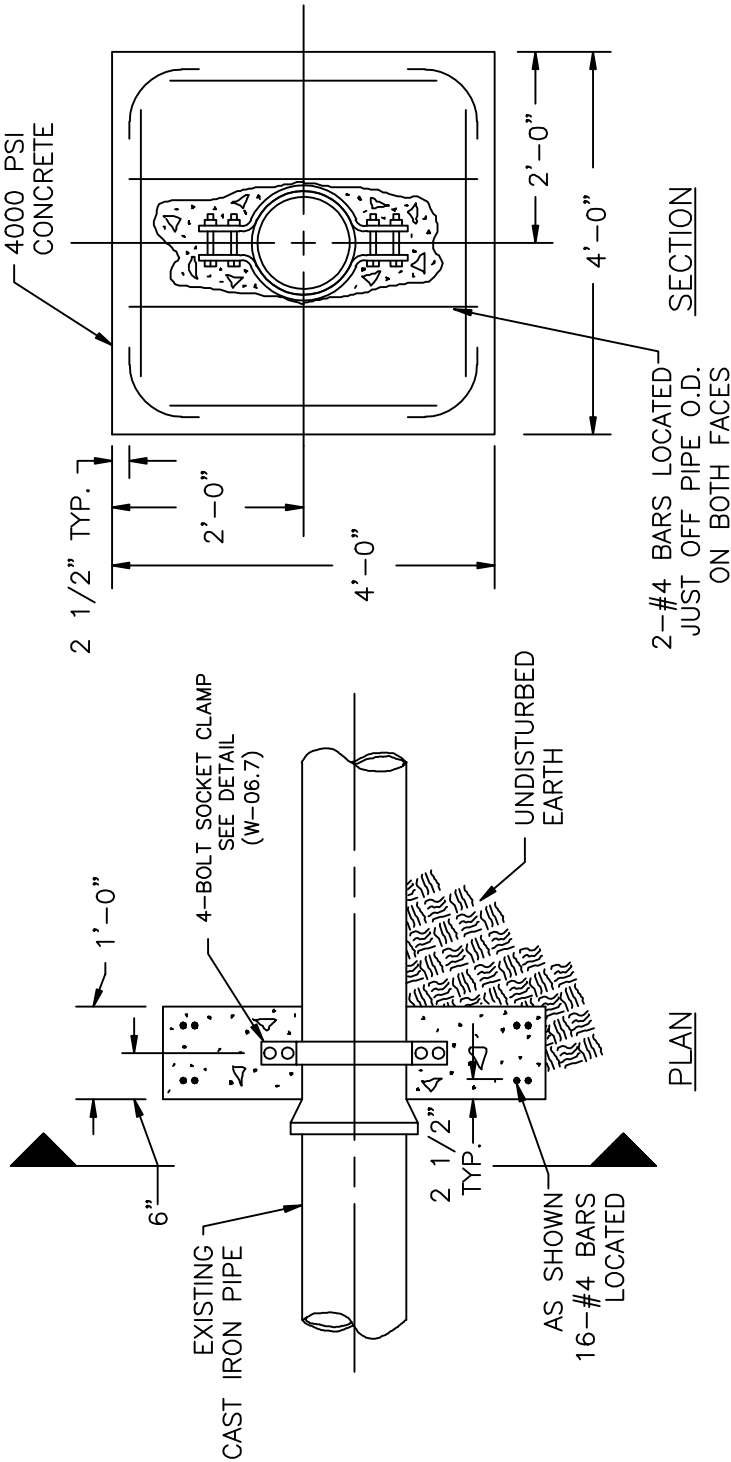


**NOTES:**

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. NUMBER OF THREADED RODS IS BASED ON MAXIMUM PRESSURE OF 150 P.S.I. IN MAIN.
3. THREADED RODS ARE TO BE FABRICATED FROM 4140 B-7 ALLOY STEEL.
4. STEEL THREADED RODS SHALL HAVE A YIELD STRESS OF NOT LESS THAN 105,000 P.S.I.
5. EYE-BOLTS SHALL HAVE A MINIMUM TENSILE STRENGTH OF 50,000 P.S.I. EACH.
6. RESTRAINT FOR 20 INCHES AND LARGER PIPES MUST BE DESIGNED ON A CASE-BY-CASE BASIS AND APPROVED BY ENGINEERING & TECHNICAL SERVICES (ET&S).
7. ALL COMPONENTS TO BE PROTECTIVE COATED WITH PROTECTIVE COATINGS AND TAPE.

		SPRINGFIELD WATER AND SEWER COMMISSION	
		WATER DETAIL W-06.5	REV. DATE 4/1/08 MAB
		<u>CUTTING-INTO EXISTING WATER MAIN WITH NO BELL FOUND</u>	
		SCALE: NTS	

# CONCRETE THRUST COLLAR



### SPECIAL NOTE:

1. IN LIEU OF CONCRETE STOP COLLAR THE CONTRACTOR MAY MECHANICALLY RESTRAIN (BY APPROVED METHOD) THREE (3) FULL PIPE LENGTHS FROM PROPOSED LOCATION OF STOP COLLAR.

### NOTES:

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. NUMBER OF THREADED RODS IS BASED ON MAXIMUM PRESSURE OF 150 P.S.I. IN MAIN.
3. THREADED RODS ARE TO BE FABRICATED FROM 4140 B-7 ALLOY STEEL.
4. STEEL THREADED RODS SHALL HAVE A YIELD STRESS OF NOT LESS THAN 105,000 P.S.I.
5. EYE-BOLTS SHALL HAVE A MINIMUM TENSILE STRENGTH OF 50,000 P.S.I. EACH.
6. RESTRAINT FOR 20 INCHES AND LARGER PIPES MUST BE DESIGNED ON A CASE-BY-CASE BASIS AND APPROVED BY ENGINEERING & TECHNICAL SERVICES (ET&S).
7. ALL COMPONENTS TO BE PROTECTIVE COATED WITH PROTECTIVE COATINGS AND TAPE.

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-06.6	REV. DATE
	CONCRETE THRUST COLLAR	4/1/08 MAB
SCALE: NTS		



# SOCKET CLAMP DATA CHART

Nominal Pipe Size (inches)	Max Hydrostatic Test Pressure (in PSD)	Force (1) on Clamp (in lbs.)	Clamp (2 & 3) Inside Diameter (in inches)	Length of Clamp (2 & 3) (in inches)	Width of Clamp (2 & 3) (in inches)	Thickness of Clamp (2 & 3) (in inches)	Minimum Bolt Size (in inches)	Thickness of CI Clamp Washer (4) (in inches)	Size of CI Clamp Washer (4) (in inches)	Thickness of Steel Clamp Washer (4) (in inches)	Size of Steel Clamp Washer (4) (in inches)	Nominal Threaded Rod (7) Diameter (in inches)	Number of Nominal Threaded Rod (7)	Associated Hardware
4	250	4550	5	14 5/8	2	1/2	5/8 x 3 1/2	5/8	3 dia or 3 x 3	1/2	3 dia or 3 x 3	3/4	1	notes 2, 5, 6, 8, & 9
6	250	9340	7 1/8	16 7/8	2	1/2	5/8 x 3 1/2	5/8	3 dia or 3 x 3	1/2	3 dia or 3 x 3	3/4	1	notes 2, 5, 6, 8, & 9
8	250	16080	9 5/16	19 1/8	2 1/2	5/8	5/8 x 4	5/8	3 dia or 3 x 3	1/2	3 dia or 3 x 3	3/4	1	notes 2, 5, 6, 8, & 9
10	250	24180	11 1/2	21 3/8	2 1/2	5/8	3/4 x 4	5/8	3 dia or 3 x 3	1/2	3 dia or 3 x 3	3/4	1	notes 2, 5, 6, 8, & 9
12	250	34230	13 1/2	25 1/8	3	5/8	7/8 x 4 1/2	3/4	3-1/2 dia or 3-1/2 x 3-1/2	1/2	3 dia or 3 x 3	1	1	notes 2, 5, 6, 8, & 9
16	115	27760	17 7/8	31 3/8	4	3/4	1 x 4 1/2	1	4 dia or 4 x 4	1/2	3-1/2 dia or 3-1/2 x 3-1/2	1	2	notes 2, 5, 6, 8, & 9
1 At Max Hydrostatic Test Pressure														
2 All Socket Clamps and associated hardware shall meet the requirements of National Fire Protection Association 24														
3 Socket Clamps shall be as provided by PHD Manufacturing, Inc. Figure 590, Anvil Company, Figure 595, Cooper B-Line, Figure B3134, Carpenter and Patterson, Figure 158DB, or the equal product of another manufacturer.														
4 Socket Clamps Washers shall be as provided by PHD Manufacturing, Inc. Figure 594, Cooper B-Line, Figure B3134W, Carpenter and Patterson, Figure 258, or the equal product of another manufacturer.														
5 Bent Eye Bolts shall be constructed of high strength low alloy steel, per ASTM A588, grade B, Unified National Coarse (UNC) rolled thread														
6 Bent Eye Bolts shall be as provided by PHD Manufacturing, Inc. - Figure 598B, Star National Products - Figures 3/4" SST747 or 3/4" SST757, Dresser Piping Specialties, Inc. - Style 442, or the equal product of another manufacturer.														
7 Threaded Rods shall be constructed of 4140-alloy steel, per ASTM A193, grade B7, Unified National Coarse (UNC) rolled thread														
8 Washers for bent eye bolts shall be cadmium plated and constructed of case hardened C1006 steel, grade 2, Rockwell hardness B55														
9 Heavy hex nuts shall be constructed of medium carbon steel, ASTM A194, grade 2H, and Unified National Coarse (UNC) thread														



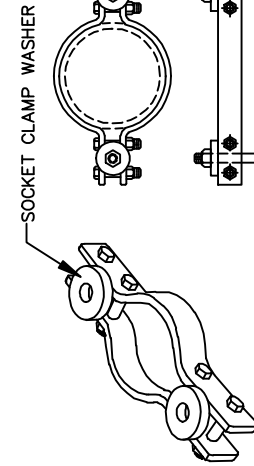
SPRINGFIELD WATER AND SEWER COMMISSION

WATER DETAIL W-06.7

SOCKET CLAMP DETAIL

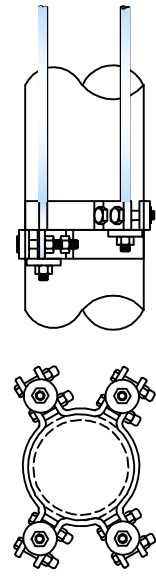
SCALE: NTS

REV. DATE  
4/1/08 MAB  
6/18/08 MAB



SOCKET CLAMP WASHER

ALL 4 BOLTS ON SOCKET CLAMP MUST BE TIGHTENED WITH A TORQUE WRENCH.  
5/8" DIAMETER BOLTS = 65 FOOT-LBS  
3/4" DIAMETER BOLTS = 75 FOOT-LBS



TYPICAL TWO 4-BOLT SOCKET CLAMP INSTALLATION

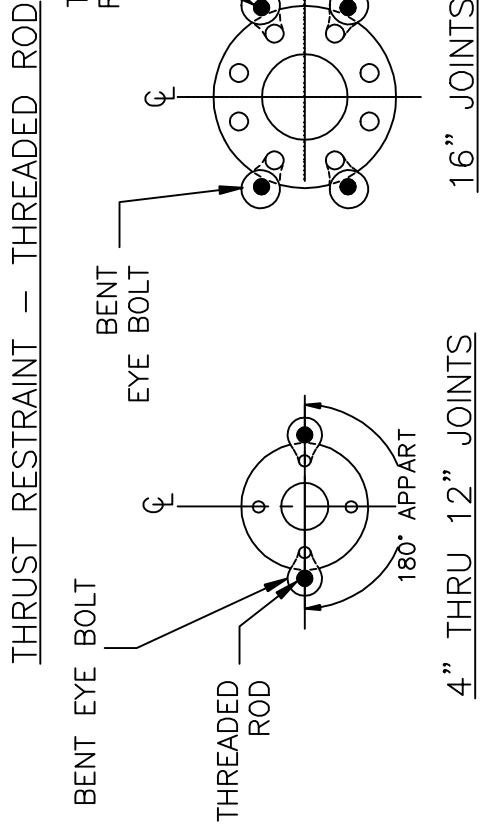
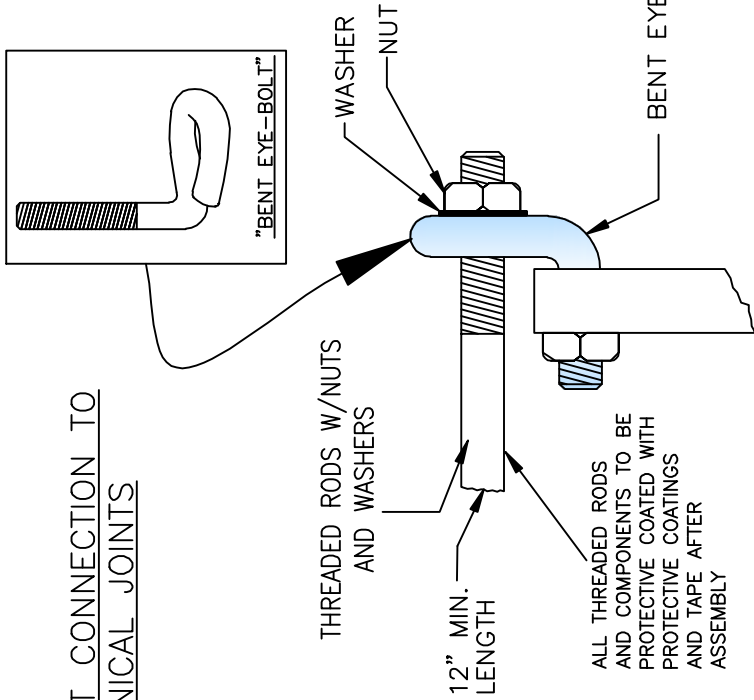
AFTER FINAL ASSEMBLY ALL THE NUTS CONNECTED TO THE THREADED RODS MUST BE HAND TIGHTENED PLUS AN ADDITIONAL 1/2 TURN TO BE PROPERLY INSTALLED.

TYPICAL SINGLE 4-BOLT SOCKET CLAMP

### NOTES:

- ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
- NUMBER OF THREADED RODS IS BASED ON MAXIMUM PRESSURE OF 150 P.S.I. IN MAIN.
- THREADED RODS ARE TO BE FABRICATED FROM 4140 B-7 ALLOY STEEL.
- STEEL THREADED RODS SHALL HAVE A YIELD STRESS OF NOT LESS THAN 105,000 P.S.I.
- EYE-BOLTS SHALL HAVE A MINIMUM TENSILE STRENGTH OF 50,000 P.S.I. EACH.
- RESTRAINT FOR 20 INCHES AND LARGER PIPES MUST BE DESIGNED ON A CASE-BY-CASE BASIS AND APPROVED BY ENGINEERING & TECHNICAL SERVICES (ET&S).
- ALL COMPONENTS TO BE PROTECTIVE COATED WITH PROTECTIVE COATINGS AND TAPE.

BENT EYE BOLT CONNECTION TO MECHANICAL JOINTS




PIPE SIZE	No. THREADED RODS*
4" THRU 10"	2 - 3/4"φ
12"	2 - 1"φ
16"	4 - 1"φ
GREATER THAN 16"	APPROVAL BY ET&S

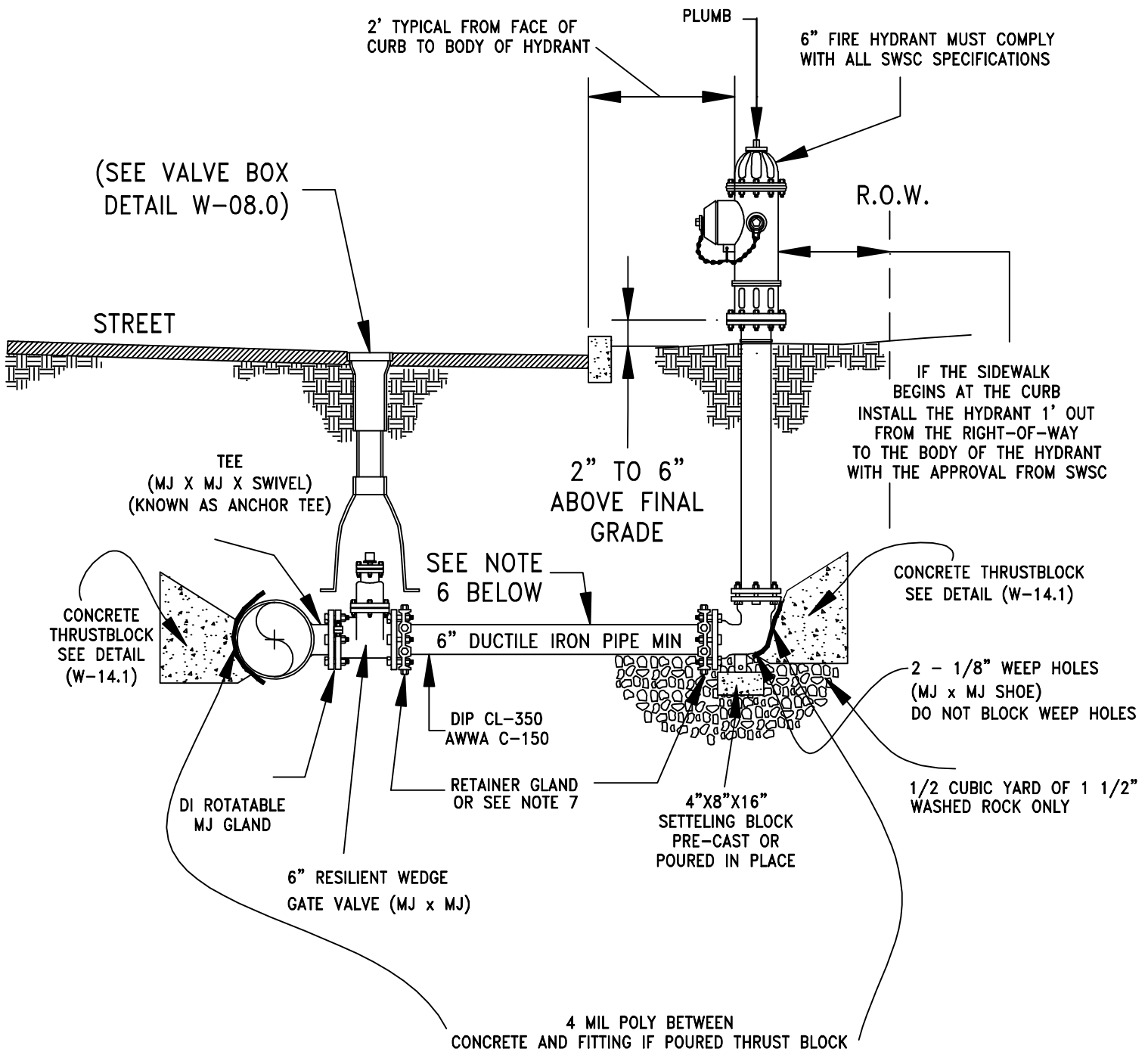
\*STANDARD LENGTHS ARE 3', 6' & 12' COUPLINGS MAY BE USED FOR LONGER LENGTHS.

SEE SOCKET CLAMP DATA CHART DETAIL (W-06.7) FOR HARDWARE, MATERIAL, MANUFACTURERS AND BOLT TIGHTENING REQUIREMENTS

**NOTES:**

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. NUMBER OF THREADED RODS IS BASED ON MAXIMUM PRESSURE OF 150 P.S.I. IN MAIN.
3. THREADED RODS ARE TO BE FABRICATED FROM 4140 B-7 ALLOY STEEL.
4. STEEL THREADED RODS SHALL HAVE A YIELD STRESS OF NOT LESS THAN 105,000 P.S.I.
5. EYE-BOLTS SHALL HAVE A MINIMUM TENSILE STRENGTH OF 50,000 P.S.I. EACH.
6. RESTRAINT FOR 20 INCHES AND LARGER PIPES MUST BE DESIGNED ON A CASE-BY-CASE BASIS AND APPROVED BY ENGINEERING & TECHNICAL SERVICES (ET&S).
7. ALL COMPONENTS TO BE PROTECTIVE COATED WITH PROTECTIVE COATINGS AND TAPE.


SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-06.8	REV. DATE
	THREADED ROD DETAIL CONNECTION TO MJ DETAIL	4/1/08 MAB
SCALE: NTS		

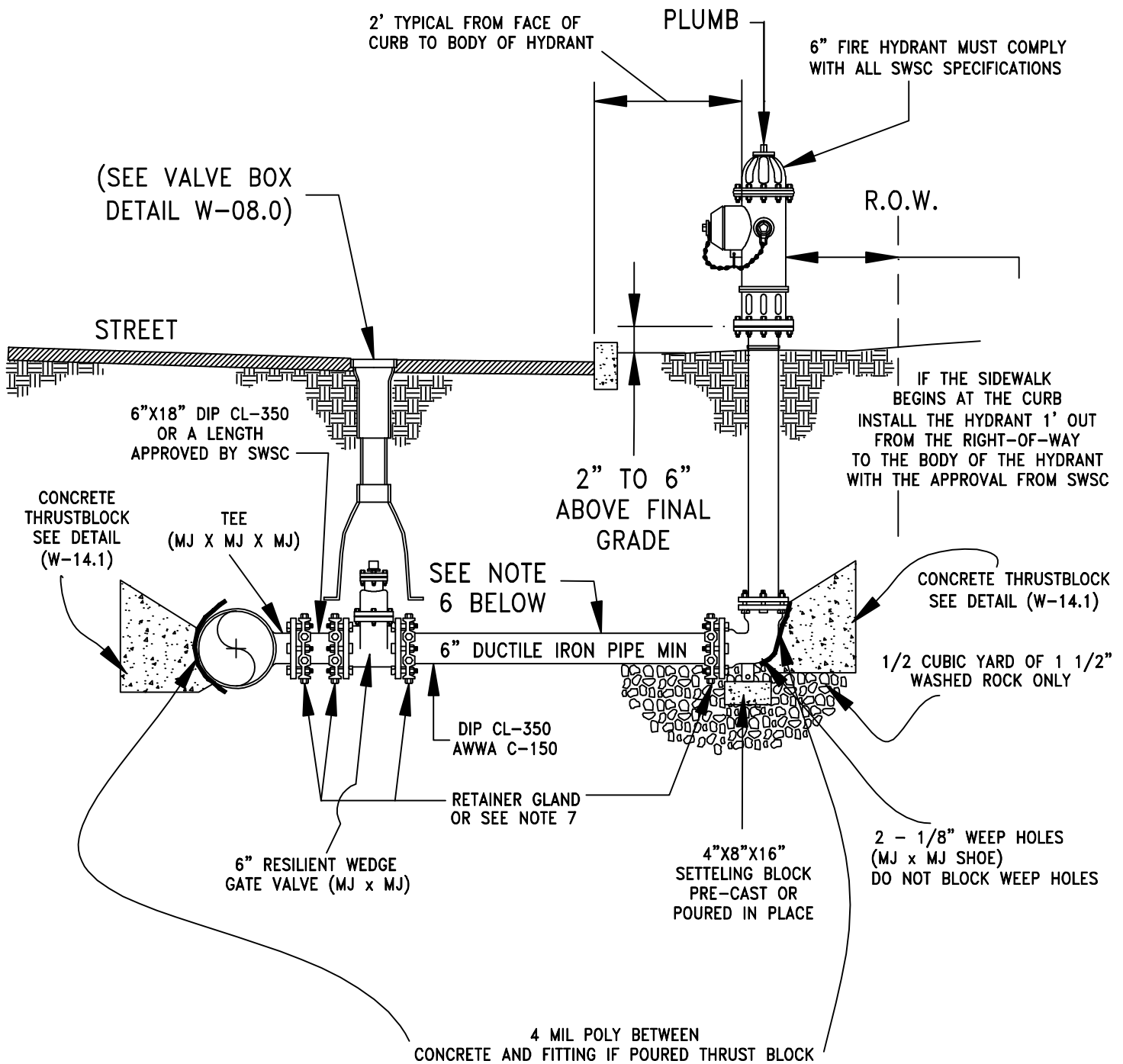


Last Modified: 04/09/2025 at 10:39AM EDT

**NOTES:**

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.
4. ALL FIRE HYDRANTS SHALL BE INSTALLED PLUMB & LOCATED ACCORDING TO PROJECT PLANS.
5. NO TAPS SHALL BE ALLOWED BETWEEN THE HYDRANT & THE VALVE.
6. THE MECHANICAL JOINTS OF THE FIRE HYDRANT ASSEMBLY SHALL BE RESTRAINED VIA RETAINER GLAND. IF MORE THAN ONE SECTION IS USED, RETAINER GLAND RESTRAINTS SHALL BE USED AT ALL CONNECTIONS.
7. FOR RESTRAINT METHODS OTHER THAN RETAINER GLAND SEE DETAILS (W-06.1 THRU W-06.6).

SPRINGFIELD WATER AND SEWER COMMISSION			
	WATER DETAIL W-07.0	REV. DATE	
	<i>STANDARD FIRE HYDRANT ASSEMBLY</i>		4/1/08 MAB
	SCALE: NTS		



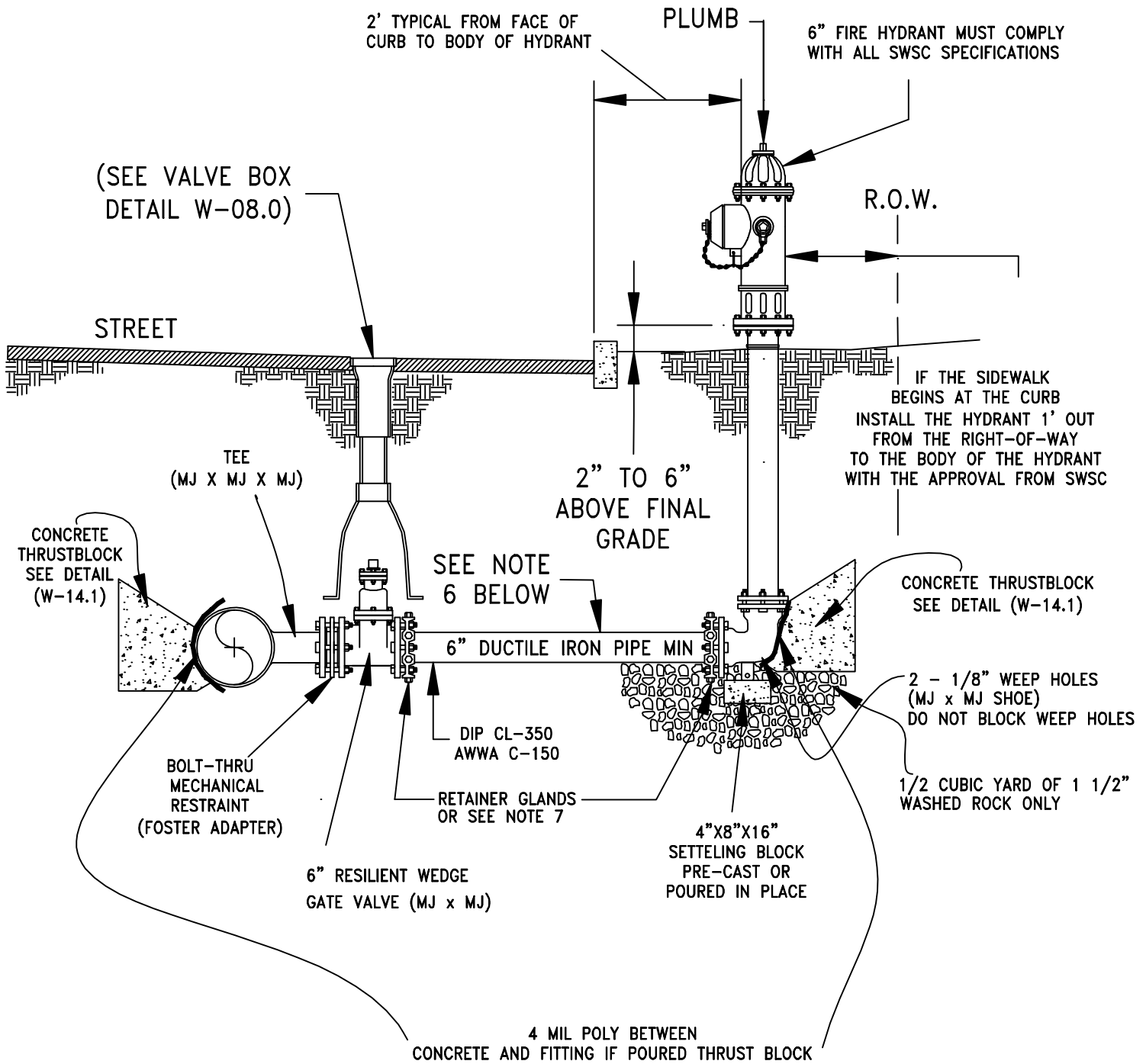
**NOTES:**

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.
4. ALL FIRE HYDRANTS SHALL BE INSTALLED PLUMB & LOCATED ACCORDING TO PROJECT PLANS.
5. NO TAPS SHALL BE ALLOWED BETWEEN THE HYDRANT & THE VALVE.
6. THE MECHANICAL JOINTS OF THE FIRE HYDRANT ASSEMBLY SHALL BE RESTRAINED VIA RETAINER GLAND. IF MORE THAN ONE SECTION IS USED, RETAINER GLAND RESTRAINTS SHALL BE USED AT ALL CONNECTIONS.
7. FOR RESTRAINT METHODS OTHER THAN RETAINER GLAND SEE DETAILS (W-06.1 THRU W-06.6).

**THIS DETAIL MUST  
BE APPROVED FOR  
USE BY THE  
S.W.S.C BEFORE IT  
CAN BE INSTALLED**

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-07.1	REV. DATE
	<i>ALTERNATE 1</i>	4/1/08 MAB
	<i>FIRE HYDRANT ASSEMBLY</i>	
	SCALE: NTS	

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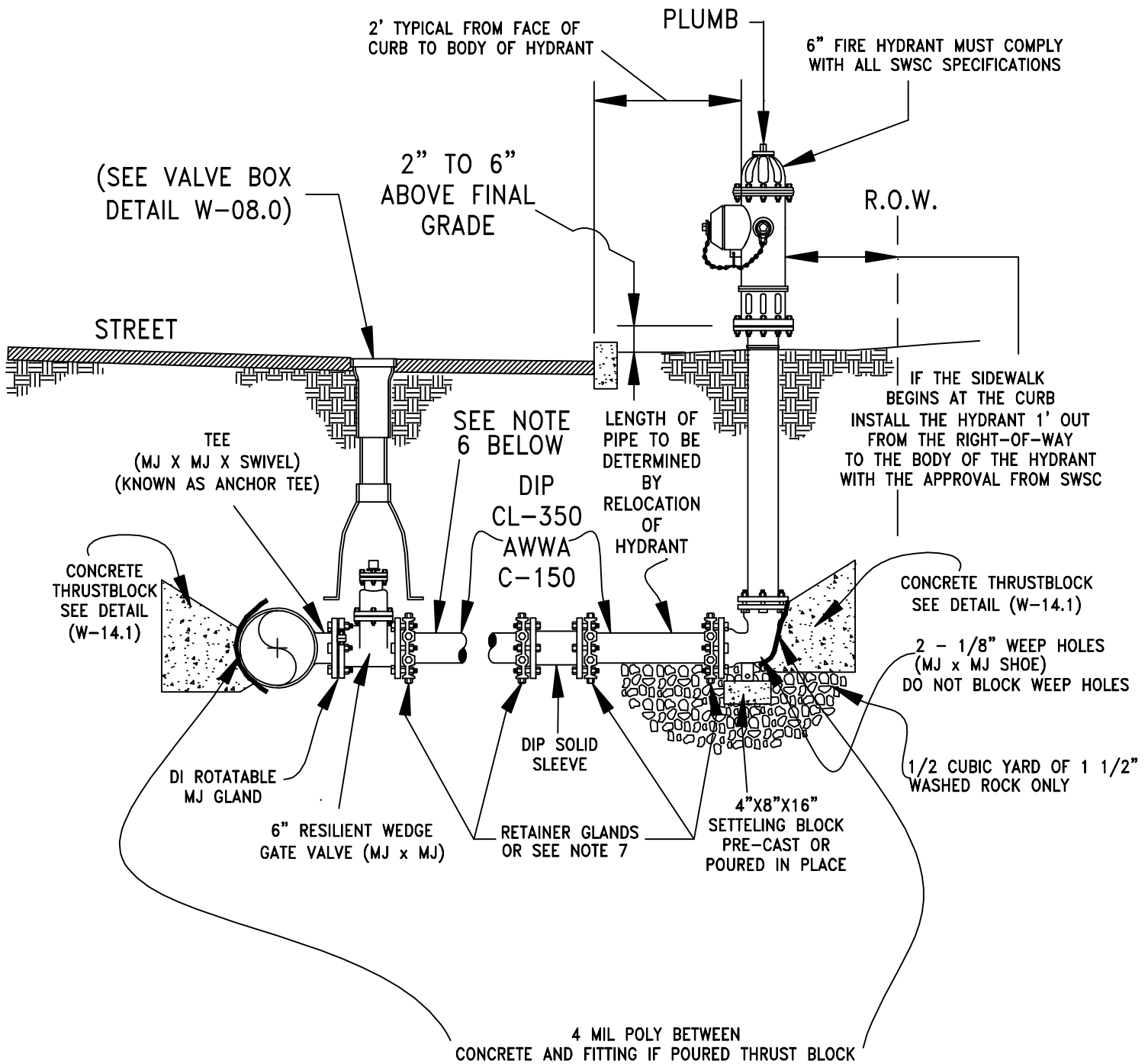
**NOTES:**

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.
4. ALL FIRE HYDRANTS SHALL BE INSTALLED PLUMB & LOCATED ACCORDING TO PROJECT PLANS.
5. NO TAPS SHALL BE ALLOWED BETWEEN THE HYDRANT & THE VALVE.
6. THE MECHANICAL JOINTS OF THE FIRE HYDRANT ASSEMBLY SHALL BE RESTRAINED VIA RETAINER GLAND. IF MORE THAN ONE SECTION IS USED, RETAINER GLAND RESTRAINTS SHALL BE USED AT ALL CONNECTIONS.
7. FOR RESTRAINT METHODS OTHER THAN RETAINER GLAND SEE DETAILS (W-06.1 THRU W-06.6).

THIS DETAIL MUST  
BE APPROVED FOR  
USE BY THE  
S.W.S.C BEFORE IT  
CAN BE INSTALLED

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-07.2	REV. DATE
	<i>ALTERNATE 2</i>	4/1/08 MAB
	<i>FIRE HYDRANT ASSEMBLY</i>	
	SCALE: NTS	

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**NOTES:**

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.
4. ALL FIRE HYDRANTS SHALL BE INSTALLED PLUMB & LOCATED ACCORDING TO PROJECT PLANS.
5. NO TAPS SHALL BE ALLOWED BETWEEN THE HYDRANT & THE VALVE.
6. THE MECHANICAL JOINTS OF THE FIRE HYDRANT ASSEMBLY SHALL BE RESTRAINED VIA RETAINER GLAND. IF MORE THAN ONE SECTION IS USED, RETAINER GLAND RESTRAINTS SHALL BE USED AT ALL CONNECTIONS.
7. FOR RESTRAINT METHODS OTHER THAN RETAINER GLAND SEE DETAILS (W-06.1 THRU W-06.6).

SPRINGFIELD WATER AND SEWER COMMISSION

WATER DETAIL W-07.3

REV. DATE

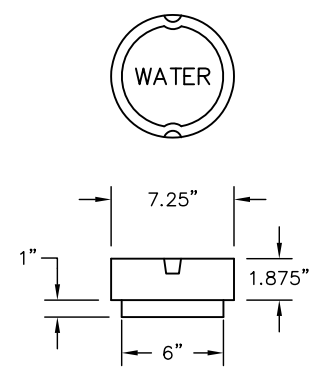
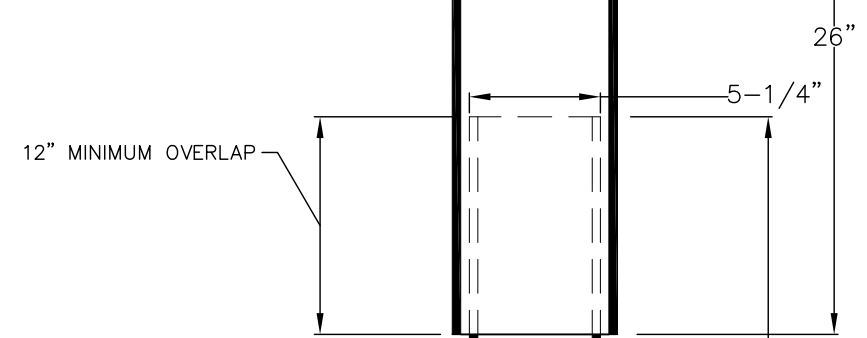
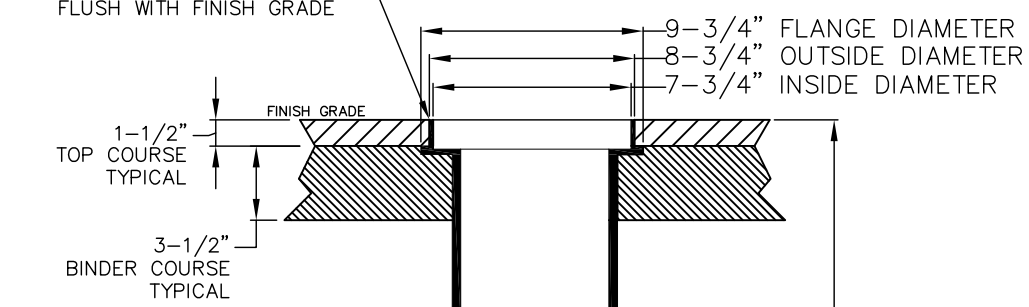
4/1/08 MAB

*RELOCATION OF  
FIRE HYDRANT ASSEMBLY  
(STRAIGHT BACK)*

SCALE: NTS



TOP OF EXISTING BOX SHALL BE FLUSH WITH FINISH GRADE



DROP STYLE COVER  
THE WORD "WATER"  
MUST BE CAST INTO COVER  
AND SHALL WEIGH  
NO LESS THAN 13 POUNDS

36"

2" OPERATING NUT  
CENTERED IN VALVE  
BOX BOTTOM

BACKFILL WITH SAND,  
CRUSHED STONE, SCREENED GRAVEL,  
OR SELECT COMMON BORROW/FILL  
TO 6" ABOVE BONNET OF VALVE IN 12" LIFTS  
COMPACTION TO 95% PROCTOR


3" CLEARANCE  
BETWEEN BLOCKING  
AND TOP OF BONNET

STANDARD BRICK (NO HOLES)  
8-1/2"x4"x2-3/4" (LENGTHXDEPTHXHEIGHT)  
PLACED OVER COMPACTED FILL  
AND UNDER VALVE BOX  
BOTTOM FOR SUPPORT

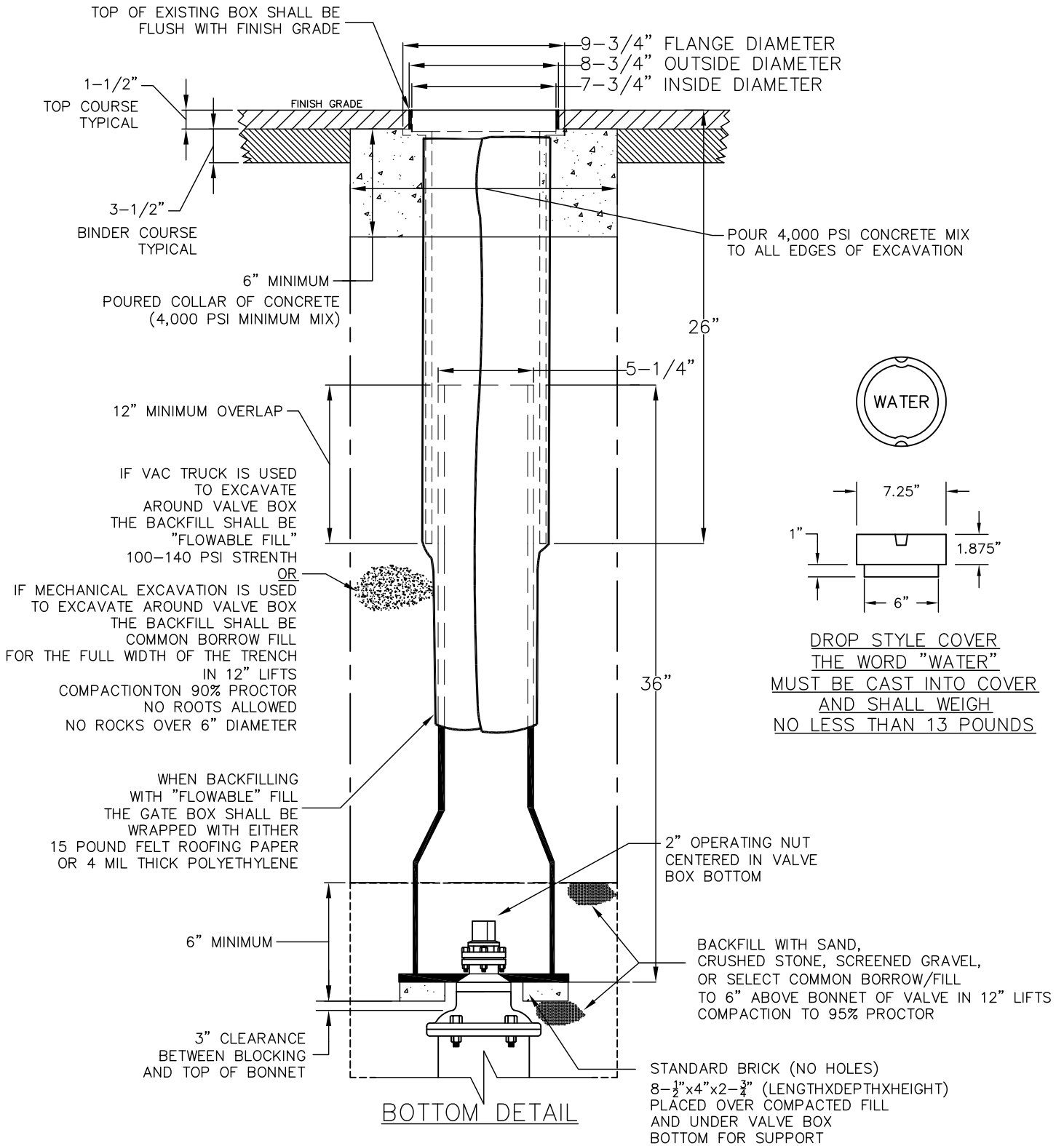
BOTTOM DETAIL

**NOTES:**

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.
4. IF BACKFILLING WITH "FLOWABLE" FILL WRAP THE VALVE BOX WITH 15 POUND FELT ROOFING PAPER OR 4 MIL THICK POLYETHYLENE IN ACCORDANCE WITH DETAIL W-08.1.

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-08.0	REV. DATE
		4/1/08 MAB
		4/1/09 MAB
	<u>VALVE BOX</u>	4/1/10 MAB
		1/9/19 DJP
SCALE: NTS		

Least Modified: 04/09/2025 at 10:35AM EDT

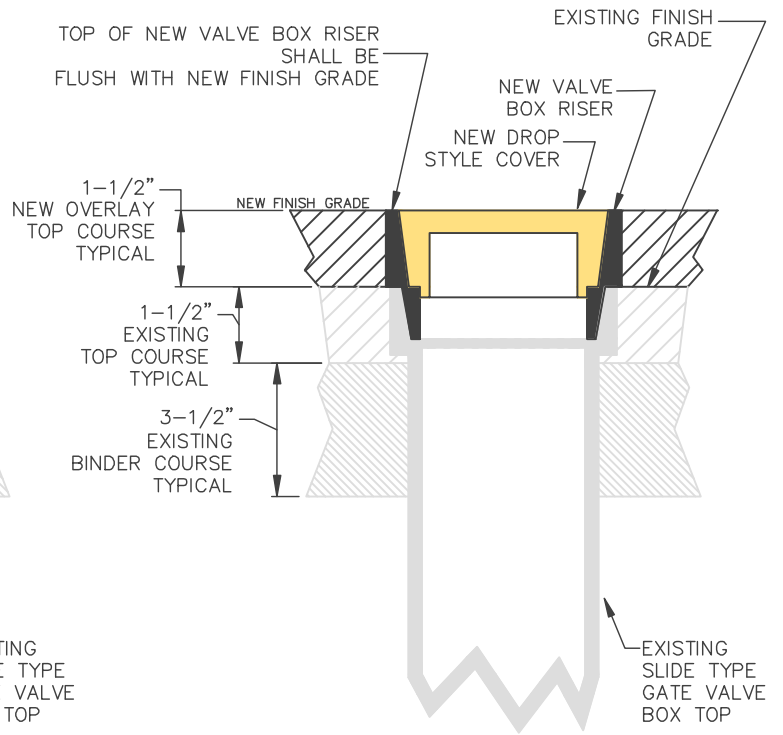
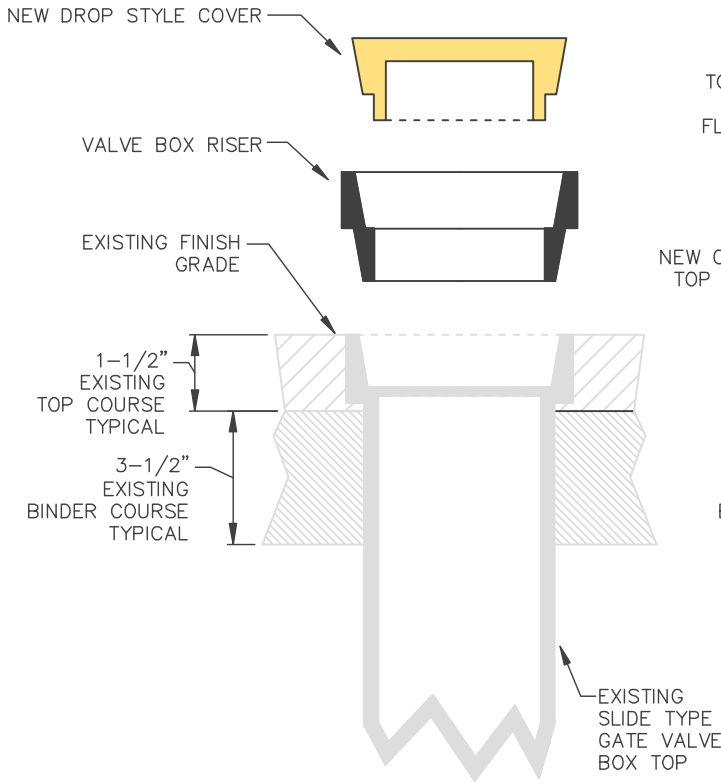


- NOTES:**
1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
  2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
  3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.

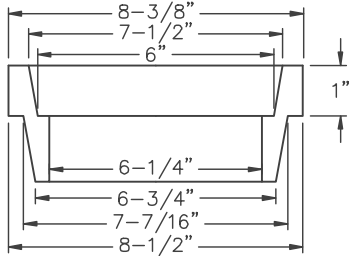
SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-08.1	REV. DATE
	<i>REPLACE, RAISE OR RESET VALVE BOX</i>	4/1/09 MAB
		1/10/19 DJP
SCALE: NTS		



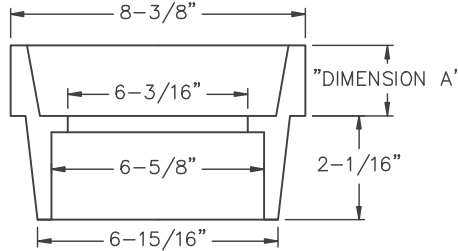
Last Modified: 04/09/2025 at 10:39AM EDT



VALVE BOX RISER INSTALLED

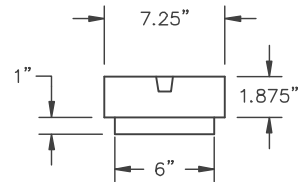


1"  
VALVE BOX RISER



1-1/2"-6"  
STANDARD VALVE BOX RISER

RISER HEIGHT INCREASE DIMENSION "A"
1"
1-1/2"
2"
3"
4"
6"



NEW DROP STYLE COVER  
THE WORD "WATER"  
MUST BE CAST INTO COVER  
AND SHALL WEIGH  
NO LESS THAN 13 POUNDS

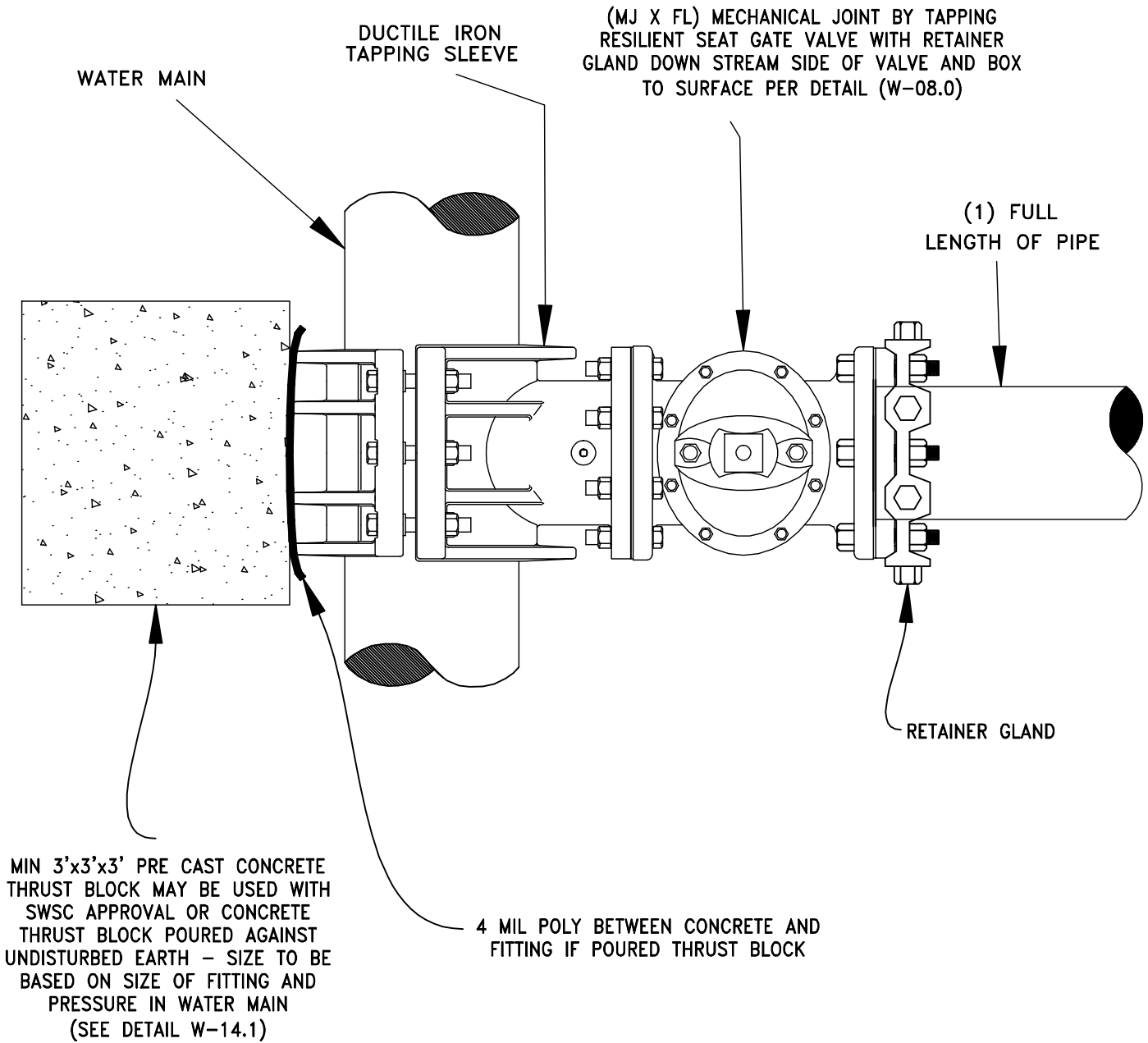
NOTE: THESE RISERS WILL WORK SATISFACTORILY WITH MOST 5-1/4" VALVE BOXES.

**NOTES:**

- ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
- ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
- SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.


SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-08.2	REV. DATE
	<i>RAISE VALVE BOX WITH RISER</i>	4/1/09 MAB
	SCALE: NTS	

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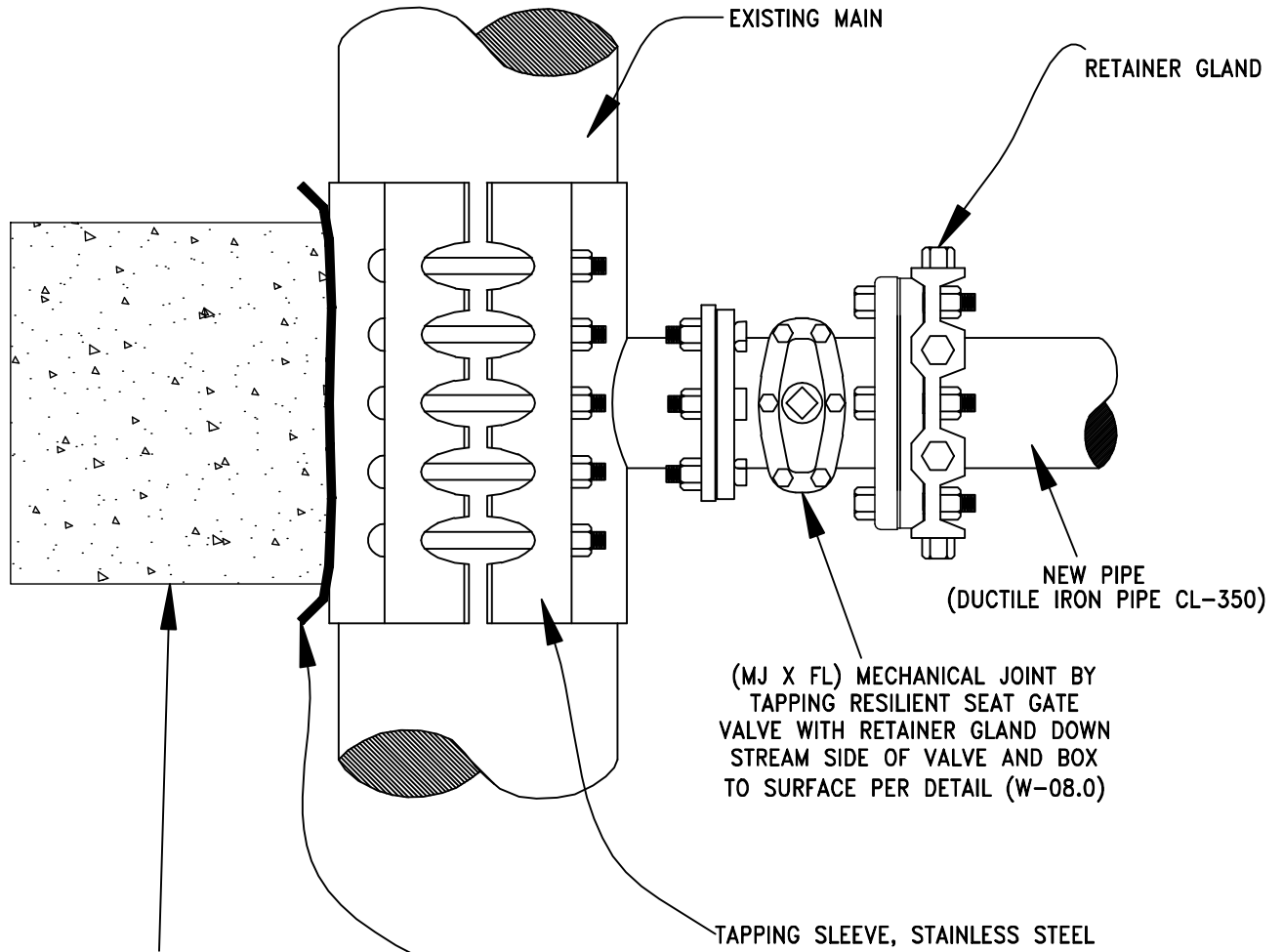


**NOTES:**

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-09.0	REV. DATE
	<i>DUCTILE IRON TAPPING SLEEVE</i>	4/1/08 MAB
	SCALE: NTS	

Last Modified: 04/09/2025 at 10:39AM EDT



MIN 3'x3'x3' PRE CAST CONCRETE THRUST BLOCK MAY BE USED WITH SWSC APPROVAL OR CONCRETE THRUST BLOCK POURED AGAINST UNDISTURBED EARTH - SIZE TO BE BASED ON SIZE OF FITTING AND PRESSURE IN WATER MAIN (SEE DETAIL W-14.1)

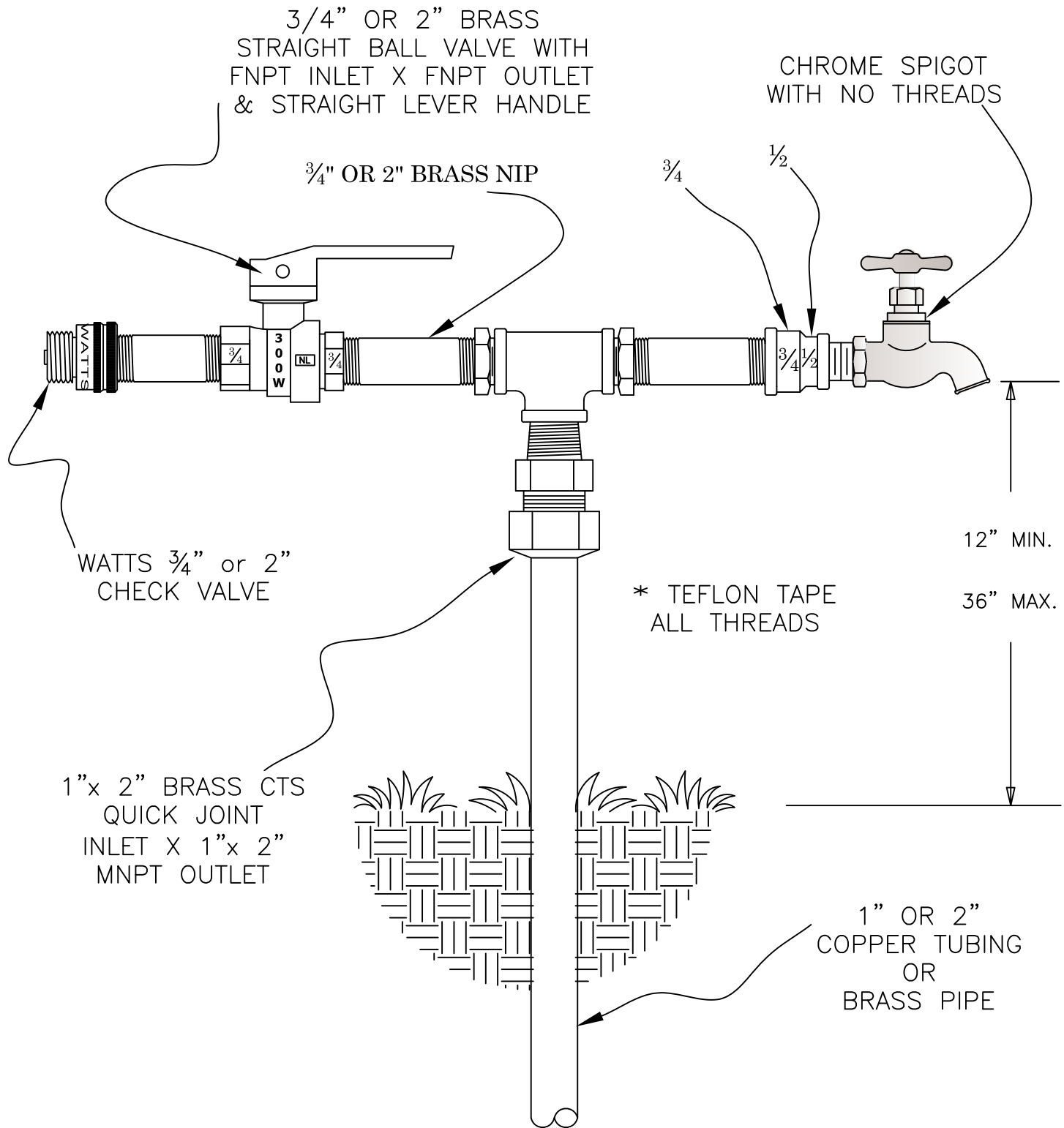
4 MIL POLY BETWEEN CONCRETE AND FITTING IF POURED THRUST BLOCK

**NOTES:**

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.


SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-09.1	REV. DATE
	<i>STAINLESS STEEL</i>	4/1/08 MAB
	<i>TAPPING SLEEVE</i>	
SCALE: NTS		

Least Modified: 04/09/2025 at 10:35AM EDT

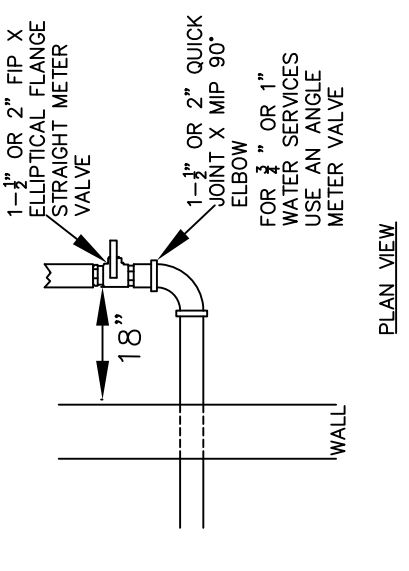


**NOTES:**

- 1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.

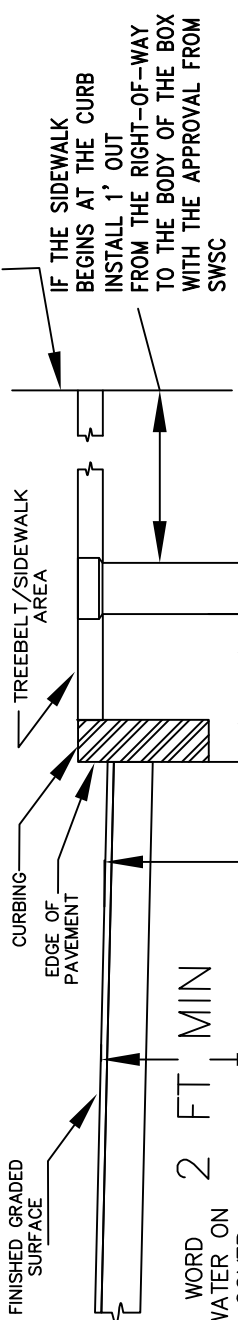
SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-10.0	REV. DATE
	<i>FLUSHING DEVICE</i>	1/6/07 MJL
		4/1/08 MAB
		6/18/08 MAB
SCALE: NTS		

**DETAIL A**



**PLAN VIEW**

**PROPERTY LINE**



IF THE SIDEWALK BEGINS AT THE CURB INSTALL 1' OUT FROM THE RIGHT-OF-WAY TO THE BODY OF THE BOX WITH THE APPROVAL FROM SWSC

INSTALL NEW BUFFALO BOX, OVERALL ASSEMBLED LENGTH IS 3'-6" SEE DETAIL (W-12.0)

6" MINIMUM OVERLAP

INSTALL BUFFALO BOX OVERALL ASSEMBLED LENGTH IS 5-6 FEET SEE DETAIL (W-12.1)

TAP MAIN @ 3 & 9 O'CLOCK POSITIONS

USE AS REQUIRED, A 1"X1" QUICK JOINT COUPLING

1" NO LEAD BRASS BALL CORPORATION (Mueller B25008EB) W/ TEE HEAD ADAPTER W/ 1" AWWA/CC INLET X 1" QUICK JOINT OUTLET

INSTALL 1" NO LEAD BRASS BALL VALVE CURB STOP (Mueller B25209EB) W/ 1" QUICK JOINT INLET X 1" QUICK JOINT OUTLET

8-1/2" x 4" x 2-3/4" (LENGTH X DEPTH X HEIGHT) ON COMPACTED SOIL

1" NO LEAD BRASS BALL CORPORATION (Mueller B25008EB) W/ TEE HEAD ADAPTER W/ 1" AWWA/CC INLET X 1" QUICK JOINT OUTLET

**NOTES:**

1. ALL BRASS MUST BE LEAD FREE TYPE. ALL MUELLER PART NUMBERS REFERENCED IN THIS DRAWING MAY BE USED, FOR ADDITIONAL APPROVED MANUFACTURERS, SEE THE SWSC MATERIAL SPECIFICATIONS.
2. ALL TAPS DONE BY SWSC.
3. BLOCKING UNDER ALL FITTINGS.
4. ALL PIPE OR AWWA/CC THREADED JOINTS TO BE SEALED WITH TEFLON PIPE JOINT SEAL TAPE (PTFE). QUICK TYPE COMPRESSION JOINTS ARE NOT SEALED WITH TEFLON TAPE.
5. 3/4" COPPER TUBING SHALL NOT BE USED. ALL SERVICES SHALL BE 1" OR LARGER COPPER TUBING.
6. THE CORPORATION AT THE WATER MAIN IS FOR EMERGENCY USE AND THE BOX WILL BE BURIED 2-FEET BELOW FINISHED GRADE.
7. A SECOND OPERATIONAL CURB STOP SHALL BE INSTALLED IN THE TREEBELT. THE ARCH PATTERN BOX WILL BE SET AT FINISHED GRADE.
8. BOTH CURB BOXES WILL BE MEASURED FOR LOCATION TIES. A MINIMUM OF (3) TIES FOR EACH BOX.
9. TO KEEP A WATER METER 18" FROM WALL SEE DETAIL A.

**TAPPING NOTES:**

FOR 1" = USE DIRECT TAPPING FOR 1-1/2" and 2" = MUST USE SWSC SADDLE

\* LAID UNDER FOOTING ONLY WHEN REQUIRED TO MAINTAIN 5'-6" OF BURY FOR FROST PROTECTION (ONLY WITH SWSC APPROVAL)

SPRINGFIELD WATER AND SEWER COMMISSION

WATER DETAIL W-11.0

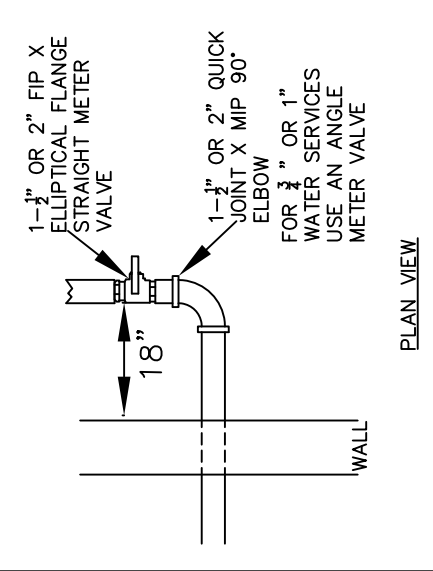


*NEW WATER SERVICE*

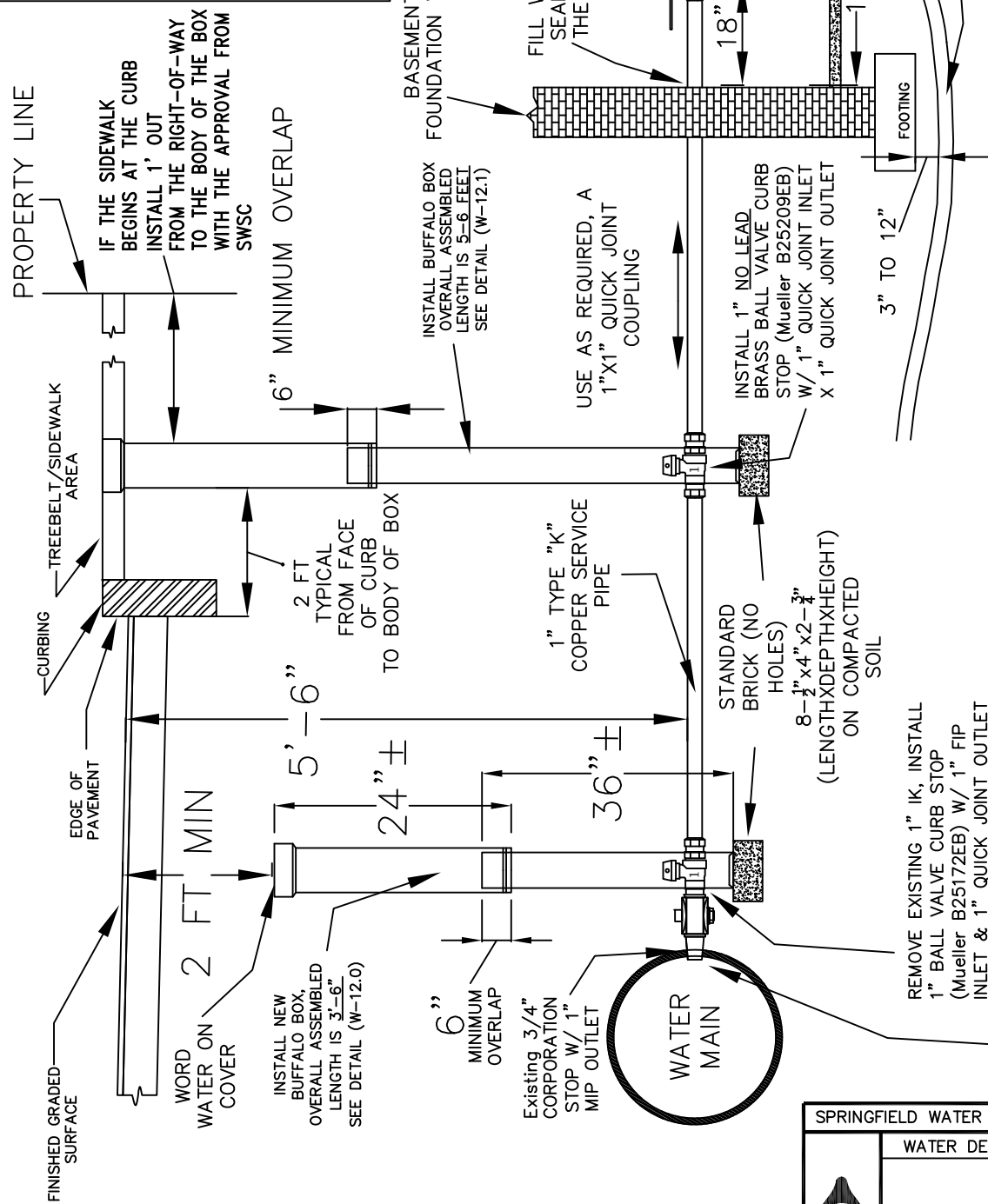
SCALE: NTS

REV. DATE
3/3/03 MJL
4/1/08 MAB
9/23/20 MAB
12/8/20 MJL

**DETAIL A**



**PLAN VIEW**




**NOTES:**

1. **ALL BRASS MUST BE LEAD FREE TYPE.** ALL MUELLER PART NUMBERS REFERENCED IN THIS DRAWING MAY BE USED, FOR ADDITIONAL APPROVED MANUFACTURERS, SEE THE SWSC SPECIFICATIONS.
2. ALL TAPS DONE BY SWSC.
3. BLOCKING UNDER ALL FITTINGS.
4. ALL PIPE OR AWWA/C C THREADED JOINTS TO BE SEALED WITH TEFLON PIPE JOINT SEAL TAPE (PTFE). QUICK TYPE COMPRESSION JOINTS ARE NOT SEALED WITH TEFLON TAPE.
5. 3/4" COPPER TUBING SHALL NOT BE USED. ALL SERVICES SHALL BE 1" OR LARGER COPPER TUBING.
6. THE CORPORATION AT THE WATER MAIN IS FOR EMERGENCY USE AND THE BOX WILL BE BURIED 2- FEET BELOW FINISHED GRADE.
7. A SECOND OPERATIONAL CURB STOP SHALL BE INSTALLED IN THE TREEBELT. THE ARCH PATTERN BOX WILL BE SET AT FINISHED GRADE.
8. BOTH CURB BOXES WILL BE MEASURED FOR LOCATION TIES. A MINIMUM OF (3) TIES FOR EACH BOX TO KEEP A WATER METER 18" FROM WALL SEE DETAIL A.
- 9.

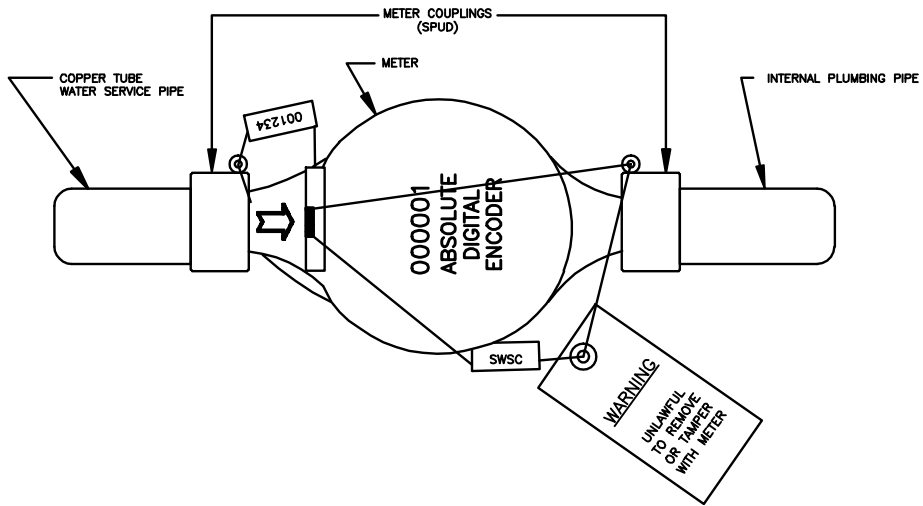
**TAPPING NOTES:**

FOR 1" = USE DIRECT TAPPING  
FOR 1-1/2" and 2" = MUST USE SWSC SADDLE

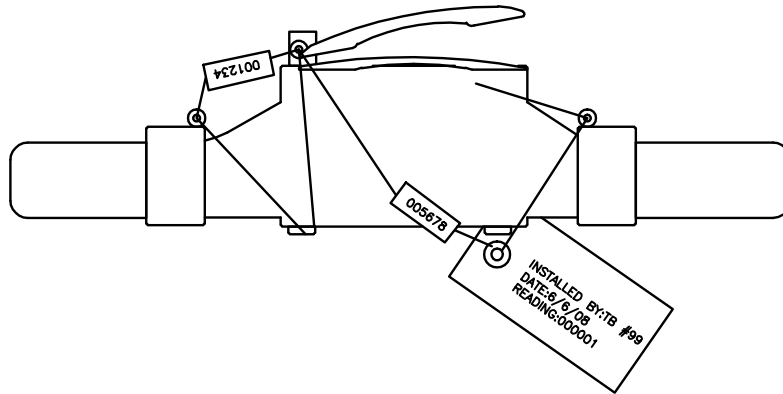
REMOVE EXISTING 1" IK, INSTALL 1" BALL VALVE CURB STOP (Mueller B25172EB) W/ 1" FIP INLET & 1" QUICK JOINT OUTLET

SPRINGFIELD WATER AND SEWER COMMISSION	
WATER DETAIL W-11.1	REV. DATE
 <b>REPLACEMENT WATER SERVICE</b>	3/3/03 MJL
	4/1/08 MAB
	9/23/20 MAB
	12/8/20 MJL
SCALE: NTS	

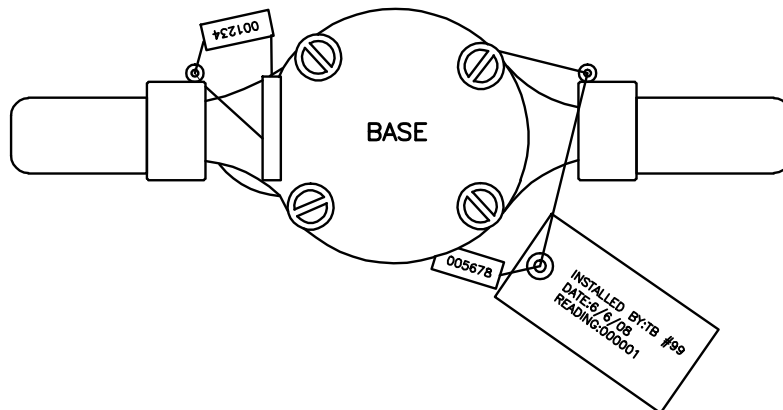
"TOP VIEW"



"SIDE VIEW"




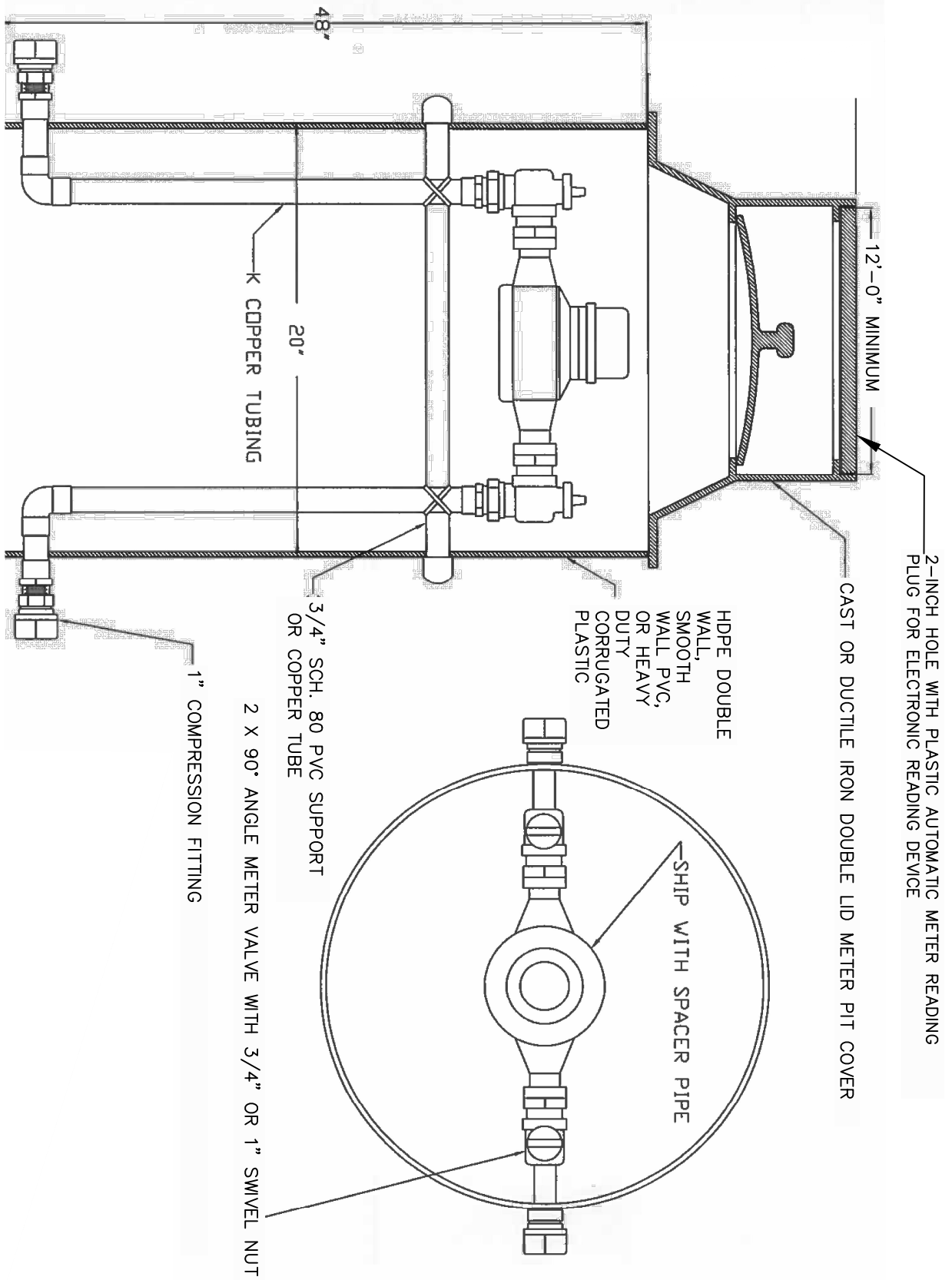
"BOTTOM VIEW"




**NOTES:**

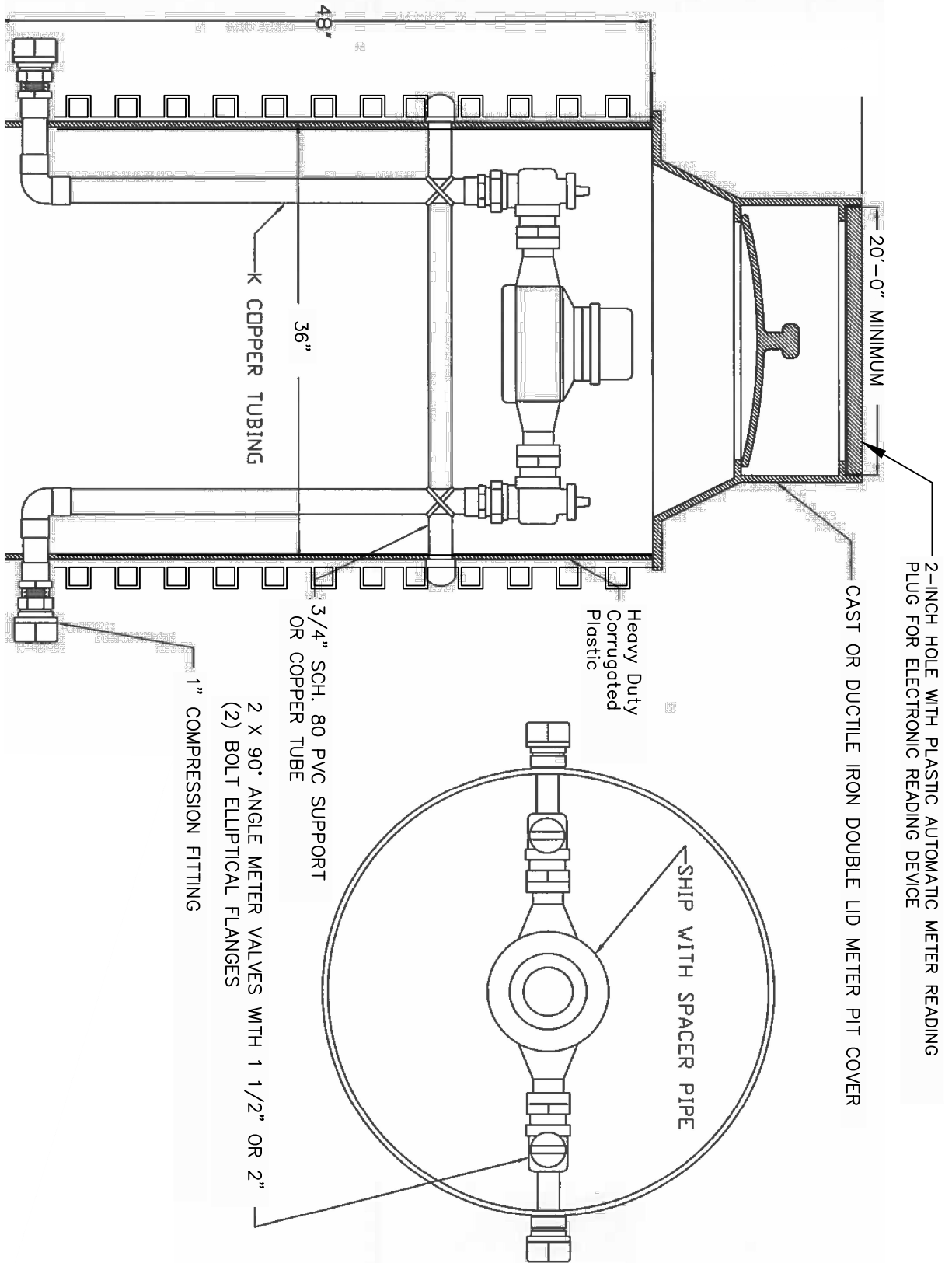
- METERS SHALL BE SEALED BY COMMISSION INSTALLERS & METER READERS ONLY.**


SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-11.2	REV. DATE
	<u>WATER METER SEALING DETAIL</u>	
SCALE: NTS		



SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-11.3	REV. DATE
	PLASTIC METER PIT FOR 5/8" - 1" METERS	9/18/18 DJP 7/30/20 LMB
SCALE: NTS		





SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-11.4	REV. DATE
	PLASTIC METER PIT FOR 1 1/2" - 2" METERS	9/18/18 DJP
	SCALE: NTS	7/30/20 LMB

1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND GUIDELINES & POLICIES.
2. ALL 2-INCH PIPING SHALL BE THREADED BRASS.
3. VALVE BOX AND METER PIT SHALL BE SUPPORTED USING BLOCKS.



SPRINGFIELD WATER AND SEWER COMMISSION

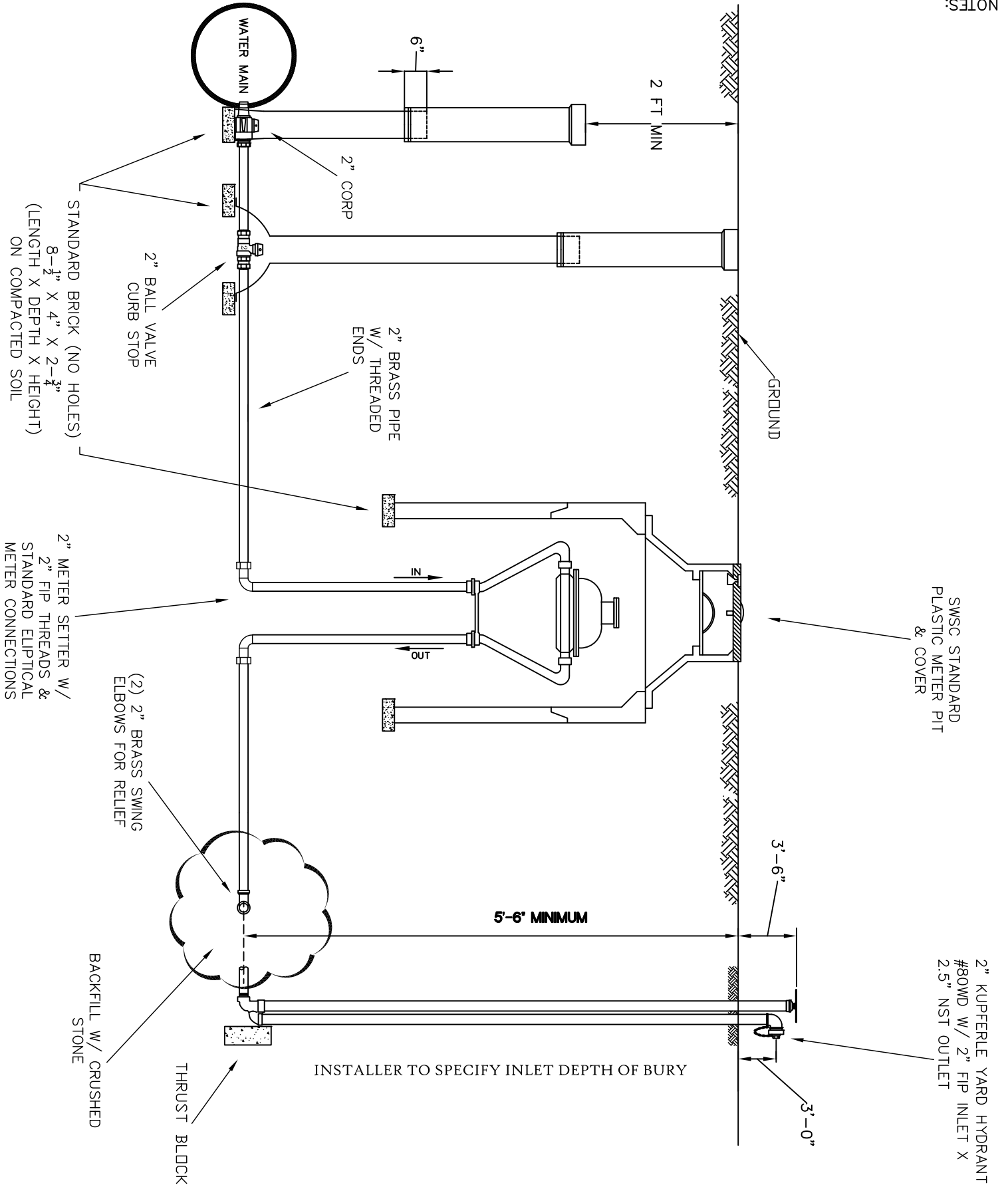
WATER DETAIL W-11.5

REV. DATE  
10/27/20 M.J.L.

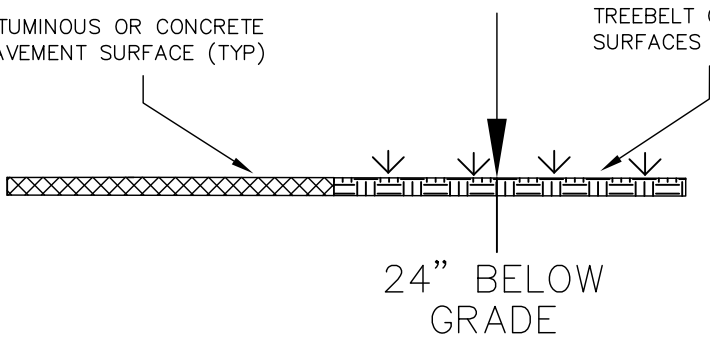
TYPICAL YARD HYDRANT

SCALE: NTS

NOTES:

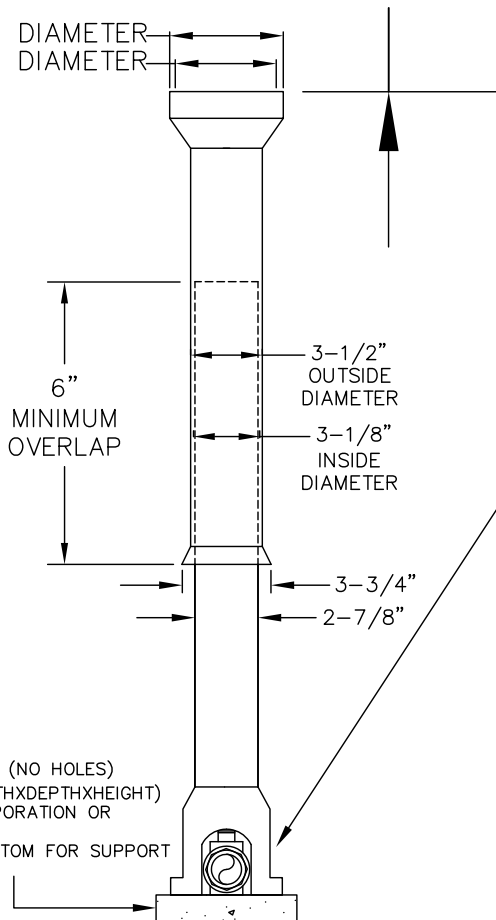


BITUMINOUS OR CONCRETE PAVEMENT SURFACE (TYP)      TREEBELT OR NON-PAVED SURFACES (TYP)



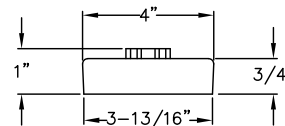
24" BELOW GRADE

4-3/4" OUTSIDE DIAMETER  
4-1/8" INSIDE DIAMETER



(1) STANDARD BRICK (NO HOLES)  
8-1/2"x4"x2-3/4" (LENGTHXDEPTHXHEIGHT)  
PLACED UNDER CORPORATION OR CURBSTOP  
AND VALVE BOX BOTTOM FOR SUPPORT

SLIDE TYPE  
BUFFALO SERVICE BOX



SERVICE BOX COVER  
WITH BRASS PENTAGON HEAD NUT  
AND THE WORD "WATER" CAST INTO COVER

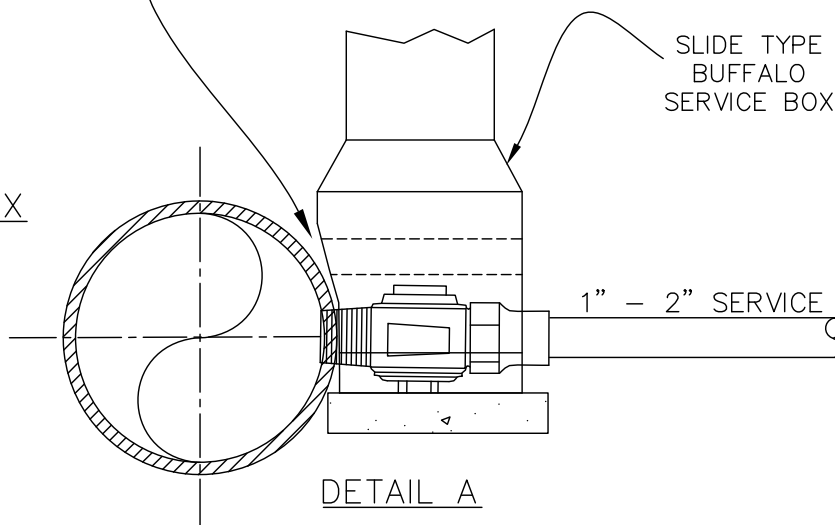
STANDARD SERVICE BOX SEE SWSC TECHNICAL SPECIFICATIONS

THE ARCH PATTERN BASE SHALL ACCOMMODATE 3/4 TO 2-INCH BALL TYPE CORPORATIONS AND BALL TYPE CURB STOPS.

A.) FOR 1-INCH BALL TYPE CORPORATIONS AND BALL TYPE CURB STOPS THE ARCH SHALL BE AT LEAST 5-INCHES TALL WITH A 3-INCH BY 3-INCH ARCH & CENTERED OVER 1-INCH BALL TYPE CORPORATION.

B.) FOR 1-1/2-INCH TO 2-INCH BALL TYPE CORPORATIONS AND BALL TYPE CURB STOPS THE ARCH SHALL BE AT LEAST 7-INCHES TALL WITH A 4-INCH BY 4-INCH ARCH.

APPROXIMATELY 1/2" TO BE REMOVED FROM SIDE OF BASE CLOSEST TO WATER MAIN IN ORDER TO CONFIRM THE BASE IS OVER THE 1-1/2"-2" BALL TYPE CURB STOPS (SEE DETAIL A).



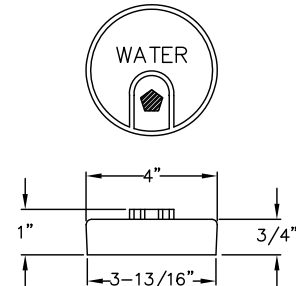
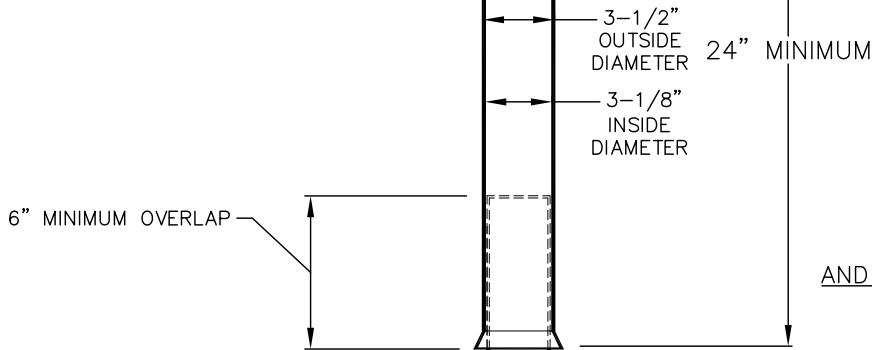
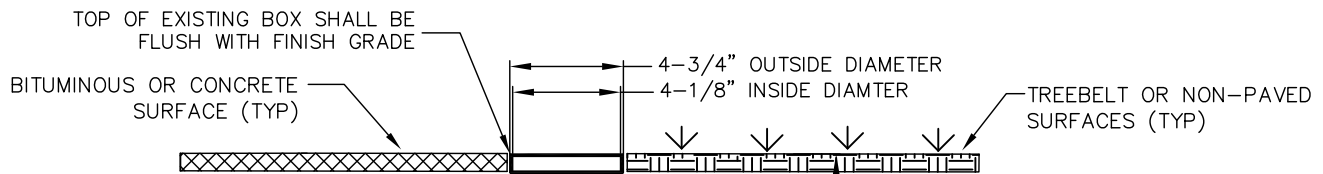
DETAIL A

**NOTES:**

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-12.0	REV. DATE
		4/1/08 MAB
	<i>TYPICAL SERVICE BOX DETAIL IN PAVED AREAS</i>	4/1/09 MAB
		1/9/19 DJP
SCALE: NTS		

Last Modified: 04/09/2025 at 10:35AM EDT



SERVICE BOX COVER  
WITH BRASS PENTAGON HEAD NUT  
AND THE WORD "WATER" CAST INTO COVER

STANDARD SERVICE BOX SEE SWSC TECHNICAL SPECIFICATIONS

THE ARCH PATTERN BASE SHALL ACCOMODATE 3/4 TO 2-INCH BALL TYPE CORPORATIONS AND BALL TYPE CURB STOPS.

A.) FOR 1-INCH BALL TYPE CORPORATIONS AND BALL TYPE CURB STOPS THE ARCH SHALL BE AT LEAST 5-INCHES TALL WITH A 3-INCH BY 3-INCH ARCH & CENTERED OVER 1-INCH BALL TYPE CORPORATION.

B.) FOR 1-1/2-INCH TO 2-INCH BALL TYPE CORPORATIONS AND BALL TYPE CURB STOPS THE ARCH SHALL BE AT LEAST 7-INCHES TALL WITH A 4-INCH BY 4-INCH ARCH.

C.) SEE DETAIL (W-12.0) IF THIS INSTALLATION IS USED AT A WATER MAIN.

BACKFILL WITH SAND, CRUSHED STONE, SCREENED GRAVEL, OR SELECT COMMON BORROW/FILL TO 6" ABOVE PIPE IN 12" LIFTS COMPACTION TO 95% PROCTOR

STANDARD BRICK (NO HOLES)  
 8-1/2" x 4" x 2-3/4" (LENGTH X DEPTH X HEIGHT)  
 PLACED OVER COMPACTED FILL  
 AND UNDER VALVE BOX  
 BOTTOM FOR SUPPORT

SLIDE TYPE  
BUFFALO SERVICE BOX

**NOTES:**

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.
4. IF BACKFILLING WITH "FLOWABLE" FILL WRAP THE SERVICE BOX WITH 15 POUND FELT ROOFING PAPER OR 4 MIL THICK POLYETHYLENE IN ACCORDANCE WITH DETAIL W-12.2.

SPRINGFIELD WATER AND SEWER COMMISSION



WATER DETAIL W-12.1

TYPICAL SERVICE BOX DETAIL  
IN NON-PAVED AREAS

SCALE: NTS

REV. DATE

4/1/08 MAB

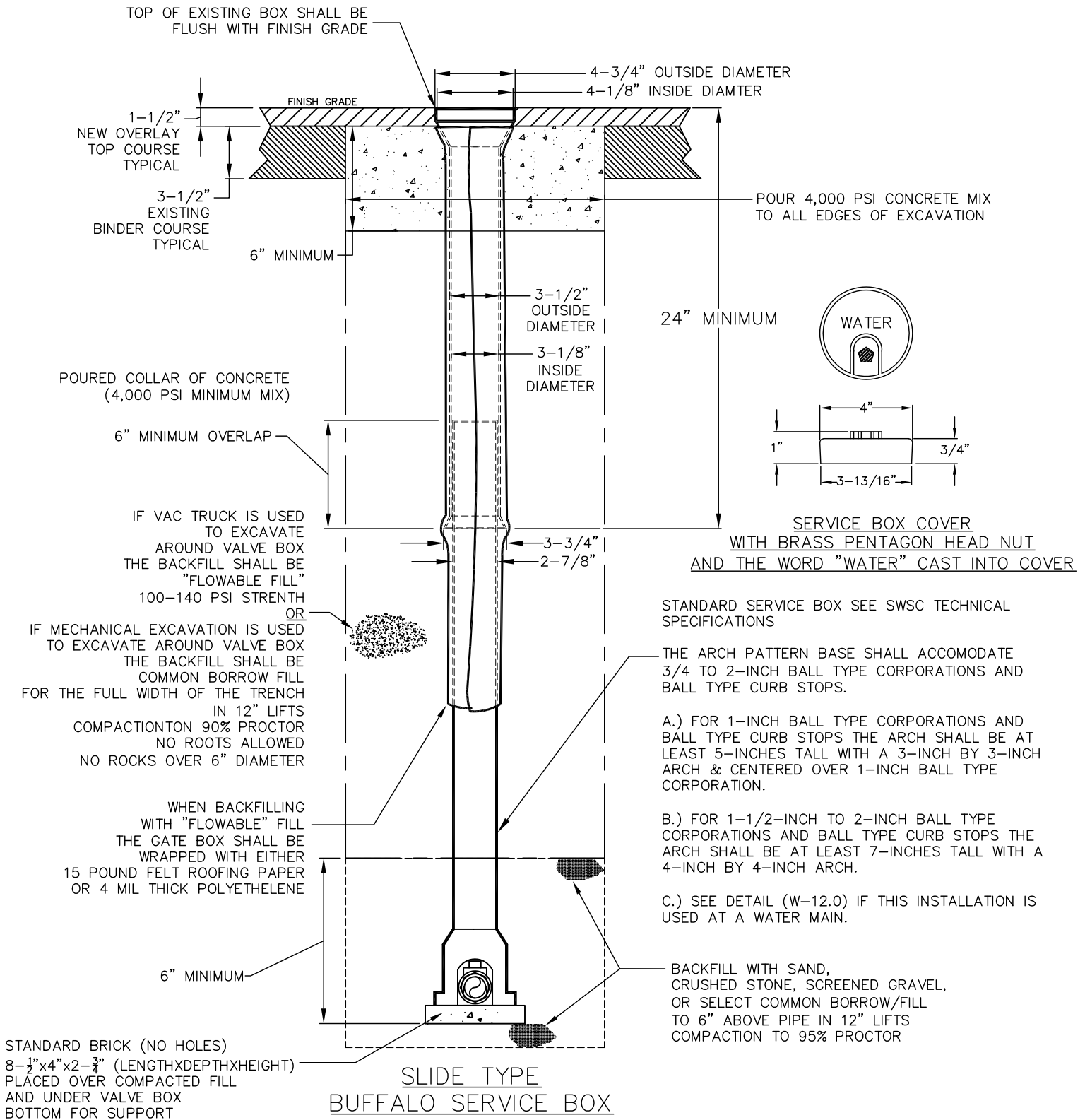
4/1/09 MAB

4/1/10 MAB

1/9/19 DJP


Last Modified: 04/09/2025 at 10:35AM EDT

Last Modified: 04/09/2025 at 10:35AM EDT

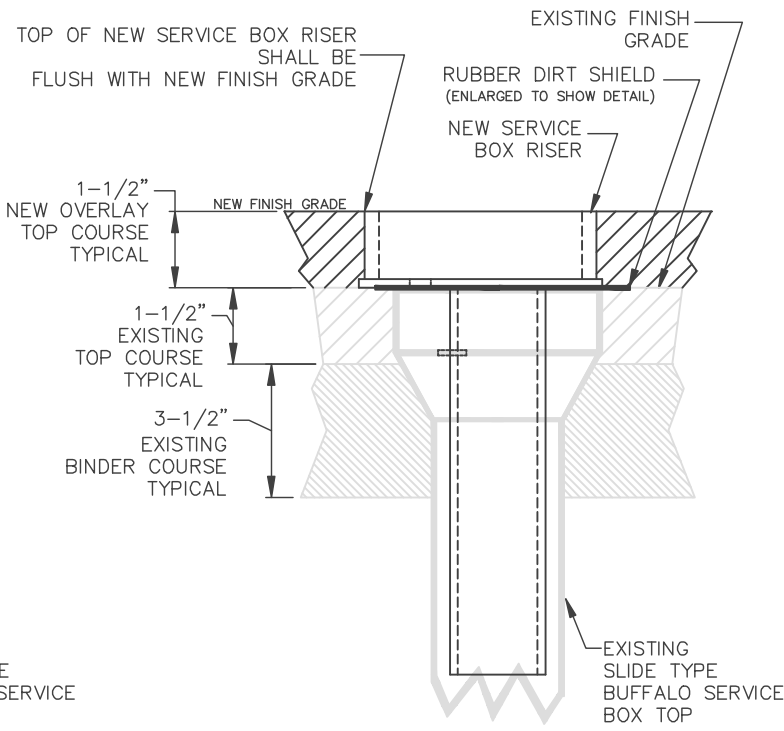
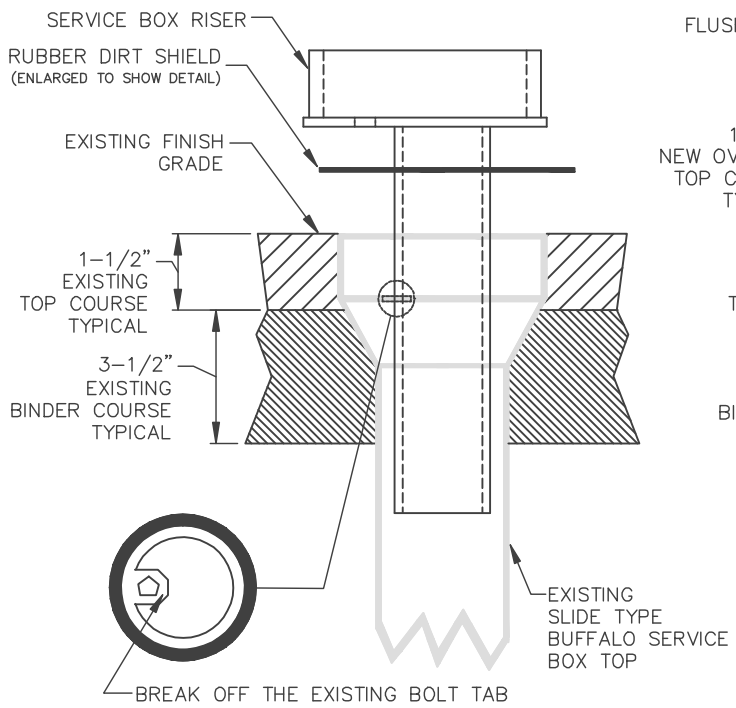


**NOTES:**

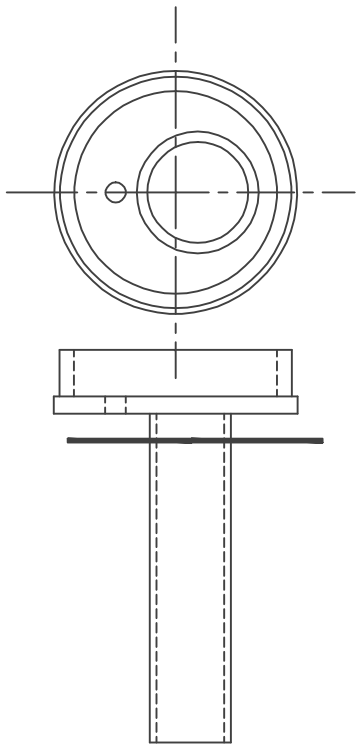
1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-12.2	REV. DATE
	REPLACE, RAISE OR RESET SERVICE BOX	4/1/09 MAB
		1/9/19 DJP
SCALE: NTS		

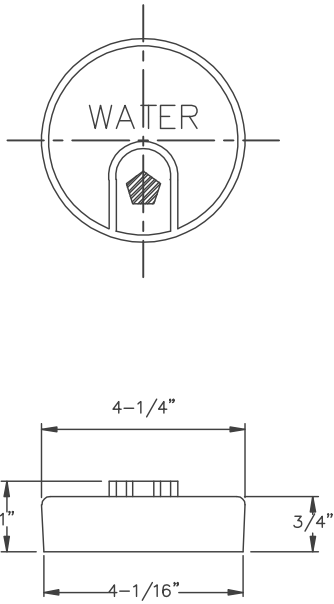
Last Modified: 04/09/2025 at 10:39AM EDT



SERVICE BOX RISER INSTALLED



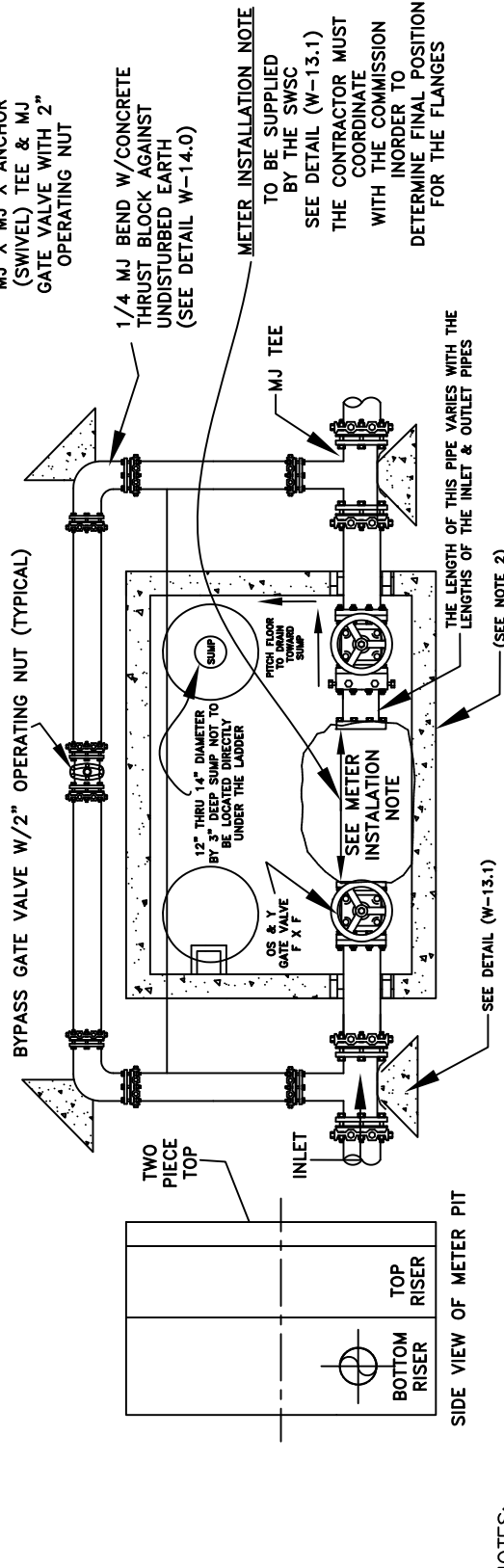
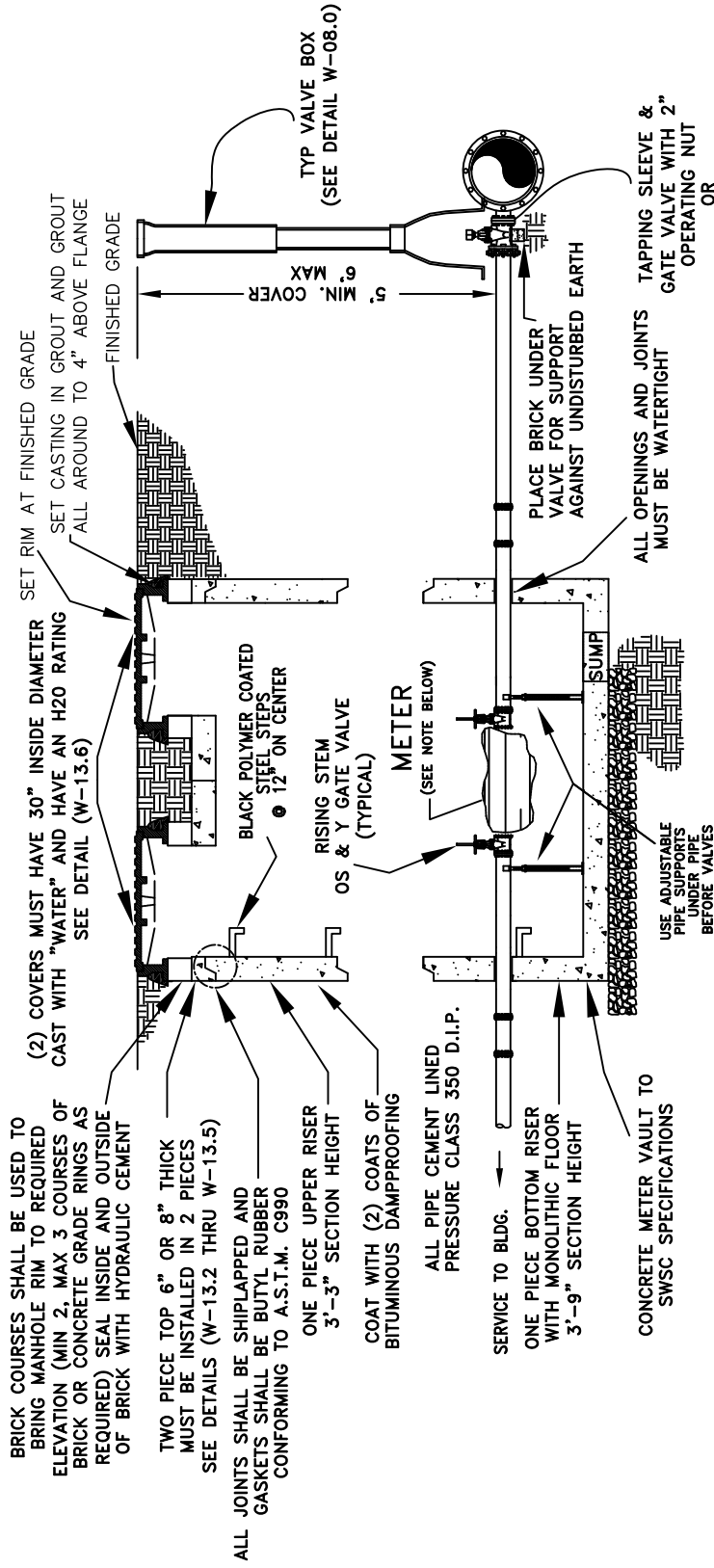
SERVICE BOX RISER



SERVICE BOX RISER COVER WITH BRASS PENTAGON HEAD NUT AND THE WORD "WATER" CAST INTO COVER

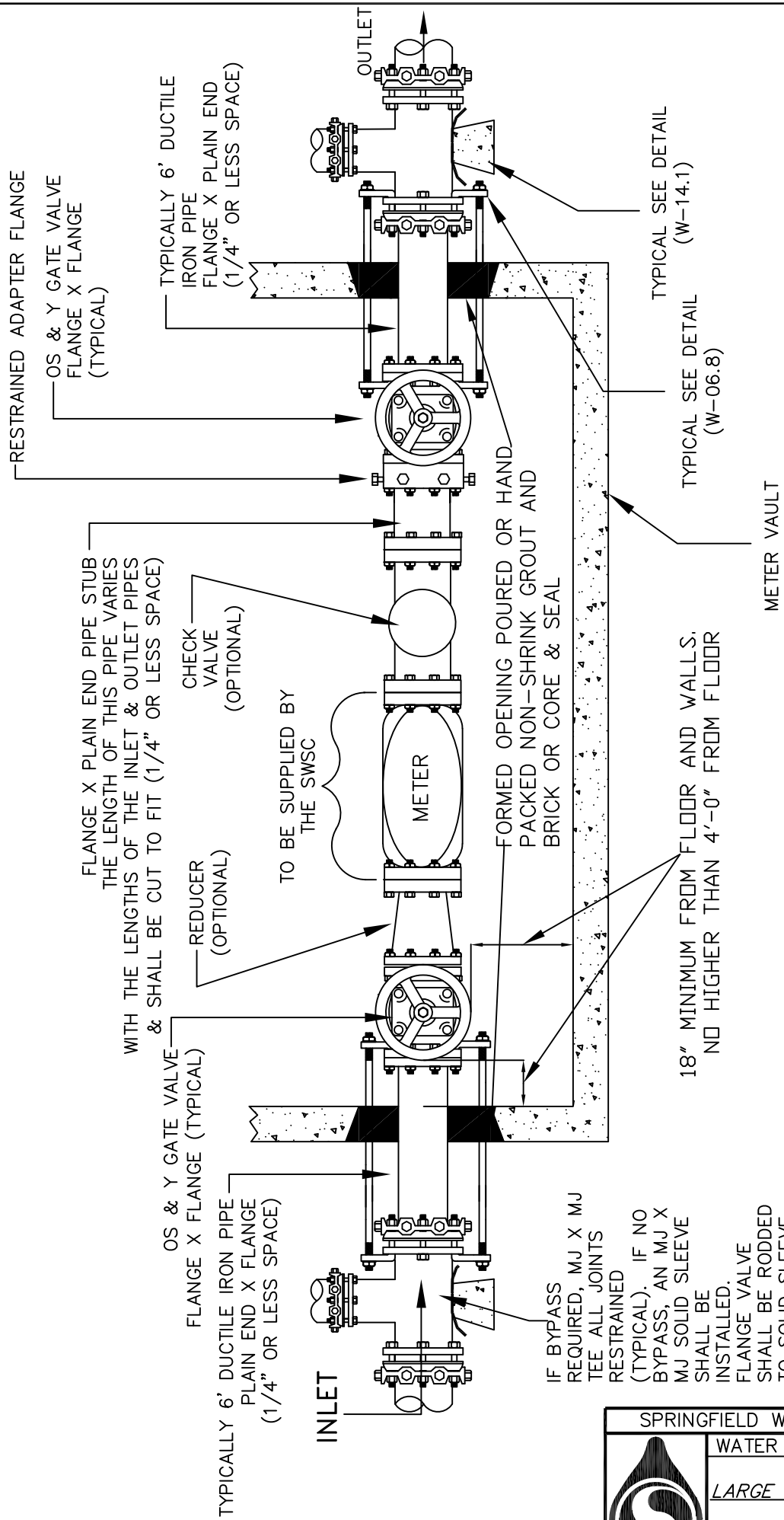
- NOTES:**
1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-12.3	REV. DATE
	RAISE SERVICE BOX WITH RISER	4/1/09 MAB
	SCALE: NTS	



- NOTES:
1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
  2. VAULT TOP, WALLS & FLOOR THICKNESS SHALL BE IN ACCORDANCE WITH DETAILS (W-13.2 THRU W-13.3).
  3. ALL MATERIALS INCLUDING THE CONE REDUCER (OPTIONAL, IF REQUIRED BY THE SWSC), AND CHECK VALVE (OPTIONAL, IF REQUIRED BY THE SWSC) SHALL BE SUPPLIED BY THE CONTRACTOR.
  4. ALL VALVES IN THE VAULT MUST HAVE HAND WHEELS. BYPASS VALVES MUST LOCKABLE OR CHAINABLE.
  5. BYPASS PIPE CAN RUN ON OUTSIDE OF THE VAULT WITH A SHUT OFF VALVE.
  6. ALL BURIED JOINTS SHALL BE MECHANICALLY RESTRAINED OR LOCKING GASKET. JOINTS IN VAULT OR BUILDING SHALL BE FLANGED.

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-13.0	REV. DATE 9/18/18 DJP
	METER VAULT PIPING	
SCALE: NTS		



FLANGE X PLAIN END PIPE STUB  
THE LENGTH OF THIS PIPE VARIES  
WITH THE LENGTHS OF THE INLET & OUTLET PIPES  
& SHALL BE CUT TO FIT (1/4" OR LESS SPACE)

TYPICALLY 6' DUCTILE IRON PIPE  
PLAIN END X FLANGE  
(1/4" OR LESS SPACE)

OS & Y GATE VALVE  
FLANGE X FLANGE (TYPICAL)

REDUCER  
(OPTIONAL)

CHECK  
VALVE  
(OPTIONAL)

TO BE SUPPLIED BY  
THE SWSC

FORMED OPENING POURED OR HAND  
PACKED NON-SHRINK GROUT AND  
BRICK OR CORE & SEAL

IF BYPASS  
REQUIRED, MJ X MJ  
TEE ALL JOINTS  
RESTRAINED  
(TYPICAL). IF NO  
BYPASS, AN MJ X  
MJ SOLID SLEEVE  
SHALL BE  
INSTALLED.  
FLANGE VALVE  
SHALL BE RODDED  
TO SOLID SLEEVE  
OR TEE (SEE  
DETAIL W-13.4).

18" MINIMUM FROM FLOOR AND WALLS.  
NO HIGHER THAN 4'-0" FROM FLOOR

METER VAULT

TYPICAL SEE DETAIL  
(W-06.8)

TYPICAL SEE DETAIL  
(W-14.1)

NOTES:

1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL MATERIALS INCLUDING THE CONE REDUCER (OPTIONAL, IF REQUIRED BY THE SWSC), AND CHECK VALVE (OPTIONAL, IF REQUIRED BY THE SWSC) SHALL BE SUPPLIED BY THE CONTRACTOR.
3. EACH OS&Y SHALL BE BOLTED TO THE INLET AND OUTLET FLANGE OF THE F X PE PIPES
4. THE OS&Y VALVE SHALL BE RESTRAINED TO THE SOLID SLEEVE OR TEE AND SECURED FROM ANY MOVEMENT.
5. EACH EXTERIOR BEND AND TEE MUST HAVE THRUST BLOCKS.
6. THE INLET AND OUTLET OPENINGS ARE TO BE SEALED AND WATER TIGHT AND FLUSH WITH THE INTERIOR AND EXTERIOR WALLS.
7. METER WILL BE SUPPLIED BY THE SWSC, CONTRACTOR TO CONFIRM WITH THE SWSC THE SPACE TO BE LEFT FOR THE METER CALL CUSTOMER FIELD SERVICES METER DIVISION AT (413-787-6207)

		SPRINGFIELD WATER AND SEWER COMMISSION	
WATER DETAIL W-13.1		REV. DATE	
LARGE METER INSTALLATION		9/18/18 DJP	
SCALE: NTS			



OUTSIDE DIMENSIONS

L= 11'-0"

W= 7'-0"

H= 7'-6"

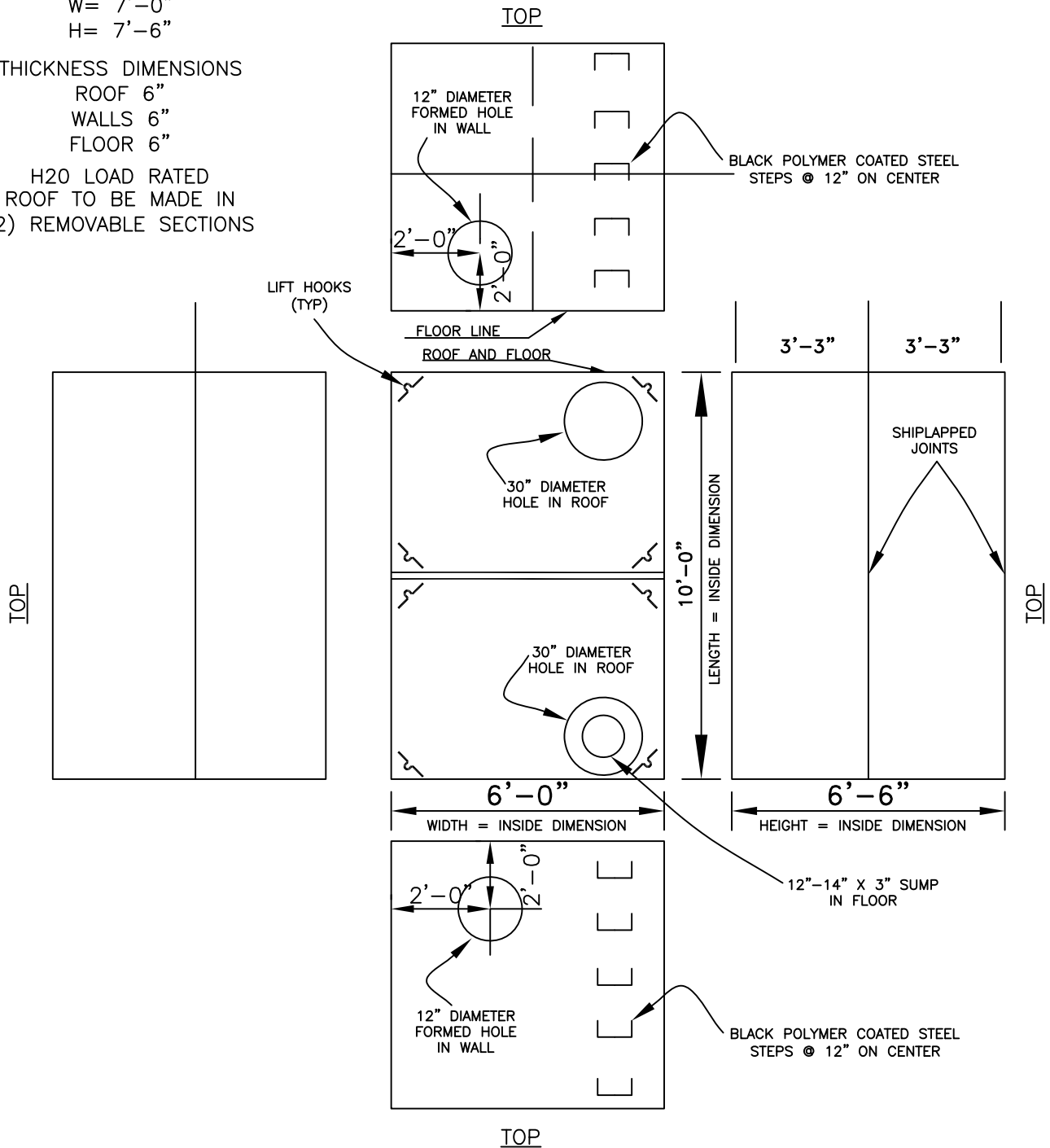
THICKNESS DIMENSIONS

ROOF 6"

WALLS 6"

FLOOR 6"

H2O LOAD RATED  
ROOF TO BE MADE IN  
(2) REMOVABLE SECTIONS



NOTES:

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. VAULT TOP, WALLS & FLOOR THICKNESS SHALL BE IN ACCORDANCE WITH DETAILS (W-13.2 - W-13.5).
3. FORMED HOLES SHALL BE TAPERED TOWARD THE INSIDE OF VAULT.
4. ALL JOINTS SHALL BE SHIPLAPPED AND GASKETS SHALL BE BUTYL RUBBER CONFORMING TO A.S.T.M. C990.

SPRINGFIELD WATER AND SEWER COMMISSION



WATER DETAIL W-13.2

STANDARD METER VAULT FOR  
DUCTILE IRON WATER SERVICE  
PIPE

SCALE: NTS

REV. DATE

9/18/18 DJP

OUTSIDE DIMENSIONS

L= 12'-2"

W= 9'-0"

H= 7'-8"

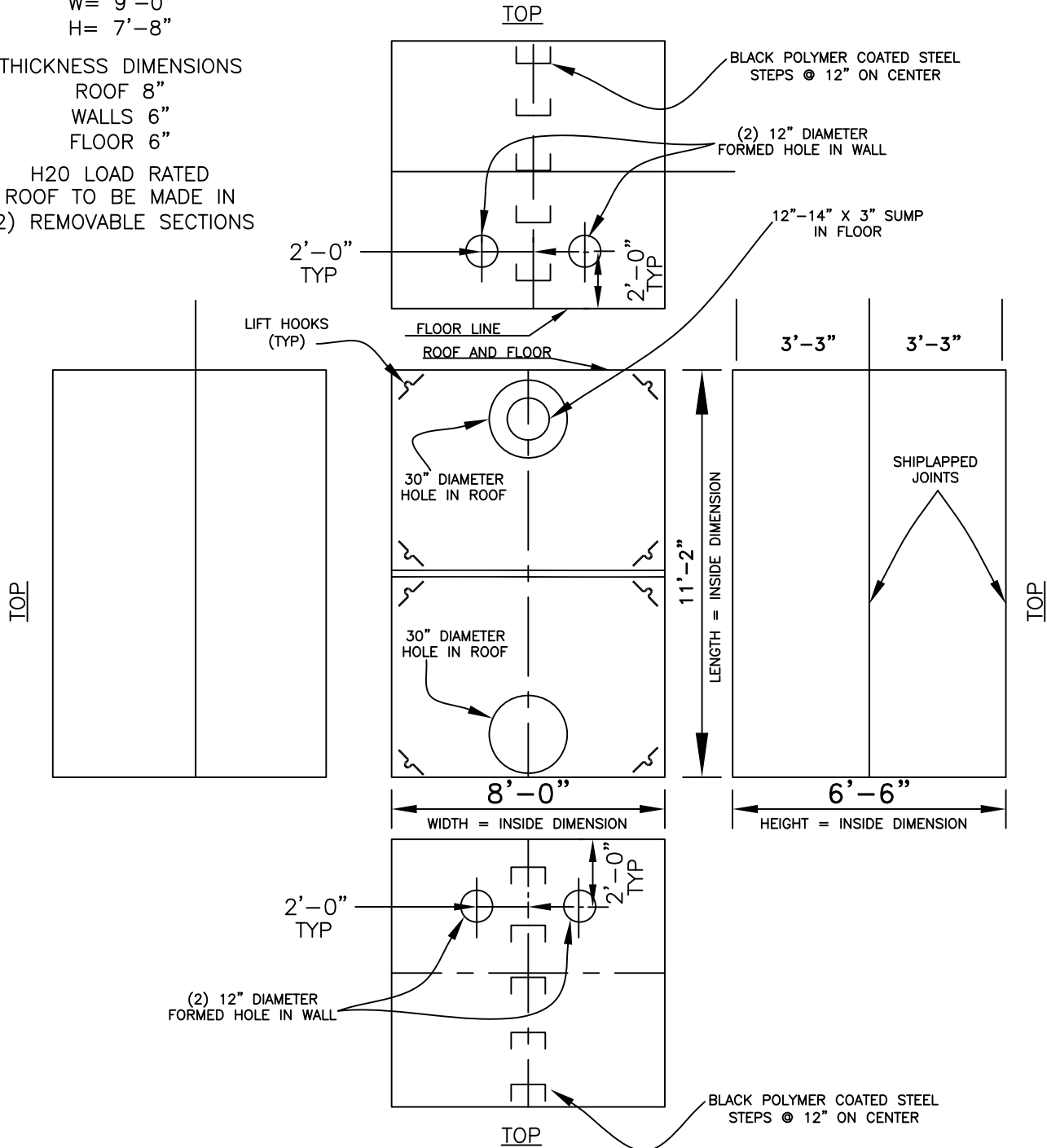
THICKNESS DIMENSIONS

ROOF 8"

WALLS 6"

FLOOR 6"

H2O LOAD RATED  
ROOF TO BE MADE IN  
(2) REMOVABLE SECTIONS



NOTES:

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. VAULT TOP, WALLS & FLOOR THICKNESS SHALL BE IN ACCORDANCE WITH DETAILS (W-13.2 - W-13.5).
3. FORMED HOLES SHALL BE TAPERED TOWARD THE INSIDE OF VAULT.
4. ALL JOINTS SHALL BE SHIPLAPPED AND GASKETS SHALL BE BUTYL RUBBER CONFORMING TO A.S.T.M. C990.

SPRINGFIELD WATER AND SEWER COMMISSION



WATER DETAIL W-13.3

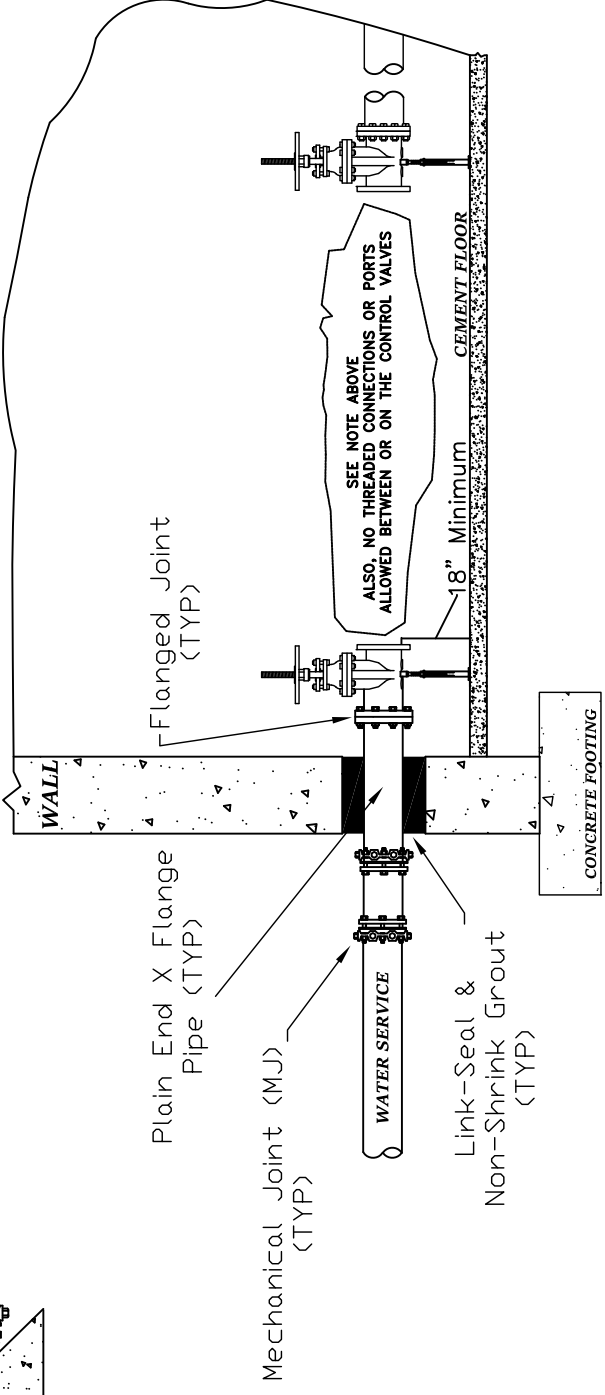
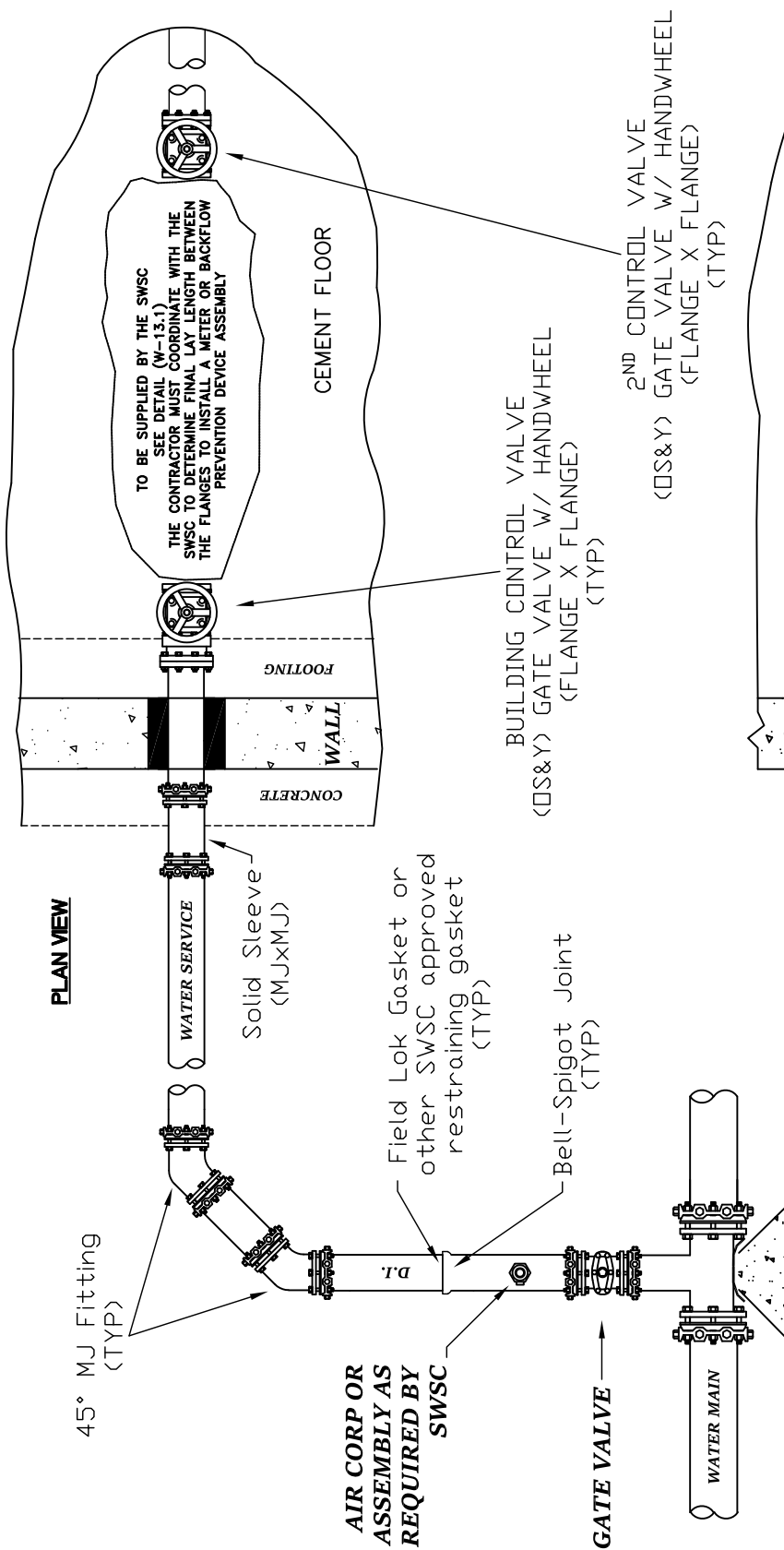
OVERSIZED METER VAULT FOR  
DUCTILE IRON WATER SERVICE  
PIPE

SCALE: NTS

REV. DATE


4/1/08 MAB

1/8/19 DJP

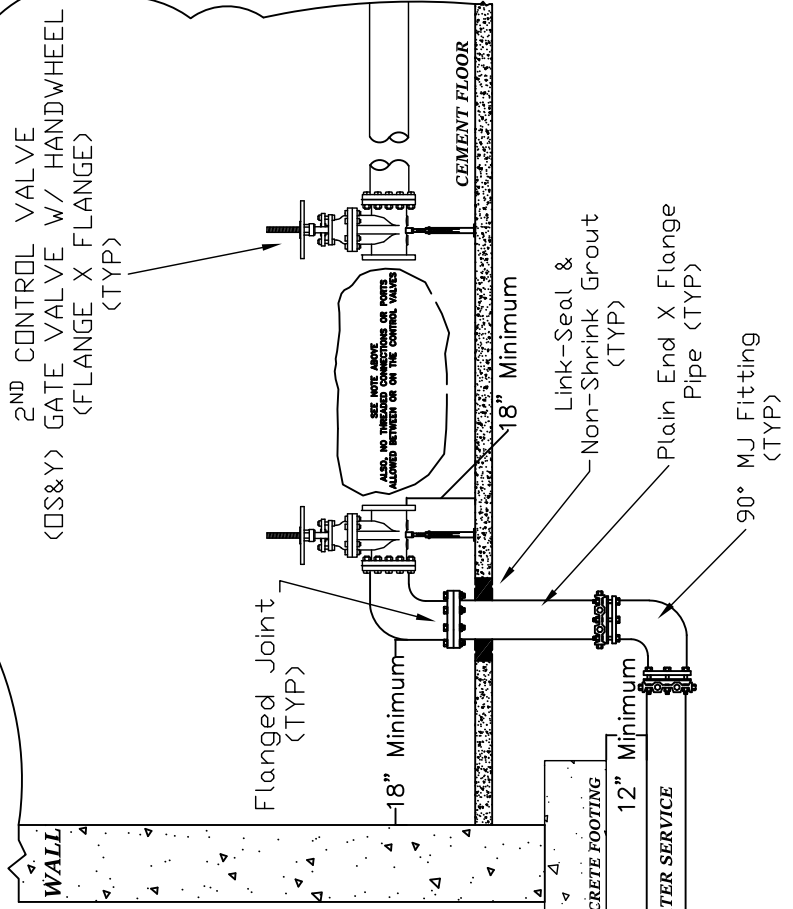
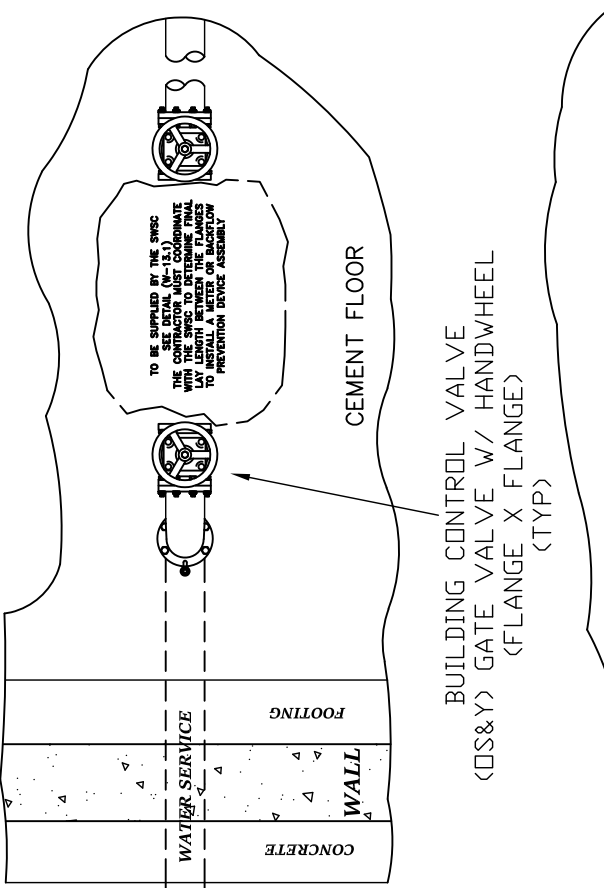


- NOTES:**
1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC MATERIAL SPECIFICATIONS & GUIDELINES & POLICIES.
  2. ALL PIPING TO THE BUILDING CONTROL VALVE SHALL BE INSTALLED BEFORE TESTING.
  3. FLANGES THAT CONNECT TO METER MUST BE SUPPLIED BY THE CONTRACTOR.
  4. THE NEXT (2<sup>ND</sup>) CONTROL VALVE AFTER THE BUILDING CONTROL VALVE SHALL BE AN OS&Y GATE VALVE AND BE LOCKABLE.
  5. ALL PIPING SHALL BE FULLY RESTRAINED FROM WATER MAIN TO 2<sup>ND</sup> CONTROL VALVE INSIDE BUILDING.

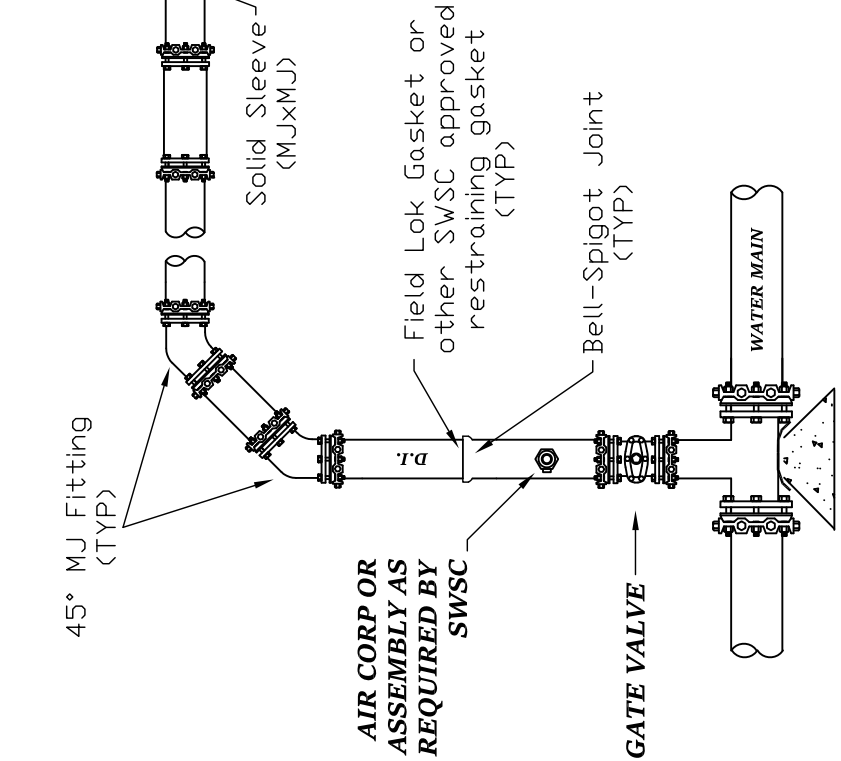
- NOTES:**
1. ALL JOINTS OUTSIDE BUILDING SHALL BE FULLY RESTRAINED W/ MJ & RESTRAINING GASKETS.
  2. ALL JOINTS INSIDE BUILDING SHALL BE FLANGED.

SPRINGFIELD WATER AND SEWER COMMISSION			
	WATER DETAIL W-13.4	REV. DATE	
	<u>TYPICAL DUCTILE IRON</u>		1/8/19 DUP
	<u>WATER SERVICE DETAIL</u>		7/28/21 MJL
	<u>THROUGH FOUNDATION WALL</u>		
SCALE: NTS			

**PLAN VIEW**



**SECTION VIEW**



**NOTES:**

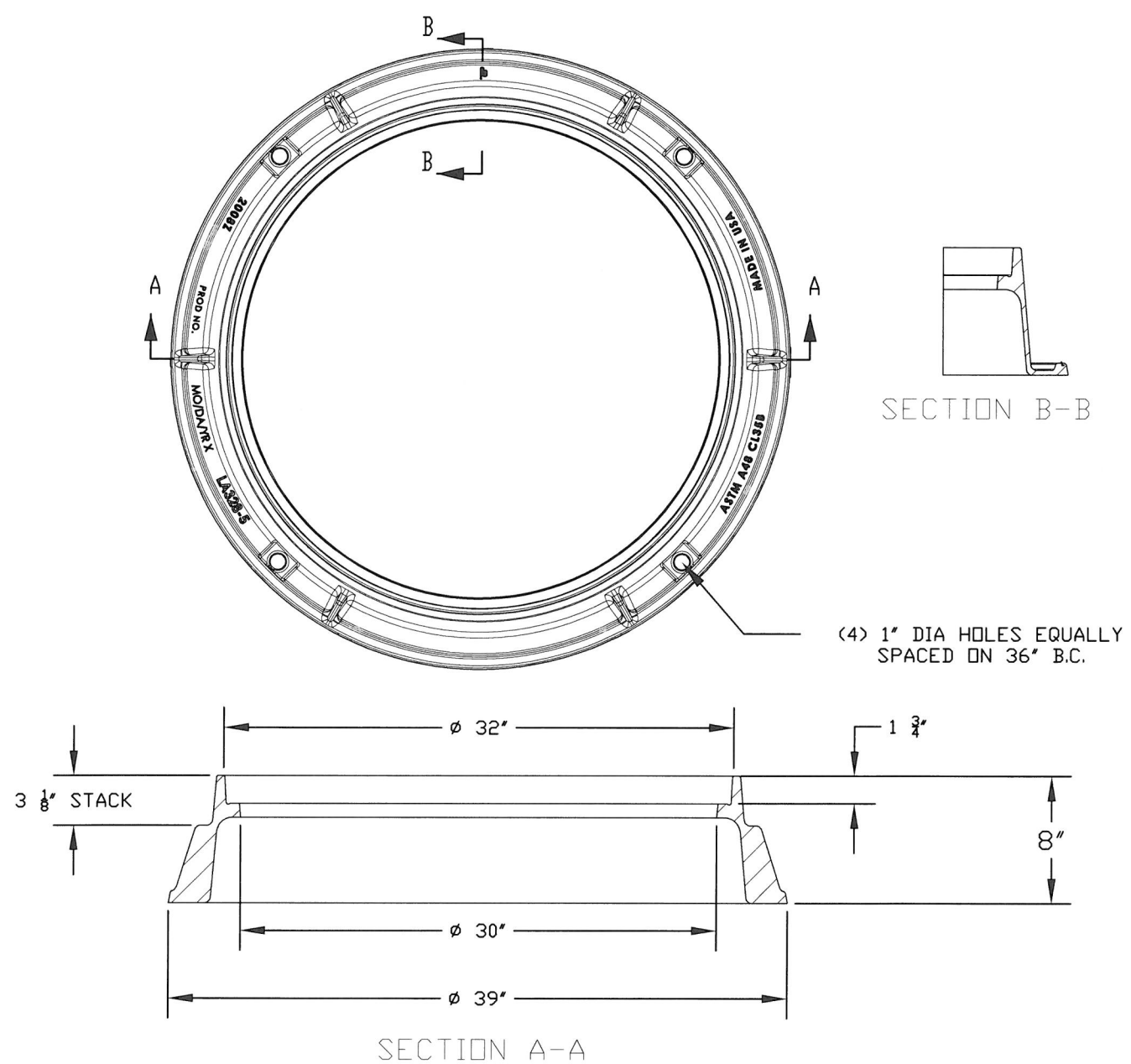
1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC MATERIAL SPECIFICATIONS & GUIDELINES & POLICIES.
2. ALL PIPING TO THE BUILDING CONTROL VALVE SHALL BE INSTALLED BEFORE TESTING.
3. FLANGES THAT CONNECT TO METER MUST BE SUPPLIED BY THE CONTRACTOR.
4. THE NEXT (2<sup>ND</sup>) CONTROL VALVE AFTER THE BUILDING CONTROL VALVE SHALL BE AN OS&Y GATE VALVE AND BE LOCKABLE.
5. ALL PIPING SHALL BE FULLY RESTRAINED FROM WATER MAIN TO 2<sup>ND</sup> CONTROL VALVE INSIDE BUILDING.

**NOTES:**


1. ALL JOINTS OUTSIDE BUILDING SHALL BE FULLY RESTRAINED W/ MJ & RESTRAINING GASKETS.
2. ALL JOINTS INSIDE BUILDING SHALL BE FLANGED.

<b>SPRINGFIELD WATER AND SEWER COMMISSION</b>			
	WATER DETAIL W-13.5	REV. DATE	
	<i>TYPICAL DUCTILE IRON WATER SERVICE DETAIL THROUGH CONCRETE FLOOR</i>		3/22/17 LMB
			1/8/19 DJP
			7/29/21 MJL
SCALE: NTS			

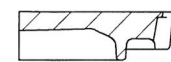
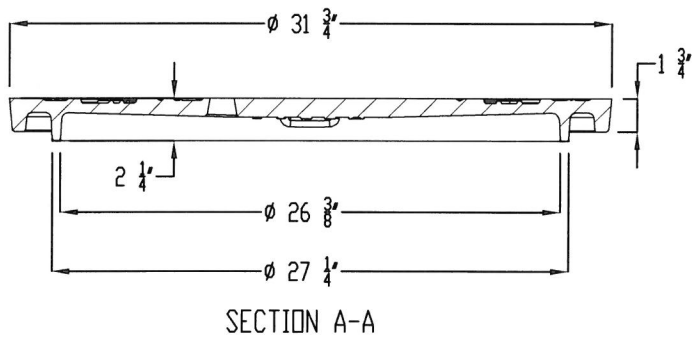
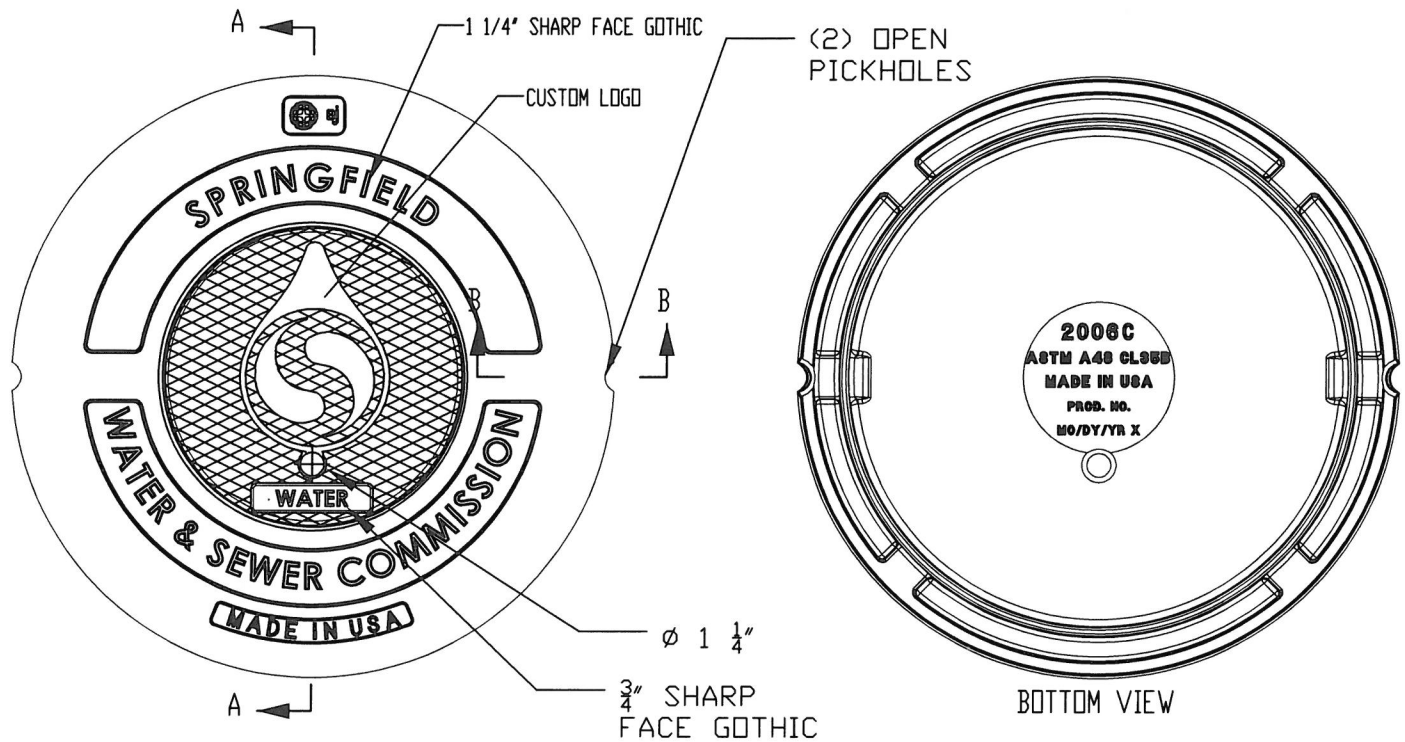
Local Modified: 04/09/2005 - wsl - 02/09/2011 - EDT



- NOTES:**
1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
  2. FRAME & COVER SHALL BE MADE FROM ASTM A48 CLASS 35B GRAY CAST IRON.
  3. DIMENSIONS ARE IN INCHES-FRACTIONAL  $\pm \frac{1}{16}$  ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL  $\pm \frac{1}{16}$  PER FOOT

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-13.6	REV. DATE
	<i>32-inch by 8-inch Frame Only</i>	
SCALE: NTS		4/16/19 DJP

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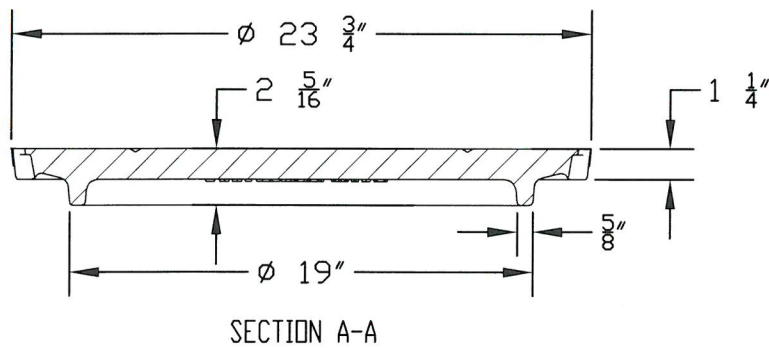
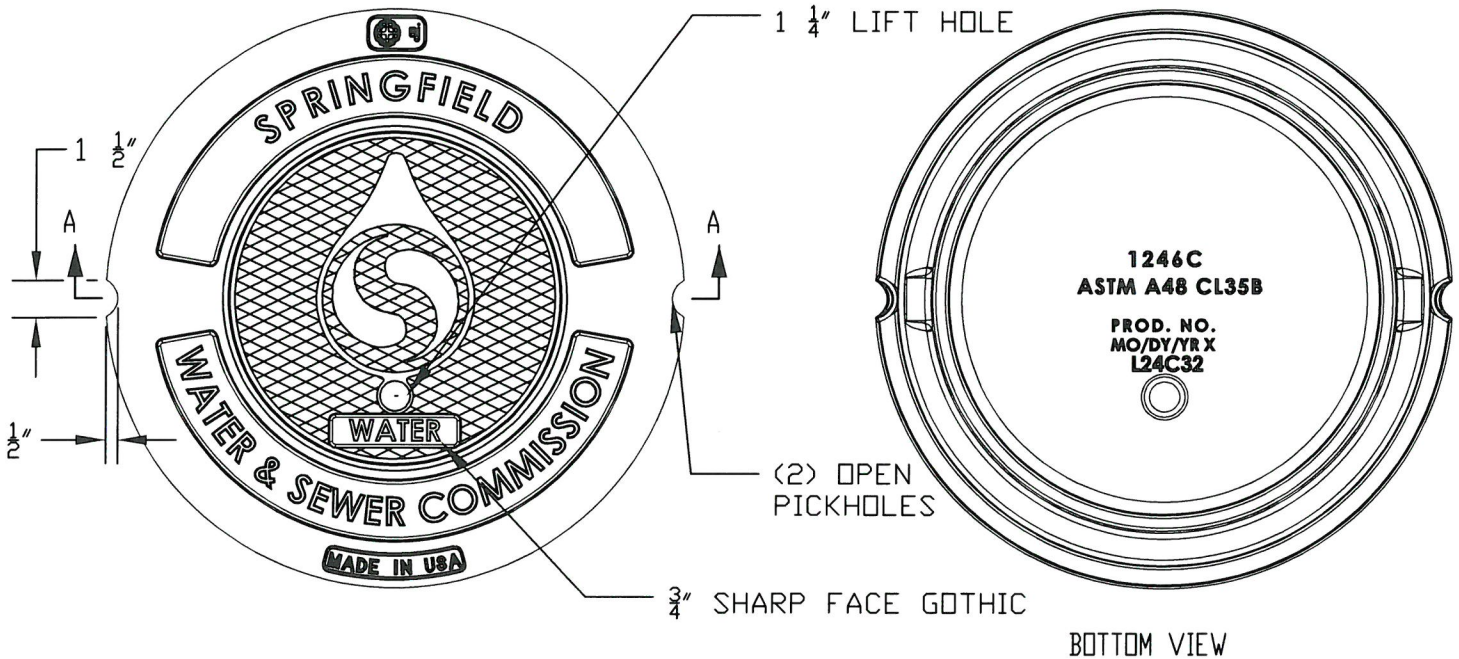


SECTION B-B  
SCALE 1 : 8

**NOTES:**

1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. FRAME & COVER SHALL BE MADE FROM ASTM A48 CLASS 35B GRAY CAST IRON.
3. DIMENSIONS ARE IN INCHES-FRACTIONAL +/- 1/16" ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL +/- 1/16" PER FOOT

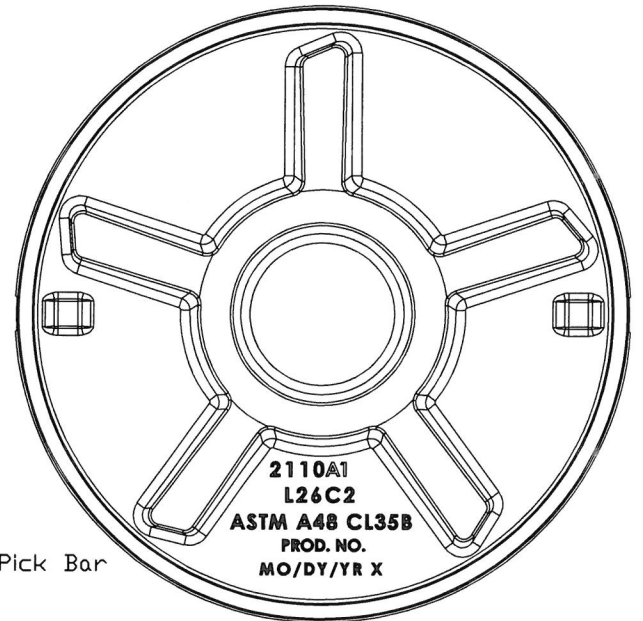
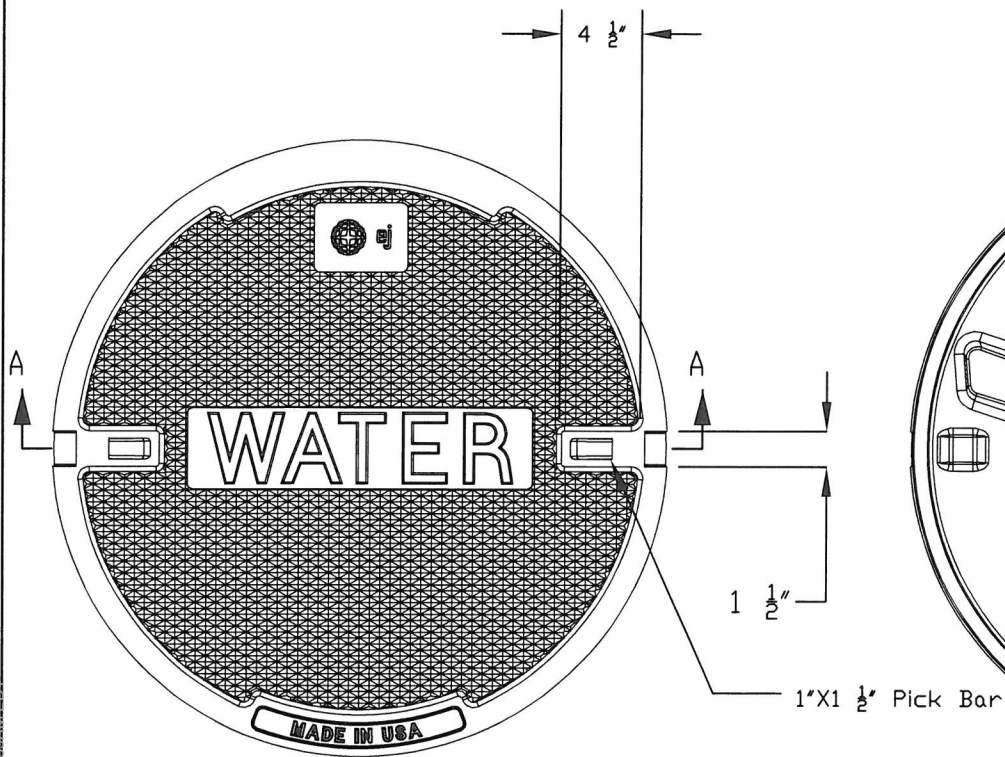
SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-13.7	REV. DATE
	32-inch Standard Water Cover	4/16/19 DJP
	SCALE: NTS	



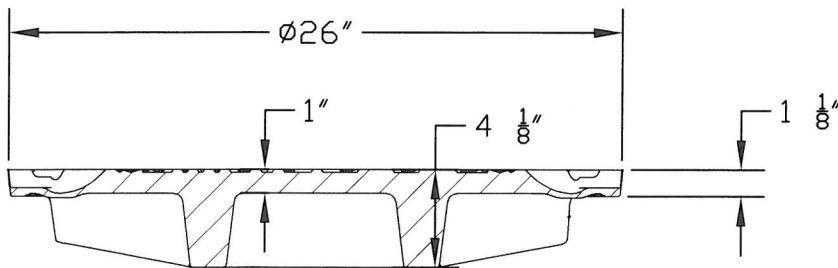
**NOTES:**

1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. FRAME & COVER SHALL BE MADE FROM ASTM A48 CLASS 35B GRAY CAST IRON.
3. DIMENSIONS ARE IN INCHES-FRACTIONAL +/- 1/16 ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL +/- 1/16" PER FOOT

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-13.8	REV. DATE
	24-inch Replacement Water Cover	4/16/19 DJP
SCALE: NTS		



BOTTOM VIEW



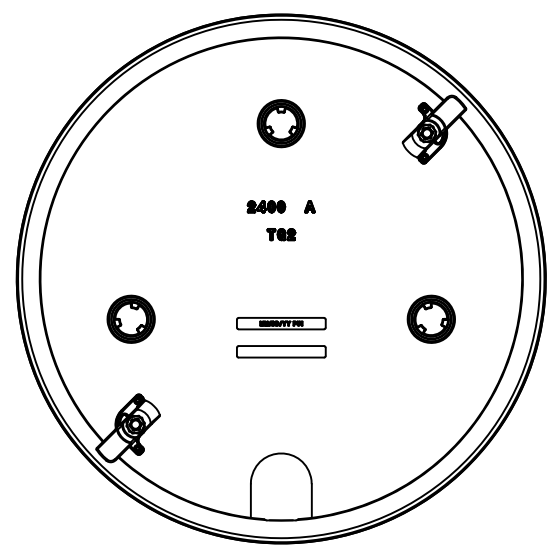
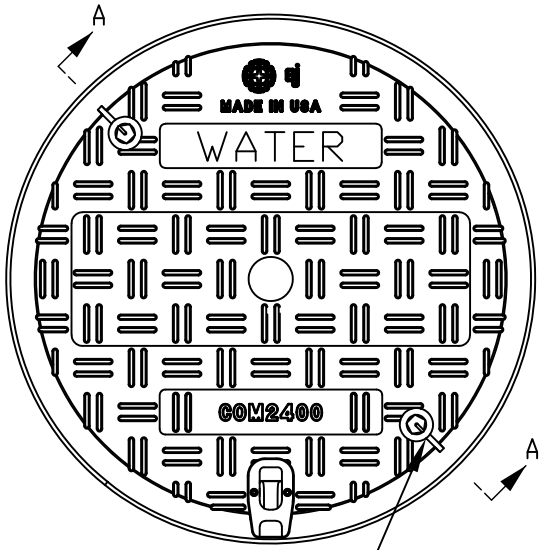
SECTION A-A

**NOTES:**

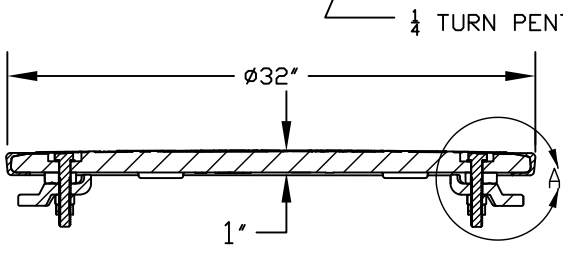
1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. FRAME & COVER SHALL BE MADE FROM ASTM A48 CLASS 35B GRAY CAST IRON.
3. DIMENSIONS ARE IN INCHES-FRACTIONAL  $\pm \frac{1}{16}$  ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL  $\pm \frac{1}{16}$  PER FOOT

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-13.9	REV. DATE
	26-inch Replacement Water Cover	4/16/19 DJP
SCALE: NTS		

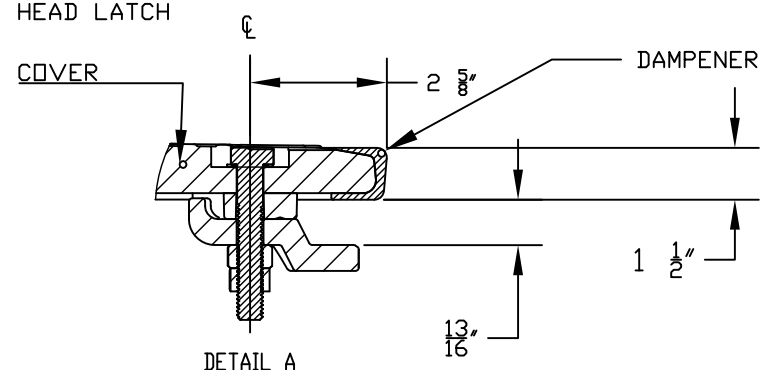




BOTTOM VIEW



SECTION A-A



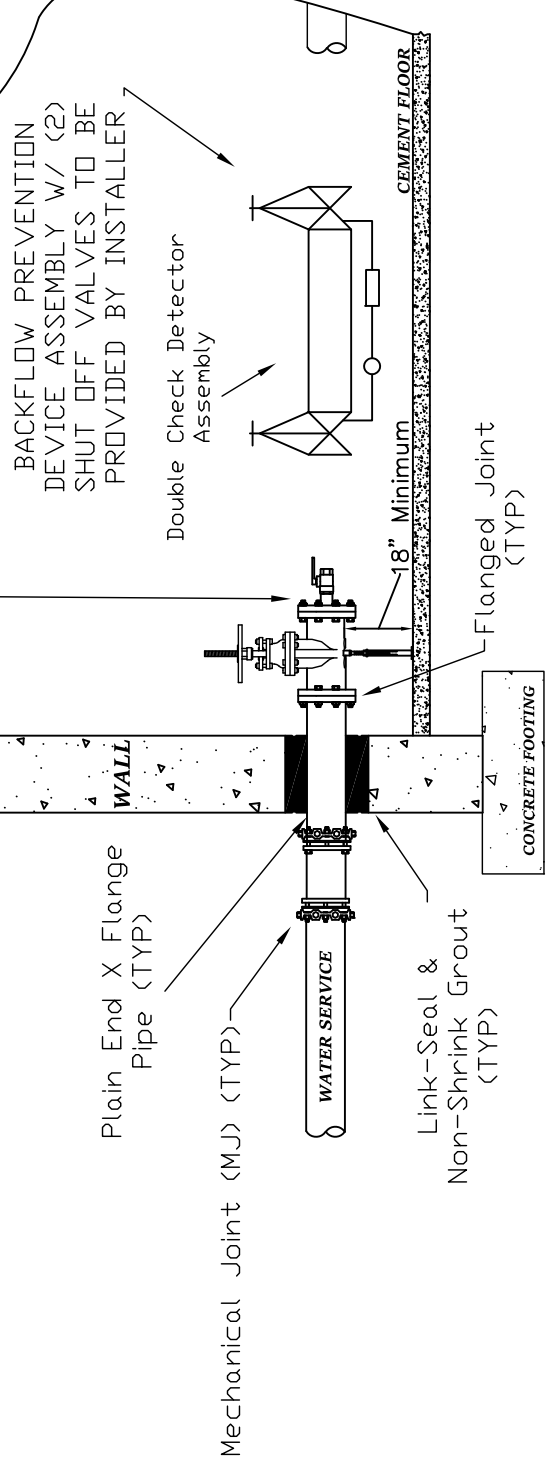
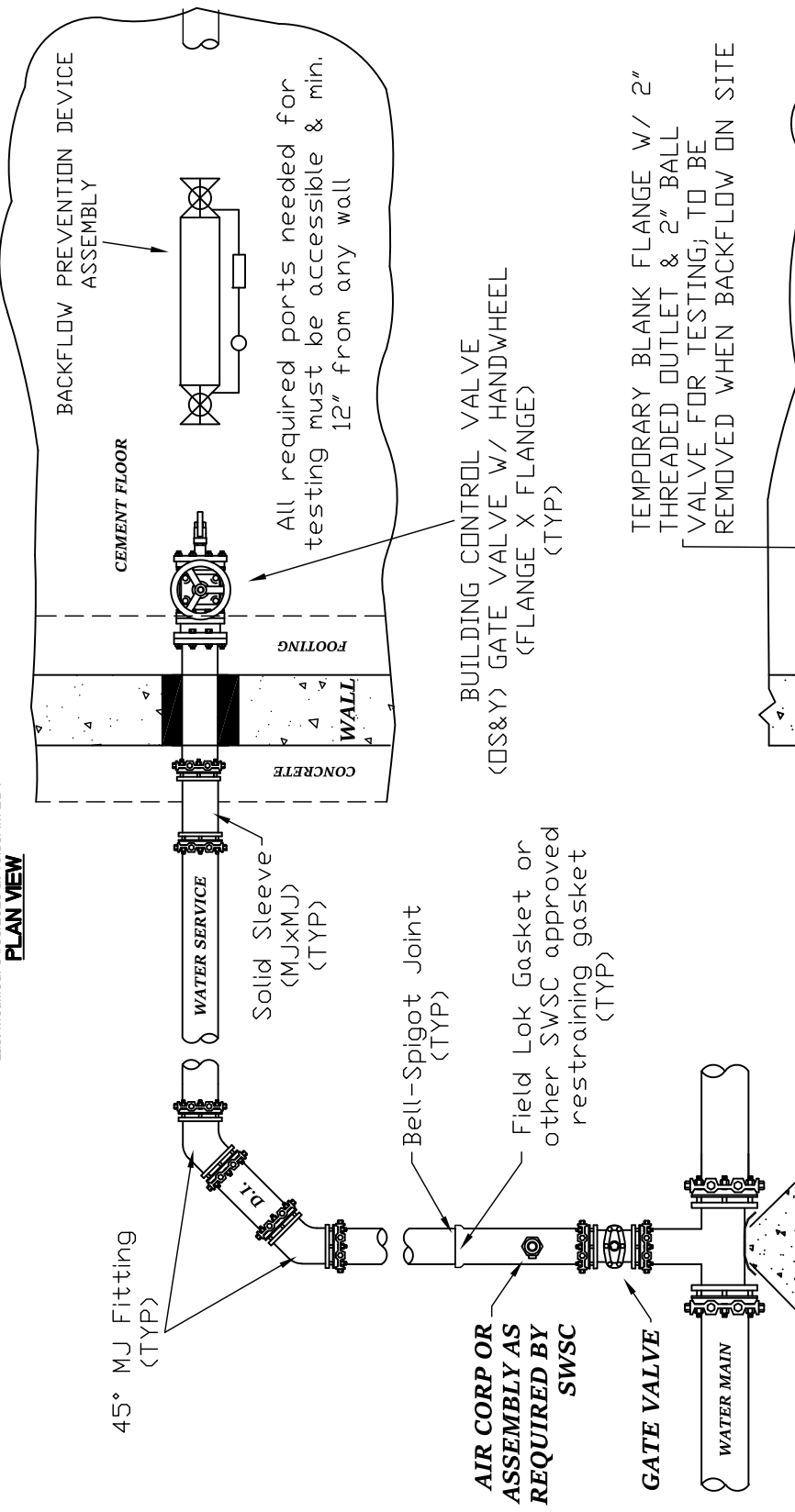
DETAIL A  
SCALE 1:3

**NOTES:**

1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. COVER SHALL BE MADE FROM FIBER REINFORCED POLYMER (FRP) ASTM C1028
3. DIMENSIONS ARE IN INCHES-FRACTIONAL +/- 1/16 ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL +/- 1/16" PER FOOT

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-13.10	REV. DATE
	32" Composite Locking Cover	4/19/19 DJP
		4/6/21 MJL
SCALE: NTS		

**PLAN VIEW**




**SECTION VIEW**

**NOTES:**

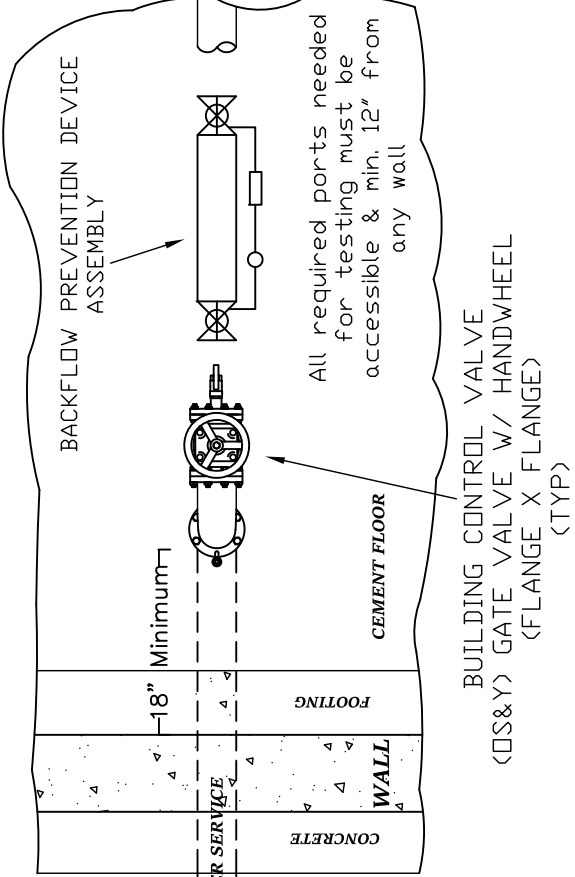
1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC MATERIAL SPECIFICATIONS & GUIDELINES & POLICIES.
2. ALL PIPING TO THE BUILDING CONTROL VALVE SHALL BE INSTALLED BEFORE TESTING.
3. BACKFLOW PREVENTION DEVICE ASSEMBLY SHALL BE INSTALLED ONTO OS&Y BUILDING CONTROL VALVE.
4. ALL VALVES AFTER THE BUILDING CONTROL VALVE MAY BE OS&Y GATE VALVE OR BUTTERFLY VALVE W/ TAMPER SWITCH. MUST BE LOCKABLE.
5. ANY COMBINATION OF FLANGE ON GROOVED CONNECTIONS AFTER BUILDING CONTROL VALVE ARE ALLOWED.

**NOTES:**

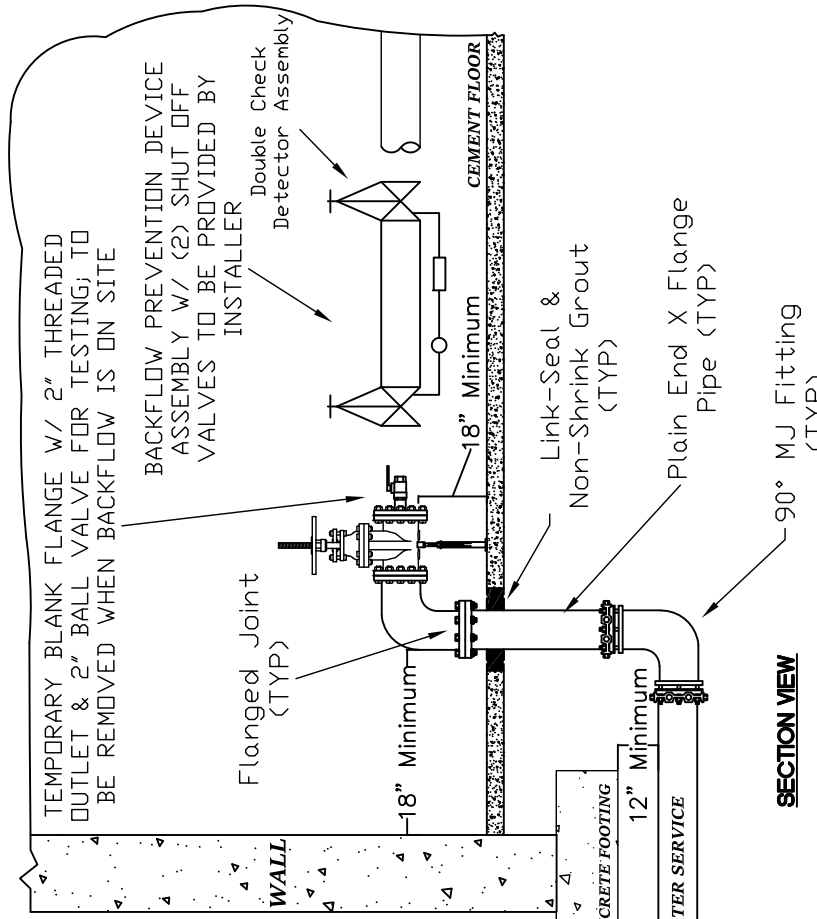
1. ALL JOINTS OUTSIDE BUILDING SHALL BE FULLY RESTRAINED W/ MJ & RESTRAINING GASKETS.
2. ALL JOINTS INSIDE BUILDING SHALL BE FLANGED.

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-13.11	REV. DATE
	<i>TYPICAL DUCTILE IRON</i>	1/8/19 DUP
	<i>FIRE SERVICE DETAIL</i>	10/6/20 MAB
	<i>THROUGH FOUNDATION WALL</i>	10/13/20 MJL
	SCALE: NTS	6/10/21 MJL
		7/28/21 MJL

**PLAN VIEW**



**SECTION VIEW**




**NOTES:**

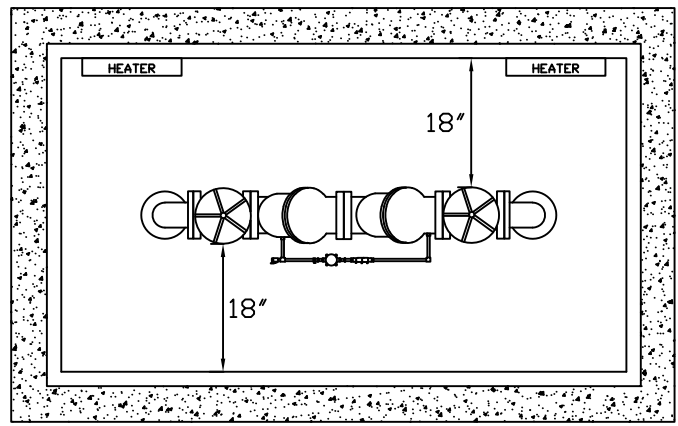
1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC MATERIAL SPECIFICATIONS & GUIDELINES & POLICIES.
2. ALL PIPING TO THE BUILDING CONTROL VALVE SHALL BE INSTALLED BEFORE TESTING.
3. BACKFLOW PREVENTION DEVICE ASSEMBLY SHALL BE INSTALLED ONTO OS&Y BUILDING CONTROL VALVE.
4. ALL VALVES AFTER THE BUILDING CONTROL VALVE MAY BE OS&Y GATE VALVE OR BUTTERFLY VALVE W/ TAMPER SWITCH. MUST BE LOCKABLE.
5. ANY COMBINATION OF FLANGE ON GROOVED CONNECTIONS AFTER BUILDING CONTROL VALVE ARE ALLOWED.

**NOTES:**

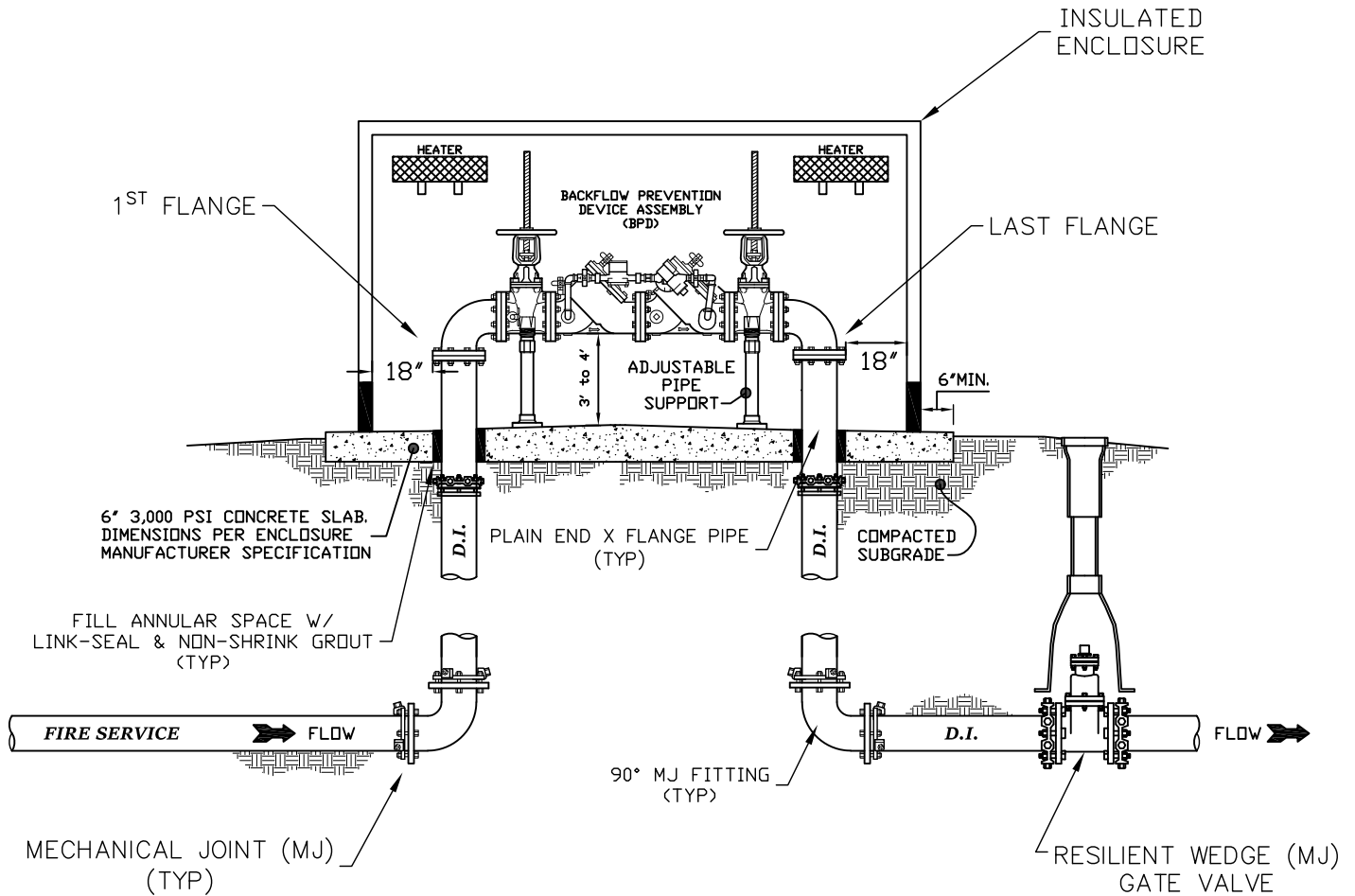
1. ALL JOINTS OUTSIDE BUILDING SHALL BE FULLY RESTRAINED W/ MJ & RESTRAINING GASKETS.
2. ALL JOINTS INSIDE BUILDING SHALL BE FLANGED.

SPRINGFIELD WATER AND SEWER COMMISSION			
	WATER DETAIL W-13.12	REV. DATE	
	<i>TYPICAL DUCTILE IRON</i>		3/22/17 LMB
	<i>FIRE SERVICE DETAIL</i>		1/8/19 DUP
	<i>THROUGH CONCRETE FLOOR</i>		10/13/20 MJL
	SCALE: NTS		6/10/21 MJL
		7/29/21 MJL	

Last Modified: 04/09/2025 at 10:39AM EDT



**PLAN VIEW**



**SECTION VIEW**

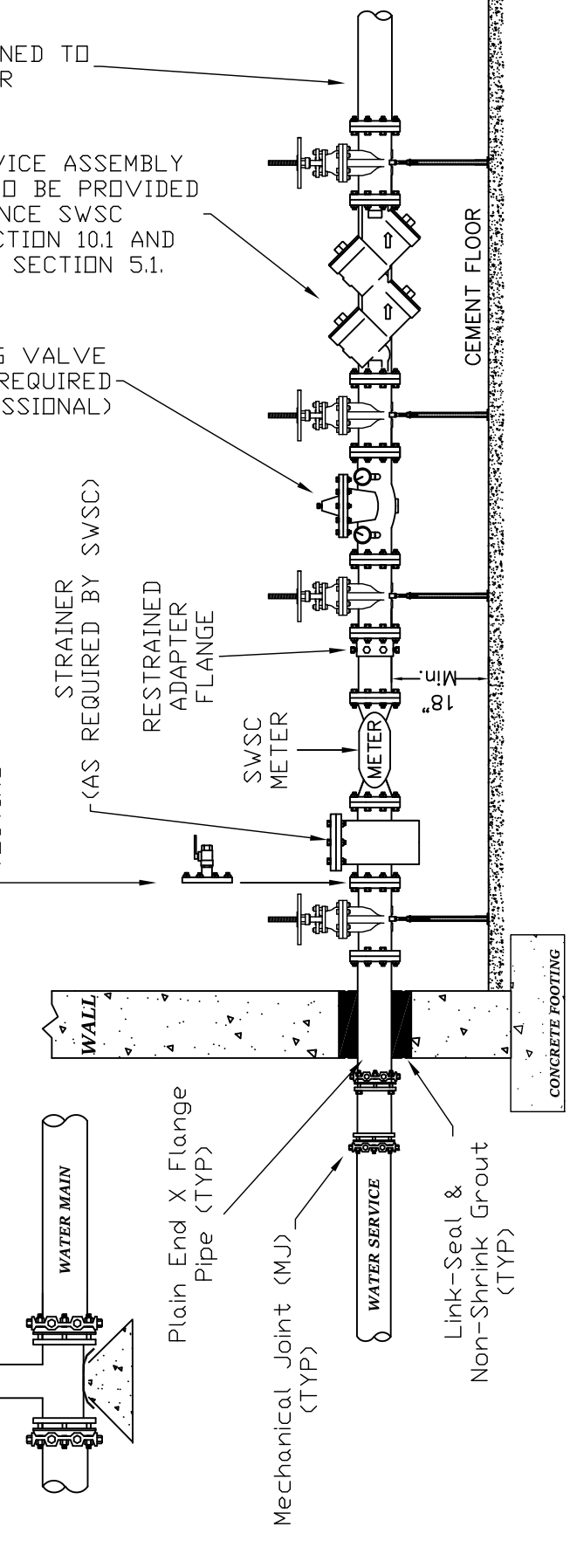
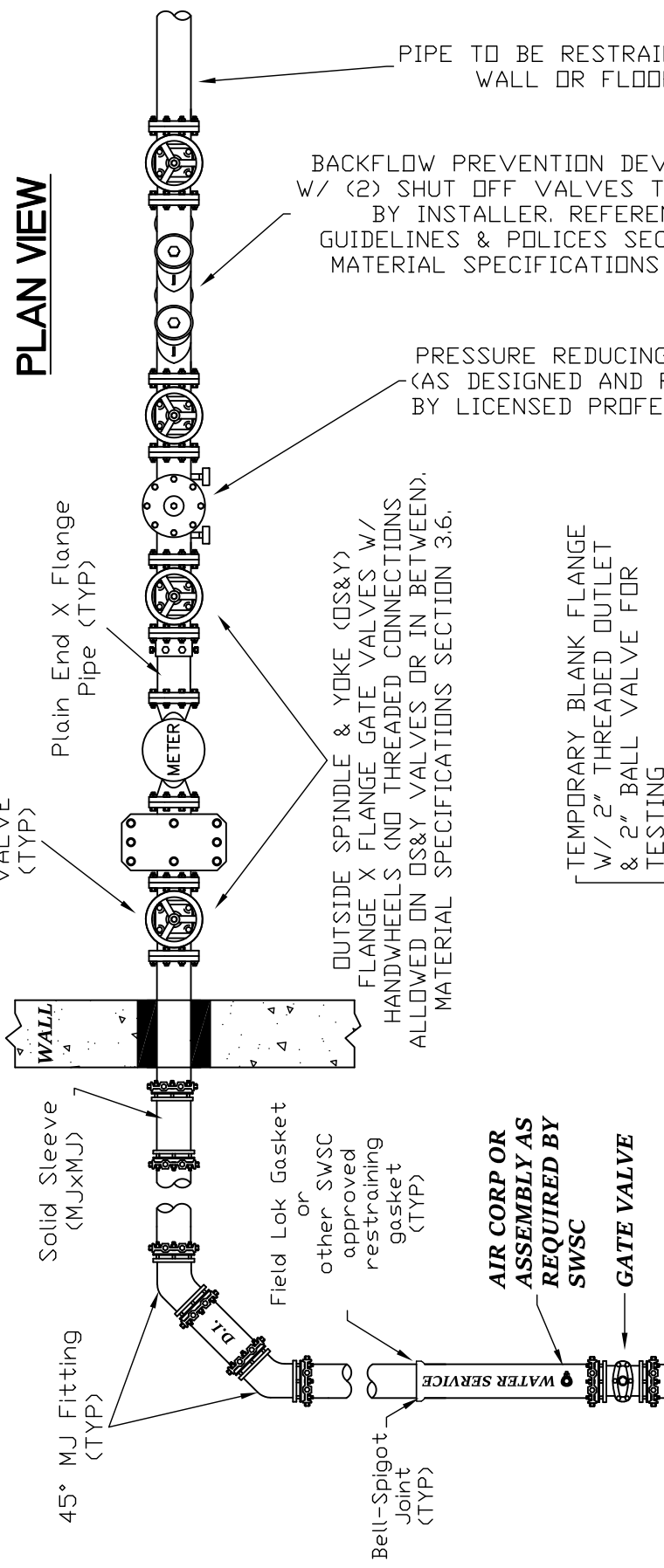
**NOTES:**

1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND GUIDELINES & POLICIES.
2. ALL PIPING FROM MAIN TO THE 1<sup>ST</sup> FLANGE MUST BE INSTALLED BEFORE TESTING.
3. ALL VALVES AFTER THE 1<sup>ST</sup> FLANGE MAY BE OS&Y GATE VALVE OR BUTTERFLY VALVE W/ TAMPER SWITCH. MUST BE LOCKABLE.
4. ANY COMBINATION OF FLANGE ON GROOVED CONNECTIONS BETWEEN 1<sup>ST</sup> FLANGE AND LAST FLANGE ARE ALLOWED.
5. ALL PIPING FROM MAIN TO LAST FLANGE, SHALL BE RESTRAINED.
6. BELL/SPIGOT PIPE JOINTS SHALL BE RESTRAINED BY FIELD LOK GASKET OR OTHER SWSC APPROVED RESTRAINING GASKET.

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-13.13	REV. DATE
	<i>TYPICAL DUCTILE IRON</i>	10/28/20 MJL
	<i>FIRE SERVICE DETAIL</i>	10/29/20 DS
	<i>IN A HOT BOX</i>	8/2/21 MJL
SCALE: NTS		


Last Modified: 04/09/2025 at 10:28 AM EDT  
BUILDING CONTROL VALVE

**PLAN VIEW**



**SECTION VIEW**

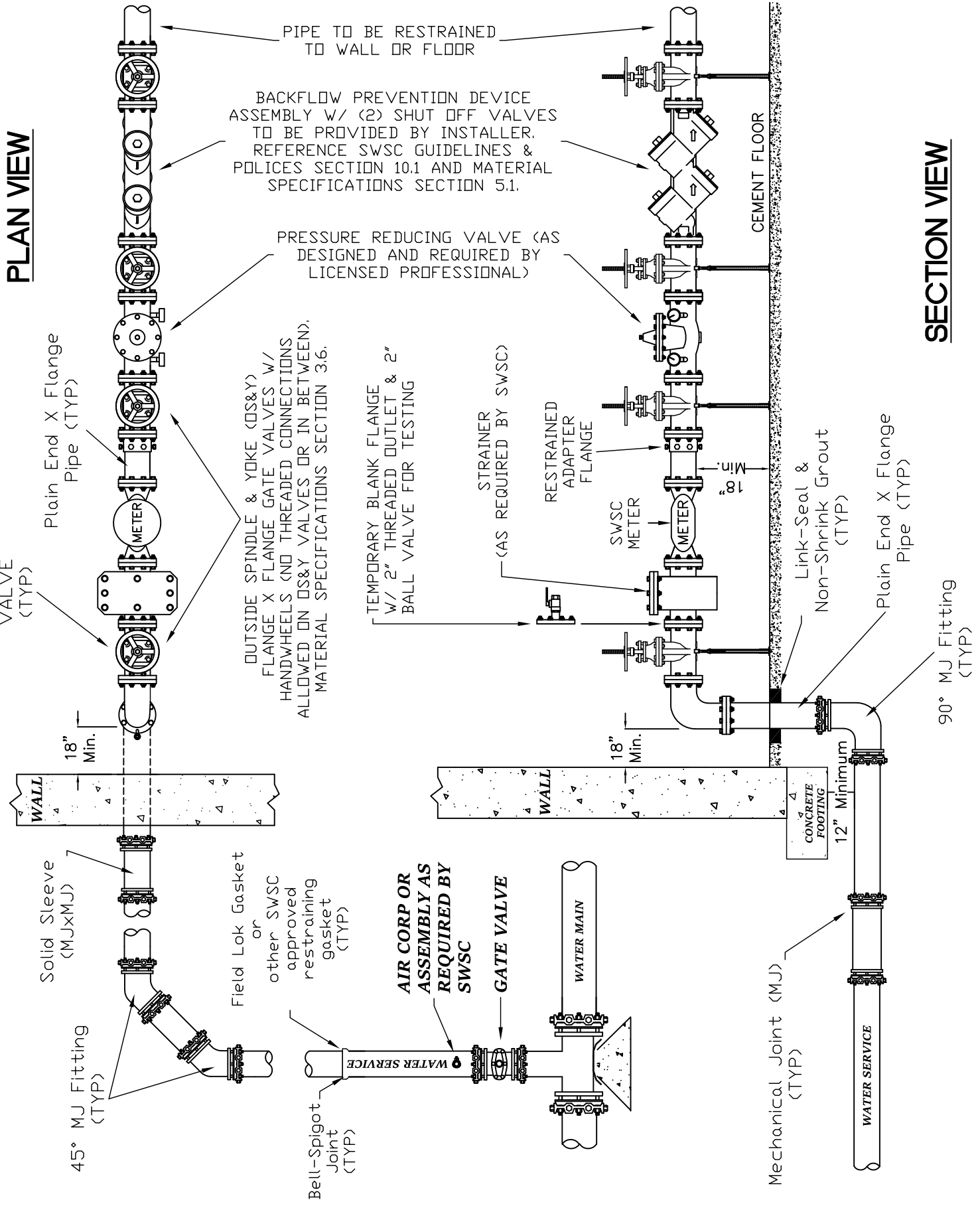
- NOTES:**
1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND GUIDELINES & POLICES.
  2. ALL PIPING TO THE BUILDING CONTROL VALVE SHALL BE INSTALLED BEFORE TESTING.
  3. ALL PIPING SHALL BE FULLY RESTRAINED FROM MAIN TO INSIDE BUILDING.
  4. ALL JOINTS INSIDE BUILDING SHALL BE FLANGE.

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-13.14	REV. DATE
	<i>TYPICAL DIP COMMERCIAL &amp; INDUSTRIAL SERVICE DETAIL THROUGH FOUNDATION WALL</i>	10/28/20 DS
	SCALE: NTS	11/5/20 DS 7/28/21 MJL


Last Modified: 04/09/2025 at 10:38AM EDT

**PLAN VIEW**

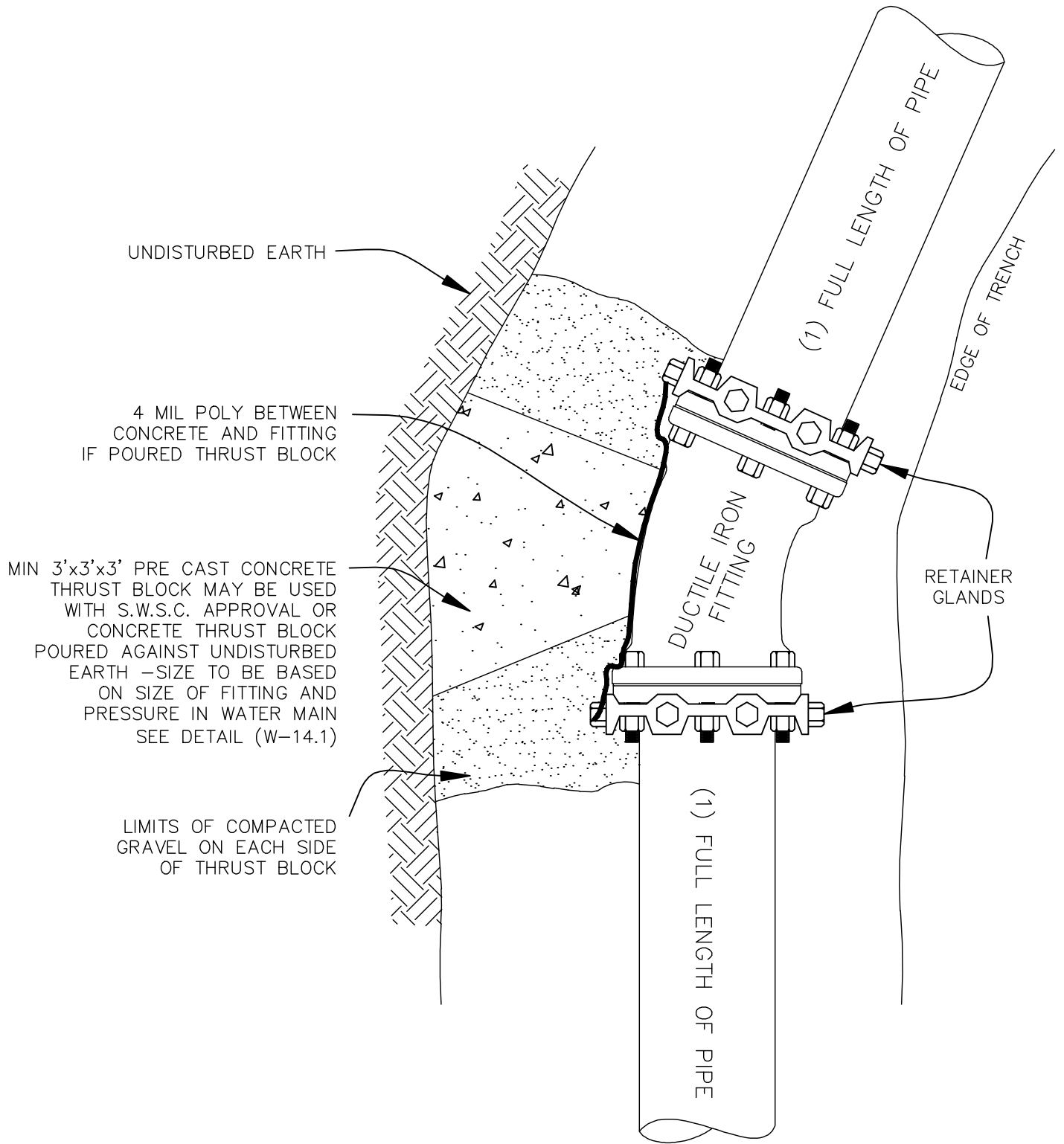
**SECTION VIEW**



- NOTES:**
1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND GUIDELINES & POLICES.
  2. ALL PIPING TO THE BUILDING CONTROL VALVE SHALL BE INSTALLED BEFORE TESTING.
  3. ALL PIPING SHALL BE FULLY RESTRAINED FROM MAIN TO INSIDE BUILDING.
  4. ALL JOINTS INSIDE BUILDING SHALL BE FLANGE.


SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-13.15	REV. DATE
	<i>TYPICAL DIP COMMERCIAL &amp; INDUSTRIAL SERVICE DETAIL THROUGH CONCRETE FLOOR</i>	10/29/20 DS
	SCALE: NTS	11/5/20 DS 7/29/21 MJL

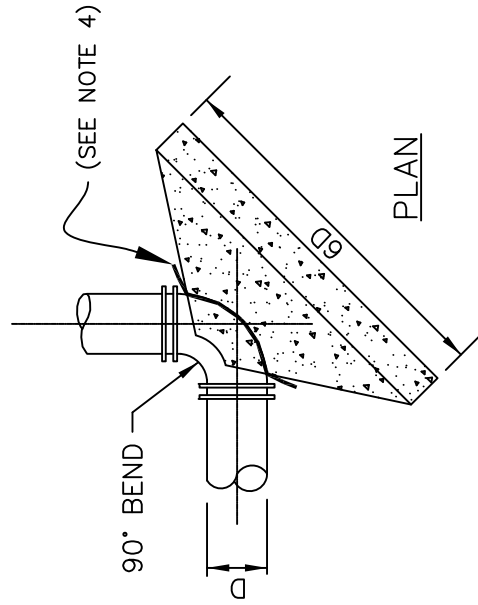
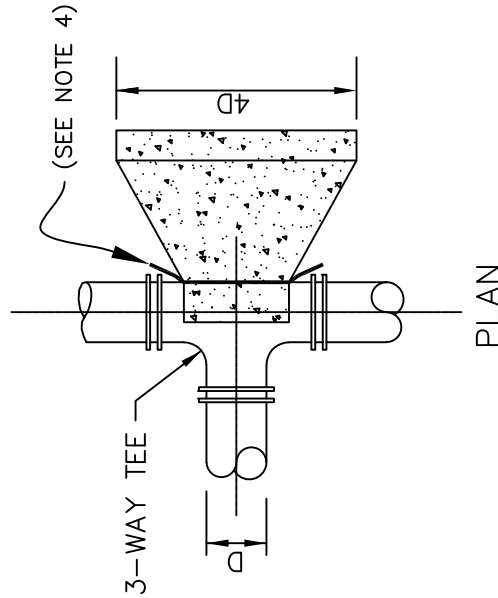
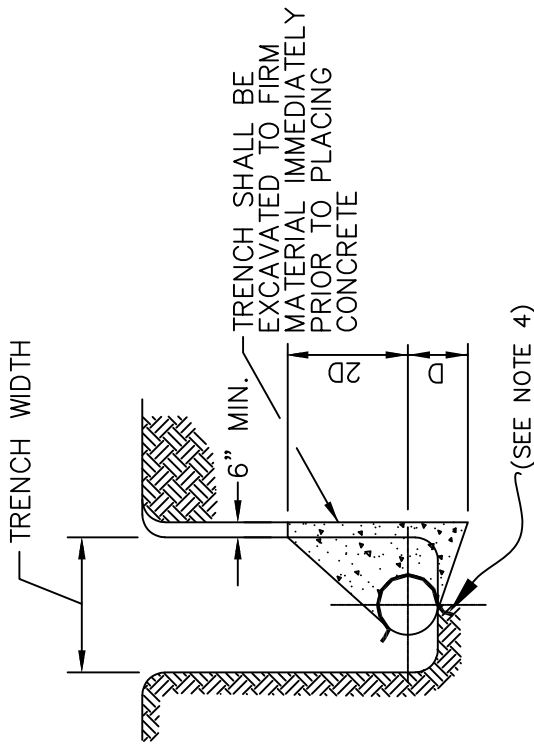
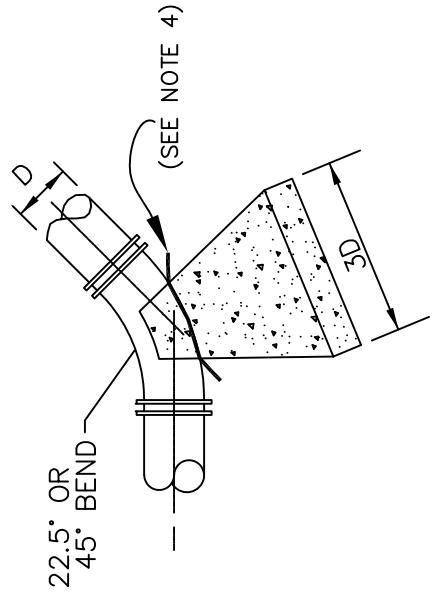
Last Modified: 04/09/2025 at 10:39AM EDT



**NOTES:**


1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-14.0	REV. DATE
	<i>THRUST BLOCK BEHIND FITTINGS</i>	4/1/08 MAB
	SCALE: NTS	



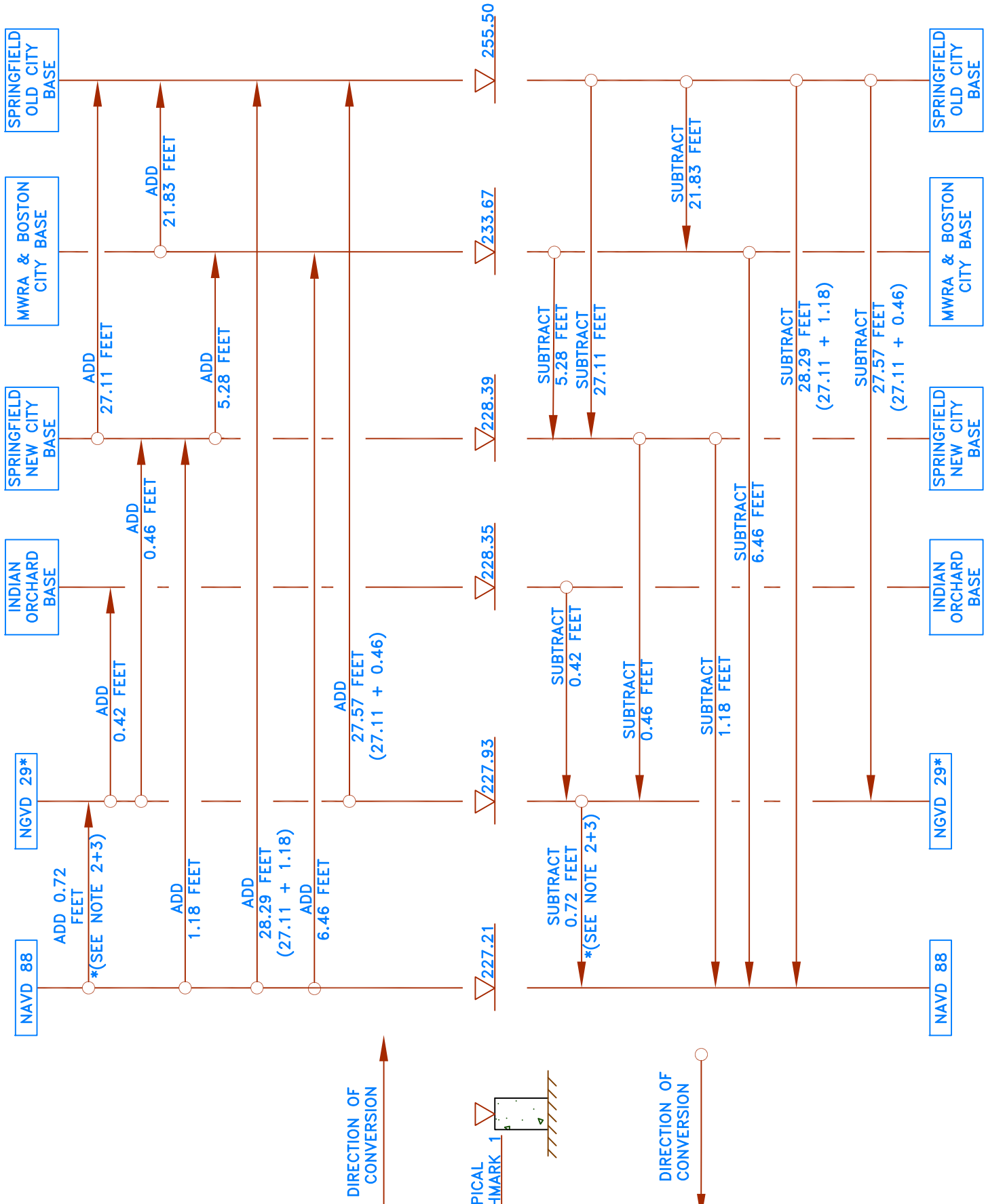
**NOTES:**

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL W-02.0, W-02.1, W-02.2, W-02.3 OR W-02.4 FOR TRENCH DETAILS.
4. 4 MIL POLY BETWEEN CONCRETE AND FITTING IF POURED THRUST BLOCK.
5. ANCHORS BASED ON MAXIMUM ALLOWABLE WATER PRESSURE OF 125 PSI SHOULD ONLY BE USED WHEN SOIL CONDITIONS ARE STABLE

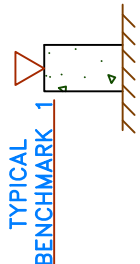
SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-14.1	REV. DATE
	<i>THRUST BLOCKS</i>	4/1/08 MAB
	SCALE: NTS	11/21/19 JFC



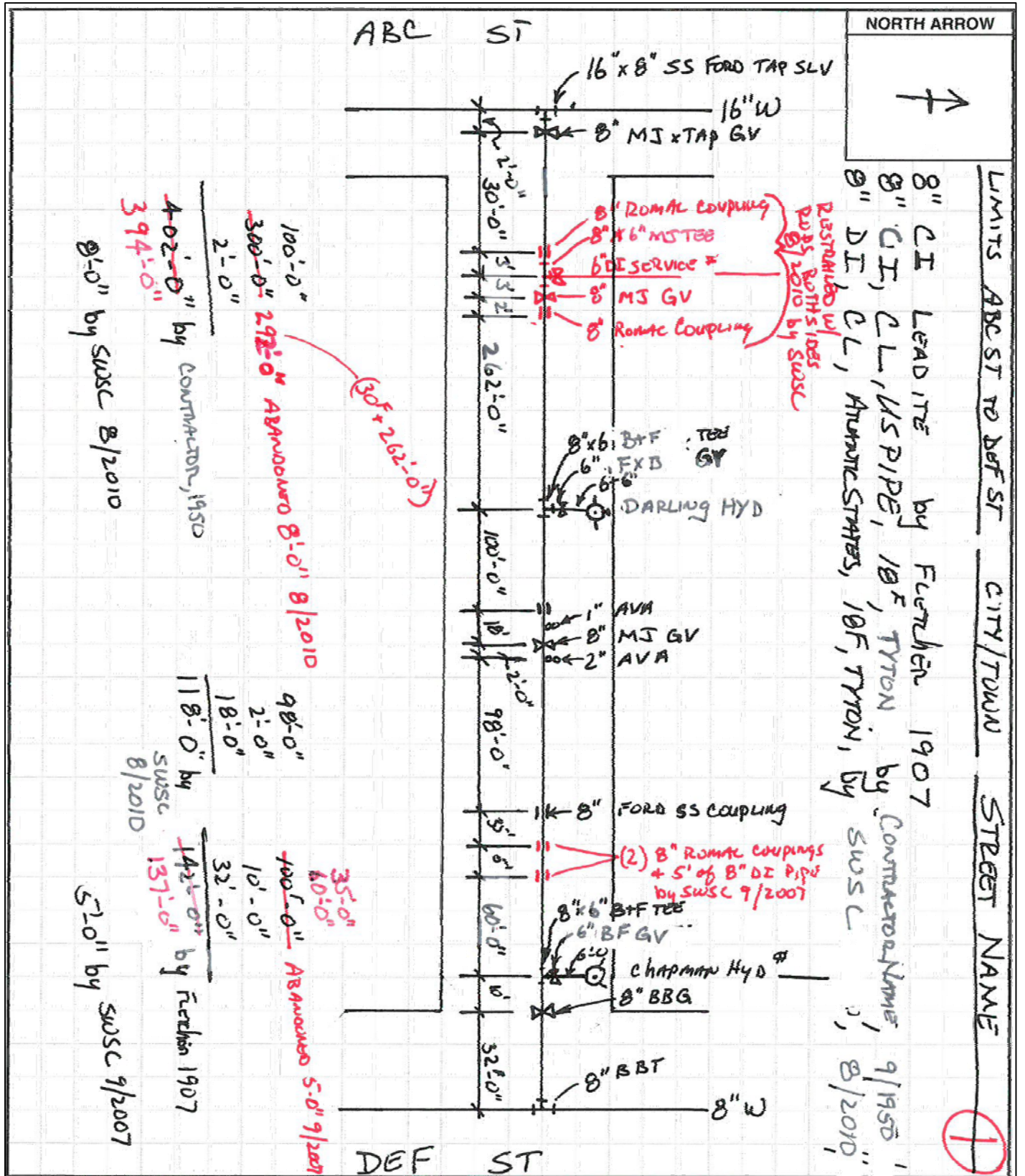
Last Modified: 04/09/2025 at 10:35AM EDT




- NOTES:**
- NOT FOR SURVEY, CONFIRM ALL ELEVATIONS, DATUMS, BASES, AND CONVERSIONS PRIOR TO SURVEY WORK
  - \* NGVD 29 IS NOT ALWAYS THE SAME ELEVATION, NGVD 29 IS DEPENDENT ON LOCATION IN SPRINGFIELD, LUDLOW, WESTFIELD, ETC. THE ELEVATION OF NGVD 29 CAN BE 0.65 - 0.72. ROUND TO THE HUNDREDTHS UPON CONVERSION COMPLETION



SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-15.0	REV. DATE
	<i>RELATION OF VERTICAL DATUMS TO SPRINGFIELD CITY BASE(S)</i>	
		1/9/19 DJP
	SCALE: NTS	

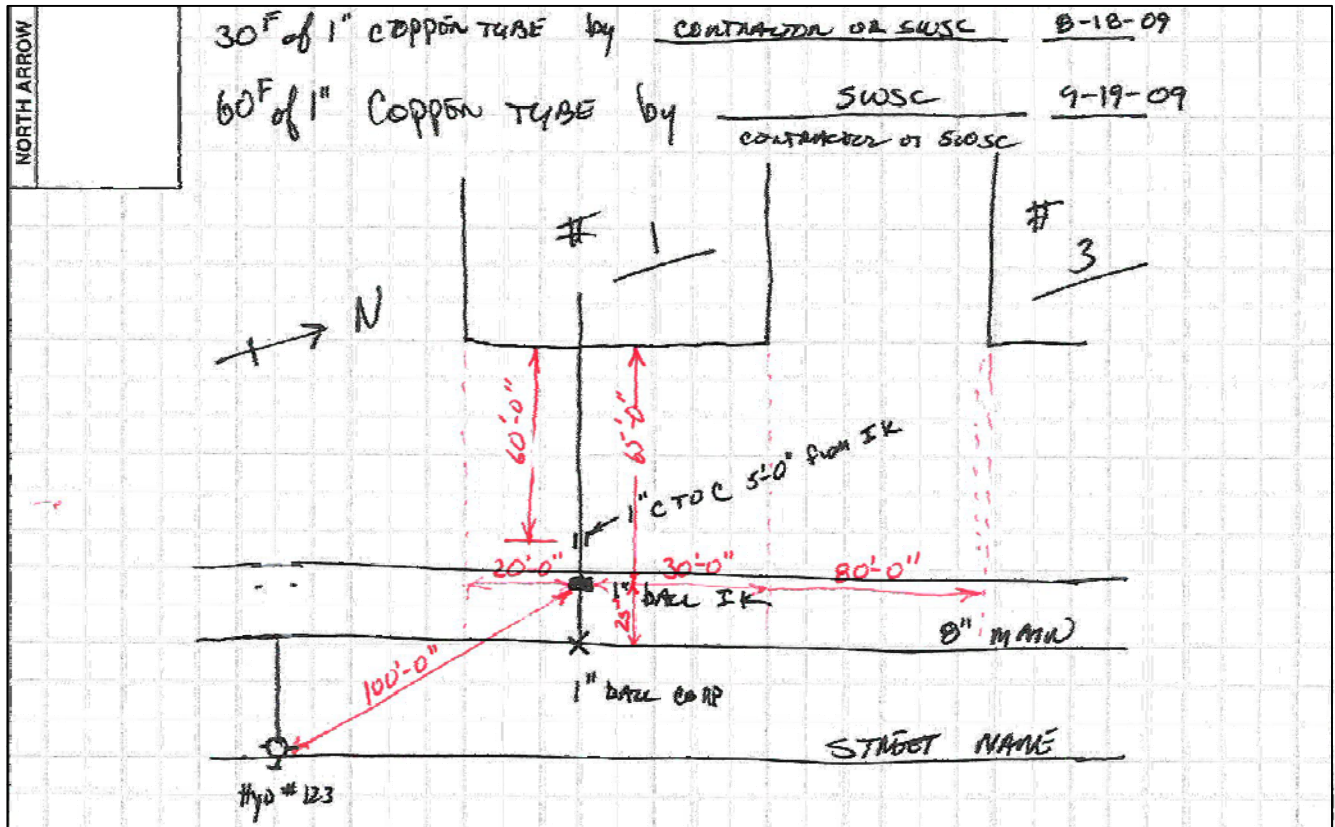


NOTES:  
1.


SPRINGFIELD WATER AND SEWER COMMISSION	
	WATER DETAIL W-16.0
	REV. DATE 10/19/17 DJP
RECORD SKETCH DETAIL	
SCALE: NTS	

No:	STREET
OWNER	SOR
DATE	WORK DONE
8-18-09	SERVICES REPLACED BY CONTRACTOR MAIN TO TROUBLE
7-19-09	SERVICES ENTER REQUESTED BY SWSC TROUBLE TO HOUSE

BUFFALO BOX IN TROUBLE OVER 1" BALL IK  
 65'-0" OUT FROM HOUSE  
 20'-0" N OF S LINE OF HOUSE  
 30'-0" S OF N LINE OF HOUSE  
 80'-0" S OF S LINE OF HOUSE # 3  
 ANOTHER BUFFALO BOX IS BURIED IN STREET OVER  
 1" BALL CORP 25'-0" E OF IK  
 1" C TO C IS 5'-0" FROM IK + 60'-0" OUT FROM HOUSE



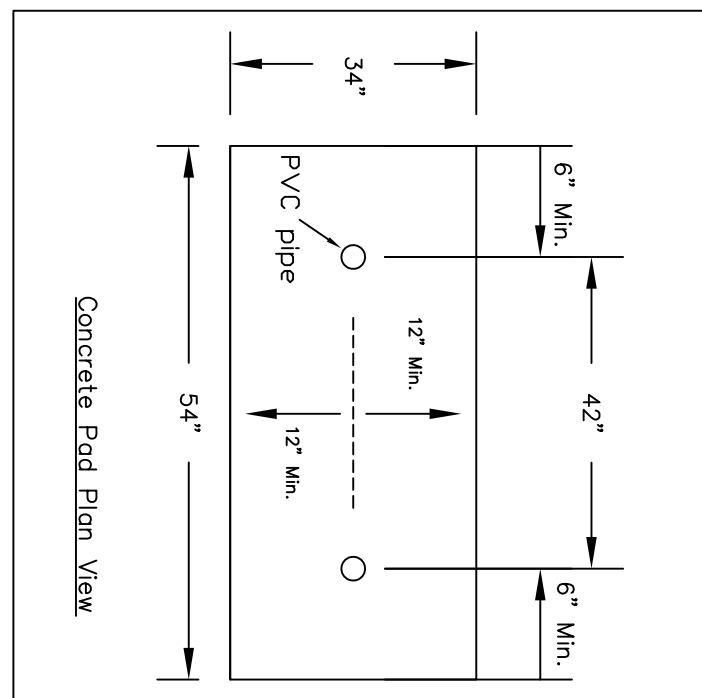
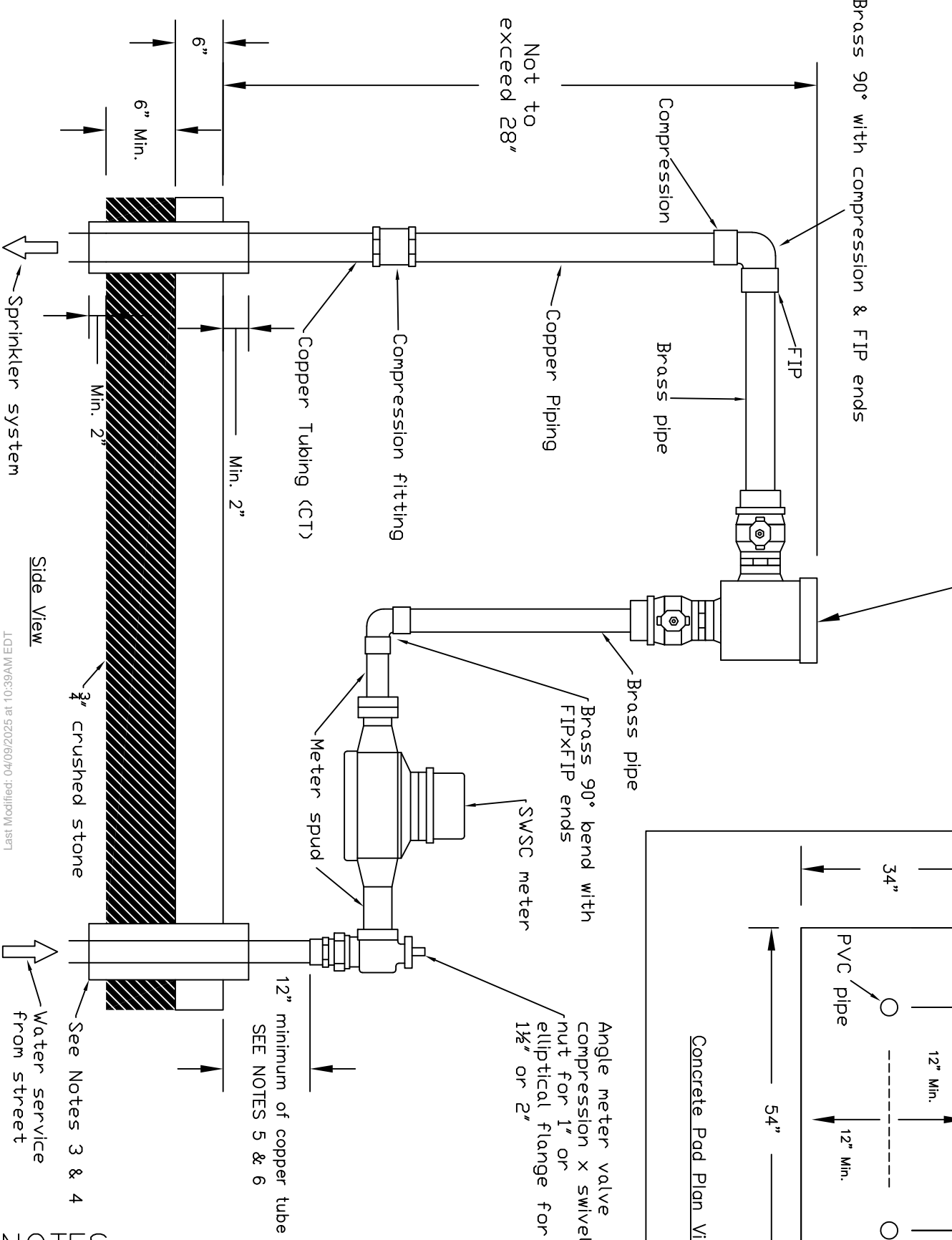
NOTES:  
1.

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-16.1	REV. DATE
	WATER SERVICES CARD DETAIL	10/19/17 DJP
SCALE: NTS		




Testable Backflow Prevention Device (BPD) using brass ball valves with FIP ends.

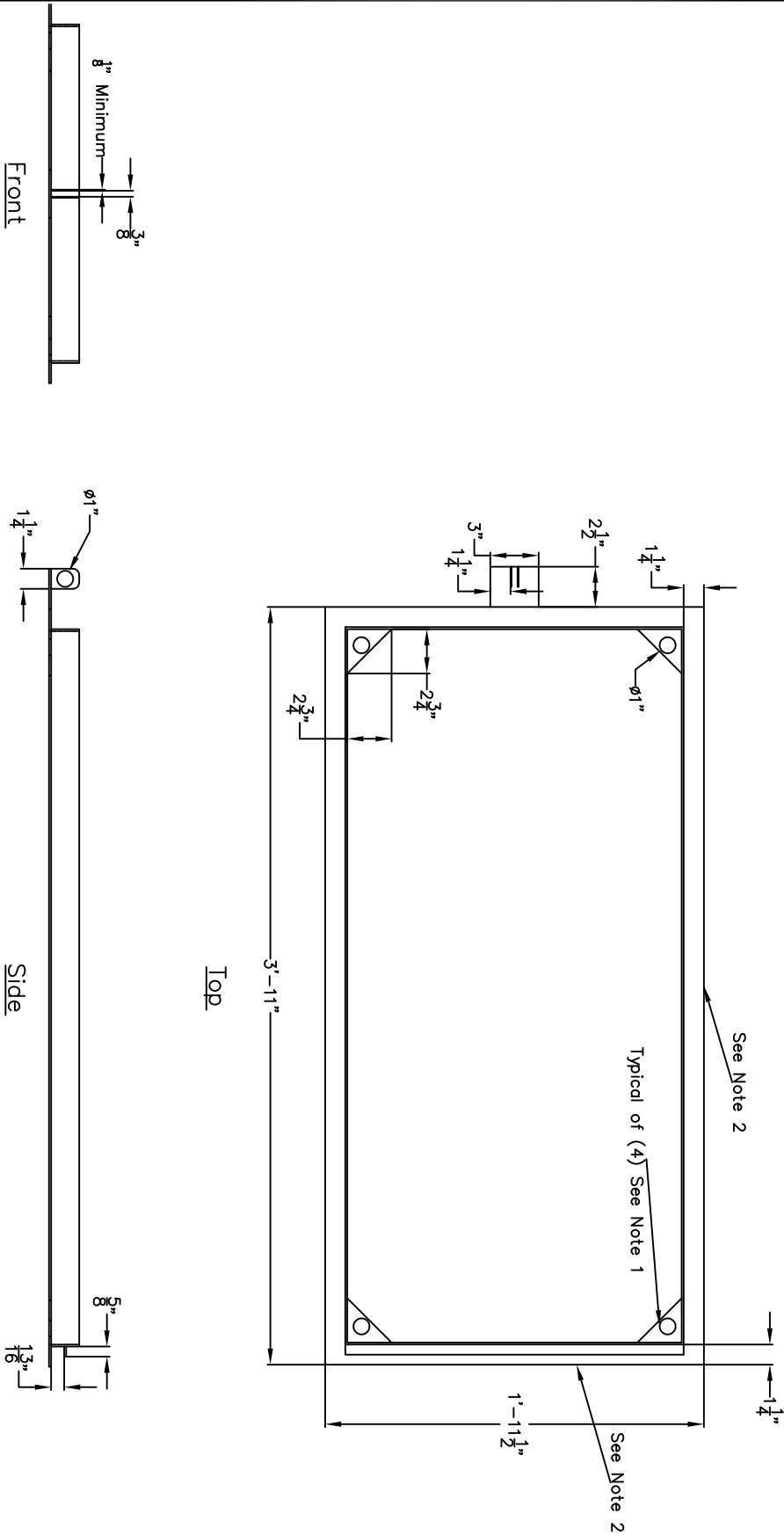
- 1) A testable pressure vacuum breaker (PVB) is allowed when the highest sprinkler head and/or fixture is 12" or greater below the PVB.
- 2) A testable RPZ is required if the highest sprinkler head and/or fixture is less than 12" below the BPD.




**NOTES:**

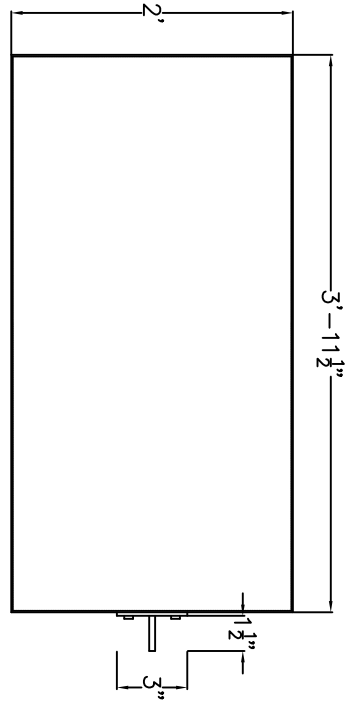
1. Seasonal services shall be 1", 1 1/2" or 2"
2. FIP = Female Iron Pipe
3. Copper Tubing (CT) risers to be centered on concrete pad
4. For 1" CT use 1 1/2" PVC sleeve; for 1 1/2" CT use 2" PVC sleeve; for 2" CT use 4" PVC sleeve
5. Copper tube shall be continuous without any joints from the angle meter valve to, at a minimum, outside the perimeter of the concrete base
6. The final height to be approved by the SWSC's Meters and Cross Connection Control Program supervisors

SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-17.0	REV. DATE
	Seasonal Water Service	04/17/18 DJP 1/14/20 LMB 6/9/21 DS 6/21/21 M.JL
SCALE: NTS		

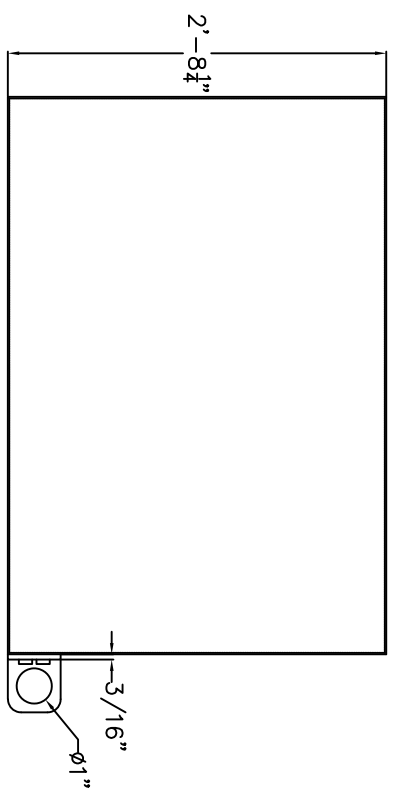


- NOTES:**
1. Plate steel shall be mild steel  $\frac{3}{16}$ " thick
  2. Angle steel shall be 1"x1"x $\frac{3}{16}$ "
  3. Coating shall be Forest Green epoxy 6mils thick

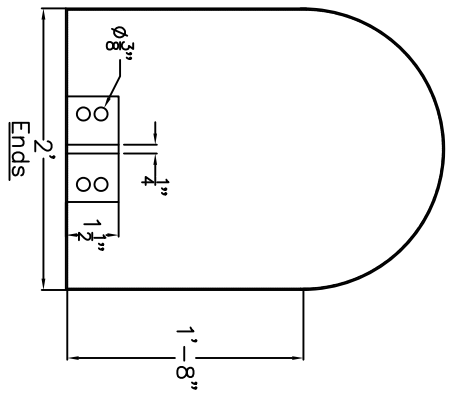
SPRINGFIELD WATER AND SEWER COMMISSION		
	WATER DETAIL W-17.1	REV. DATE
	Seasonal Water Service Base	04/17/18 DJP
		01/9/19 LMB
		1/10/19 DJP
SCALE: NTS		



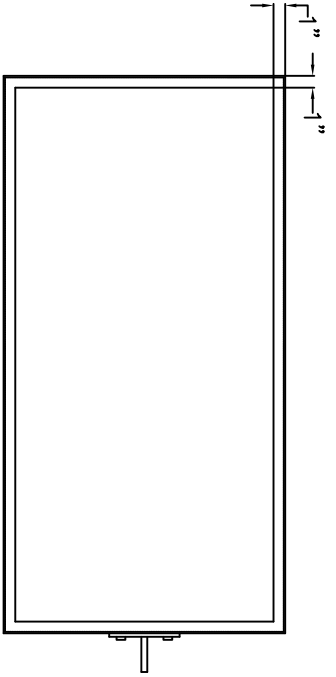
Top



Front



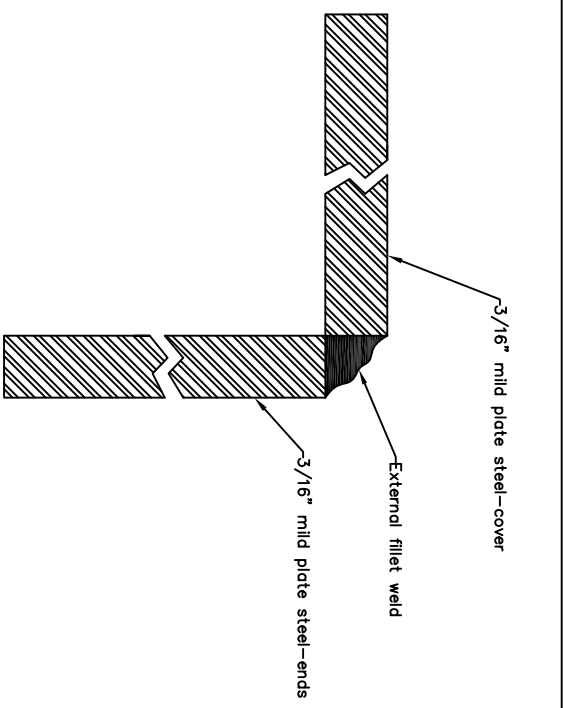
Ends




Bottom

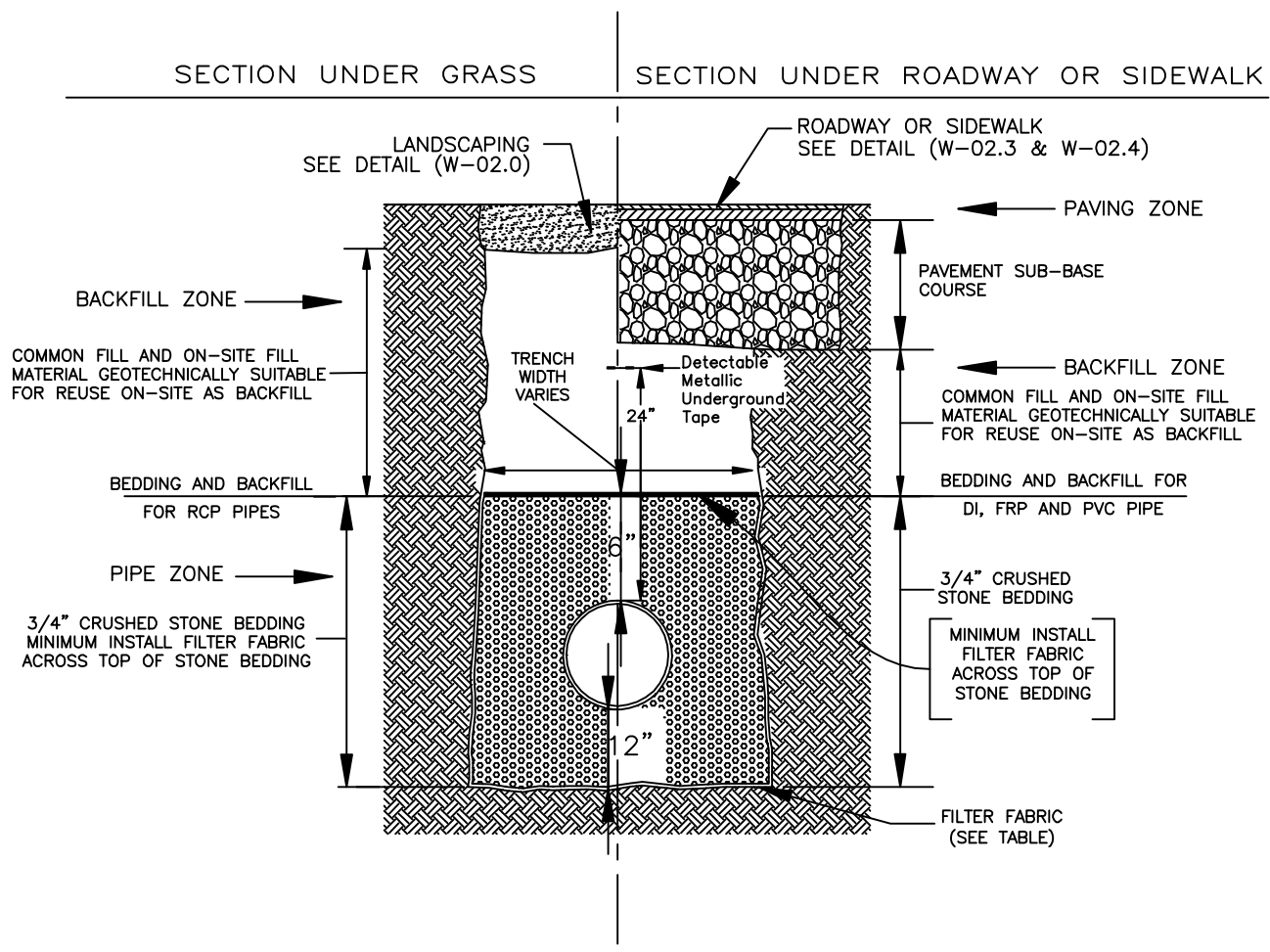
**NOTES:**

1. Plate steel shall be mild steel  $\frac{3}{16}$ " thick
2. Coating shall be Forest Green epoxy 6 mils thick
3. Four  $\frac{5}{8}$ " x  $1\frac{1}{4}$ " galvanized bolts with  $\frac{5}{16}$ " flat washers,  $\frac{5}{8}$ " lock washers, &  $\frac{5}{8}$ " nuts



Weld Detail

		<b>SPRINGFIELD WATER AND SEWER COMMISSION</b>	
WATER DETAIL W-17.2		REV. DATE	
Seasonal Water Service Cover		1/10/19 DJP	
SCALE: NTS			




TOTAL STONE BEDDING WRAP  
FILTER FABRIC REQUIREMENT

	SOIL TYPE	
	SILT OR CLAY	GRANULAR SOIL
ABOVE GROUND WATER	FILTER FABRIC NOT REQUIRED	FILTER FABRIC NOT REQUIRED
BELOW GROUND WATER	FILTER FABRIC REQUIRED	FILTER FABRIC NOT REQUIRED
2' OVERLAP MINIMUM OF FILTER FABRIC AT TOP OF BEDDING		

**NOTES:**

1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES & POLICIES AND SPECIFICATIONS.
2. ALL SEWER MAIN PIPE SHOULD HAVE A MINIMUM DEPTH OF 4' FROM TOP OF PIPE TO FINISH GRADE.
3. IF 4' OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.
4. ALL SERVICE LINES SHALL BE PVC SDR-35 AND MUST BE A MINIMUM OF 6" DIAMETER, NO EXCEPTIONS.

SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-01.0	REV. DATE
	TRENCH DETAIL FOR SEWER PIPES	4/1/08 MAB
SCALE: NTS		

Last Modified: 04/09/2025 at 10:39AM EDT

# ELEVATION

BRICK COURSES SHALL BE USED TO BRING MANHOLE RIM TO REQUIRED ELEVATION (MIN 2, MAX 3 COURSES OF BRICK OR CONCRETE GRADE RINGS AS REQUIRED) SEAL INSIDE AND OUTSIDE OF BRICK WITH HYDRAULIC CEMENT

COAT WITH (2) COATS OF BITUMINOUS DAMPPROOFING

TABLE 1			
MANHOLE DIAMETER	SIDE WALL MIN. THICKNESS	BOTTOM SLAB MIN. THICKNESS	MAX PIPE DIAMETER * ALLOWED RCP DI/PVC
4'	5"	6"	18" 24"
5'	6"	8"	30" 36"
6'	7"	8"	36" 48"

\* PIPE DIAMETER MAY VARY DEPENDING ON NUMBER OF PENETRATIONS.

POLYPROPYLENE COATED STEEL MANHOLE STEPS 12" O.C.

STANDARD BARREL SECTION COMBINATIONS OF 1', 2', 3' OR 4' LENGTHS AS NEEDED

8" MIN.

16" MAX

12" MINIMUM OF 3/4" CRUSHED STONE

FOR FILTER FABRIC USE REQUIREMENTS, SEE TRENCH DETAIL FOR SEWER PIPES DETAIL (S-01.0)

BRICK OR CONCRETE FILL

6" MINIMUM

UNDISTURBED EARTH

MANHOLE FRAME AND COVER SEE FRAME & COVER DETAIL (S-02.5)

SET RIM AT FINISHED GRADE

SET CASTING IN GROUT AND GROUT ALL AROUND TO 4" ABOVE FLANGE

FINISHED GRADE

STANDARD PRECAST ECCENTRIC OR CONCENTRIC CONE SECTION OR FLAT TOP (AS REQUIRED) NO BARREL BLOCK ALLOWED

TOUNGE & GROOVE GASKET SHALL BE O-RING RUBBER GASKET CONFORMING TO A.S.T.M. C443

BELL & SPIGOT GASKET SHALL BE BUTYL RUBBER GASKET JOINTS CONFORMING TO A.S.T.M. C990

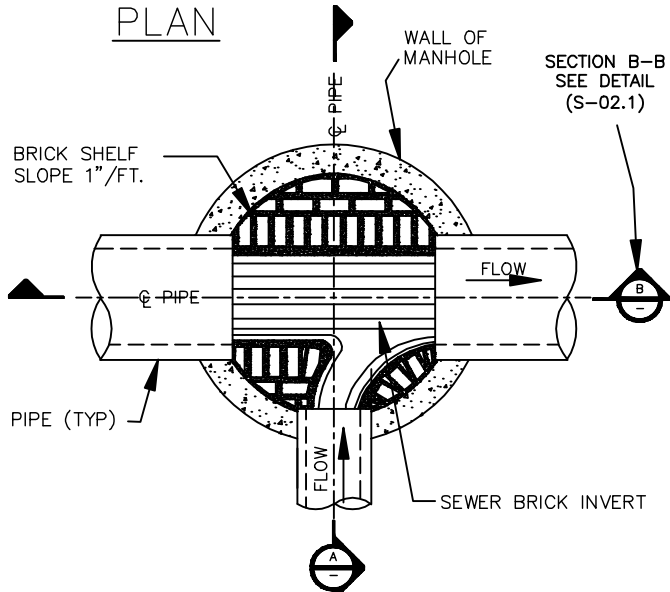
SEE TABLE 1

SHELF ELEVATION SAME AS CROWN OF HIGHEST PIPE

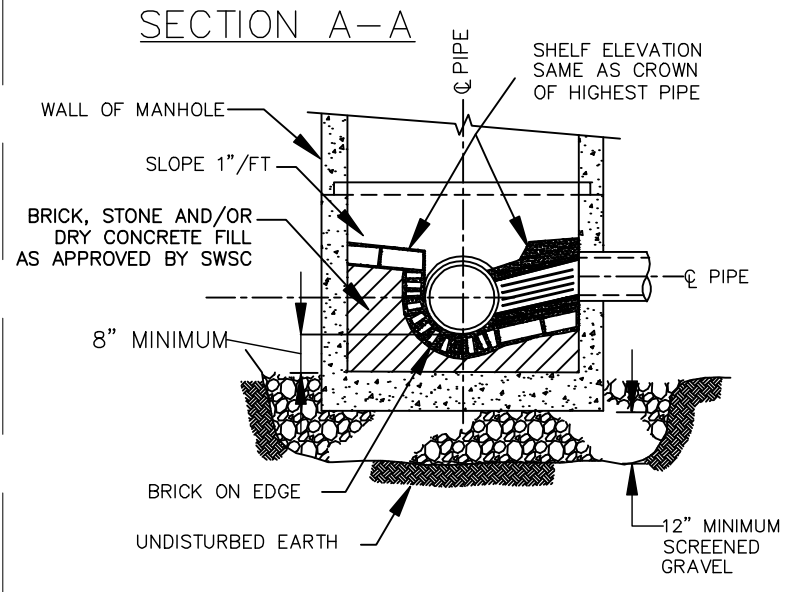
SEE PIPE CONNECTION DETAIL (S-02.1)

PIPE

## PLAN



## SECTION A-A



### NOTES:

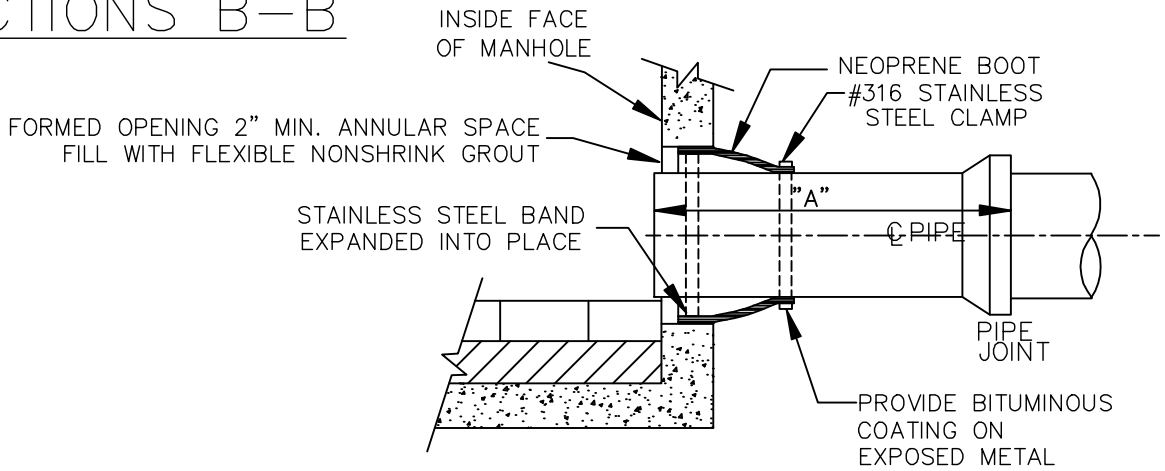
1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES & POLICIES AND SPECIFICATIONS.
2. ALL SEWER MAIN PIPE SHOULD HAVE A MINIMUM DEPTH OF 4' FROM TOP OF PIPE TO FINISH GRADE.
3. IF 4' OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.
4. REINFORCED CONCRETE MANHOLE SECTIONS CONFORMING TO A.S.T.M.C478.
5. DESIGN PRECAST SECTIONS WITH FRAME AND COVER FOR AASHTO H-20 LOADING.
6. PRE-CAST CONCRETE SHALL BE 5,000 PSI @ 28 DAYS.
7. ALL BRICK SHALL BE HARD NON-POROUS CLAY.
8. ADMIXTURES, AIR & PLASTICIZERS PER ASTM C233-82.
9. REINFORCING PER ASTM A615 FOR WIRE FABRIC.
10. DESIGN LOADING PER AASHTO HS20-44, ACI 318-83; ASTM C478-82, C890-82, C913-71.

SPRINGFIELD WATER AND SEWER COMMISSION	
SEWER DETAIL S-02.0	REV. DATE
PRE-CAST CONCRETE SEWER MANHOLE	4/1/08 MAB
SCALE: NTS	

Last Modified: 14/09/2025 at 10:39AM EDT

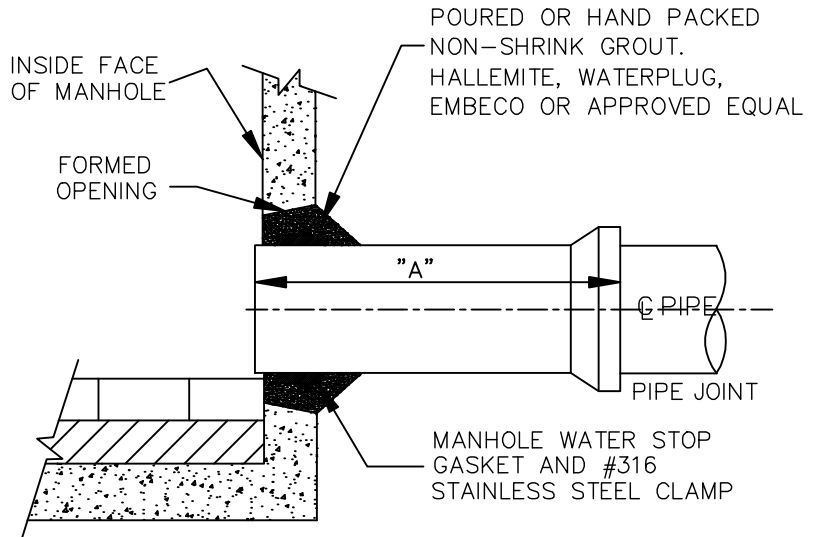


# SECTIONS B-B



FLEXIBLE MANHOLE SEAL

MAXIMUM STUB LENGTH		
PIPE MATERIAL	"A"	"A"
	(MAX.)	(MIN.)
RC	4'-0"	2'-0"
PVC	3'-3"	2'-0"
DI	4'-6"	2'-0"



HYDRAULIC CEMENT SEAL\*

\*THIS METHOD REQUIRES SWSC APPROVAL

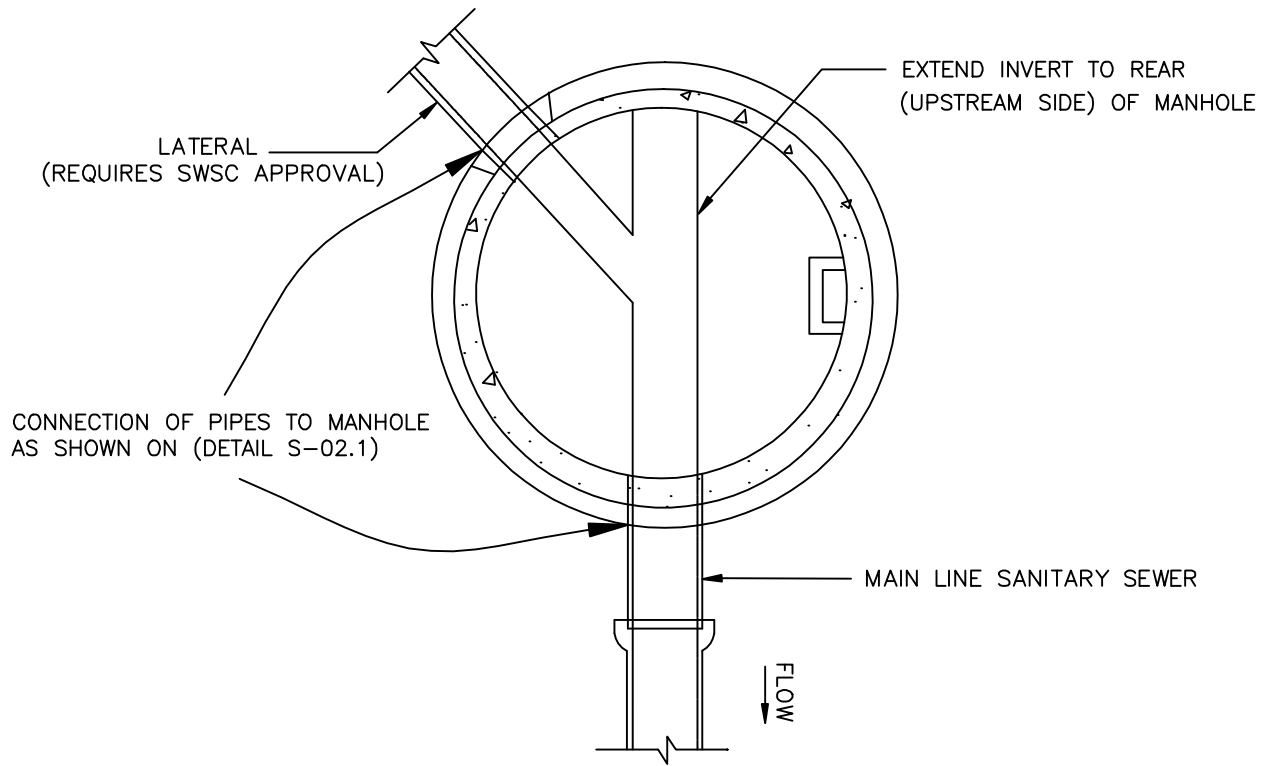
NOTES:

1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES & POLICIES AND MATERIAL SPECIFICATIONS.
2. ALL SEWER MAIN PIPE SHOULD HAVE A MINIMUM DEPTH OF 4' FROM TOP OF PIPE TO FINISH GRADE.
3. IF 4' OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.
4. REINFORCED CONCRETE MANHOLE SECTIONS CONFORMING TO A.S.T.M.C478.
5. DESIGN PRECAST SECTIONS WITH FRAME AND COVER FOR AASHTO H-20 LOADING.
6. PRE-CAST CONCRETE SHALL BE 5,000 PSI @ 28 DAYS.
7. ALL BRICK SHALL BE HARD NON-POROUS CLAY.
8. ADMIXTURES, AIR & PLASTICIZERS PER ASTM C233-82.
9. REINFORCING PER ASTM A615 FOR WIRE FABRIC.
10. DESIGN LOADING PER AASHTO HS20-44, ACI 318-83; ASTM C478-82, C890-82, C913-71.

SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-02.1	REV. DATE
	PRE-CAST CONCRETE SEWER PIPE CONNECTIONS	4/1/08 MAB
	SCALE: NTS	

Last Modified: 04/09/2025 at 10:39AM EDT

Last Modified: 04/09/2025 at 10:39AM EDT



### END MANHOLE

**NOTES:**

1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES & POLICIES AND MATERIAL SPECIFICATIONS.
2. ALL SEWER MAIN PIPE SHOULD HAVE A MINIMUM DEPTH OF 4' FROM TOP OF PIPE TO FINISH GRADE.
3. IF 4' OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.
4. ALL SERVICE LINES SHALL BE PVC SDR-35 AND MUST BE A MINIMUM OF 6" DIAMETER, NO EXCEPTIONS.

SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-02.2	REV. DATE
	<u>END OF SEWER MAIN</u>	4/1/08 MAB
SCALE: NTS		

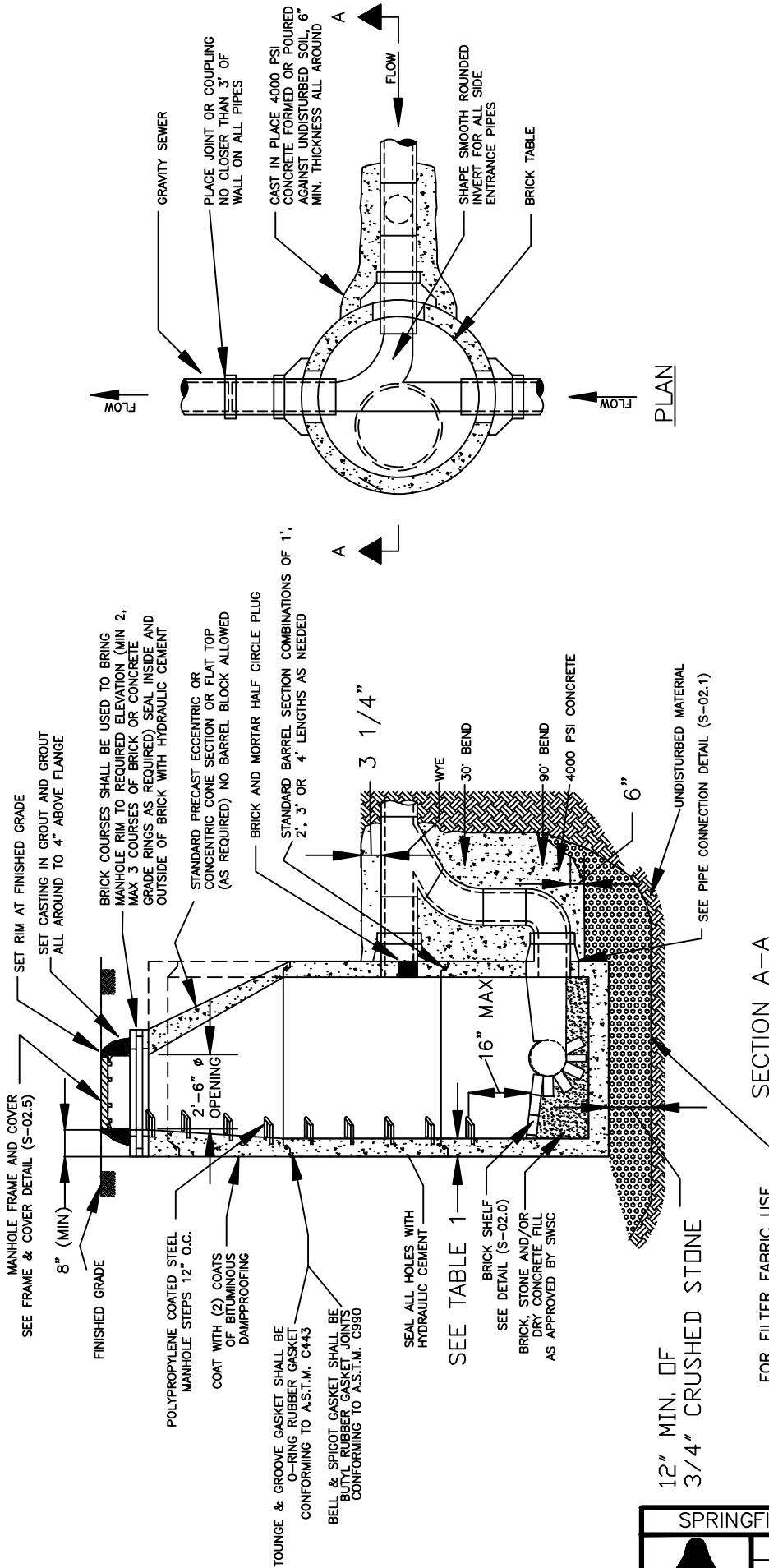



TABLE 1

MANHOLE DIAMETER	SIDE WALL MIN. THICKNESS	BOTTOM SLAB MIN. THICKNESS	MAX PIPE DIAMETER * ALLOWED DI/PVC
4'	5"	6"	18"
5'	6"	8"	30"
6'	7"	8"	36"
			48"

\* PIPE DIAMETER MAY VARY DEPENDING ON NUMBER OF PENETRATIONS.

NOTES:  
1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES & POLICIES AND SPECIFICATIONS.  
2. ALL SEWER MAIN PIPE SHOULD HAVE A MINIMUM DEPTH OF 4' FROM TOP OF PIPE TO FINISH GRADE.  
3. IF 4' OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.  
4. REINFORCED CONCRETE MANHOLE SECTIONS CONFORMING TO A.S.T.M.C478.  
5. DESIGN PRECAST SECTIONS WITH FRAME AND COVER FOR AASHTO H-20 LOADING.  
6. PRE-CAST CONCRETE SHALL BE 5,000 PSI @ 28 DAYS.  
7. ALL BRICK SHALL BE HARD NON-POROUS CLAY.  
8. ADMIXTURES, AIR & PLASTICIZERS PER ASTM C233-82.  
9. REINFORCING PER ASTM A615 FOR WIRE FABRIC.  
10. DESIGN LOADING PER AASHTO HS20-44, ACI 318-83; ASTM C478-82, C890-82, C913-71.

SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-02.3	REV. DATE
	<i>EXTERIOR DROP MANHOLE</i>	1/1/08 MAB
	SCALE: NTS	

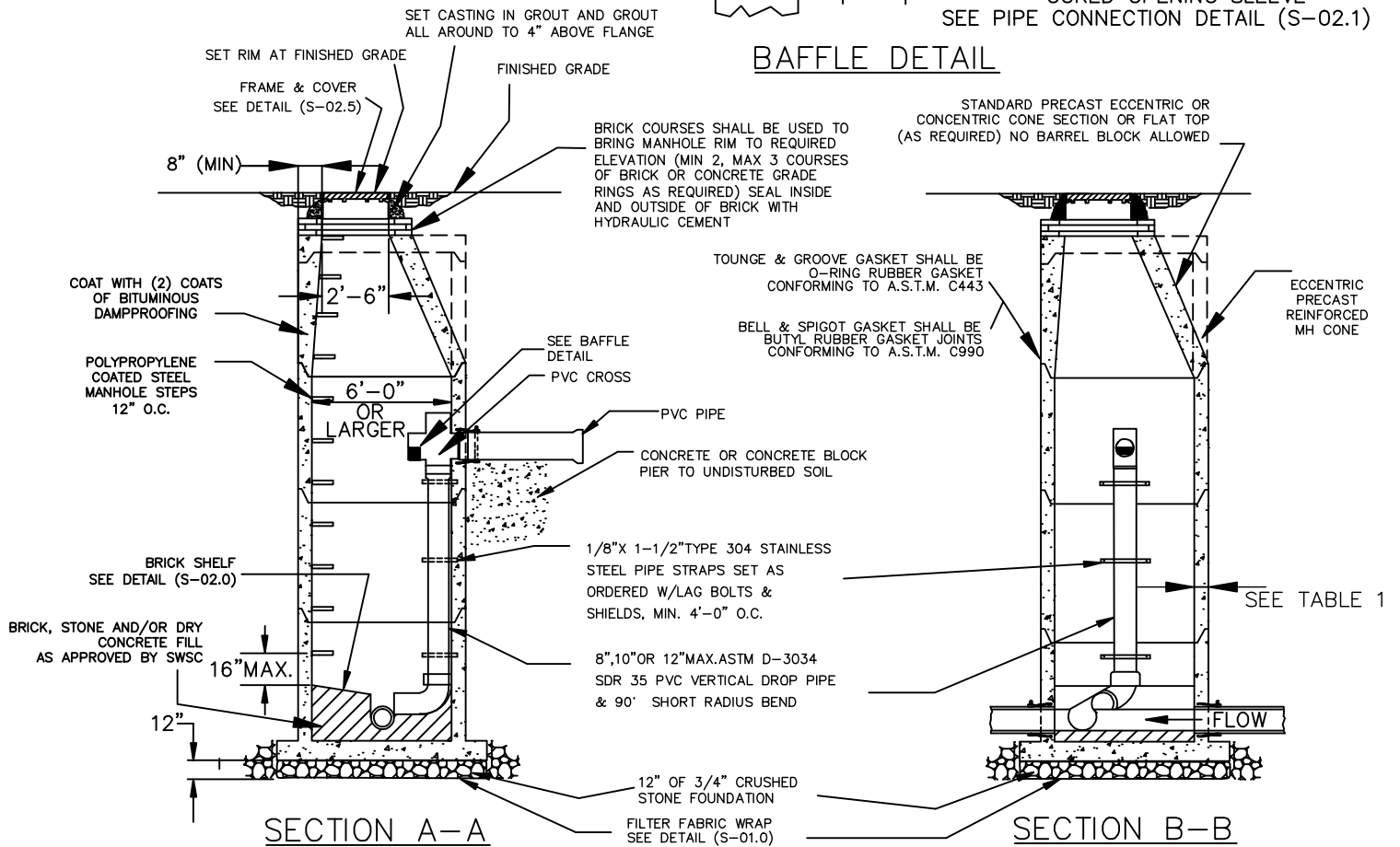
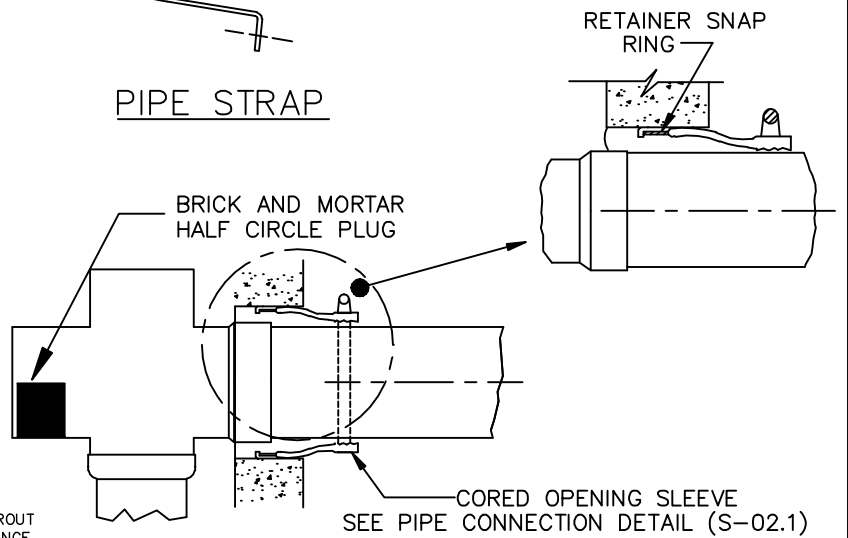
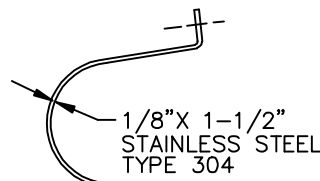
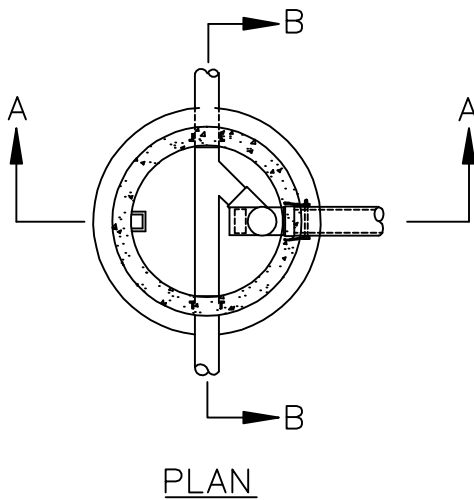


TABLE 1

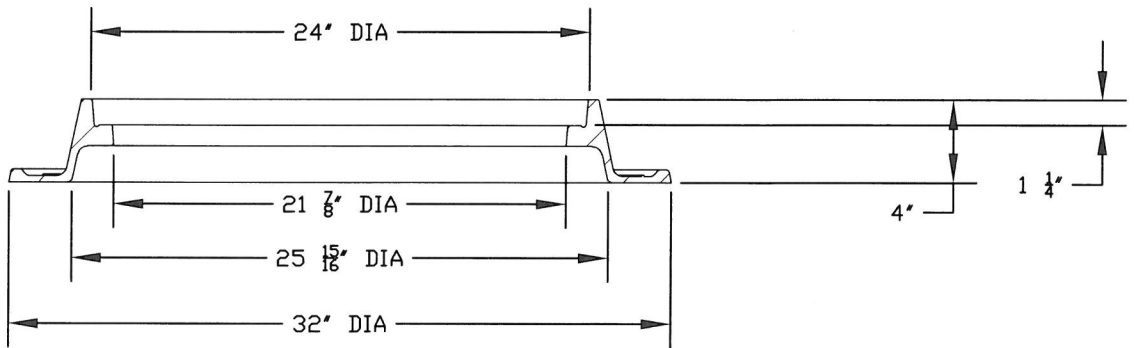
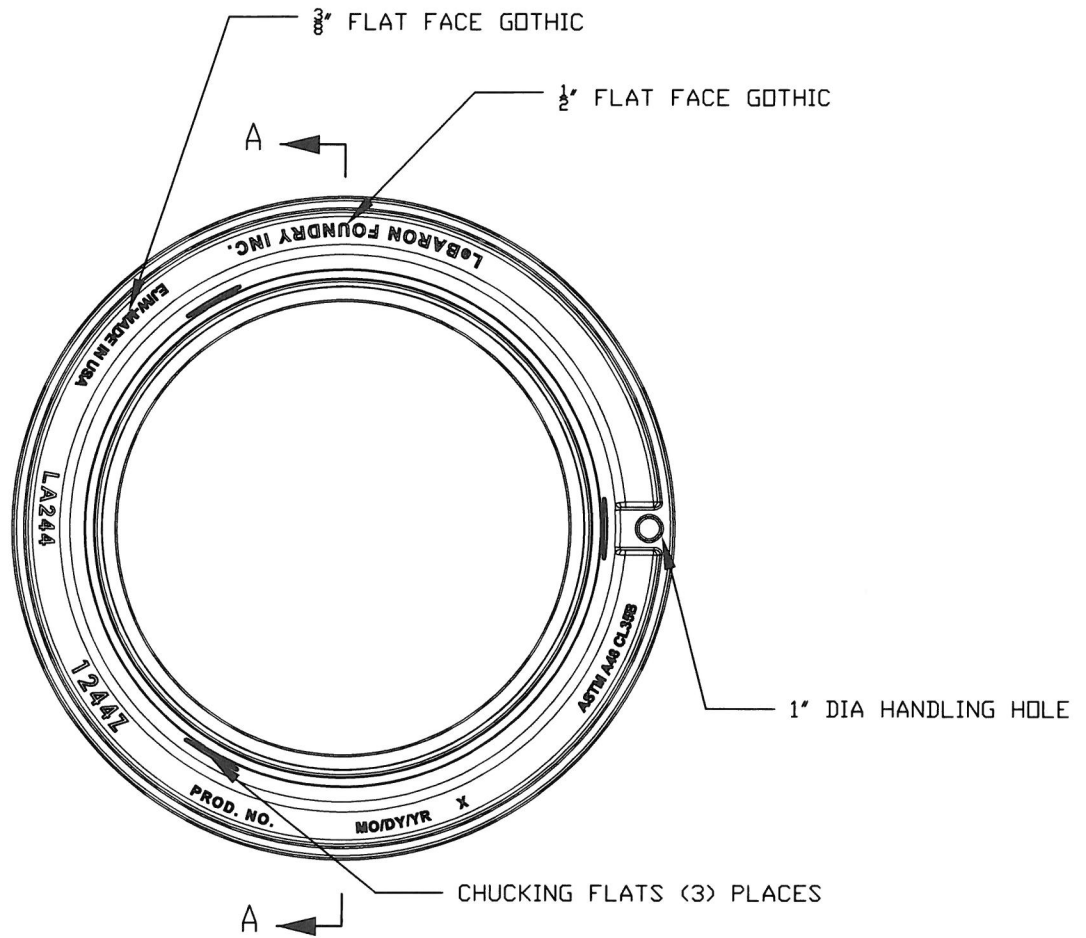
MANHOLE DIAMETER	SIDE WALL MIN. THICKNESS	BOTTOM SLAB MIN. THICKNESS	MAX PIPE DIAMETER * ALLOWED	
			RCP	DI/PVC
6'	7"	8"	18"	24"
6'	7"	8"	30"	36"
6'	7"	8"	36"	48"

NOTES:

- ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES & POLICIES AND SPECIFICATIONS.
- ALL SEWER MAIN PIPE SHOULD HAVE A MINIMUM DEPTH OF 4' FROM TOP OF PIPE TO FINISH GRADE.
- IF 4' OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.
- REINFORCED CONCRETE MANHOLE SECTIONS CONFORMING TO A.S.T.M.C478.
- DESIGN PRECAST SECTIONS WITH FRAME AND COVER FOR AASHTO H-20 LOADING.
- PRE-CAST CONCRETE SHALL BE 5,000 PSI @ 28 DAYS.
- ALL BRICK SHALL BE HARD NON-POROUS CLAY.
- ADMIXTURES, AIR & PLASTICIZERS PER ASTM C233-82.
- REINFORCING PER ASTM A615 FOR WIRE FABRIC.
- DESIGN LOADING PER AASHTO HS20-44, ACI 318-83; ASTM C478-82, C890-82, C913-71.

\* PIPE DIAMETER MAY VARY  
DEPENDING ON NUMBER OF PENETRATIONS.


SPRINGFIELD WATER AND SEWER COMMISSION	
	SEWER DETAIL S-02.4
	<i>INTERIOR DROP MANHOLE</i>
	SCALE: NTS
	REV. DATE
	4/1/08 MAB
	6/18/08 MAB

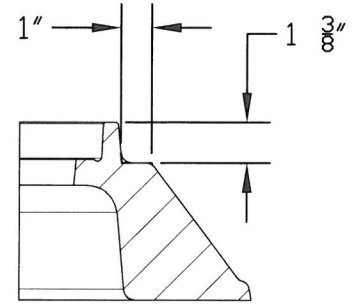
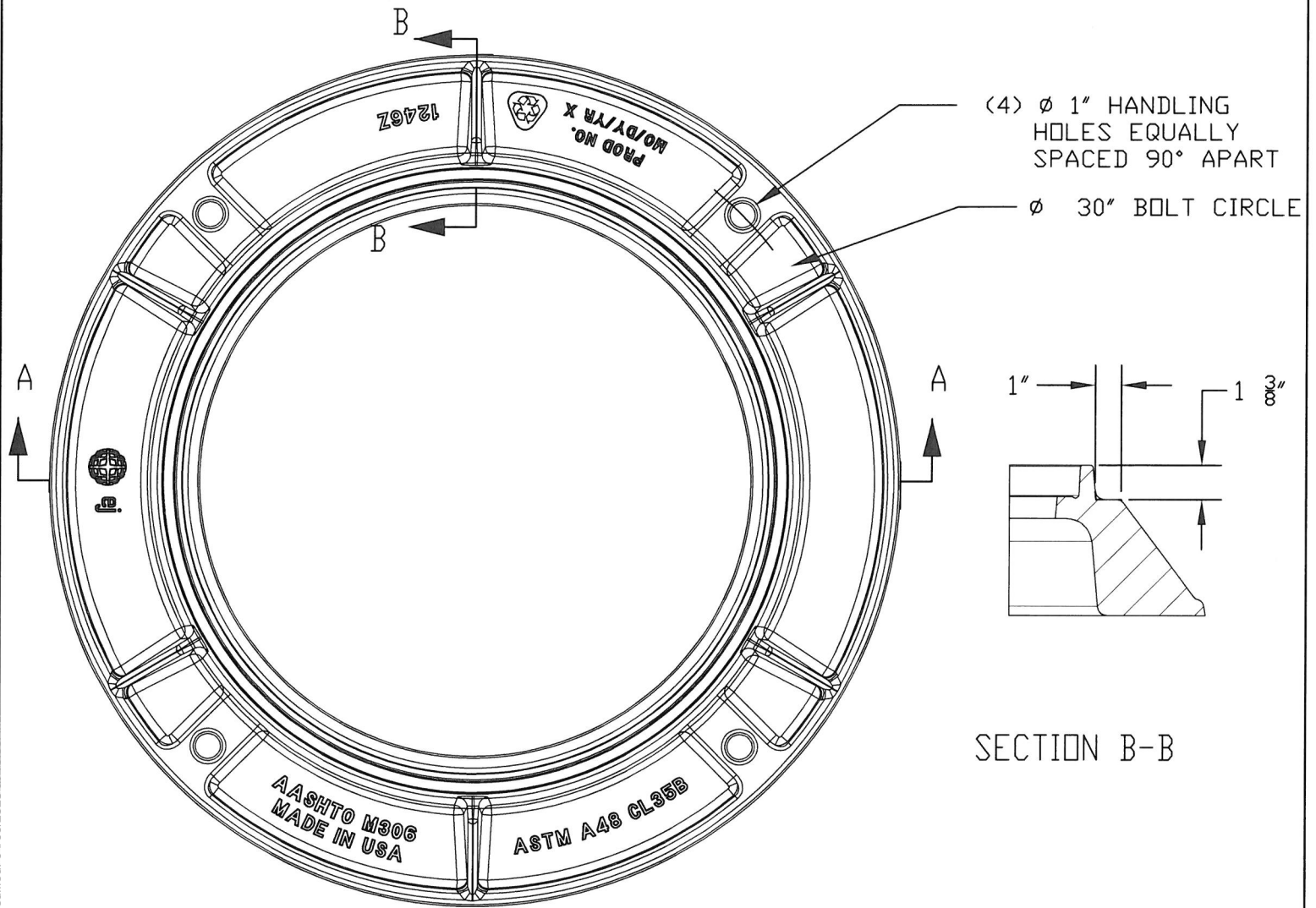


SECTION A-A  
SCALE 1:10

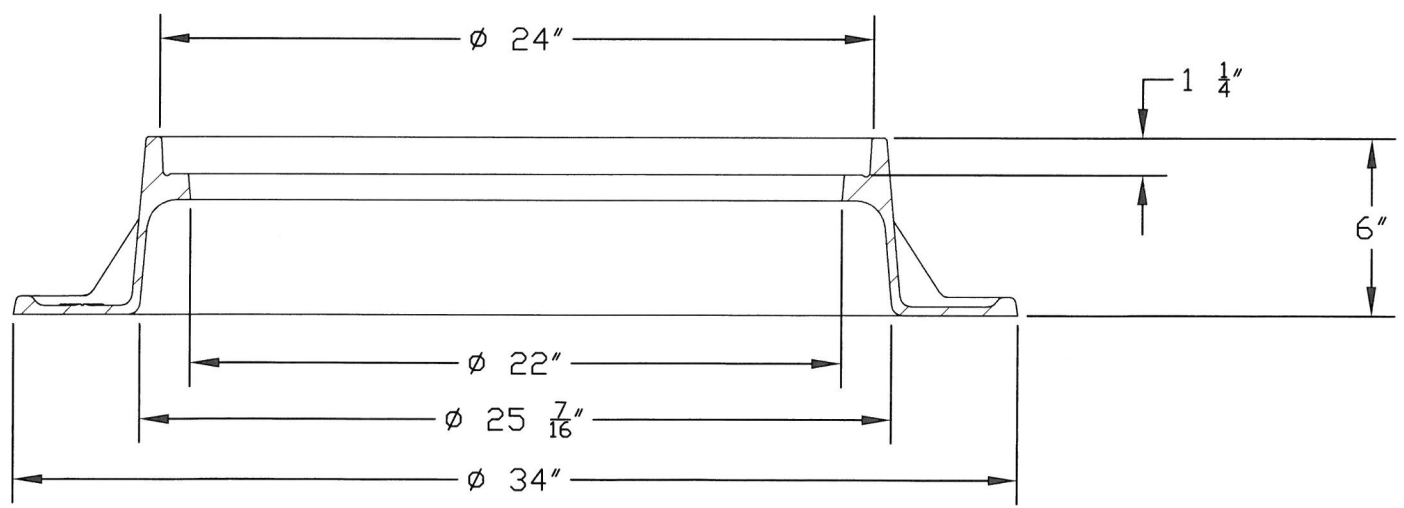
**NOTES:**

1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. FRAME & COVER SHALL BE MADE FROM ASTM A48 CLASS 35B GRAY CAST IRON.
3. DIMENSIONS ARE IN INCHES-FRACTIONAL +/- 1/16" ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL +/- 1/16" PER FOOT

SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-02.51	REV. DATE
	<i>24-inch by 4-inch</i>	
	<i>Frame Only</i>	
	SCALE: NTS	
		4/16/19 DJP



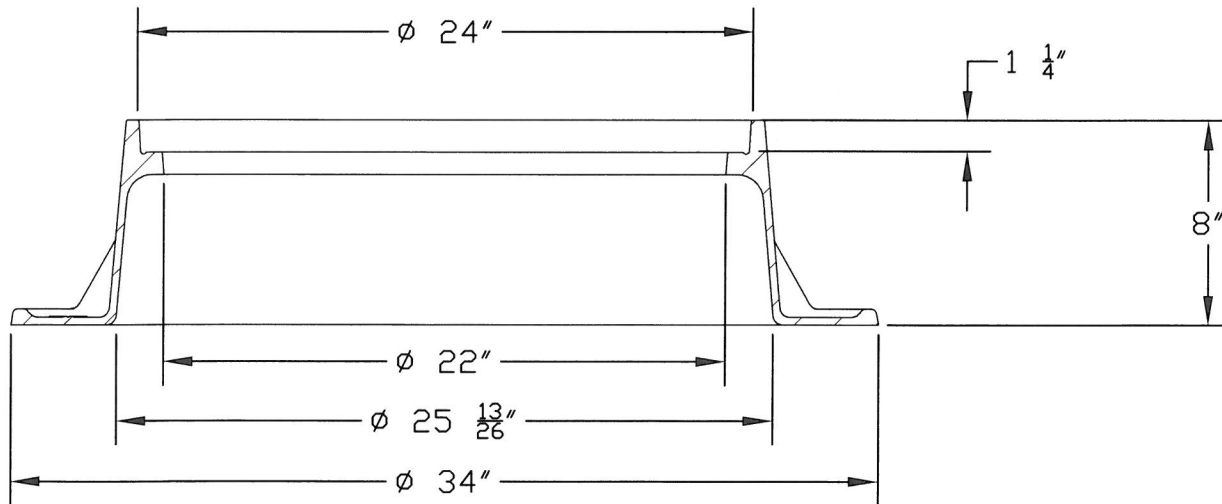
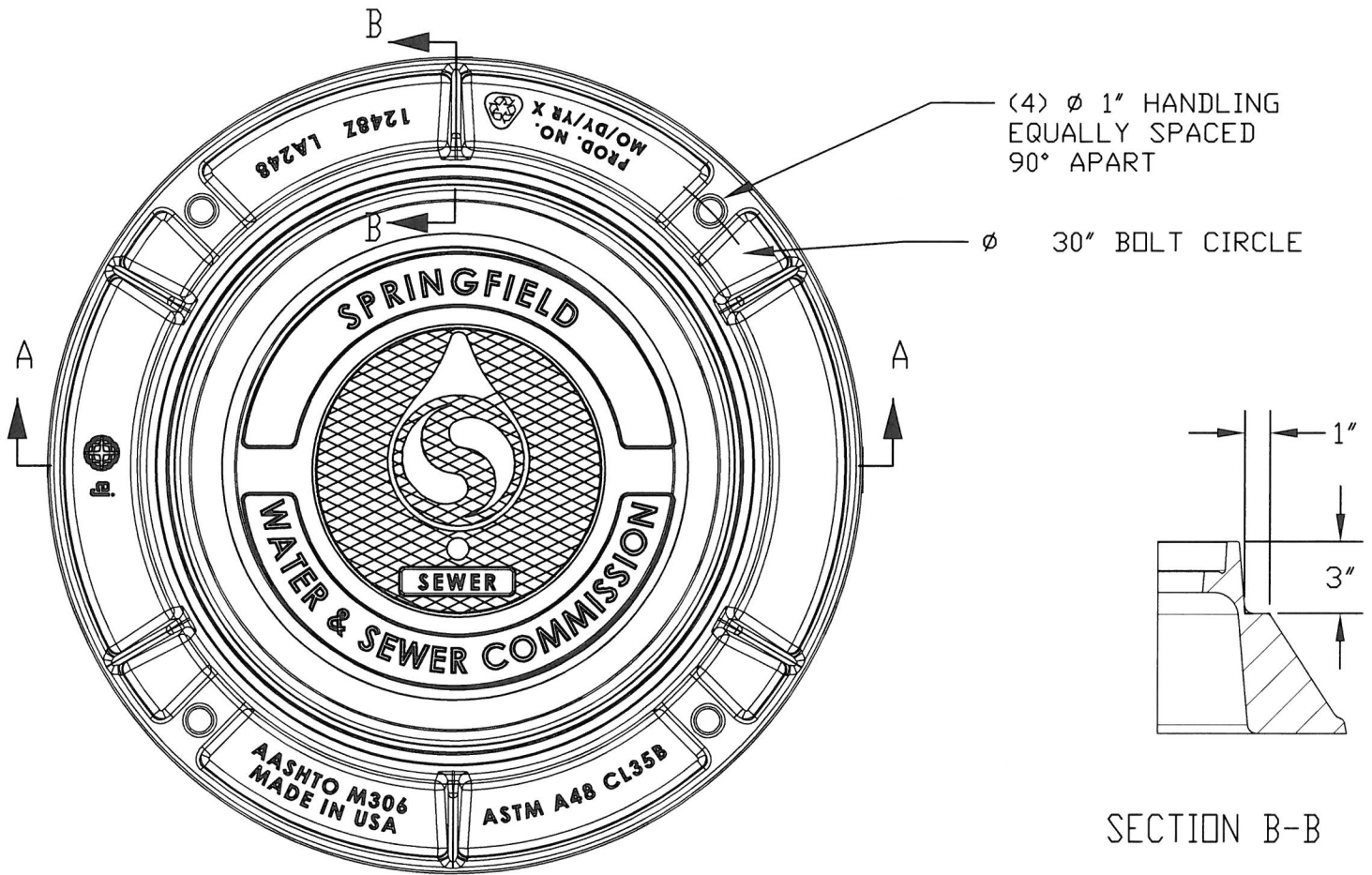
SECTION B-B



**NOTES:**

1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. FRAME & COVER SHALL BE MADE FROM ASTM A48 CLASS 35B GRAY CAST IRON.
3. DIMENSIONS ARE IN INCHES-FRACTIONAL  $\pm \frac{1}{16}$  ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL  $\pm \frac{1}{16}$ " PER FOOT

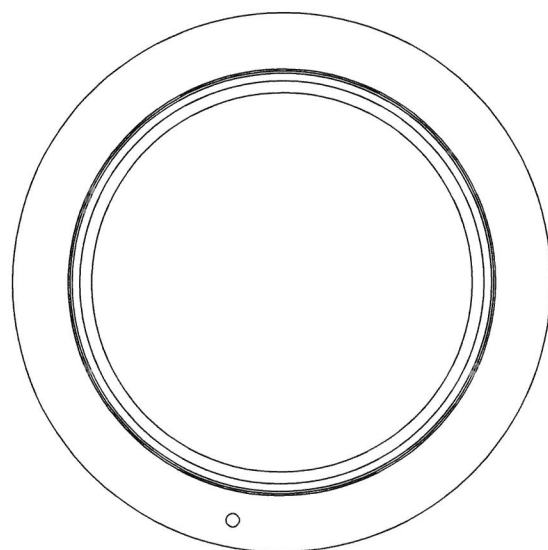
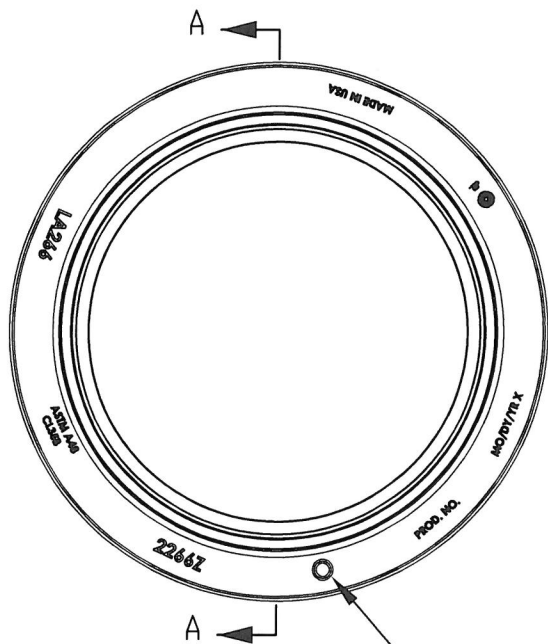
SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-02.52	REV. DATE
	24-inch by 6-inch Frame Only	4/16/19 DJP
SCALE: NTS		



**NOTES:**

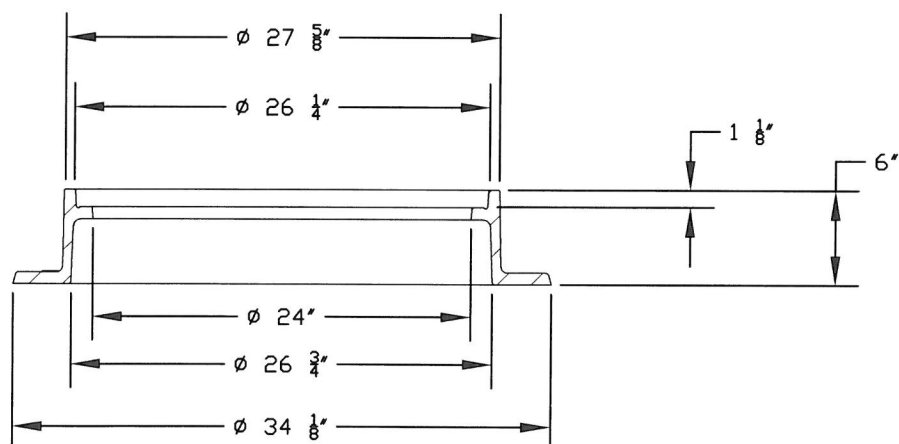
1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. FRAME & COVER SHALL BE MADE FROM ASTM A48 CLASS 35B GRAY CAST IRON.
3. DIMENSIONS ARE IN INCHES-FRACTIONAL  $\pm \frac{1}{16}$  ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL  $\pm \frac{1}{16}$ " PER FOOT

SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-02.53	REV. DATE
	24-inch by 8-inch Frame Only	4/16/19 DJP
SCALE: NTS		



BOTTOM VIEW

Ø 7/8" HANDLING HOLE



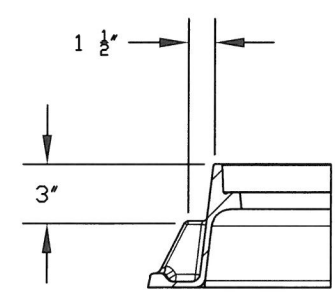
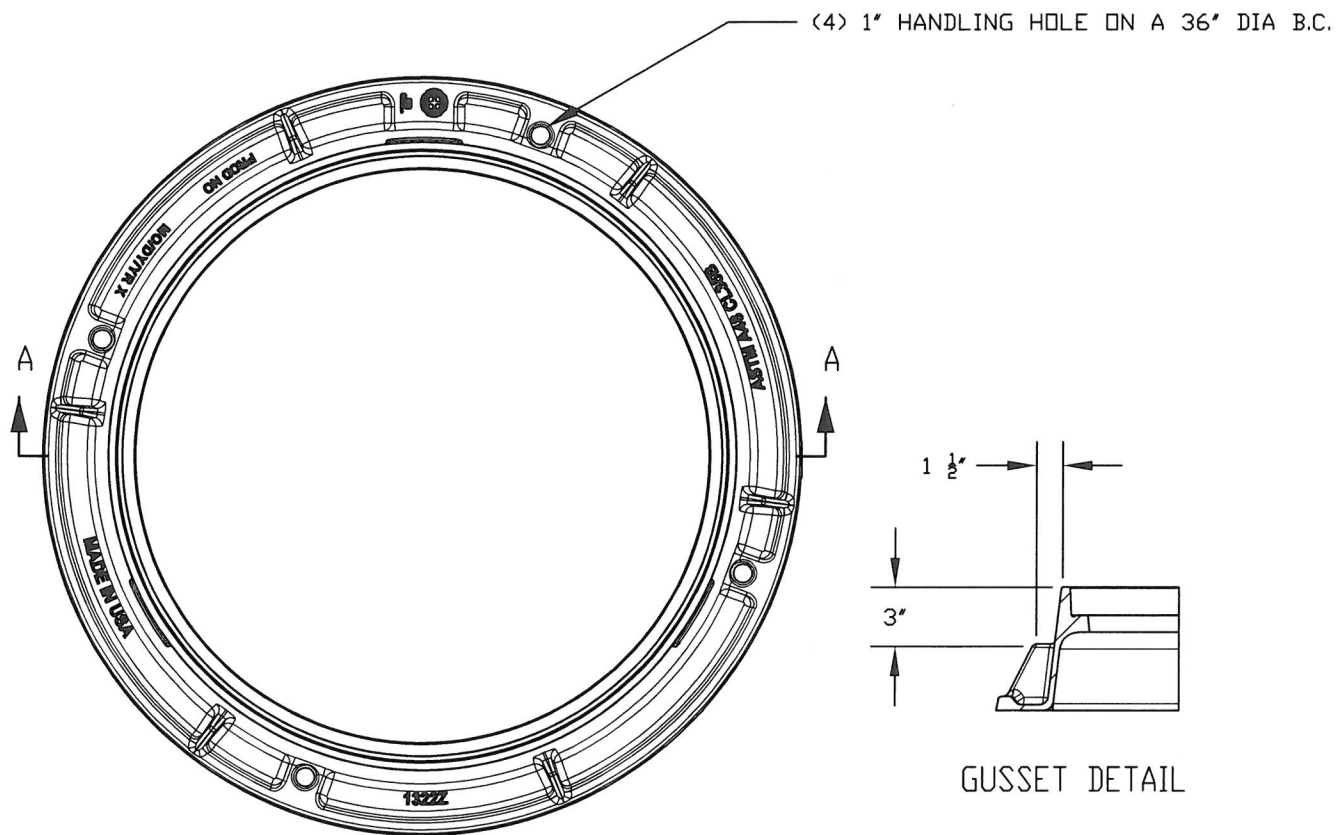
SECTION A-A

**NOTES:**

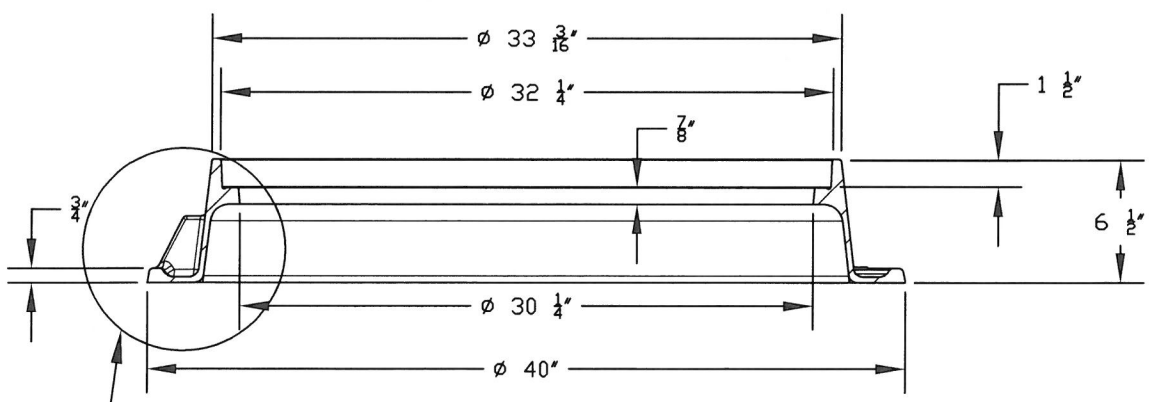
1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. FRAME & COVER SHALL BE MADE FROM ASTM A48 CLASS 35B GRAY CAST IRON.
3. DIMENSIONS ARE IN INCHES-FRACTIONAL +/- 1/16" ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL +/- 1/16" PER FOOT

SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-02.54	REV. DATE
	26-inch by 6-inch Frame Only	4/16/19 DJP
	SCALE: NTS	





GUSSET DETAIL



GUSSET DETAIL SECTION A-A

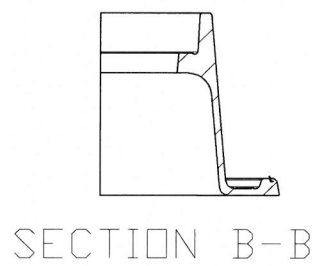
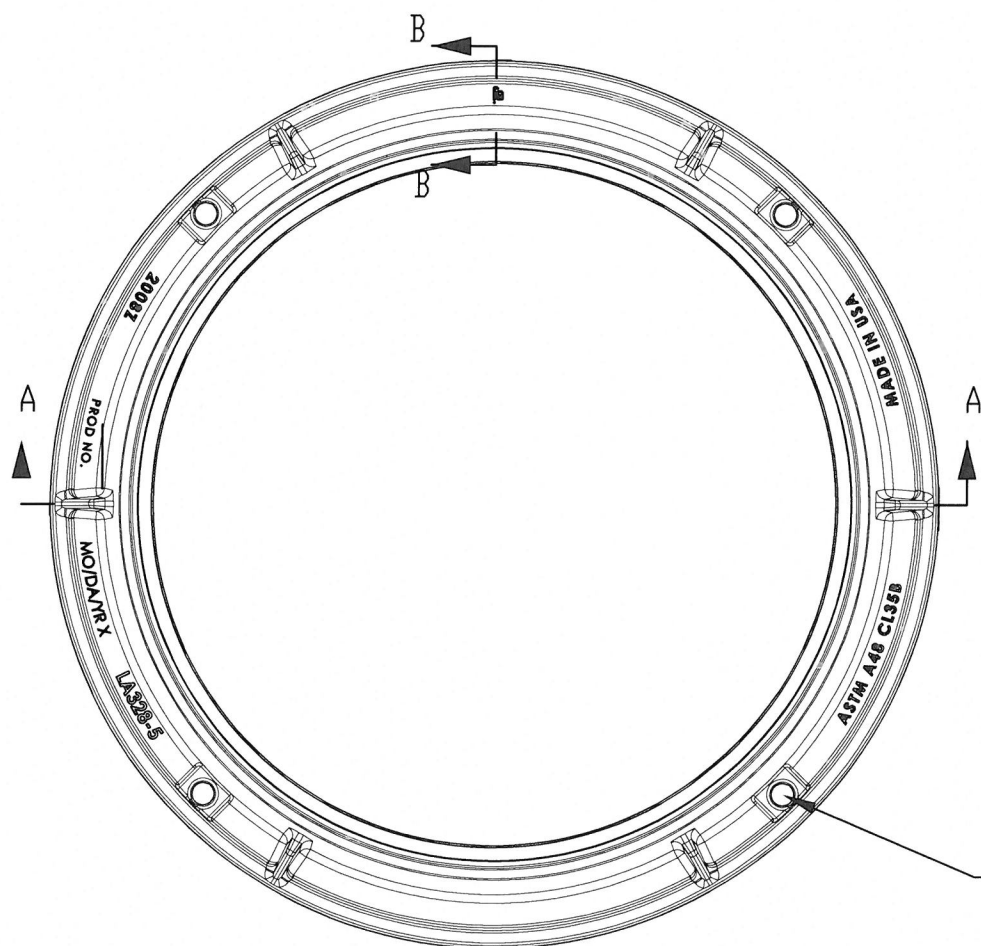
**NOTES:**

1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. FRAME & COVER SHALL BE MADE FROM ASTM A48 CLASS 35B GRAY CAST IRON.
3. DIMENSIONS ARE IN INCHES-FRACTIONAL  $\pm \frac{1}{16}$  ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL  $\pm \frac{1}{16}$  PER FOOT

SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-02.55	REV. DATE
	<i>32-inch by 6-inch Frame Only</i>	4/16/19 DJP
SCALE: NTS		

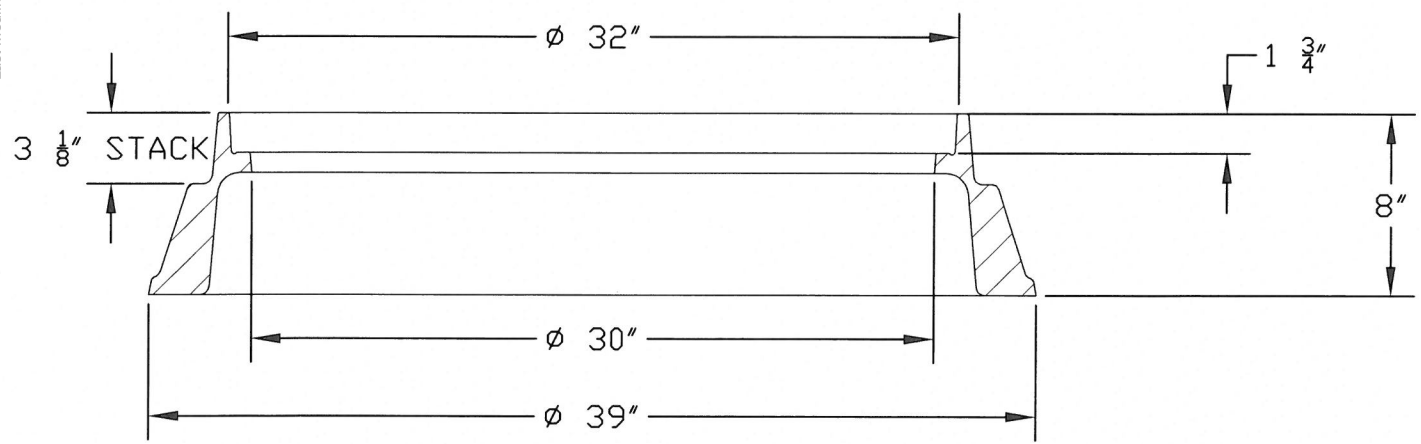
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SECTION B-B

(4)  $\varnothing$  1" HOLES  
EQUALLY SPACED  
ON 36" B.C.

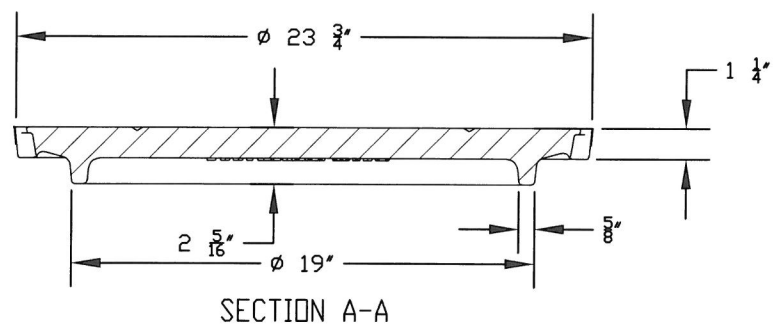
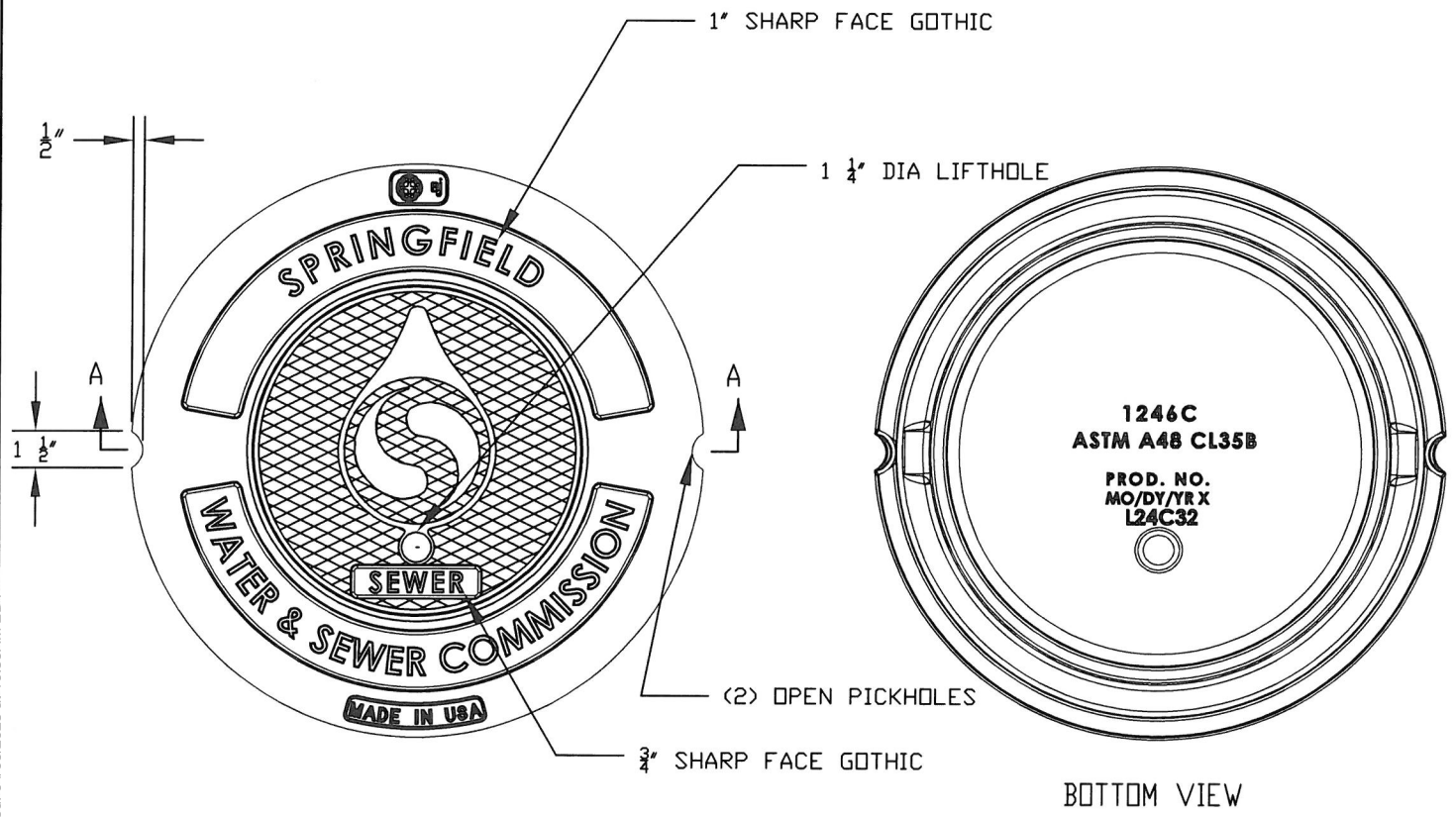


SECTION A-A


**NOTES:**

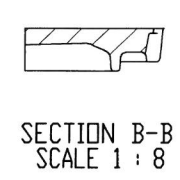
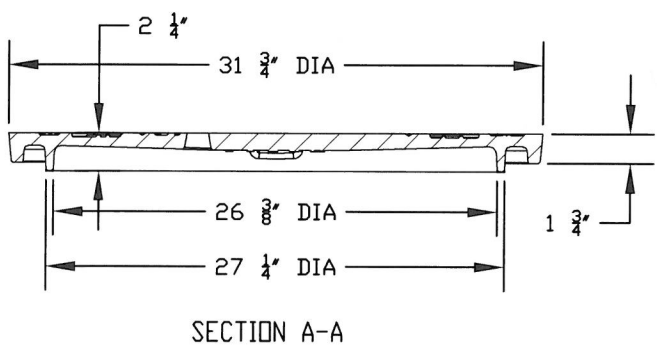
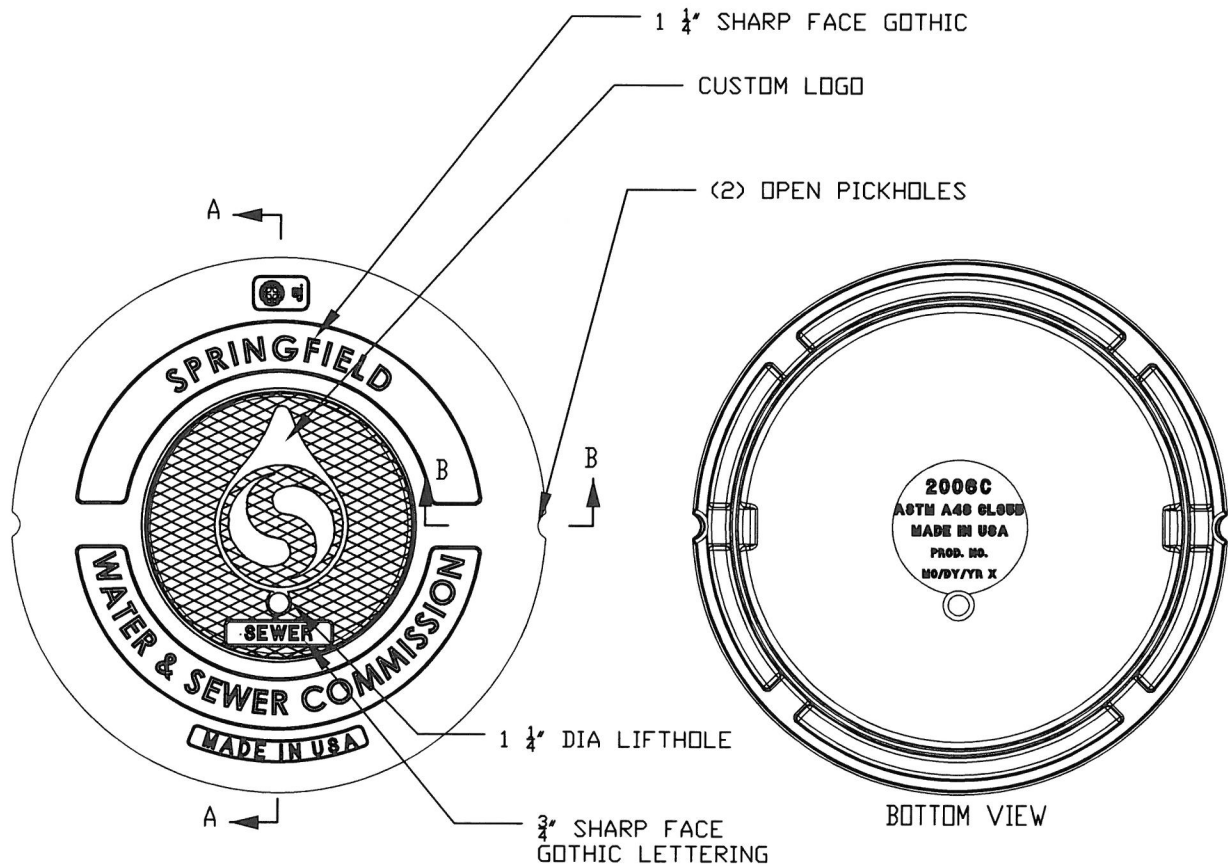
1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. FRAME & COVER SHALL BE MADE FROM ASTM A48 CLASS 35B GRAY CAST IRON.
3. DIMENSIONS ARE IN INCHES-FRACTIONAL  $\pm \frac{1}{16}$  ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL  $\pm \frac{1}{16}$  PER FOOT

SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-02.56	REV. DATE
	32-inch by 8-inch Frame Only	4/16/19 DJP
SCALE: NTS		




- NOTES:**
1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
  2. FRAME & COVER SHALL BE MADE FROM ASTM A48 CLASS 35B GRAY CAST IRON.
  3. DIMENSIONS ARE IN INCHES-FRACTIONAL  $\pm \frac{1}{16}$  ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL  $\pm \frac{1}{16}$  PER FOOT

SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-02.61	REV. DATE
	24-inch Standard Sewer Cover	4/16/19 DJP
	SCALE: NTS	

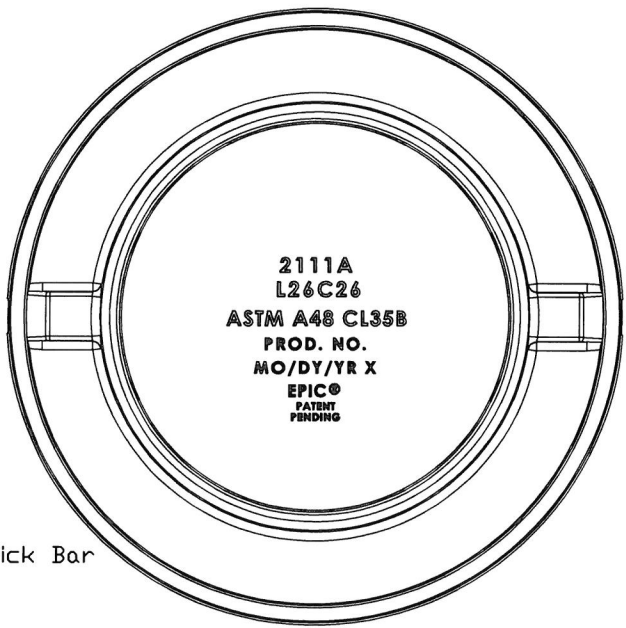
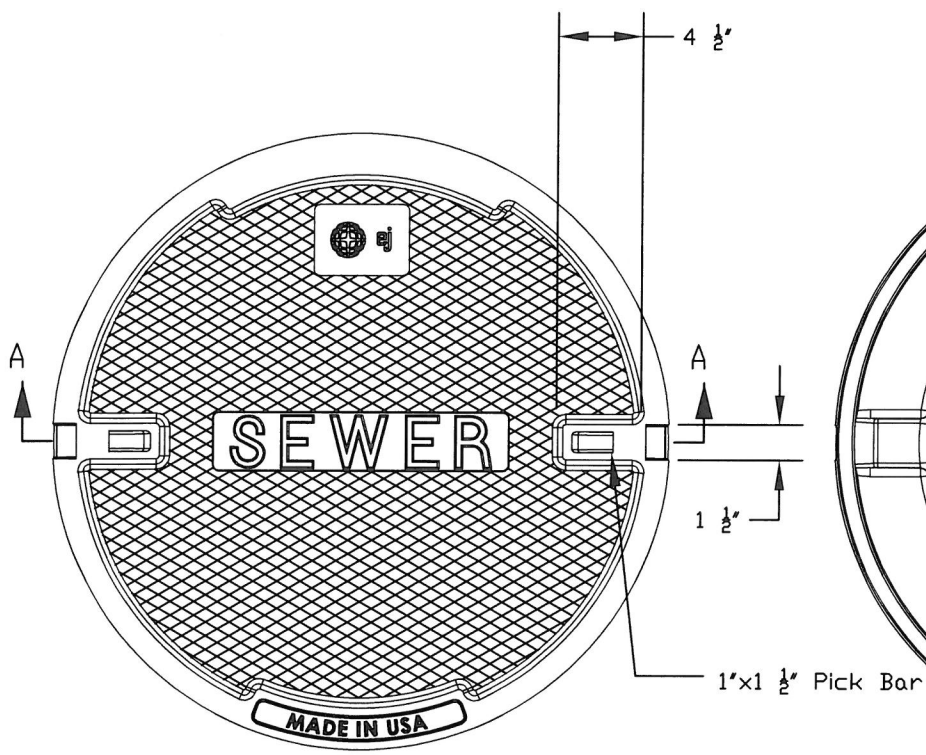


**NOTES:**

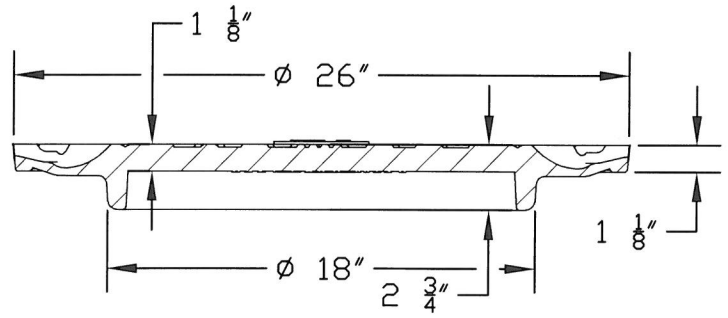
1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. FRAME & COVER SHALL BE MADE FROM ASTM A48 CLASS 35B GRAY CAST IRON.
3. DIMENSIONS ARE IN INCHES-FRACTIONAL +/- 1/16 ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL +/- 1/16" PER FOOT

SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-02.62	REV. DATE
	<i>32-inch Standard Sewer Cover</i>	4/16/19 DJP
	SCALE: NTS	

LocalMedia@cs.cmu.edu - 410.510.1300 - 410.510.1300



BOTTOM VIEW

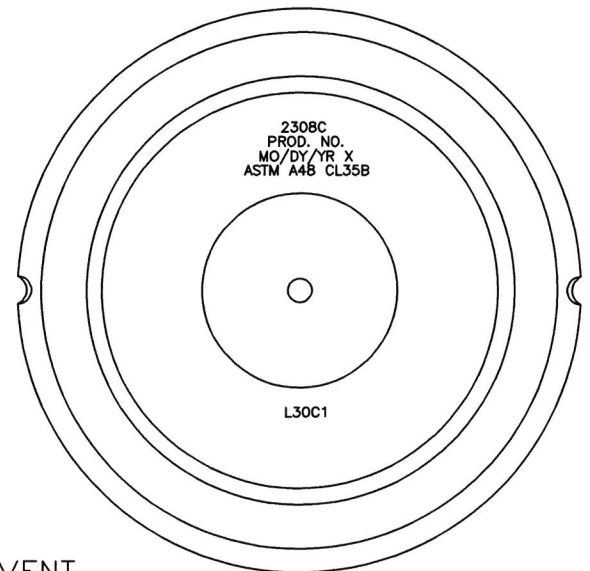
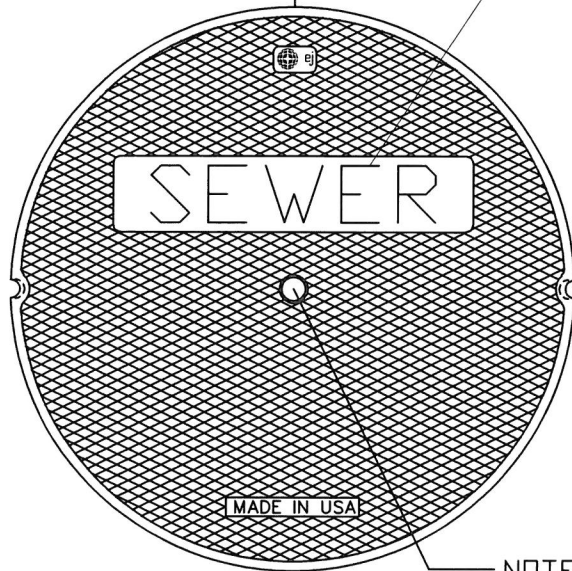


SECTION A-A

- NOTES:**
1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
  2. FRAME & COVER SHALL BE MADE FROM ASTM A48 CLASS 35B GRAY CAST IRON.
  3. DIMENSIONS ARE IN INCHES-FRACTIONAL +/- 1/16 ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL +/- 1/16" PER FOOT

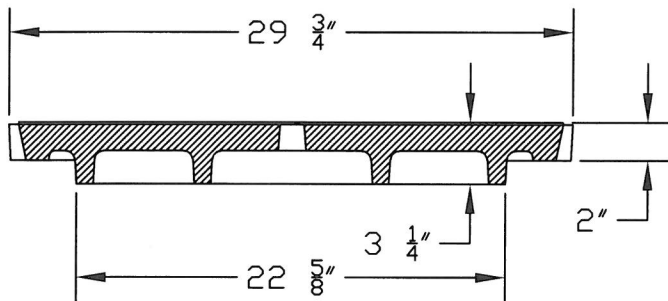
SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-02.63	REV. DATE
	26-inch Replacement Sewer Cover	4/16/19 DJP
SCALE: NTS		

A ← 3" FLAT FACE  
GOTHIC



NOTE: CENTER VENT  
HOLE DIA. 1-1/4"

A ←

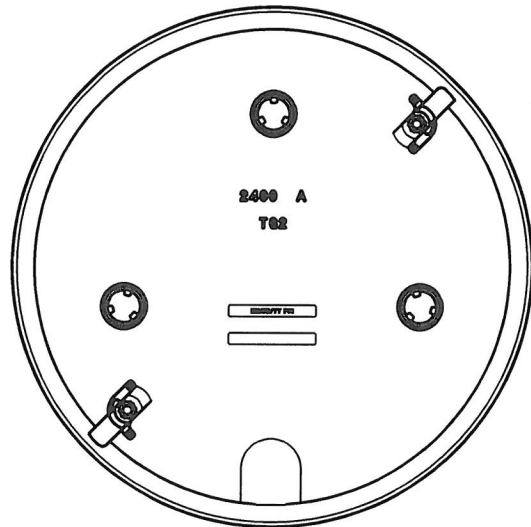
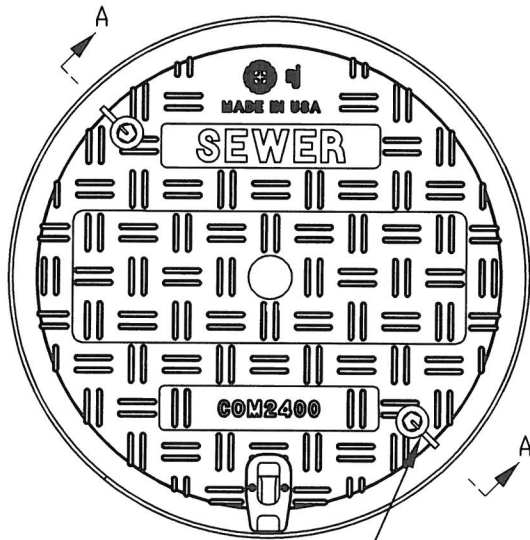


SECTION A-A

**NOTES:**

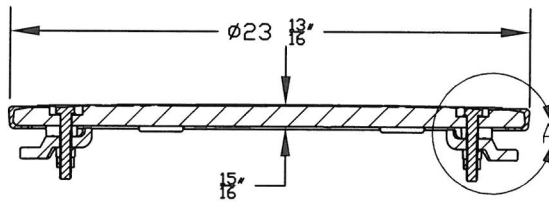
1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. FRAME & COVER SHALL BE MADE FROM ASTM A48 CLASS 35B GRAY CAST IRON.
3. DIMENSIONS ARE IN INCHES-FRACTIONAL +/- 1/16" ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL +/- 1/16" PER FOOT

SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-02.64	REV. DATE
	30-inch Replacement Sewer Cover	4/16/19 DJP
	SCALE: NTS	

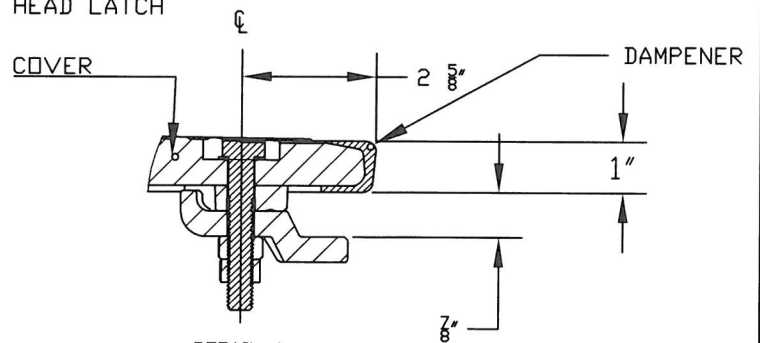


BOTTOM VIEW

¼ TURN PENTA HEAD LATCH



SECTION A-A

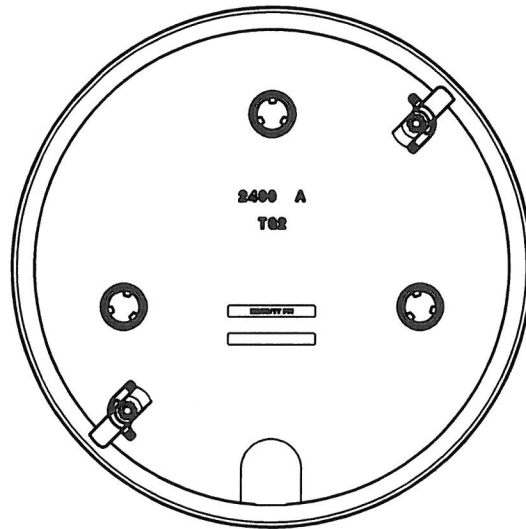
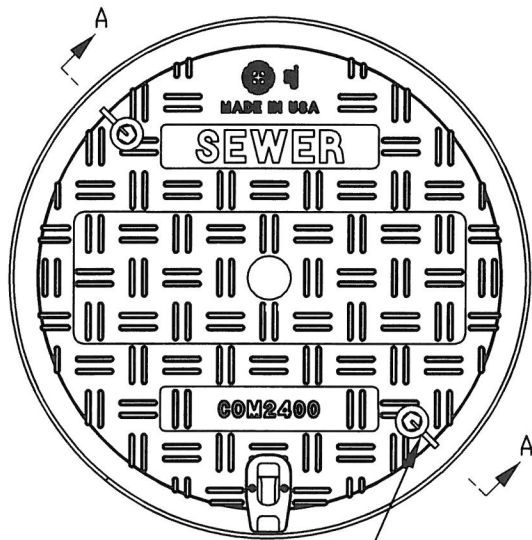


DETAIL A  
SCALE 1:3

**NOTES:**

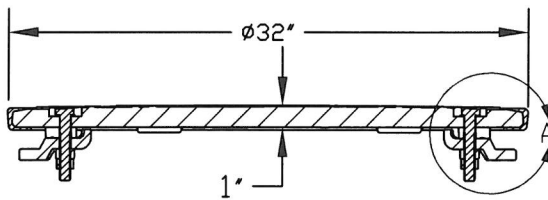
1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. COVER SHALL BE MADE FROM FIBER REINFORCED POLYMER (FRP) ASTM C1028
3. DIMENSIONS ARE IN INCHES-FRACTIONAL +/- 1/16 ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL +/- 1/16" PER FOOT

SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-02.65	REV. DATE
	24" Composite Locking Cover	4/19/19 DJP
SCALE: NTS		

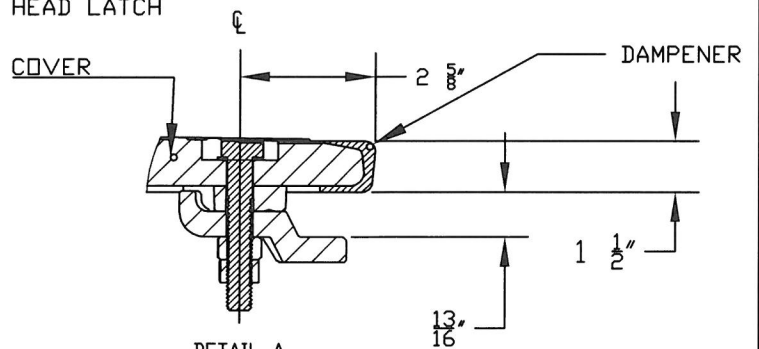


BOTTOM VIEW

¼ TURN PENTA HEAD LATCH




SECTION A-A



DETAIL A  
SCALE 1/3

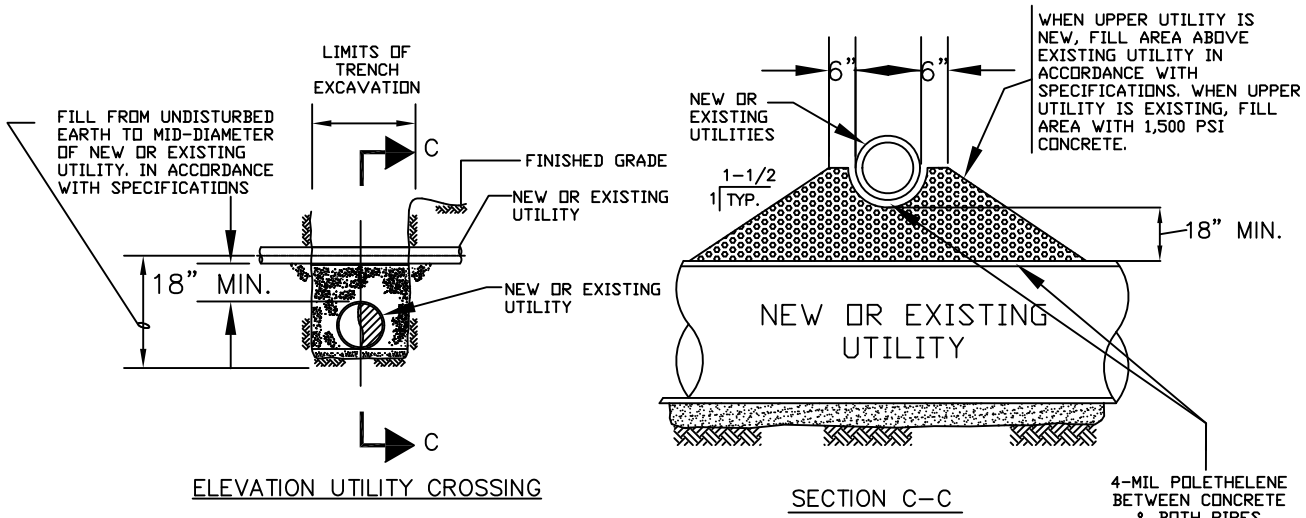
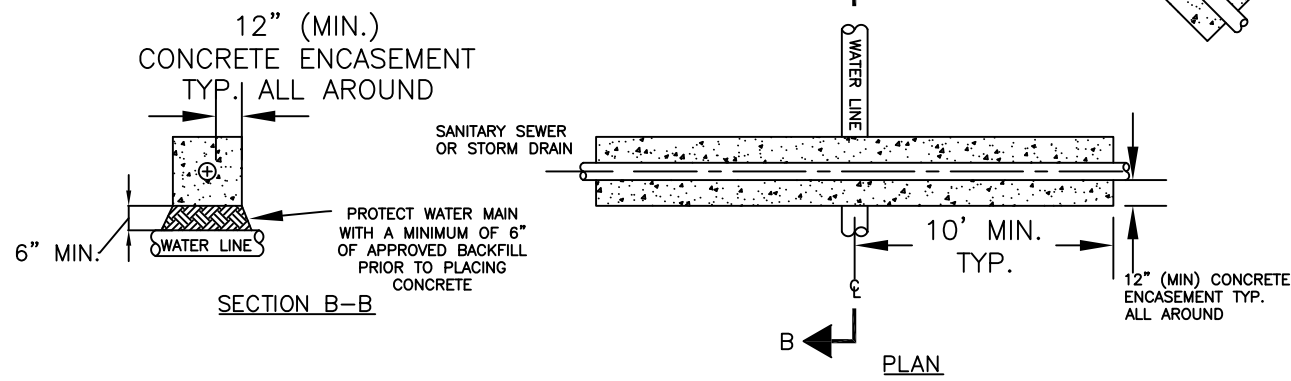
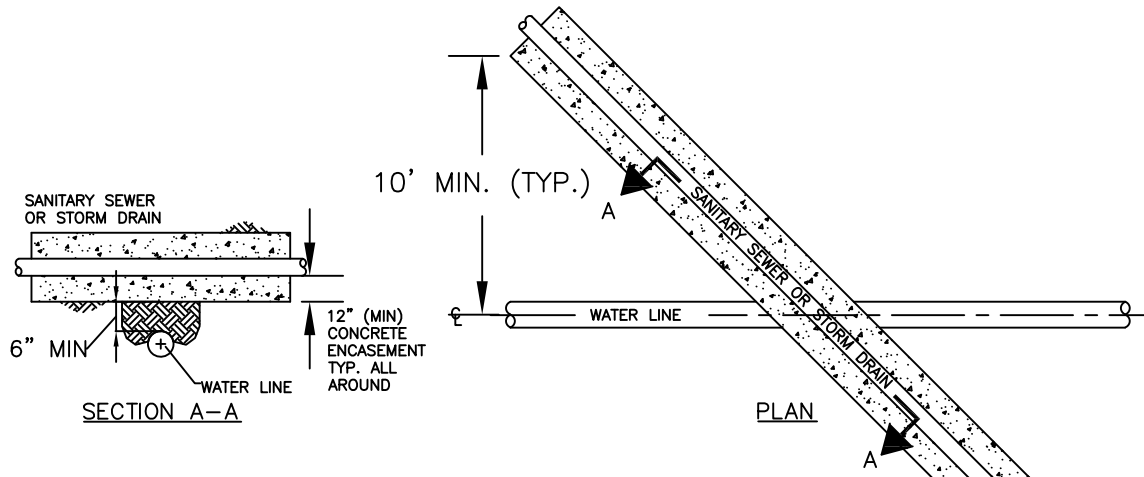
**NOTES:**

1. ALL MATERIALS WILL CONFORM TO SWSC SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. COVER SHALL BE MADE FROM FIBER REINFORCED POLYMER (FRP) ASTM C1028
3. DIMENSIONS ARE IN INCHES-FRACTIONAL +/- 1/16 ON ALL DIMENSIONS UP TO 12" AND AN ADDITIONAL +/- 1/16" PER FOOT

SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-02.66	REV. DATE
	32-inch Composite Locking Cover	4/19/19 DJP
	SCALE: NTS	



Least modification: 04/09/2025 at 10:35AM EDT

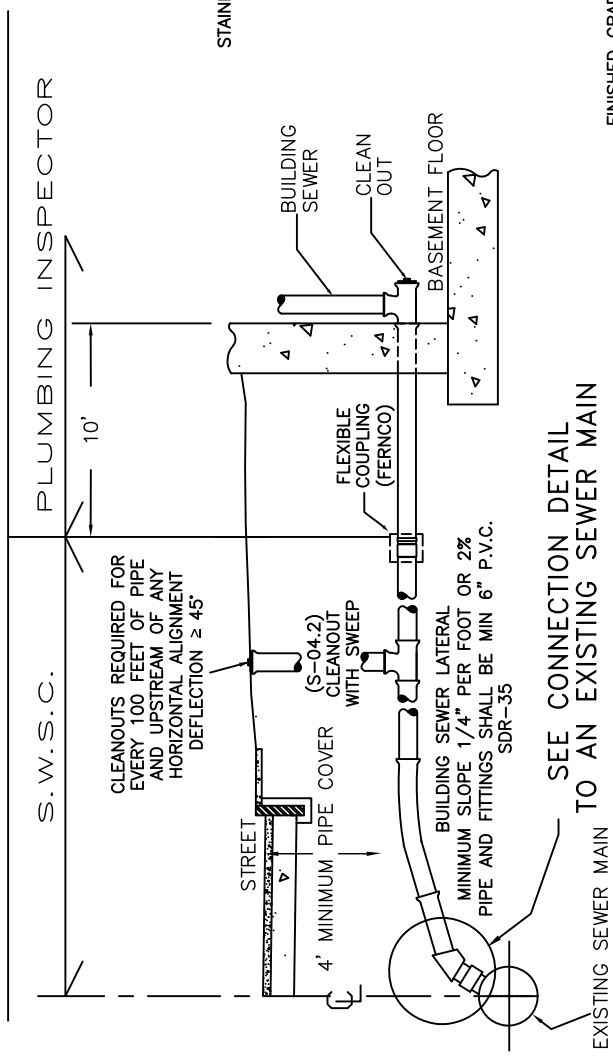


**NOTES:**

1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES & POLICIES AND SPECIFICATIONS.
2. ALL SEWER MAIN PIPE SHOULD HAVE A MINIMUM DEPTH OF 4' FROM TOP OF PIPE TO FINISH GRADE.
3. IF 4' OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.
4. IF DEPTH OF COVER ABOVE CONCRETE ENCASMENT IS GREATER THAN 5'-0" REINFORCEMENT STEEL SHALL BE USED.

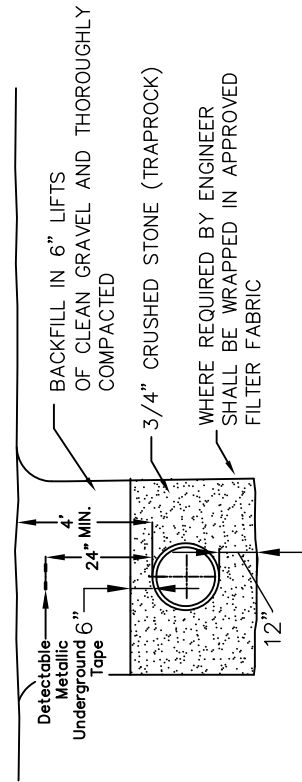
<b>SPRINGFIELD WATER AND SEWER COMMISSION</b>		
	SEWER DETAIL S-03.0	REV. DATE
		4/1/08 MAB
	<b>UTILITY CROSSING DETAIL</b>	6/18/08 MAB
		4/6/21 MJL
SCALE: NTS		

INSPECTION JURISDICTION

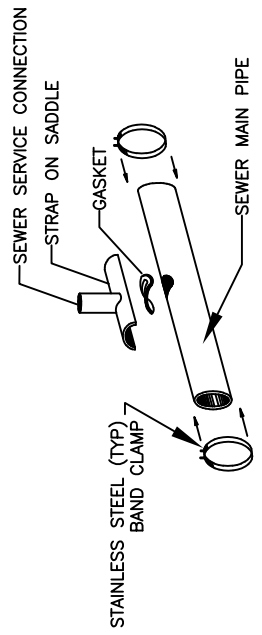


SEE CONNECTION DETAIL TO AN EXISTING SEWER MAIN

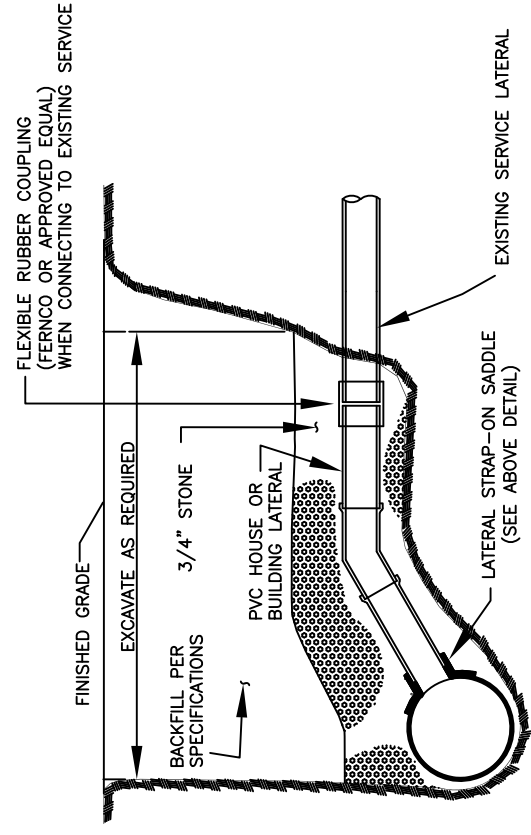
BUILDING SEWER



REFERENCE TRENCH DETAIL S-01.0




LATERAL STRAP-ON SADDLE

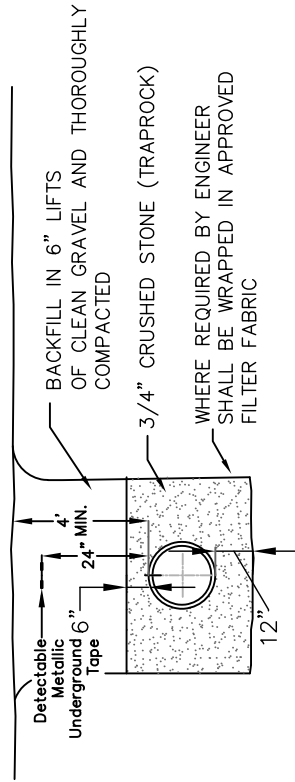
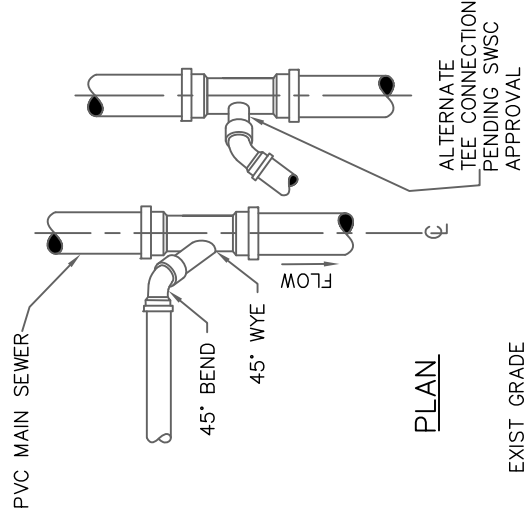
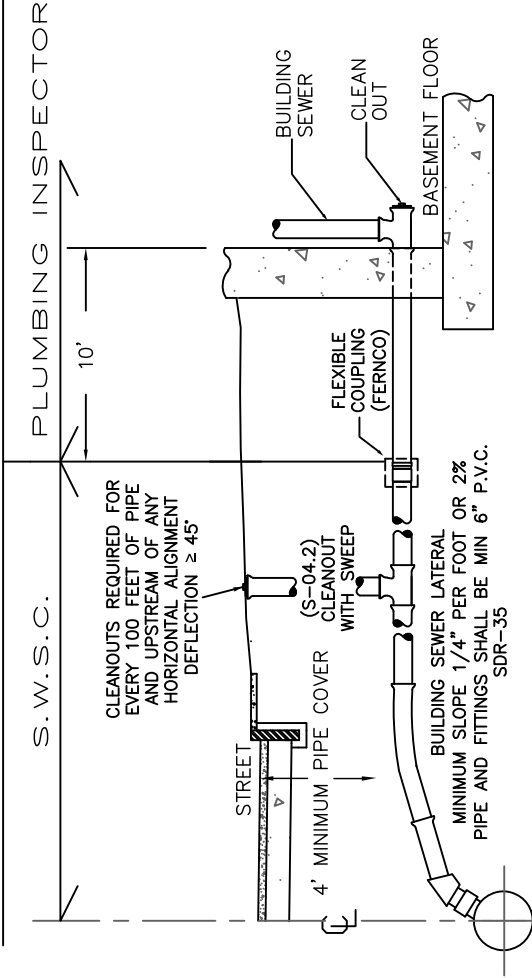


CONNECTION TO AN EXISTING SEWER LATERAL

- NOTES:
1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES & POLICIES AND SPECIFICATIONS.
  2. ALL SEWER MAIN PIPE SHOULD HAVE A MINIMUM DEPTH OF 4' FROM TOP OF PIPE TO FINISH GRADE.
  3. IF 4' OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.
  4. ALL SERVICE LINES SHALL BE PVC SDR-35 AND MUST BE A MINIMUM OF 6" DIAMETER, NO EXCEPTIONS.

	SPRINGFIELD WATER AND SEWER COMMISSION	
	SEWER DETAIL S-04.0	
	<u>EXISTING SEWER MAIN TO BUILDING CONNECTION</u>	
	SCALE: NTS	REV. DATE
		4/1/08 MAB
		10/6/20 DS
		3/17/21 M.JL

# INSPECTION JURISDICTION



## LATERAL CONNECTION TO A NEW SEWER MAIN

### REFERENCE TRENCH DETAIL S-01.0

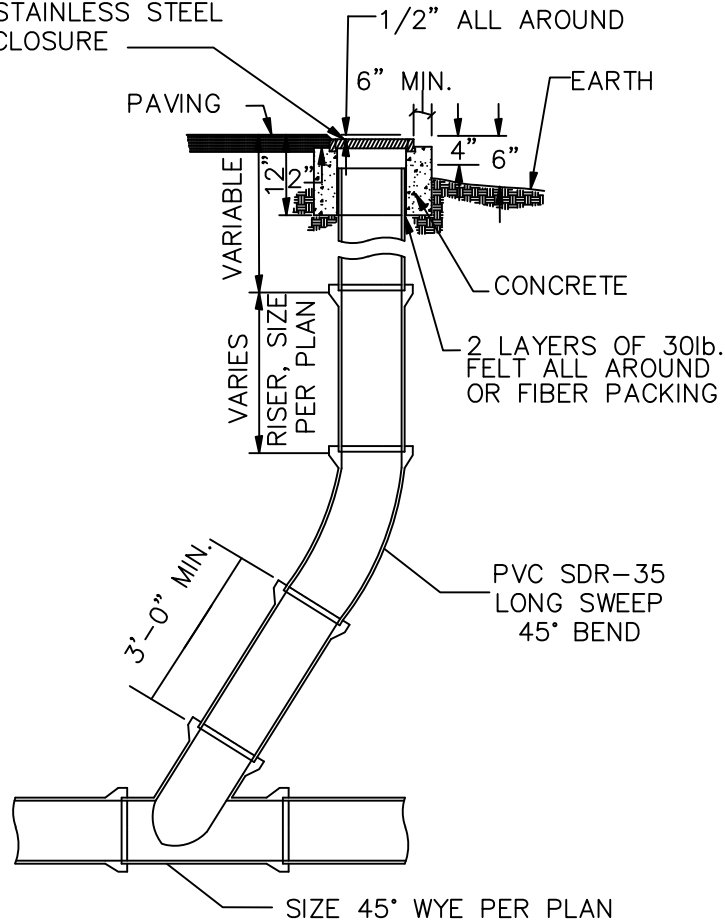
- NOTES:**
1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES & POLICIES AND SPECIFICATIONS.
  2. ALL SEWER MAIN PIPE SHOULD HAVE A MINIMUM DEPTH OF 4' FROM TOP OF PIPE TO FINISH GRADE.
  3. IF 4' OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.
  4. ALL SERVICE LINES SHALL BE PVC SDR-35 AND MUST BE A MINIMUM OF 6" DIAMETER, NO EXCEPTIONS.

<b>SPRINGFIELD WATER AND SEWER COMMISSION</b>		
	SEWER DETAIL S-04.1	REV. DATE
	<i>NEW SEWER MAIN TO BUILDING CONNECTION</i>	4/1/08 MAB
	SCALE: NTS	10/6/20 DS
		3/17/21 M.JL

DETAIL FOR CLEANOUTS  
IN PAVED SURFACES

DETAIL FOR CLEAN OUTS  
IN EASEMENTS

"NEENAH" R-7506 SERIES OR EQUAL  
FLOOR BOX FRAME AND LID,  
OR EQUAL WITH STAINLESS STEEL  
CAP SCREW LID CLOSURE



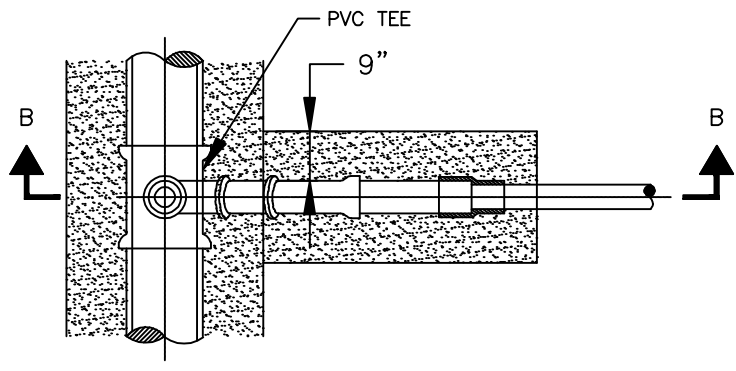
\* REQUIRED – EVERY 100 FEET OF PIPE AND UPSTREAM OF ANY HORIZONTAL ALIGNMENT DEFLECTION GREATER THAN OR EQUAL TO 45 DEGREES

NOTES:

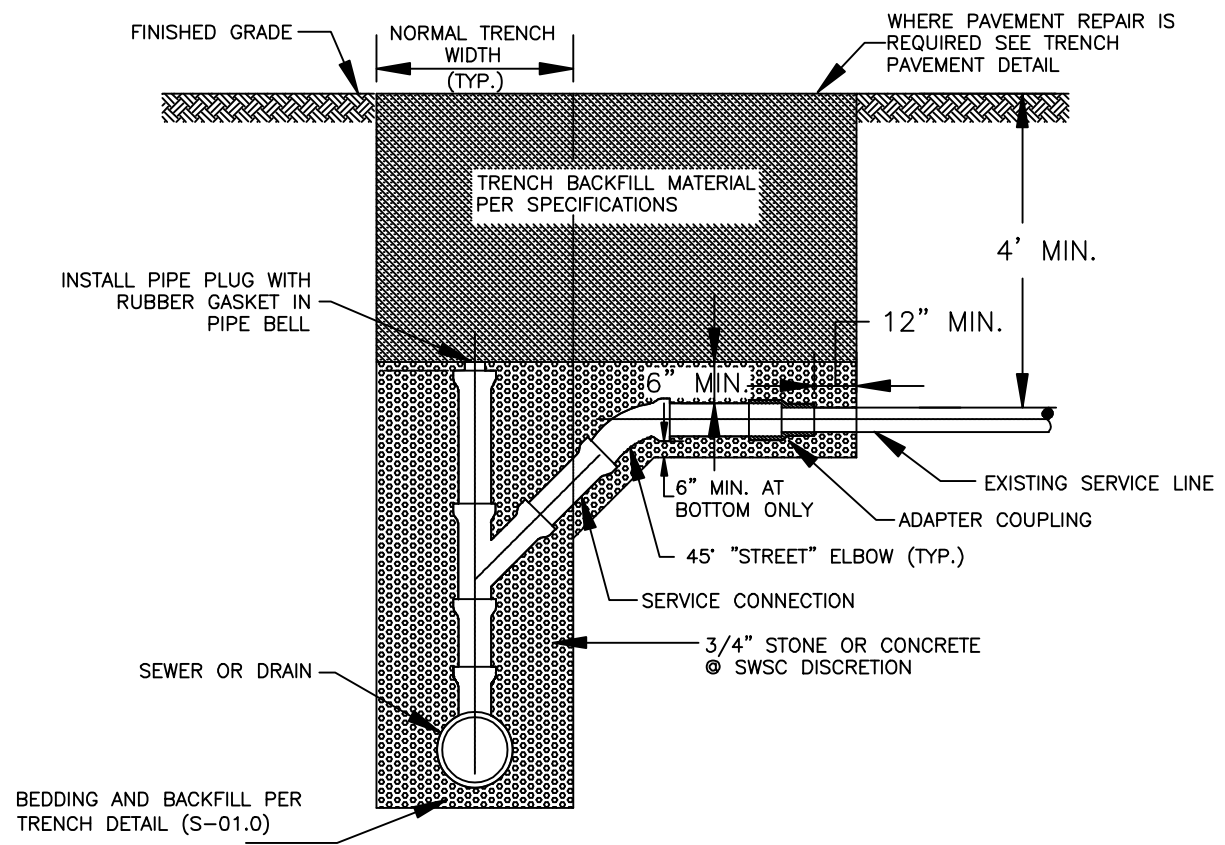
1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES & POLICIES AND SPECIFICATIONS.
2. ALL SEWER MAIN PIPE SHOULD HAVE A MINIMUM DEPTH OF 4' FROM TOP OF PIPE TO FINISH GRADE.
3. IF 4' OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.
4. ALL SERVICE LINES SHALL BE PVC SDR-35 AND MUST BE A MINIMUM OF 6" DIAMETER, NO EXCEPTIONS.
5. CLEAN OUT PIPE DIAMETER SHALL BE THE SAME AS THE SEWER LINE AT THE WYE.

SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-04.2	REV. DATE
	<u>CLEAN OUT WITH SWEEP</u>	4/1/08 MAB
		10/06/20 DS
SCALE: NTS		

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PLAN




SECTION B-B

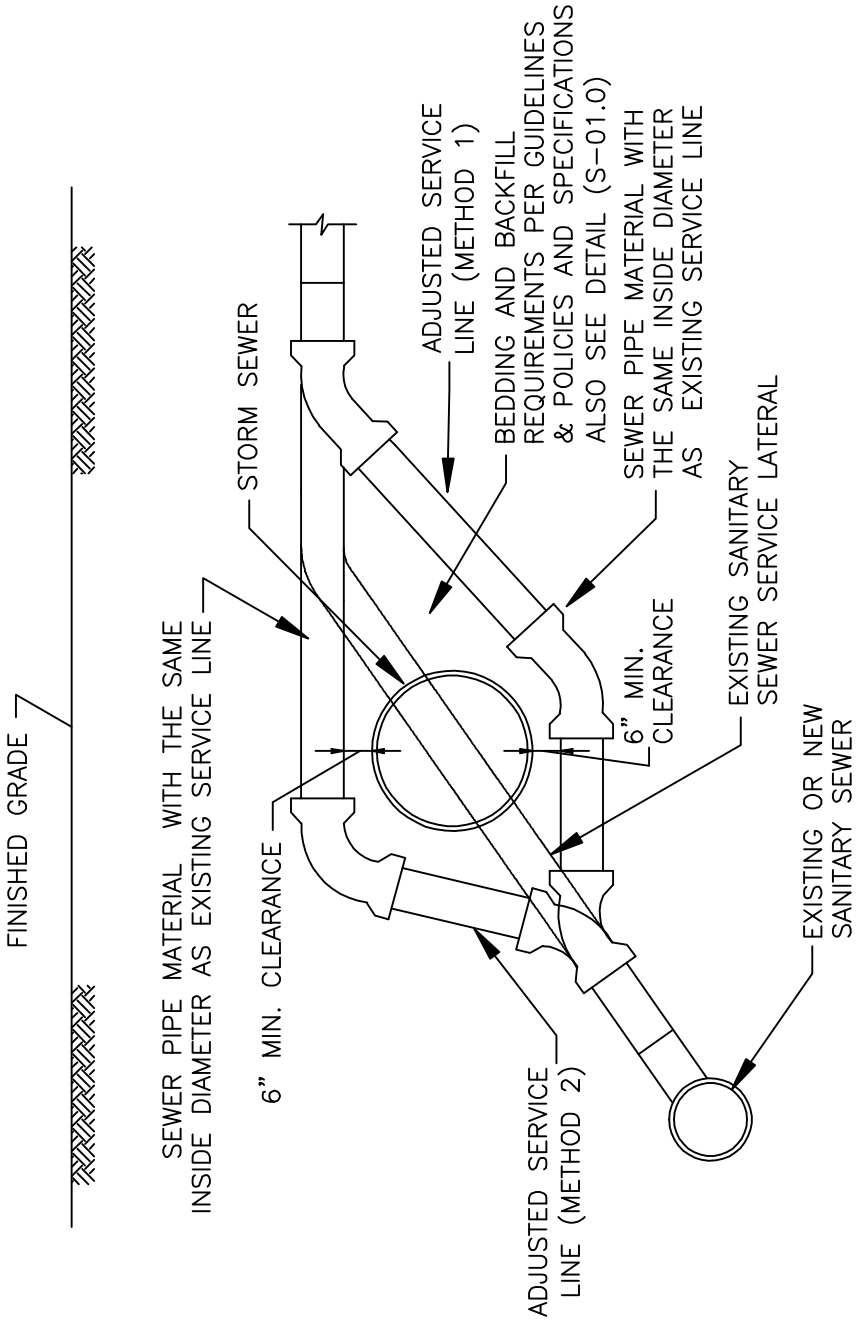
SEWER OR DRAIN SERVICE CONNECTION  
WITH CHIMNEY GREATER THAN 12' DEEP

NOTES:


1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES & POLICIES AND MATERIAL SPECIFICATIONS.
2. ALL SEWER MAIN PIPE SHOULD HAVE A MINIMUM DEPTH OF 4' FROM TOP OF PIPE TO FINISH GRADE.
3. IF 4' OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.
4. ALL SERVICE LINES SHALL BE PVC SDR-35 AND MUST BE A MINIMUM OF 6" DIAMETER, NO EXCEPTIONS.
5. CLEAN OUT PIPE DIAMETER SHALL BE THE SAME AS THE SEWER LINE AT THE WYE.

SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-04.3	REV. DATE
	<i>SEWER SERVICE CONNECTION WITH CHIMNEY &gt;12' DEEP</i>	4/1/08 MAB
SCALE: NTS		

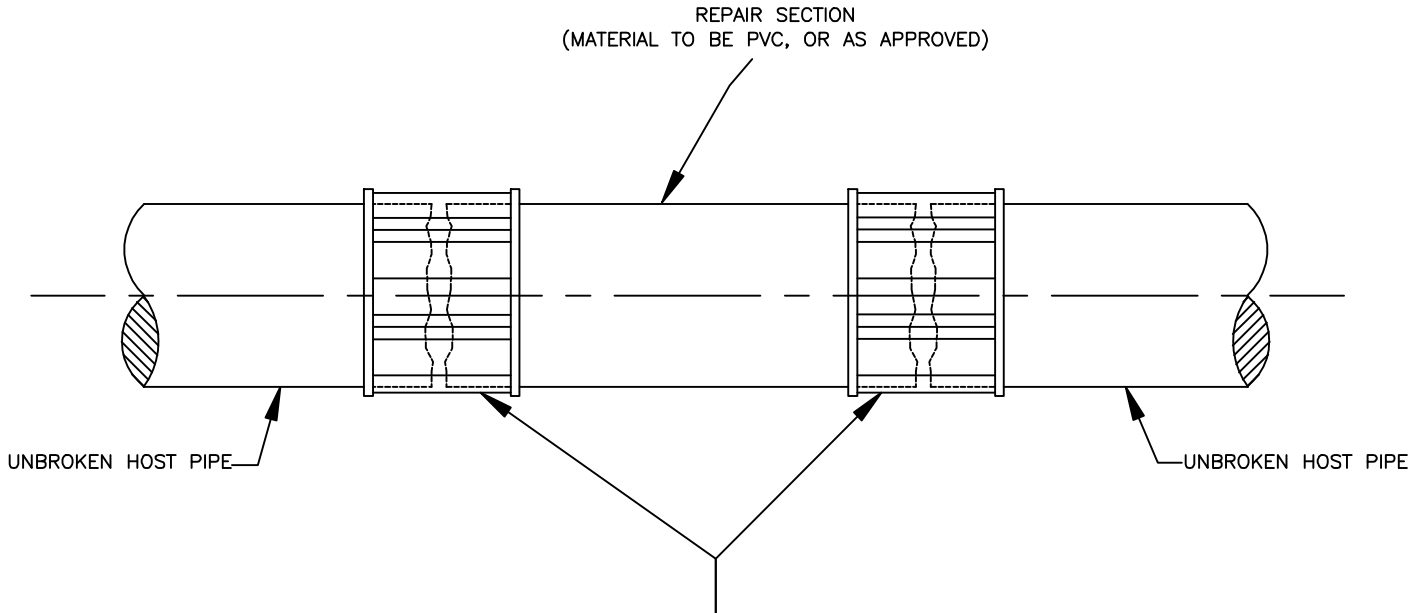
Last Modified: 04/09/2025 at 10:39AM EDT



- NOTES:**
1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES & POLICIES AND MATERIAL SPECIFICATIONS.
  2. ALL SEWER MAIN PIPE SHOULD HAVE A MINIMUM DEPTH OF 4' FROM TOP OF PIPE TO FINISH GRADE.
  3. IF 4' OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.
  4. ALL SERVICE LINES SHALL BE PVC SDR-35 AND MUST BE A MINIMUM OF 6" DIAMETER, NO EXCEPTIONS.

SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-04.4	REV. DATE
	BUILDING CONNECTION TO SEWER MAIN WITH CONFLICTS	4/1/08 MAB
	SCALE: NTS	

# TYPICAL REPAIR

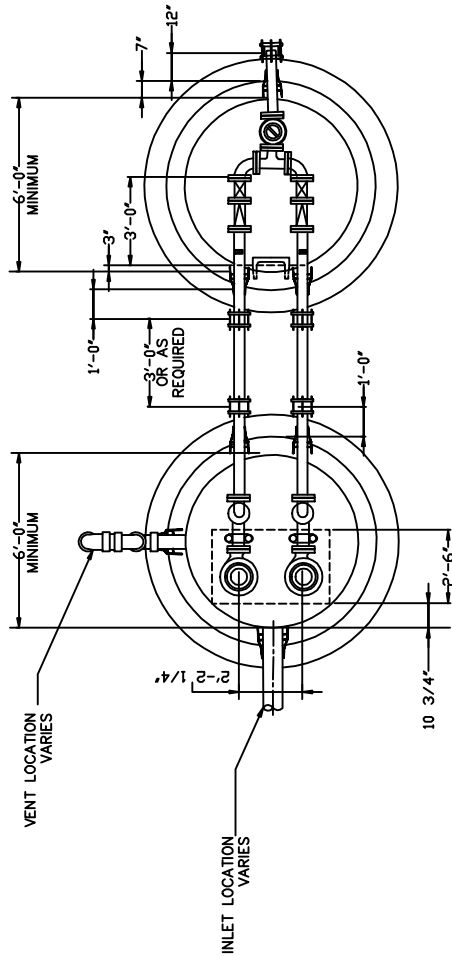


PVC SLIP COUPLINGS, RUBBER COUPLINGS (FERNCO OR APPROVED EQUAL)  
 BRICK OR EGG SHAPED SEWER REPAIR MAY HAVE ADDITIONAL REQUIREMENTS BY SWSC

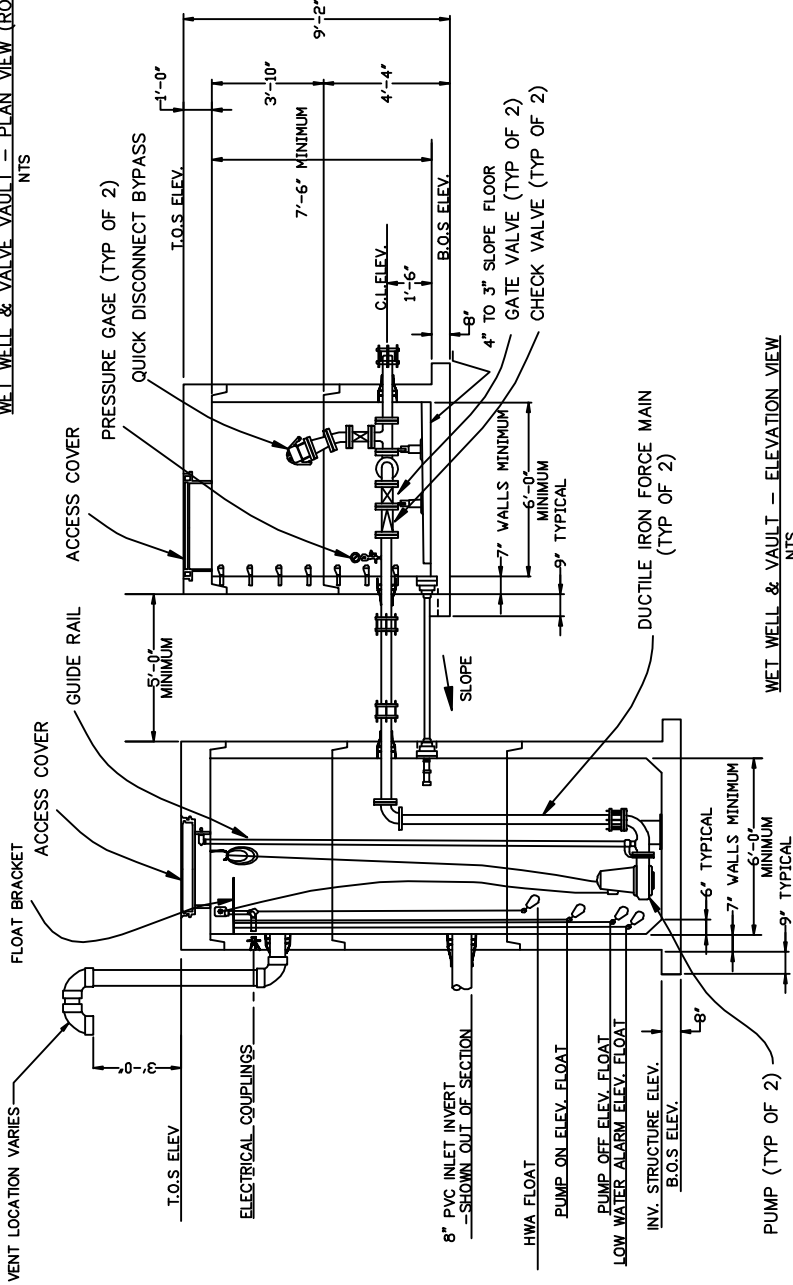
- NOTES:**
1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES & POLICIES AND SPECIFICATIONS.
  2. ALL SEWER MAIN PIPE SHOULD HAVE A MINIMUM DEPTH OF 4' FROM TOP OF PIPE TO FINISH GRADE.
  3. IF 4' OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.
  4. SEWER REPAIR SECTION MATERIAL SHALL BE THE SAME MATERIAL AS THE HOST PIPE, OR AS APPROVED BY SWSC.
  5. REPAIR SECTION SHALL BE SIZED TO BUTT AGAINST THE HOST PIPES.

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SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-05.0	REV. DATE
	<i>BUILDING AND MAINLINE</i>	4/1/08 MAB
	<i>SEWER REPAIR</i>	
SCALE: NTS		




WET WELL & VALVE VAULT - PLAN VIEW (ROOF REMOVED)  
NTS



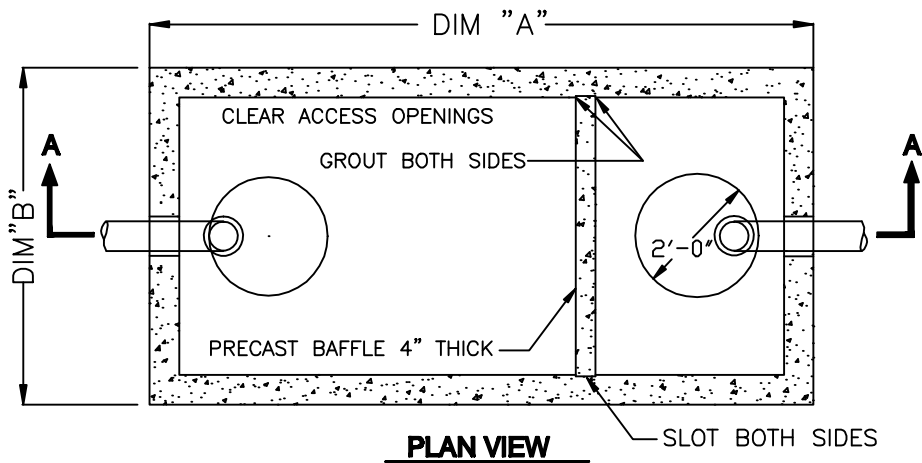
WET WELL & VALVE VAULT - ELEVATION VIEW  
NTS

NOTES:

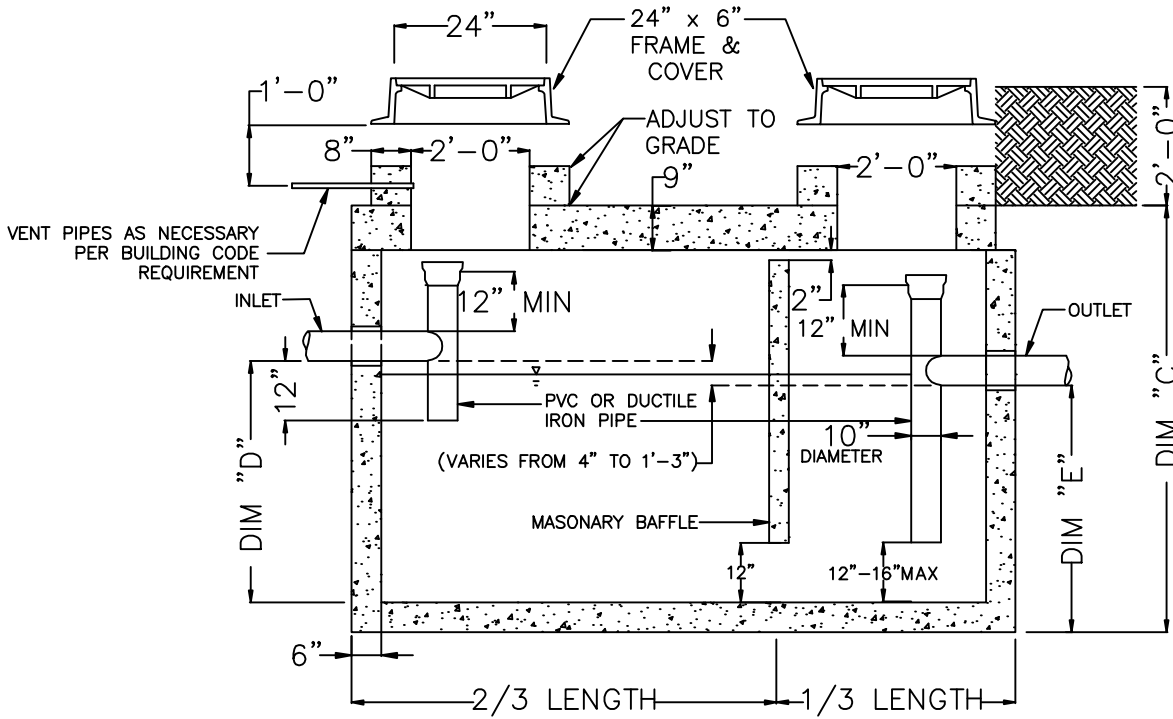
1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES & POLICIES AND MATERIAL SPECIFICATIONS.
2. ALL SEWER MAIN PIPE SHOULD HAVE A MINIMUM DEPTH OF 4' FROM TOP OF PIPE TO FINISH GRADE.
3. IF 4' OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.

		SPRINGFIELD WATER AND SEWER COMMISSION	
SEWER DETAIL S-06.0		REV. DATE	
<i>WETWELL &amp; VALVE VAULT</i> <i>PRECAST</i>		4/1/08 MAB	
SCALE: NTS			





**PLAN VIEW**



**SECTION A-A**


SIZING CHART					
GALLON CAPACITY	DIM 'A'	DIM 'B'	DIM 'C'	DIM 'D'	DIM 'E'
750	7'-0"	4'-8"	7'-0"	4'-3"	3'-11"
1000	9'-0"	5'-0"	7'-2"	4'-2"	3'-10"
1250	9'-0"	5'-0"	7'-2"	5'-2"	4'-10"
1500	11'-2"	5'-8"	7'-2"	4'-4"	4'-0"
1750	11'-2"	5'-8"	7'-2"	4'-11"	4'-7"
2000	12'-8"	6'-8"	8'-0"	4'-7"	3'-10"
2500	12'-8"	6'-8"	8'-0"	5'-6"	4'-9"
2750	12'-8"	6'-8"	8'-0"	6'-0"	5'-3"
3000	15'-7"	9'-7"	8'-6.5"	5'-0"	3'-9"
4000	15'-7"	9'-7"	8'-6.5"	6'-3"	5'-0"
5000	19'-11"	9'-11"	8'-11"	6'-2"	4'-9"
6000	19'-11"	9'-11"	10'-5"	7'-2"	5'-9"

**GENERAL CONSTRUCTION NOTES:**

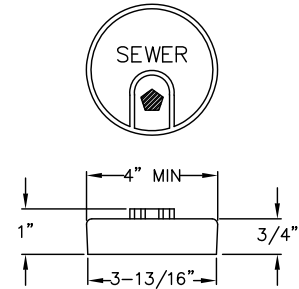
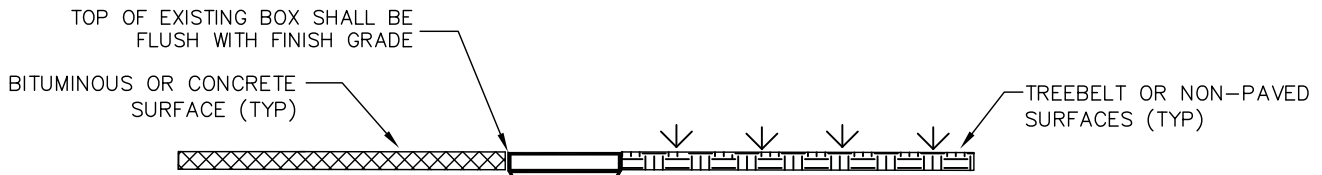
1. CONCRETE : 28 DAY F'c= 4500 psi
2. REBAR : ASTM A615 GRADE 60.
3. MESH : ASTM A-185 GRADE 65
4. DESIGN : AC1318-83 BUILDING CODE  
ASTM C-857 MINIMUM STRUCTURAL DESIGN  
LOADING FOR UNDERGROUND PRECAST  
CONCRETE UTILITY STRUCTURES
5. LOADS : H-20 LOADING.
6. FILL w/CLEAN WATER PRIOR TO START UP OF SYSTEM.
7. CONTRACTOR TO SUPPLY AND INSTALL ALL PIPING AND  
SANITARY TEES ,4 CLEAN OUTS, FOR CLEANING TOWARD  
TRAP AND FOR CLEANING AWAY FROM TRAP ON BOTH THE  
INLET AND OUTLET / ALT. DUAL SWEEP CLEANOUTS.
8. GRAY WATER ONLY, BLACK WATER SHALL BE CARRIED BY  
SEPARATE SEWER.
9. TRAP SIZE WILL BE BASED ON 15 GPD PER SEAT OR  
OTHER APPROVED SIZING CRITERIA.
10. LARGER SIZES MAY BE REQUIRED AS PER REVIEW OF  
FACILITY.
11. MUST BE PRESSURE TESTED PER ASTM C163-06.
12. BALLAST/BOUYANCY CALCULATIONS REQUIRED IF AVERAGE  
HIGH GROUND WATER TABLE IS ENCOUNTERED.

**NOTES:**

1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO  
SWSC GUIDELINES & POLICIES AND SPECIFICATIONS.
2. ALL SEWER SERVICE PIPE SHOULD HAVE A MINIMUM DEPTH OF 4'  
FROM TOP OF PIPE TO FINISH GRADE.
3. IF 4' OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.
4. SEWER REPAIR SECTION MATERIAL SHALL BE THE SAME MATERIAL AS  
THE HOST PIPE, OR AS APPROVED BY SWSC.
5. REPAIR SECTION SHALL BE SIZED TO BUTT AGAINST THE HOST PIPES.

<b>SPRINGFIELD WATER AND SEWER COMMISSION</b>		
	<b>SEWER DETAIL S-08.0</b>	<b>REV. DATE</b>
	<b>STANDARD EXTERNAL GREASE INTERCEPTOR</b>	4/1/09 MAB
	SCALE: NTS	

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SERVICE BOX COVER  
WITH BRASS PENTAGON HEAD NUT  
AND THE WORD "SEWER" CAST INTO COVER

6" MINIMUM OVERLAP

BACKFILL WITH SAND,  
 CRUSHED STONE, SCREENED GRAVEL,  
 OR SELECT COMMON BORROW/FILL

MINIMUM 2 1/2" I.D.

2 1/2" SLIDING BUFFALO STYLE VALVE BOX SHALL BE HEAVY CAST IRON EXTENSION (ADJUSTABLE) TYPE WITH 3 1/2" X 4 7/8" ARCH BASE

MINIMUM TOTAL BOX WEIGHT SHALL BE 41 lbs FOR 48-66 INCH EXTENSION

UTILIZE ENLARGED BASE WITH 4 1/8" X 4 7/8" ARCH FOR 3" LPSS MAINS (ADD 9lbs MIN TO TOTAL BOX WEIGHT WHEN USING ENLARGED BASE)

THE ARCH PATTERN BASE SHALL ACCOMMODATE BALL TYPE CORPORATIONS AND BALL TYPE CURB STOPS SIZED TO MATCH LPSS MAIN AND SERVICE LATERALS.

THE BUFFALO STYLE SERVICE BOX SHALL HAVE A HEAVY COAT OF ASPHALT-BASE PAINT.

BACKFILL WITH THOROUGHLY COMPACTED SAND TO 6" ABOVE PIPE IN MAX 12" LIFTS  
 COMPACTION TO 95% PROCTOR

STANDARD BRICK  
 4"x2-3/4"x8" NO HOLES  
 PLACED OVER COMPACTED FILL  
 AND UNDER VALVE BOX  
 BOTTOM FOR SUPPORT

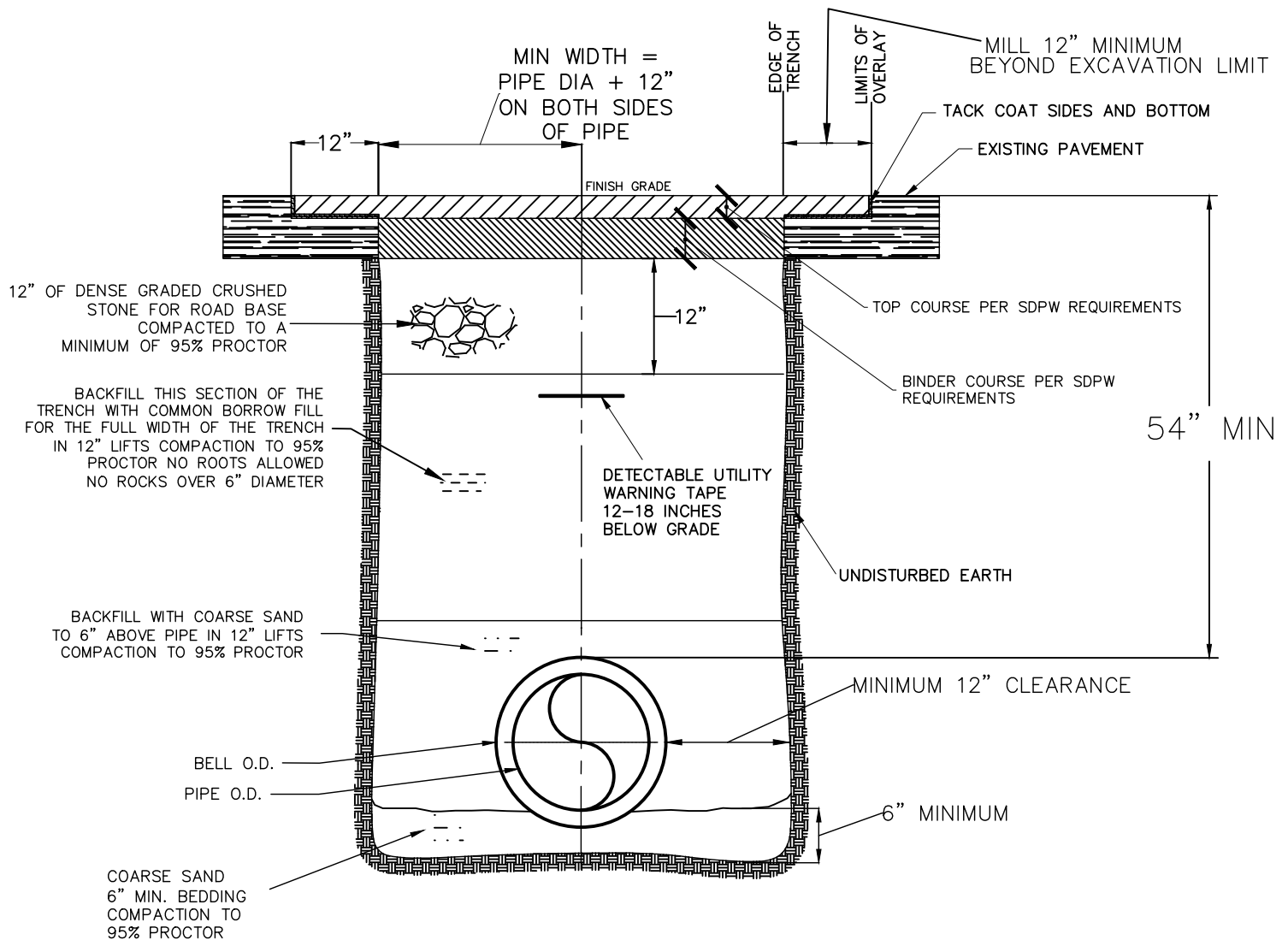
SLIDE TYPE  
BUFFALO VALVE BOX

**NOTES:**

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES WILL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. LPSS DEPTH SHALL BE 6 INCHES BELOW THE AVERAGE FROST DEPTH (48 INCHES) FOR A TOTAL OF 54 INCHES. PIPE SHALLOWER THAN 54 INCHES SHALL BE INSULATED.
3. SEE DETAIL S-09.3 FOR TRENCH DETAILS
4. IF BACKFILLING WITH "FLOWABLE" FILL WRAP THE SERVICE BOX WITH 15 POUND FELT ROOFING PAPER OR 4 MIL THICK POLYETHYLENE.









SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-09.1	REV. DATE
	<i>LOW PRESSURE SANITARY</i>	1/18/19 DS
	<i>SERVICE / MAIN 2 1/2" VALVE</i>	10/28/20 DS
	<i>BOX IN NON-PAVED AREAS</i>	
	SCALE: NTS	


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**NOTES:**

1. ALL MATERIALS WILL CONFORM TO SWSC MATERIAL SPECIFICATIONS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES AND POLICIES.
2. LPSS DEPTH SHALL BE 6 INCHES BELOW THE AVERAGE FROST DEPTH (48 INCHES) FOR A TOTAL OF 54 INCHES. PIPE SHALLower THAN 54 INCHES SHALL BE INSULATED.
3. DETECTABLE WARNING TAPE SHALL BE INSTALLED 12-18 INCHES BELOW GRADE TO ALLOW USE OF A METAL DETECTOR FOR FUTURE FIELD LOCATION AND UTILITY MARKOUT.
4. REQUIREMENTS FOR ROAD BASE, PAVEMENT, AND JOINT SEAL ARE TO BE IN ACCORDANCE WITH THE LATEST VERSION OF THE CITY OF SPRINGFIELD DEPARTMENT OF PUBLIC WORKS - ENGINEERING DIVISION'S "MANUAL FOR OCCUPANCY OF PUBLIC WAYS AND PRIVATE WAYS WITHIN THE CITY OF SPRINGFIELD".
5. TRENCH RESTORATION OUTSIDE OF ROADWAY LPSS ALIGNMENTS SHALL MEET REQUIREMENTS FOR GRAVEL, VEGETATION, LOAM AND/OR SEED IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN NON-PAVED AREAS.
6. FOR TYPICAL LOCATION OF SEWER MAINS SEE DETAIL (W-01.0).
7. ALL MATERIALS USED TO MEET MASS. STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES.

	EXISTING PAVEMENT		EXCAVATED AND REPLACED WITH BINDER COURSE
	DENSE GRADED CRUSHED STONE		COMMON BORROW
	BEDDING SAND		TACK COAT
	MILLED AND REPLACED WITH TOP COURSE		UNDISTURBED EARTH

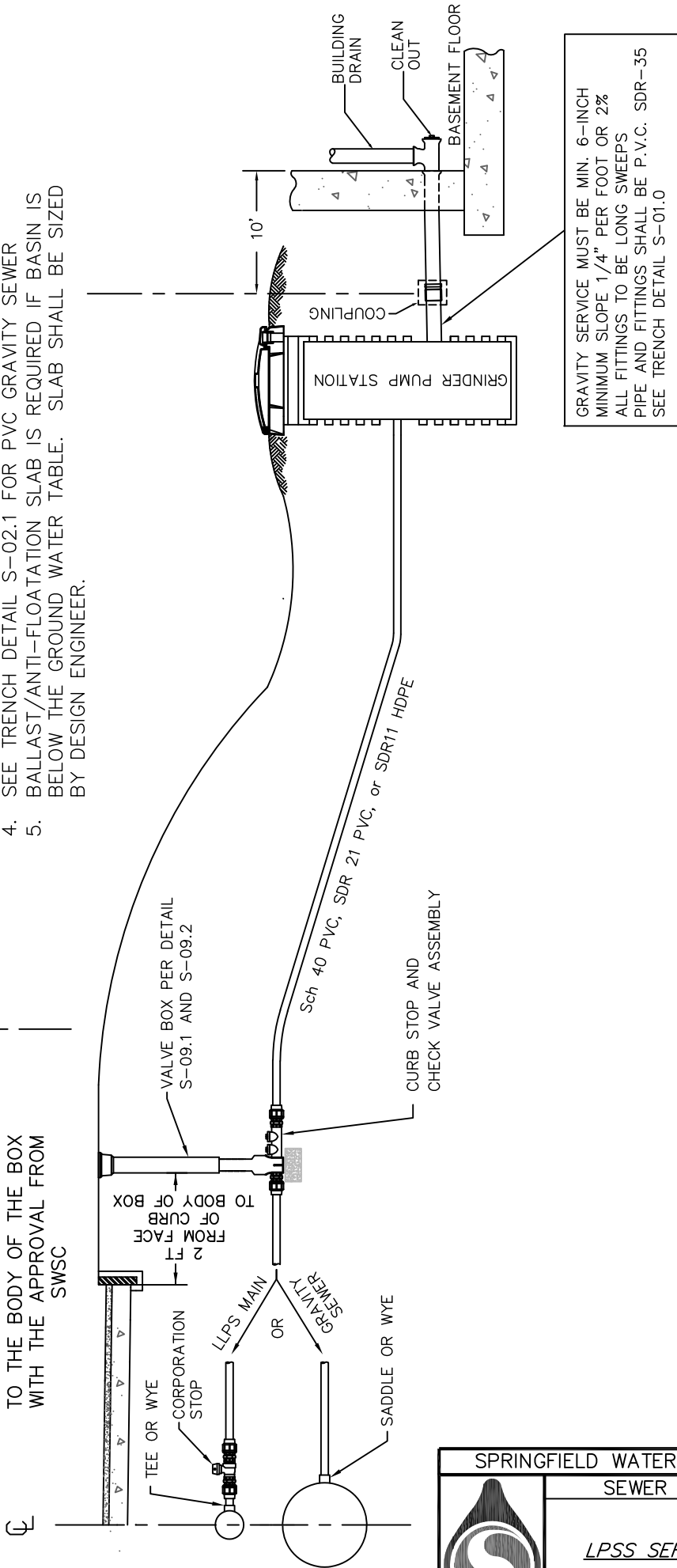
<b>SPRINGFIELD WATER AND SEWER COMMISSION</b>		
	WATER DETAIL S-09.2	REV. DATE
	<i>LOW PRESSURE SANITARY SEWER PIPE TRENCH DETAIL</i>	
	SCALE: NTS	
	1-18-19 DS	

PLUMBING  
INSPECTOR

S.W.S.C. INSPECTOR


- GRINDER PUMP BASIN NOTES:**
1. TOP OF GRINDER PUMP BASIN MUST BE A MINIMUM OF 4 INCHES ABOVE SURROUNDING GRADE.
  2. SURROUNDING GRADE MUST SLOPE AWAY FROM GRINDER PUMP BASIN.
  3. EPDM INLET GROMMET TO ACCEPT PVC GRAVITY SEWER PIPE FROM BUILDING.
  4. SEE TRENCH DETAIL S-02.1 FOR PVC GRAVITY SEWER BALLAST/ANTI-FLOATATION SLAB IS REQUIRED IF BASIN IS BELOW THE GROUND WATER TABLE. SLAB SHALL BE SIZED BY DESIGN ENGINEER.

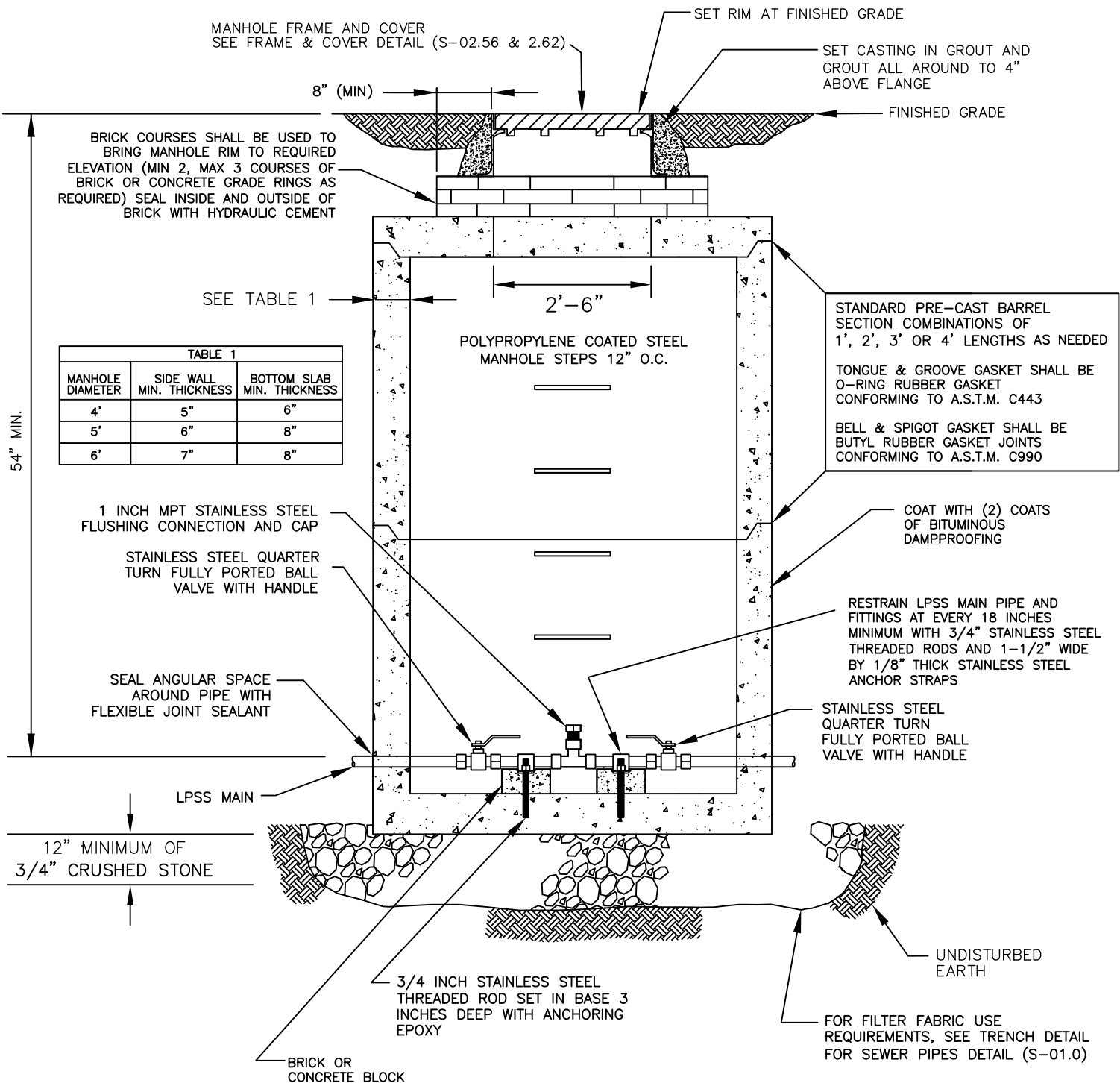
IF THE SIDEWALK BEGINS AT THE CURB INSTALL VALVE BOX 1' OUT FROM THE RIGHT-OF-WAY TO THE BODY OF THE BOX WITH THE APPROVAL FROM SWSC




**NOTES:**

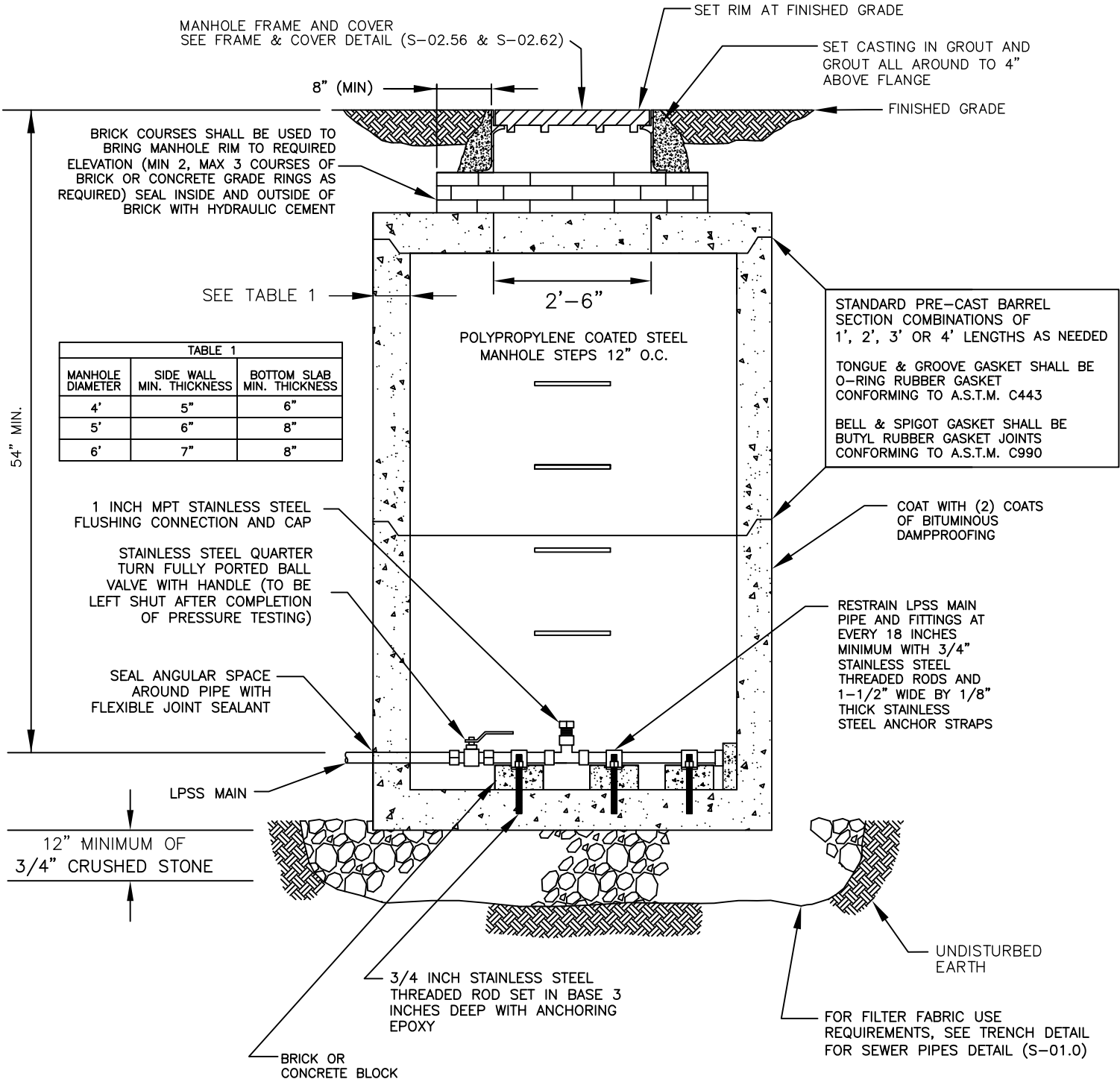
1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES & POLICIES AND SPECIFICATIONS.
2. LPSS PIPE SHALL BE INSTALLED PER TRENCH DETAIL S-09.3
3. ALL SEWER MAIN AND SERVICE PIPE SHALL HAVE A MINIMUM DEPTH OF 4' FROM TOP OF PIPE TO FINISH GRADE.
4. FINAL DETERMINATION OF THE TYPE OF PIPE AND SIZE OF PIPE TO BE USED IS THE RESPONSIBILITY OF THE PROJECT OWNER'S CONSULTING ENGINEER (P.E. IN MASSACHUSETTS) OR THE SEWAGE GRINDER PUMP STATION'S MANUFACTURER.
5. LPSS DEPTH SHALL BE 6 INCHES BELOW THE AVERAGE FROST DEPTH (48 INCHES) FOR A TOTAL OF 54 INCHES. PIPE SHALLower THAN 54 INCHES SHALL BE INSULATED.
6. ALL MATERIALS USED FOR THE PRESSURE PORTION OF THE SYSTEM MUST BE PRESSURE RATED FOR AT MINIMUM 160 PSI OPERATING PRESSURE AND SUITABLE FOR THE WASTEWATER ENVIRONMENT AND RESISTANT TO CORROSION.

		SPRINGFIELD WATER AND SEWER COMMISSION SEWER DETAIL S-09.3	
LPSS SERVICE LATERAL		REV. DATE 1/22/19 DS 3/17/21 M.L.	
SCALE: NTS			




- NOTES:**
1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES & POLICIES AND SPECIFICATIONS.
  2. LPSS MAIN PIPE SHOULD HAVE A MINIMUM DEPTH OF 54 INCH FROM TOP OF PIPE TO FINISH GRADE.
  3. IF 54 INCHES OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.
  4. PRE-CAST REINFORCED CONCRETE MANHOLE SECTIONS CONFORMING TO A.S.T.M.C478.
  5. DESIGN PRECAST SECTIONS WITH FRAME AND COVER FOR AASHTO H-20 LOADING.
  6. PRE-CAST CONCRETE SHALL BE 5,000 PSI @ 28 DAYS.
  7. ALL BRICK SHALL BE HARD NON-POROUS CLAY.
  8. ADMIXTURES, AIR & PLASTICIZERS PER ASTM C233-82.
  9. REINFORCING PER ASTM A615 FOR WIRE FABRIC.
  10. DESIGN LOADING PER AASHTO HS20-44, ACI 318-83; ASTM C478-82, C890-82, C913-71.
  11. 90 DEGREE BEND FITTINGS ARE NOT ACCEPTABLE. 45 DEGREE BENDS AT INLET AND OUTLET OF MANHOLE SHALL BE INSTALLED WHERE A 90 DEGREE ALIGNMENT CHANGE IS REQUIRED.

<b>SPRINGFIELD WATER AND SEWER COMMISSION</b>		
	SEWER DETAIL S-09.4	REV. DATE
	<i>LOW PRESSURE SANITARY</i>	1/23/19 DS
	<i>SEWER MAIN</i>	
	<i>INLINE FLUSHING STRUCTURE</i>	
	SCALE: NTS	



- NOTES:**
1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL CONFORM TO SWSC GUIDELINES & POLICIES AND SPECIFICATIONS.
  2. LPSS PIPE SHOULD HAVE A MINIMUM DEPTH OF 54 INCHES FROM TOP OF PIPE TO FINISH GRADE.
  3. IF 54 INCHES OF COVER IS NOT POSSIBLE PIPE SHALL BE INSULATED.
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  10. DESIGN LOADING PER AASHTO HS20-44, ACI 318-83; ASTM C478-82, C890-82, C913-71.

SPRINGFIELD WATER AND SEWER COMMISSION		
	SEWER DETAIL S-09.5	REV. DATE
	<i>LOW PRESSURE SANITARY SEWER TERMINAL FLUSHING STRUCTURE</i>	1/23/19 DS
	SCALE: NTS	



**WILBRAHAM**

**HAMPDEN**

**LUDLOW**

**EAST LONGMEADOW**

**SPRINGFIELD**

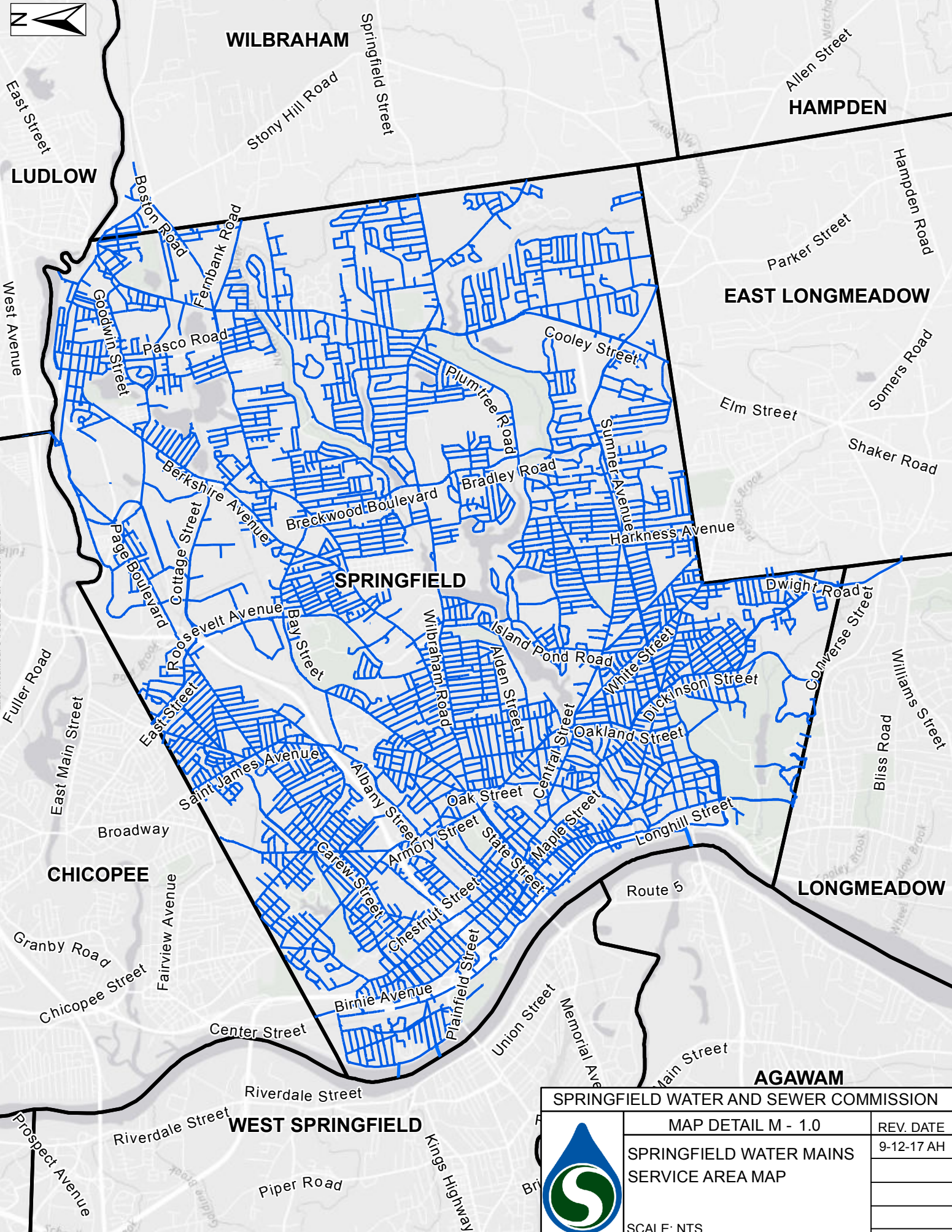
**CHICOPEE**

**LONGMEADOW**

**AGAWAM**

**WEST SPRINGFIELD**

<b>SPRINGFIELD WATER AND SEWER COMMISSION</b>		
	MAP DETAIL M - 1.0	REV. DATE
	SPRINGFIELD WATER MAINS SERVICE AREA MAP	9-12-17 AH
	SCALE: NTS	







Springfield Reservoir

Boston Road

LUDLOW

Fuller Street

West Street

Road Street

Center Street

Holyoke Street

Cady Street

West Avenue

Russell Street

East Street

Chapin Street

Parker Street

Goodwin Street

Main Street

SPRINGFIELD

Worcester

CHICOPEE

Burns

SPRINGFIELD WATER AND SEWER COMMISSION



MAP DETAIL M - 2.0

LUDLOW WATER MAINS SERVICE AREA MAP

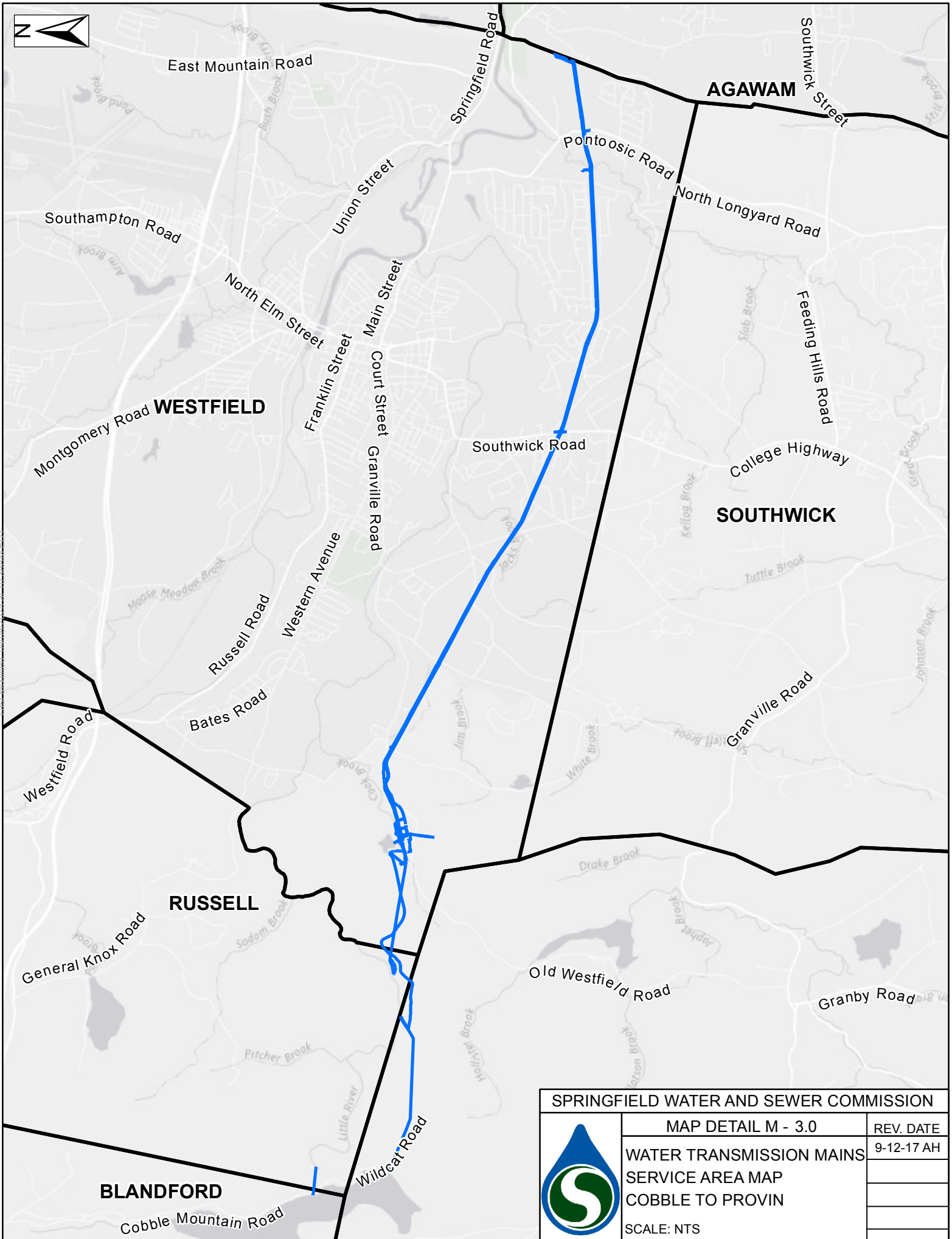
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REV. DATE

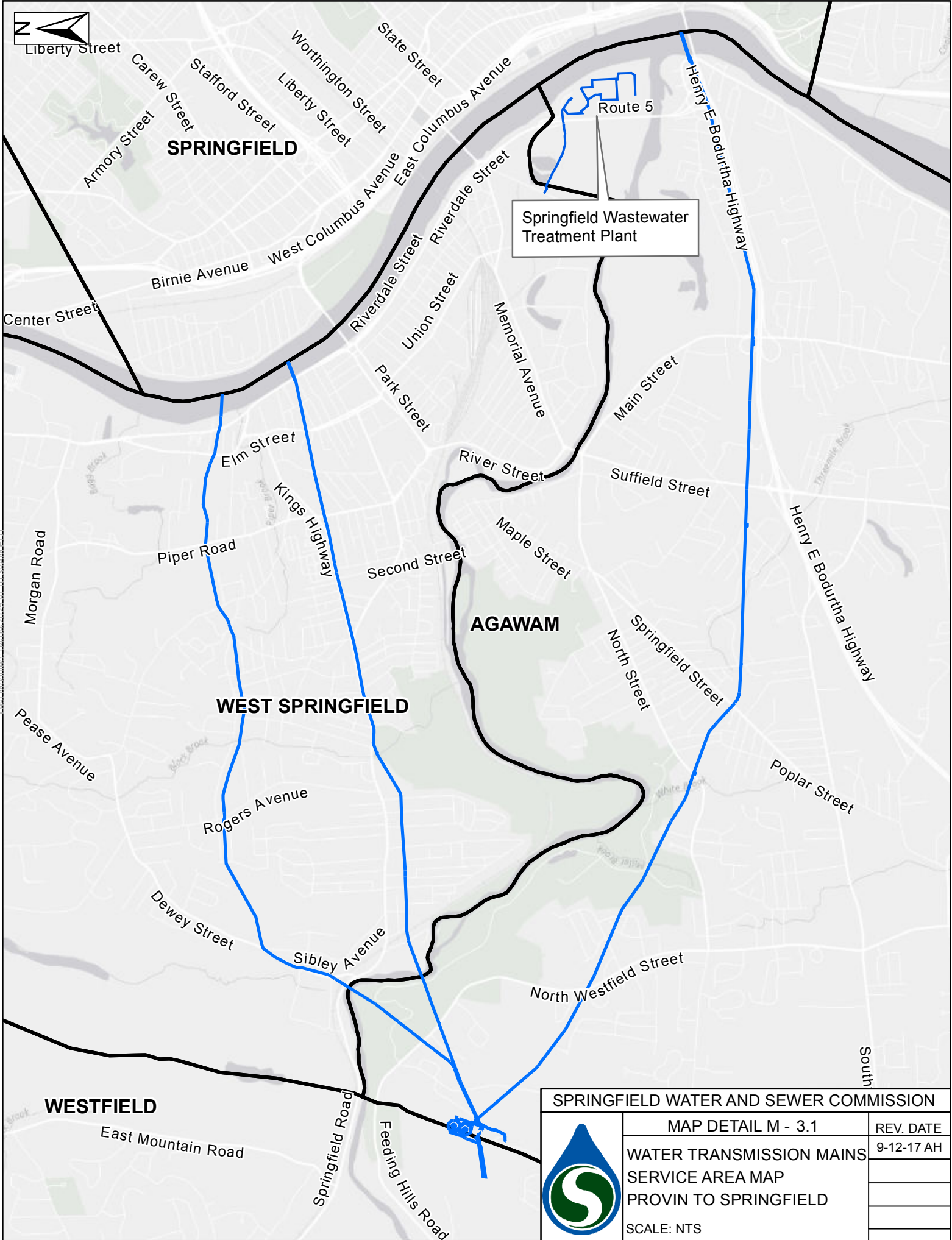
9-12-17 AH

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SPRINGFIELD WATER AND SEWER COMMISSION		
	MAP DETAIL M - 3.0	REV. DATE
	WATER TRANSMISSION MAINS	9-12-17 AH
	SERVICE AREA MAP	
	COBBLE TO PROVIN	
	SCALE: NTS	




**SPRINGFIELD**

**AGAWAM**

**WEST SPRINGFIELD**

**WESTFIELD**

Springfield Wastewater Treatment Plant

SPRINGFIELD WATER AND SEWER COMMISSION		
	MAP DETAIL M - 3.1	REV. DATE
	WATER TRANSMISSION MAINS	9-12-17 AH
	SERVICE AREA MAP	
	PROVIN TO SPRINGFIELD	
SCALE: NTS		





LUDLOW

WILBRAHAM

HAMPDEN

EAST LONGMEADOW

SPRINGFIELD

CHICOPEE

WEST SPRINGFIELD

Stony Hill Road

Springfield Street

Allen Street

Parker Street

Pasco Road

Parker Street

Cooley Street

Berkshire Avenue

Plumtree Road

Elm Street

Boston Road

Bradley Road

Summer Avenue

North Main Street

Breckwood Boulevard

Page Boulevard

Jasper Street

Wilbraham Road

Island Pond Road

Shawinigan Drive

Cottage Street

Bay Street

White Street

Tiffany Street

East Main Street

East Street

Saint James Avenue

Alen Street

Dickinson Street

Broadway

Liberty Street

Oak Street

Central Street

Oakland Street

Granby Road

Front Street

Fairview Avenue

Garew Street

Worthington Street

State Street

Maple Street

Longhill Street

Chicopee Street

Hampden Street

Springfield Street

Plainfield Street

Congress Street

Riverdale Street

Memo

Route 5

Henry E. Bodurtha Highway

Center Street

Riverdale Street

Kings Highway

SPRINGFIELD WATER AND SEWER COMMISSION



MAP DETAIL M - 4.0

REV. DATE

SPRINGFIELD SEWER MAINS SERVICE AREA MAP

9-12-17 AH

SCALE: NTS

## SWSC AND CITY HOLIDAYS

Last Modified: 04/09/2025 at 10:39AM EDT

# Massachusetts Legal Holidays

Holiday	2021	2022	2023
<b>New Year's Day</b> January First	Jan. 1, Fri.	Jan. 1, Sat.	Jan. 1, Sun. (3)
<b>Martin Luther King, Jr. Day</b> Third Monday in January	Jan. 18, Mon.	Jan. 17, Mon.	Jan. 16, Mon.
<b>Washington's Birthday</b> Third Monday in February	Feb. 15, Mon.	Feb. 21, Mon.	Feb. 20, Mon.
<b>Patriots' Day</b> Third Monday in April	Apr. 19, Mon.	Apr. 18, Mon.	Apr. 17, Mon.
<b>Memorial Day</b> Last Monday in May** (1A)	May 31, Mon.** (1A)	May 30, Mon.** (1A)	May 29, Mon.** (1A)
<b>Juneteenth Independence Day</b> June 19th	June 19th, Sat. (3)	June 19th, Sun. (3)	June 19, Mon.
<b>Independence Day</b> July 4th**	July 4, Sun.** (3)	July 4, Mon.**	July 4, Tue. **
<b>Labor Day</b> First Monday in September**	Sept. 6, Mon.**	Sept. 5, Mon.**	Sept. 4, Mon.**
<b>Columbus Day</b> Second Monday in October* (Restrictions until 12 noon) (2)	Oct. 11, Mon.* (2)	Oct. 10, Mon.* (2)	Oct. 9, Mon.* (2)
<b>Veterans' Day</b> November 11th* (Restrictions until 1pm) (2)	Nov. 11, Thu.* (2)	Nov. 11, Fri.* (2)	Nov. 11, Sat.* (2)
<b>Thanksgiving Day</b> Customarily the fourth Thursday in November* (1)	Nov. 25, Thurs.* (1)	Nov. 24, Thurs.* (1)	Nov. 23, Thurs.* (1)
<b>Christmas Day</b> December 25th* (1)	Dec. 25, Sat.* (1)	Dec. 25, Sun.* (1)(3)	Dec. 25, Mon.* (1)

\* - Full restrictions apply for ALL commerce

\*\* - Restrictions apply except to retail

(1) Liquor Stores must be closed for Thanksgiving and Christmas Days.

(1A) Liquor stores may not open prior to 12:00 noon Memorial Day.

(2) Many companies operate all day on these holidays, pending obtaining a local permit.

(3) All holidays falling on Sunday must be observed on Monday, under state law. Saturday holidays are observed on Saturday.

Above is a list of all legal holidays observed in Massachusetts. State, county, and municipal offices are closed on the days listed above. Federal offices are only closed on holidays which the federal government recognizes (i.e. New Year's Day, Martin Luther King, Jr. Day, Washington's Birthday, Memorial Day, Juneteenth Independence Day, Independence Day, Labor Day, Columbus Day, Veterans' Day, Thanksgiving, and Christmas). The term "federal holiday" is not applicable to individual states and the private sector since each state has jurisdiction over its holidays.

In Massachusetts certain holidays are subject to laws which restrict the type of work that may be performed as well as the kind of business and commercial activities that may remain open. Only those holidays followed by asterisks (\*) have certain restrictions. On holidays not followed by asterisks, business and commercial activities may operate as usual.

**Please note: Only retail establishments may open during the summer holidays of Memorial Day, Independence Day, and Labor Day.** Some businesses may be required to pay premium pay on some holidays. Please contact the Attorney General's Fair Labor Division at 617-727-3465. The Department of Labor Standards (617-626-6975) oversees the approval of local permits allowing businesses to open on Columbus, Veteran's Days, Thanksgiving and Christmas when they otherwise could not open for some or all hours on those days.

For further information on holiday laws, contact Citizen Information Service:

Secretary of the Commonwealth	Telephone: 617-727-7030
Citizen Information Service	Toll-Free: 1-800-392-6090
One Ashburton Place, Room 1611	TTY: 617-878-3889
Boston, MA 02108-1512	Fax: 617-742-4528
	Email: <a href="mailto:cis@sec.state.ma.us">cis@sec.state.ma.us</a>

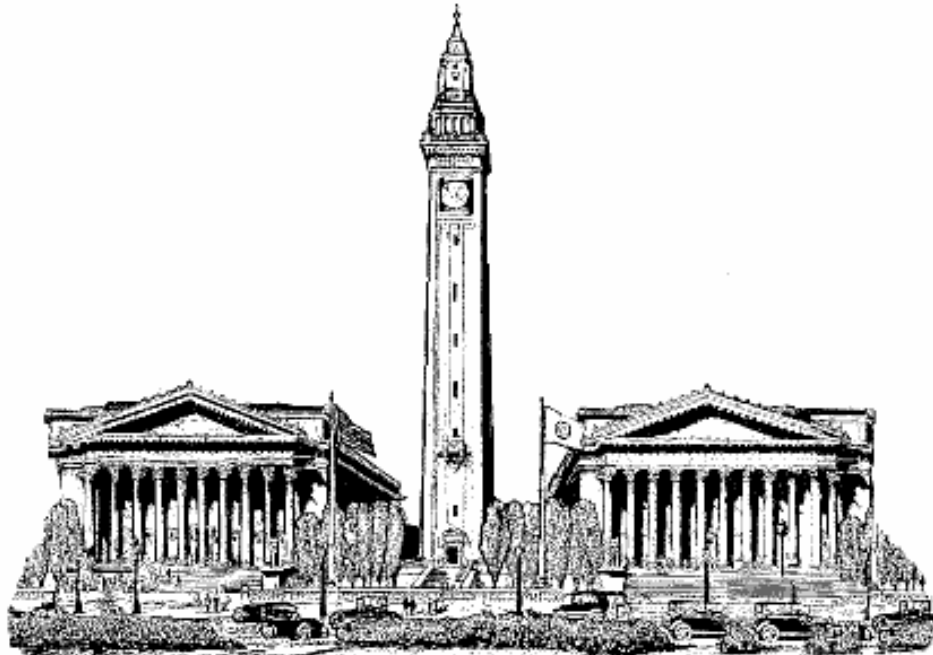
## SPRINGFIELD DPW STANDARD ENGINEERING DETAILS

Last Modified: 04/09/2025 at 10:39AM EDT

# Springfield

## Department of Public Works

### Standard Engineering Details



## **CONSTRUCTION NOTES**

- 1.** CALL DIG-SAFE (1-800-322-4844) A MINIMUM OF 72 HOURS PRIOR TO CONSTRUCTION.
- 2.** CONTRACTOR IS RESPONSIBLE FOR STREET OCCUPANCY PERMITS FROM THE ENGINEERING DIVISION, DEPARTMENT OF PUBLIC WORKS.
- 3.** NOTIFY FIELD INSPECTOR 48 HOURS PRIOR TO CONSTRUCTION.
- 4.** APPROVED PLANS SHALL BE ON SITE AT ALL TIMES.
- 5.** CHANGES TO THIS PLAN MAY OCCUR AS UNFORSEEN CONDITIONS ARISE. ALL CHANGES SHALL BE APPROVED BY FIELD INSPECTOR.
- 6.** CALCIUM CHLORIDE/ WATER FOR DUST CONTROL SHALL BE AVAILABLE AT ALL TIMES.
- 7.** ALL MATERIALS AND METHODS SHALL CONFORM TO CITY OF SPRINGFIELD D.P.W. AND WATER AND SEWER COMMISSION STANDARDS.
- 8.** THE CONTRACTOR SHALL ENSURE THE MAINTENANCE OF SAFETY AND TRAFFIC ON THE PUBLIC AND PRIVATE WAYS AFFECTED BY THE CONSTRUCTION OF THIS PROJECT.
- 9.** THE CONTRACTOR SHALL PROTECT ALL SLOPES, VEGETATION, PAVING, WALKS AND IMPROVEMENTS OUTSIDE THE AREAS TO BE AFFECTED BY THE CONSTRUCTION OF THIS PROJECT.
- 10.** ALL DRAINAGE STRUCTURES (CATCH BASINS / LEECHING BASINS) IN THE AREA SHALL BE PROTECTED FROM RUNOFF.
- 11.** "AS-BUILT" UTILITY DRAWINGS ARE TO BE SUBMITTED TO THE ENGINEERING DIVISION UPON COMPLETION OF THIS PROJECT.
- 12.** ALL PAVEMENT MARKINGS CHANGED, ALTERED OR REMOVED SHALL BE RE-APPLIED.
- 13.** SPRINGFIELD D.P.W. APPROVAL IS NOT TO BE CONSTRUED AS AN ALL-INCLUSIVE APPROVAL, AS OTHER APPROVALS MAY BE NECESSARY, I.E. CITY FORESTER, CONSERVATION, FIRE DEPT. AND WATER AND SEWER COMMISSION, ETC.
- 14.** THE CONTRACTOR SHALL HAVE AN APPROVED S.W.P.P.P. ON SITE AS NEEDED.
- 15.** (OTHER NOTES AS NEEDED)



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(ASPHALT)

**0003** - TYPICAL STANDARD SECTION FOR SIDEWALK CONSTRUCTION WITH  
UNSUITABLE SUB BASE (ASPHALT)

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**0033 - PRECAST CB OFFSET**

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- 0038** - DECORATIVE LIGHTING BOROUGH STYLE
- 0039** - PRECAST LIGHT POLE FOUNDATION
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- 0041** - DECORATIVE LIGHTING BISHOP'S CROOK
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- 0044** - PRECAST CONCRETE CATCH BASIN
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- 0047** - TYPICAL LEACHING GALLEY
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- 0050** - SPRINGFIELD CITY SEAL
- 0051** - ACCEPTANCE PLAN KEY 1
- 0052** - ACCEPTANCE PLAN KEY 2
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- 0057** - GRANITE CURBING
- 0058** - SEWER CONNECTION
- 0059** - SIGNING AND BARRICADE PLAN TWO- WAY STREET CENTER OF ROAD  
WORK AREA

**0060** - SIGNING AND BARRICADE PLAN TWO- WAY STREET SIDE OF ROAD  
WORK AREA

**0061** - SIGNING AND BARRICADE PLAN TWO- WAY STREET ALL TWO- WAY  
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**0065** - SIGN FACE DETAILS

**0066** - BERM TYPE A

**0067** - BERM TYPE B

**0068** - BERM TYPE C

**0069** - BERM TYPE D

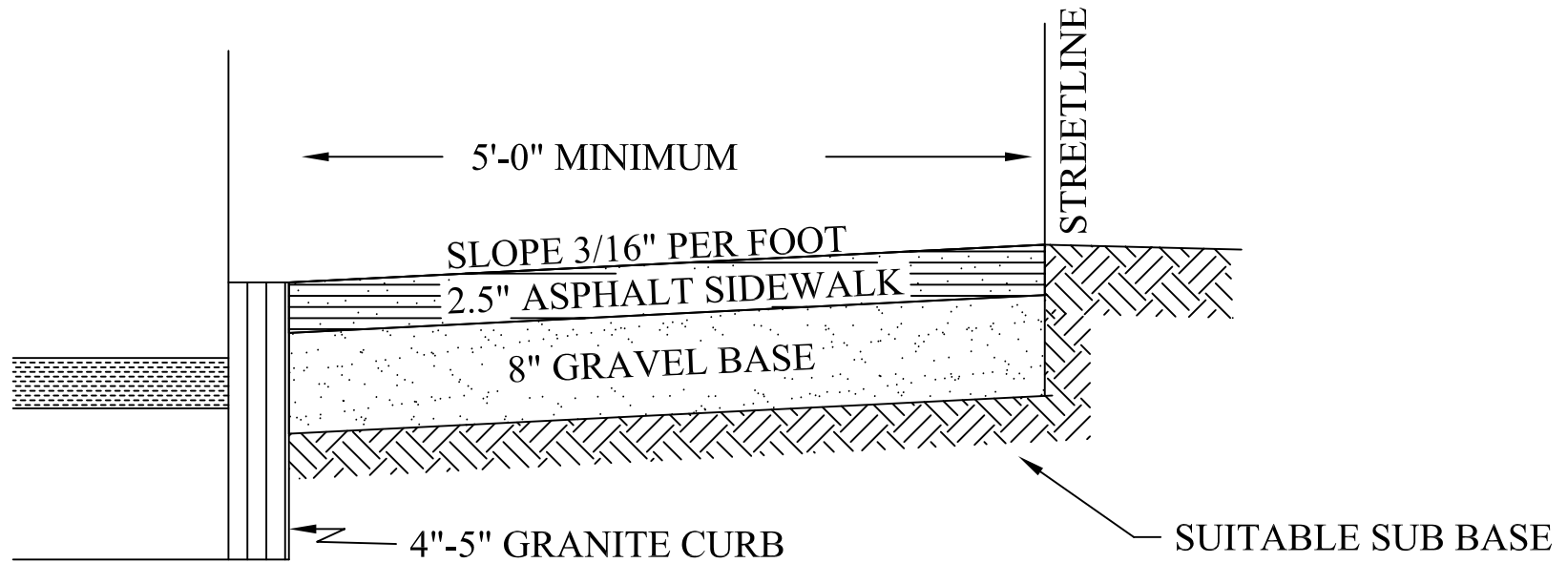
**0070** - SIDEWALK REPAIR

**0071** - MULTIPLE EXCAVATION REPAIR

**0072** - IMPRINT OR INLAYED CROSSWALK REPAIR

**0073** - CROSSWALK DETAIL – CONTINENTAL STYLE

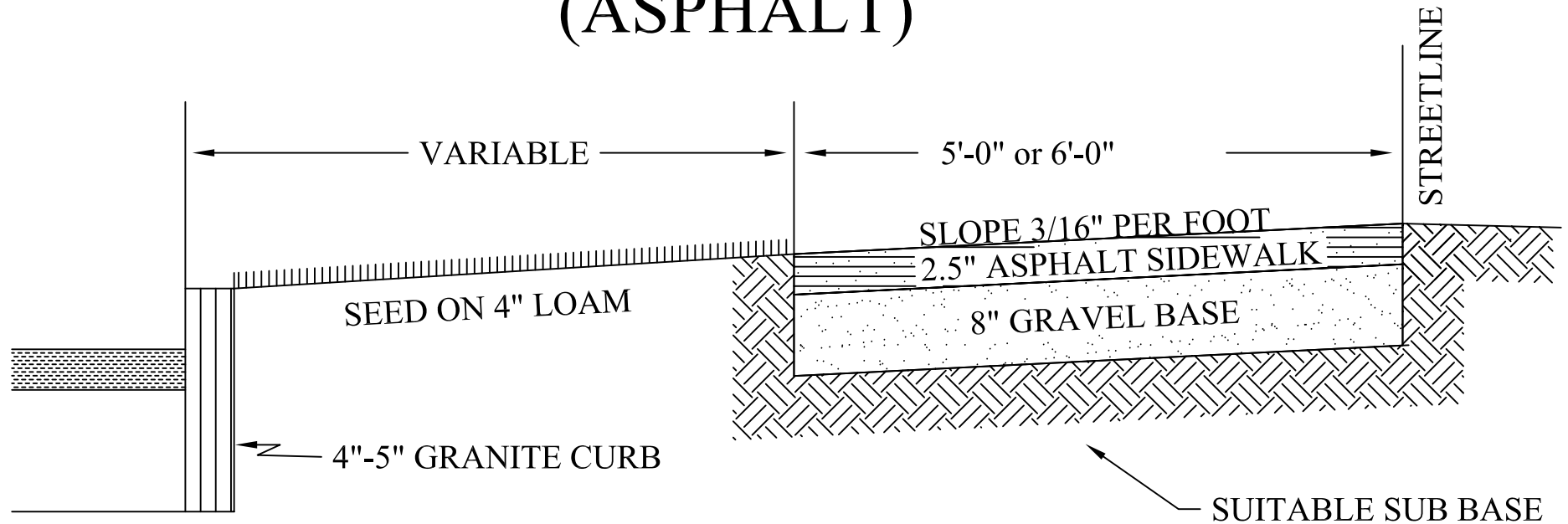
# TYPICAL STANDARD SECTION FOR SIDEWALK CONSTRUCTION AT CURB LINE (ASPHALT)



## NOTES:

- STANDARD SIDEWALK SLOPE IS 3/16 PER FT.
- ALL WORK TO CONFORM WITH SECTION 701.62 OF THE MASSACHUSETTS HIGHWAY DEPARTMENT'S STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES

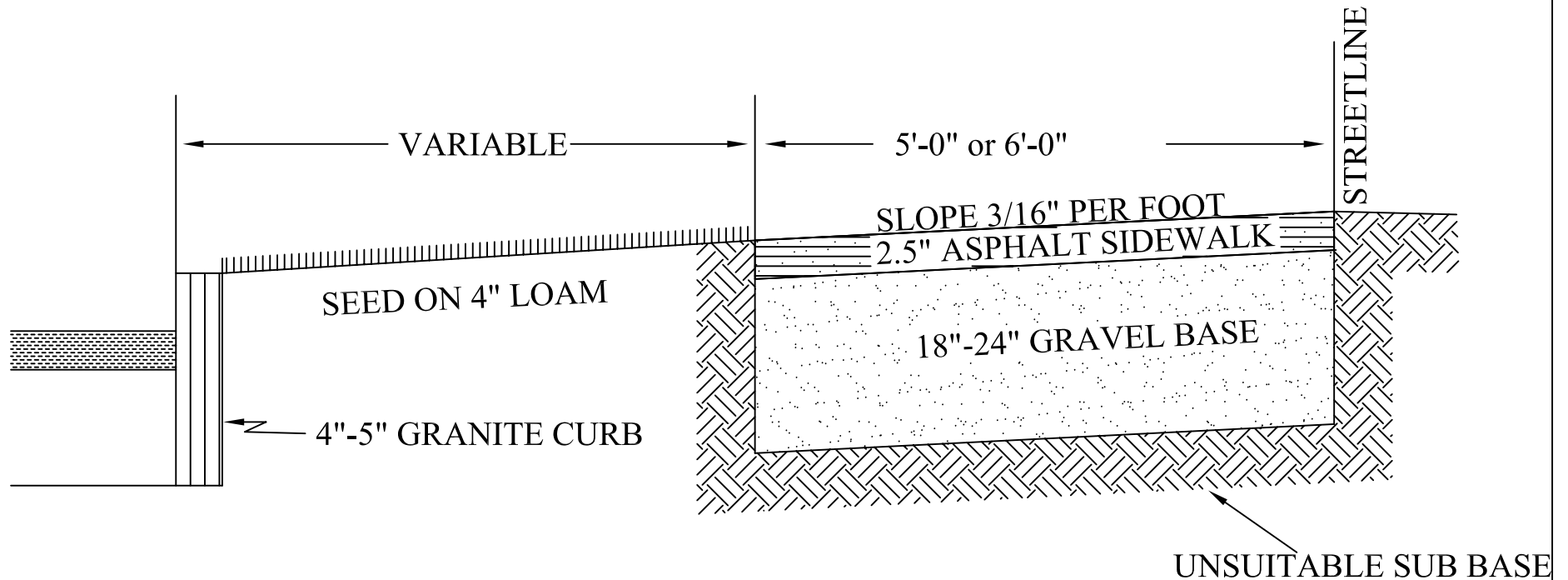
# TYPICAL STANDARD SECTION FOR SIDEWALK CONSTRUCTION (ASPHALT)



## NOTES:

- STANDARD SIDEWALK SLOPE IS 3/16 PER FT.
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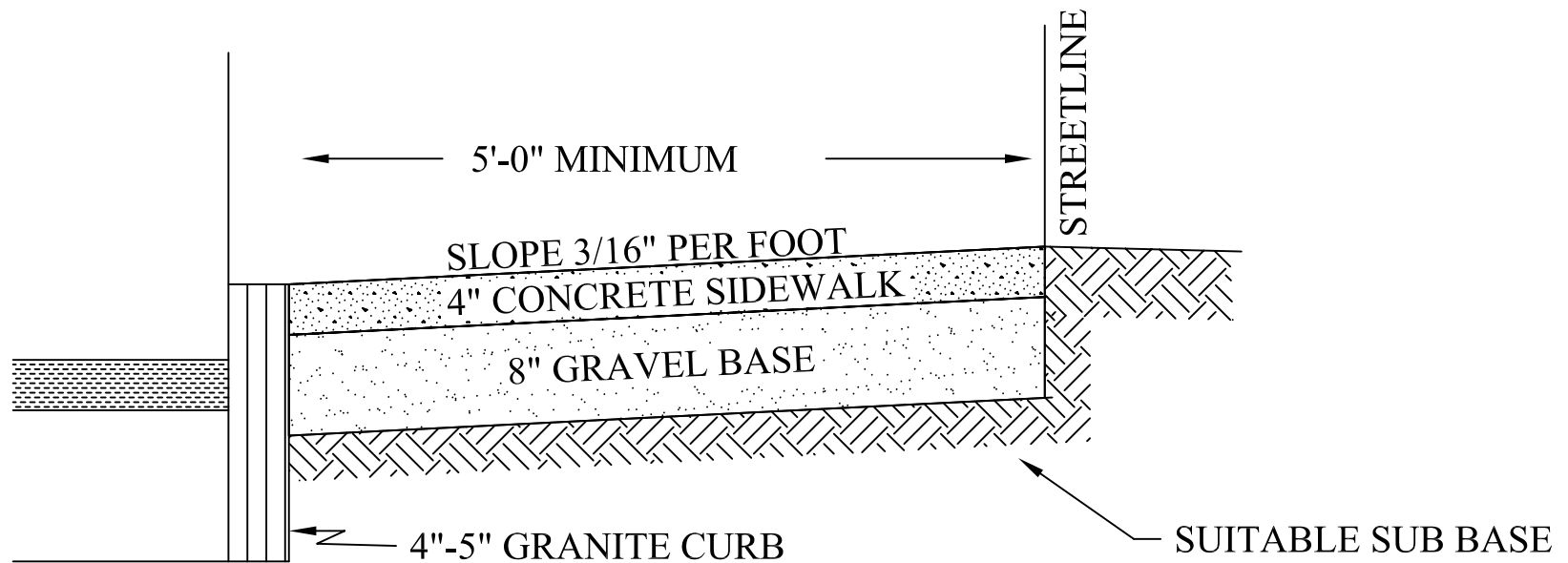
# TYPICAL STANDARD SECTION FOR SIDEWALK CONSTRUCTION WITH UNSUITABLE SUB BASE (ASPHALT)



## NOTES:

- STANDARD SIDEWALK SLOPE IS 3/16 PER FT.
- ALL WORK TO CONFORM WITH SECTION 701.62 OF THE MASSACHUSETTS HIGHWAY DEPARTMENT'S STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES

# TYPICAL STANDARD SECTION FOR SIDEWALK CONSTRUCTION AT CURB LINE (CONCRETE)

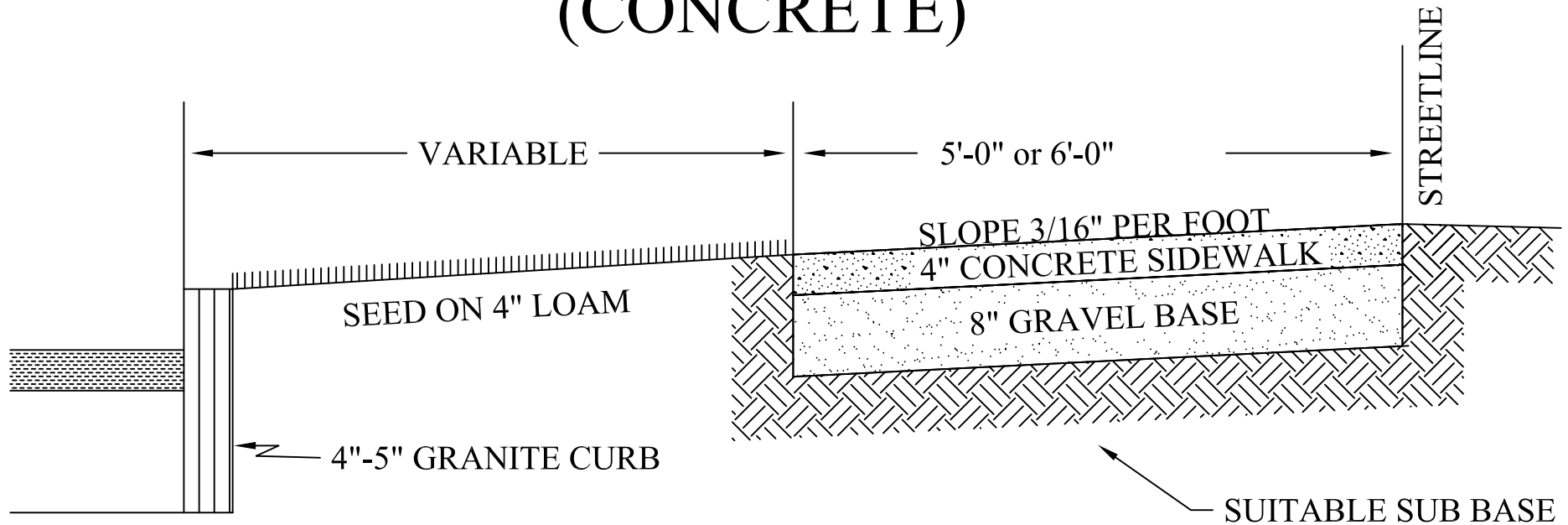


## NOTES:

- STANDARD SIDEWALK SLOPE IS 3/16 PER FT.
- MINIMUM CONCRETE STENGTH WILL BE 4,000#, CLASS D



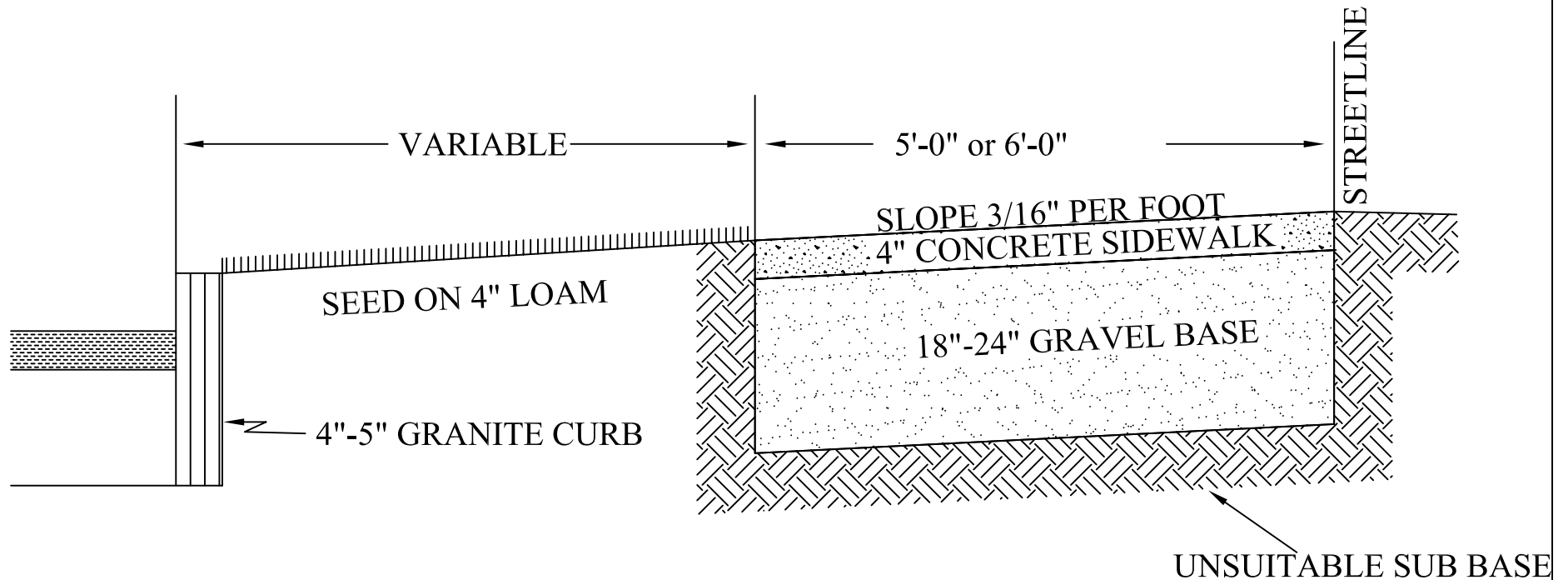
# TYPICAL STANDARD SECTION FOR SIDEWALK CONSTRUCTION (CONCRETE)



## NOTES:

- STANDARD SIDEWALK SLOPE IS 3/16 PER FT.
- MINIMUM CONCRETE STENGTH WILL BE 4,000#, CLASS D

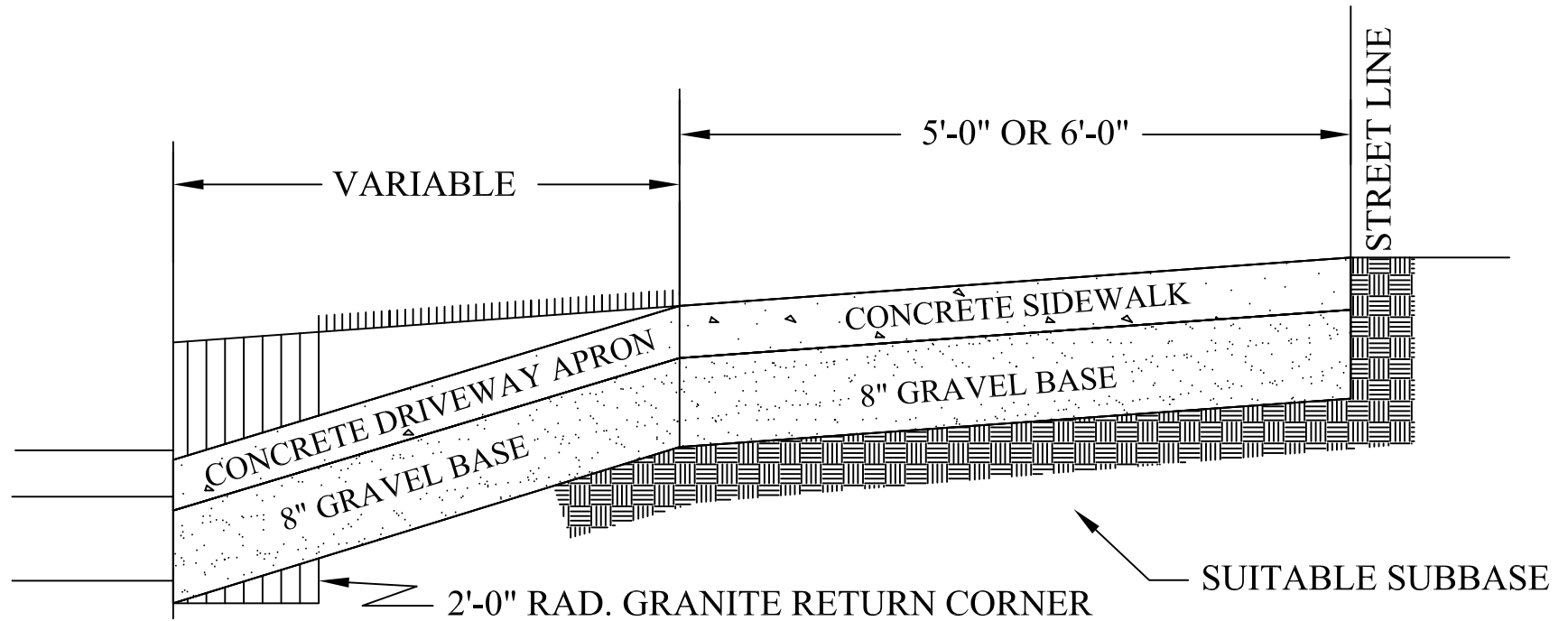
# TYPICAL STANDARD SECTION FOR SIDEWALK CONSTRUCTION WITH UNSUITABLE SUB BASE (CONCRETE)



## NOTES:

- STANDARD SIDEWALK SLOPE IS 3/16 PER FT.
- MINIMUM CONCRETE STRENGTH WILL BE 4,000#, CLASS D

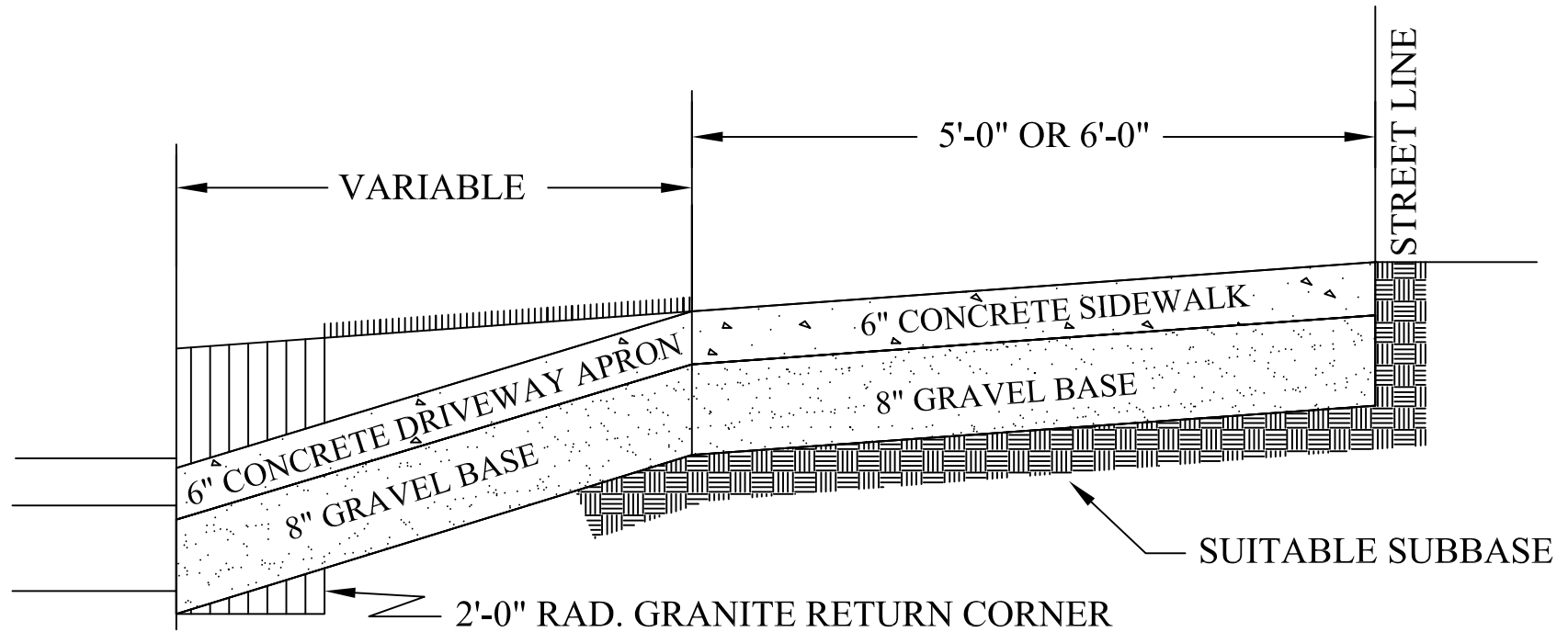
# STANDARD SIDEWALK CONSTRUCTION AT COMMERCIAL DRIVEWAYS



## NOTES:

- 9" CONCRETE MAY BE REPLACED BY 6" ASPHALT IF APPROVED
- STANDARD SIDEWALK SLOPE IS 3/16 PER FT.
- MAXIMUM DRIVEWAY WIDTH IS 40' WITH TWO 2' CURB RETURNS (36' OPENING)
- #3 REINFORCEING BARS SHALL BE PLACED 12" O.C., 3" FROM GRAVEL BASE
- MINIMUM CONCRETE STRENGTH WILL BE 4,000#, CLASS D

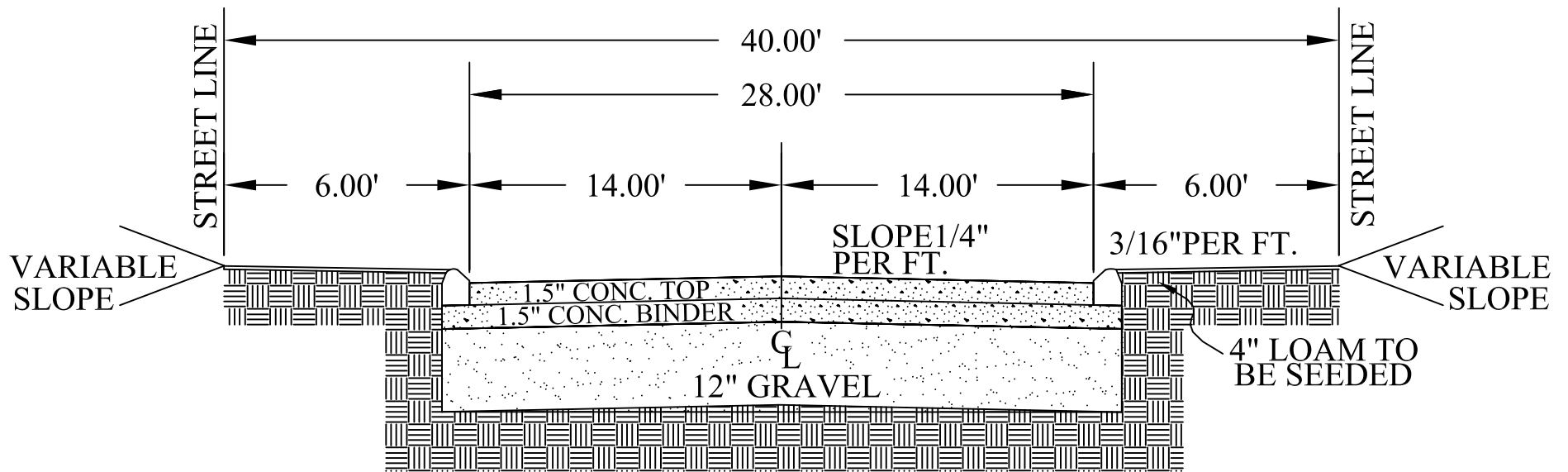
# STANDARD SIDEWALK CONSTRUCTION AT RESIDENTIAL DRIVEWAYS



## NOTES:

- 6" CONCRETE DEPTH TO BE REPLACED BY 3-1/2" ASPHALT(2" BINDER, 1- 1/2" TOP) AS DIRECTED BY THE ENGINEER
- STANDARD SIDEWALK SLOPE IS 3/16 PER FT.
- MAXIMUM DRIVEWAY WIDTH IS 24' WITH TWO 2' CURB RETURNS (20' OPENING)
- WIRE WELDED FABRIC PLACED 1-1/2" ABOVE GRAVEL BASE
- MINIMUM CONCRETE STRENGTH WILL BE 4,000#, CLASS D

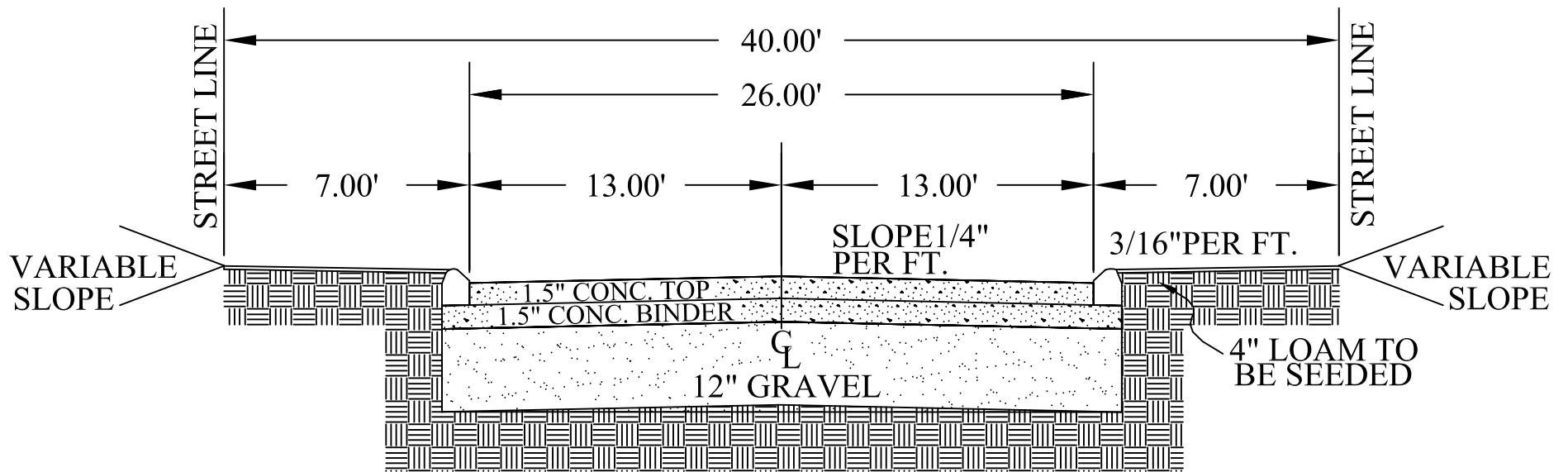
# TYPICAL SECTION 40' STREET LINE 28' PAVEMENT



## NOTES:

- EXISTING SUBGRADE TO BE SHAPED AND COMPACTED
- USE CALCIUM CHLORIDE APPLIED AT 1.5 LBS PER SQ. YD. OR APPROVED ALTERNATE
- SURFACE COURSE:  
1.5" BITUMINOUS CONCRETE TOP, 1.5" BITUMINOUS CONCRETE BINDER
- BASE:  
12" GRAVEL

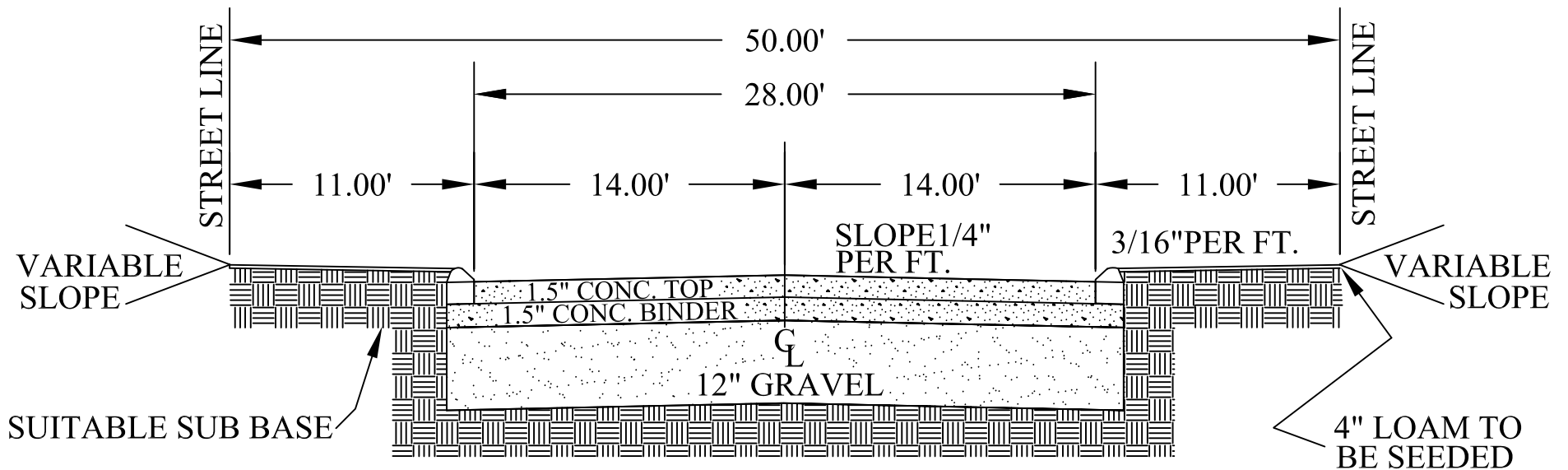
# TYPICAL SECTION 40' STREET LINE 26' PAVEMENT CAPE COD BERM



## NOTES:

- EXISTING SUBGRADE TO BE SHAPED AND COMPACTED
- USE CALCIUM CHLORIDE APPLIED AT 1.5 LBS PER SQ. YD. OR APPROVED ALTERNATE
- SURFACE COURSE:  
1.5" BITUMINOUS CONCRETE TOP, 1.5" BITUMINOUS CONCRETE BINDER
- BASE:  
12" GRAVEL

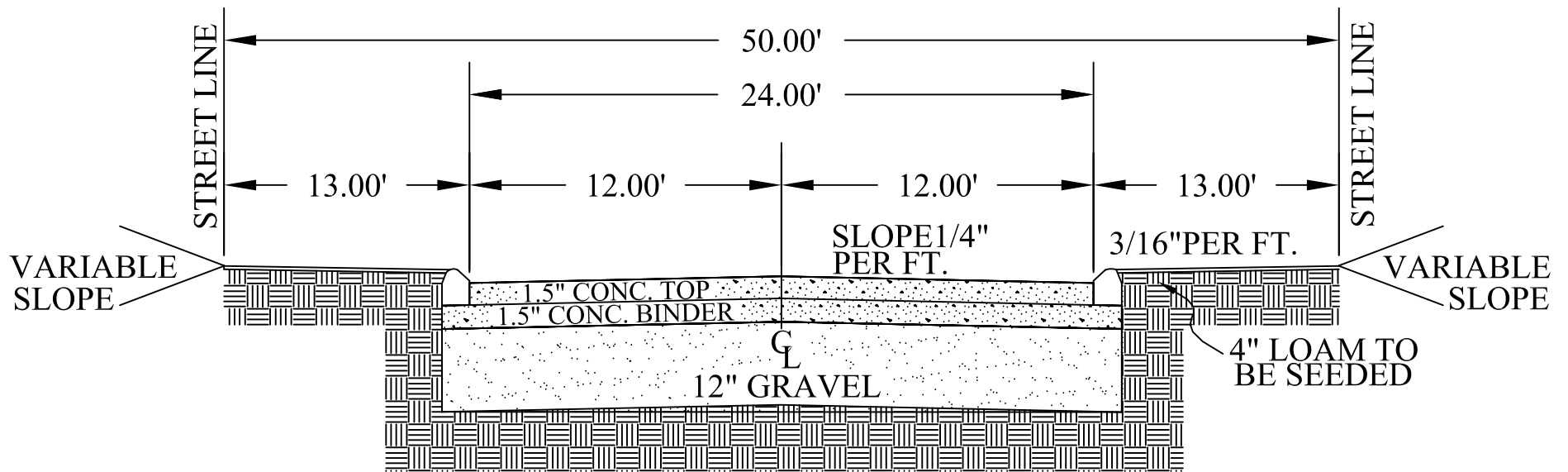
# TYPICAL SECTION 50' STREET LINE 28' PAVEMENT CAPECOD BERM



## NOTES:

- EXISTING SUBGRADE TO BE SHAPED AND COMPACTED
- USE CALCIUM CHLORIDE APPLIED AT 1.5 LBS PER SQ. YD. OR APPROVED ALTERNATE
- SURFACE COURSE:  
1.5" BITUMINOUS CONCRETE TOP, 1.5" BITUMINOUS CONCRETE BINDER
- BASE:  
12" GRAVEL

# TYPICAL SECTION 50' STREET LINE 24' PAVEMENT

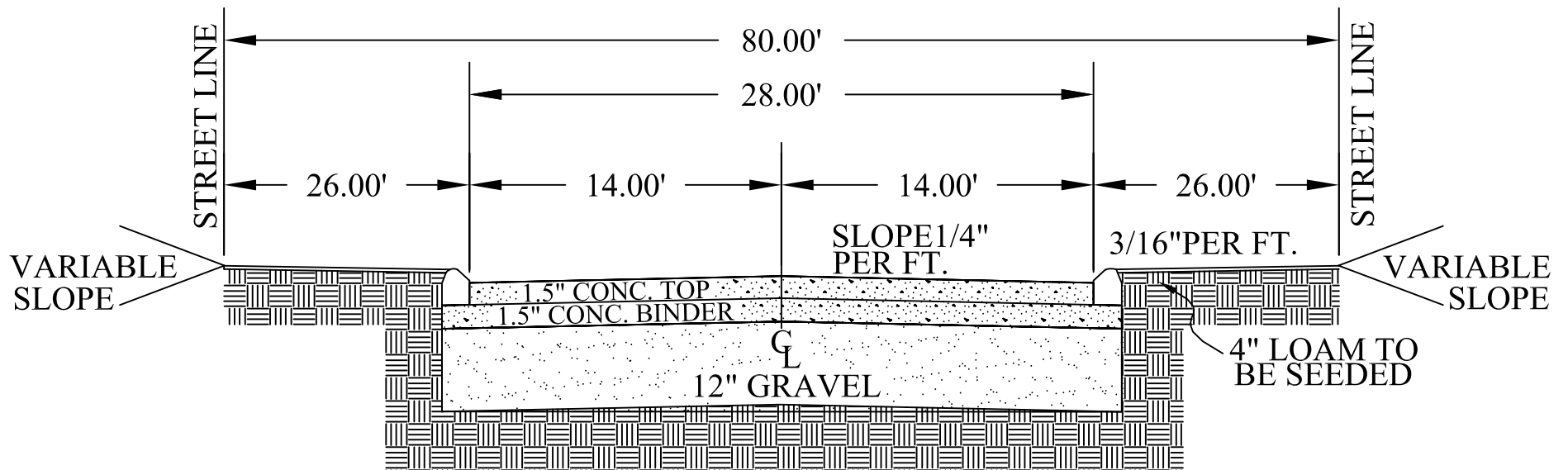


## NOTES:

- EXISTING SUBGRADE TO BE SHAPED AND COMPACTED
- USE CALCIUM CHLORIDE APPLIED AT 1.5 LBS PER SQ. YD. OR APPROVED ALTERNATE
- SURFACE COURSE:  
1.5" BITUMINOUS CONCRETE TOP, 1.5" BITUMINOUS CONCRETE BINDER
- BASE:  
12" GRAVEL



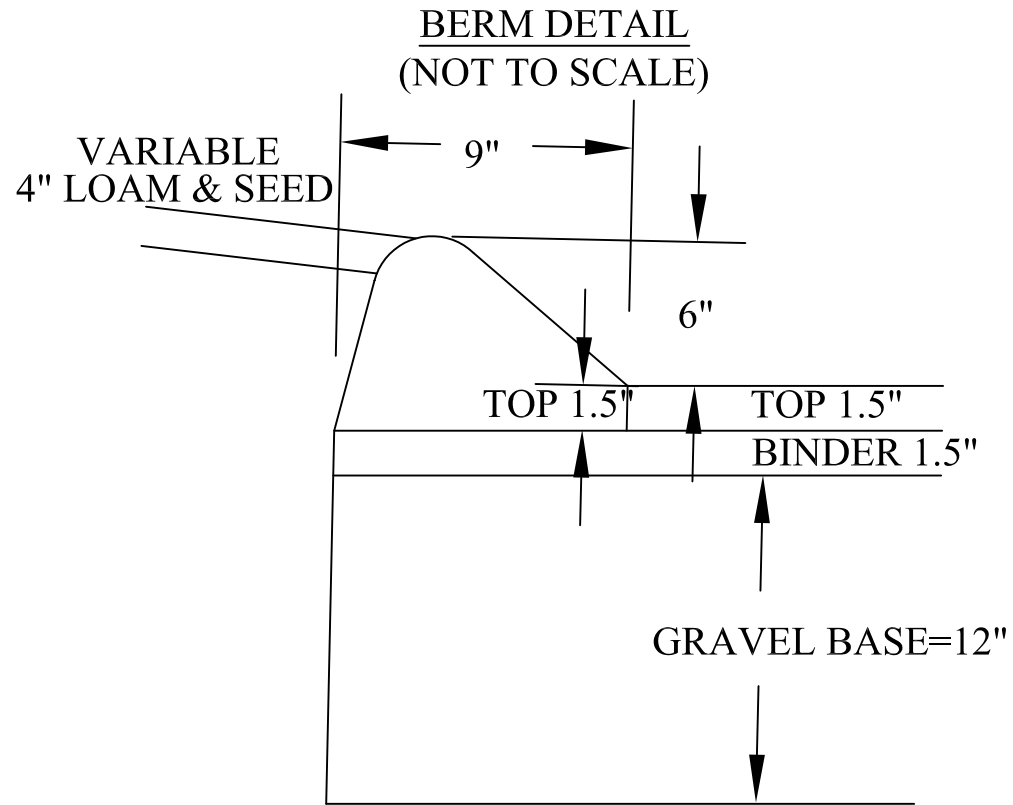
# TYPICAL SECTION 80' STREET LINE 28' PAVEMENT



## NOTES:

- EXISTING SUBGRADE TO BE SHAPED AND COMPACTED
- USE CALCIUM CHLORIDE APPLIED AT 1.5 LBS PER SQ. YD. OR APPROVED ALTERNATE
- SURFACE COURSE:  
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- BASE:  
12" GRAVEL

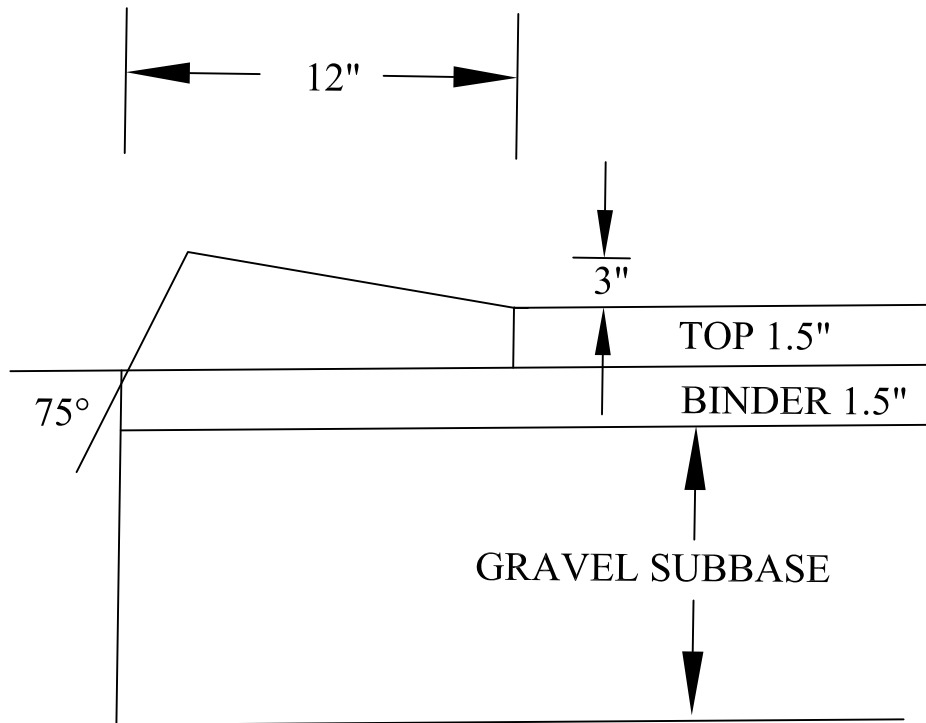
# BERM 6"



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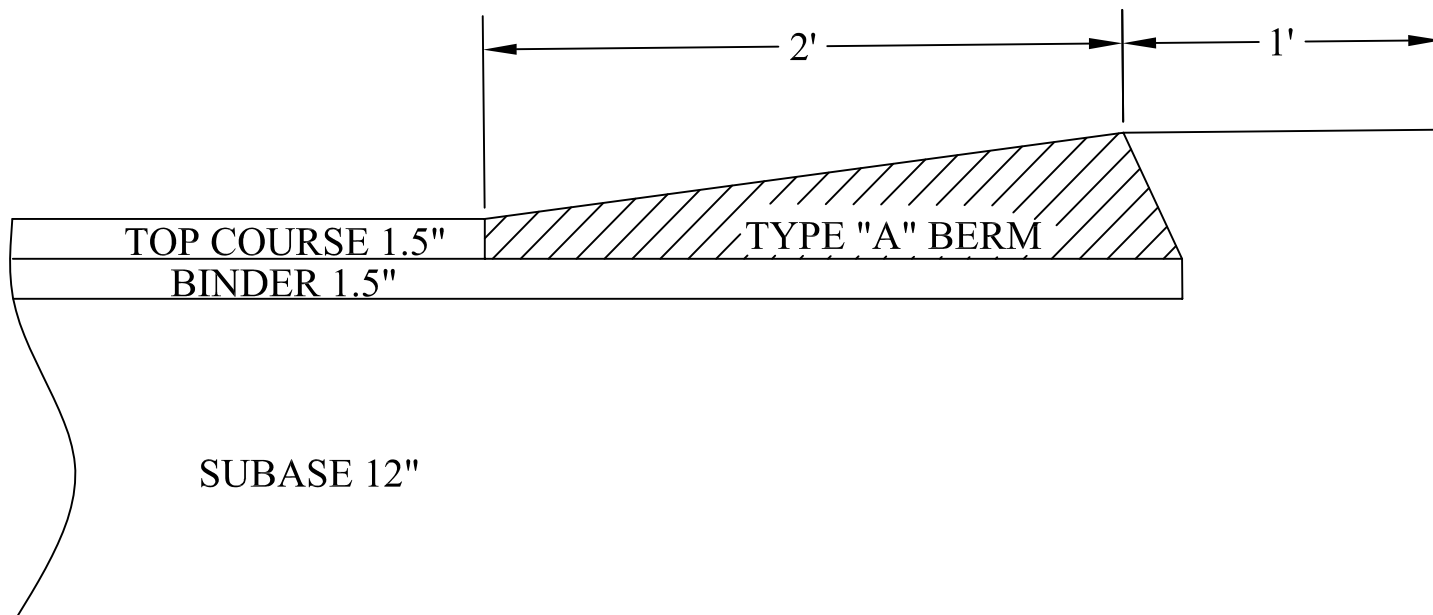
# CAPE COD BERM

CAPE COD BERM DETAIL  
(NOT TO SCALE)



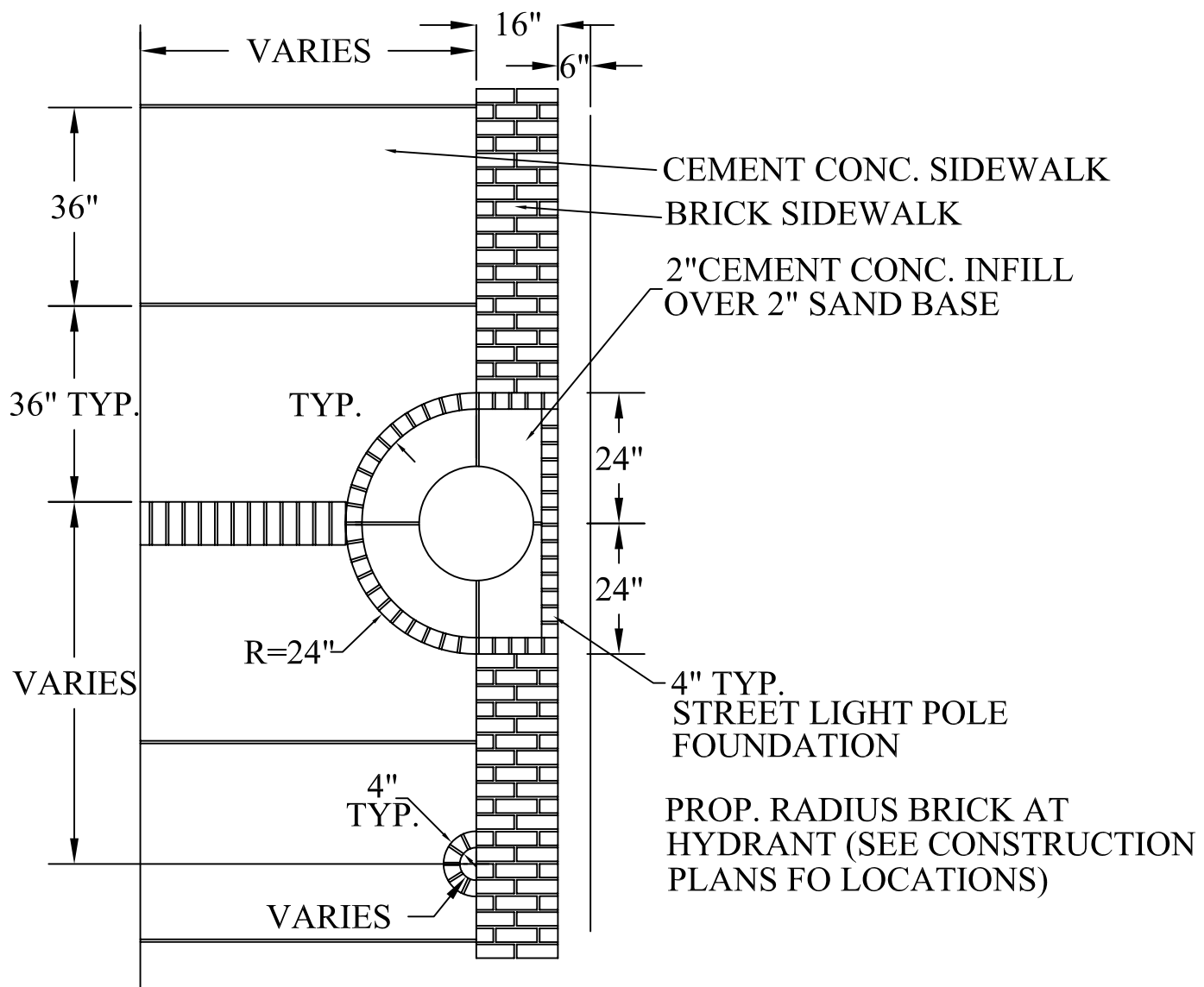
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# BERM TYPE A



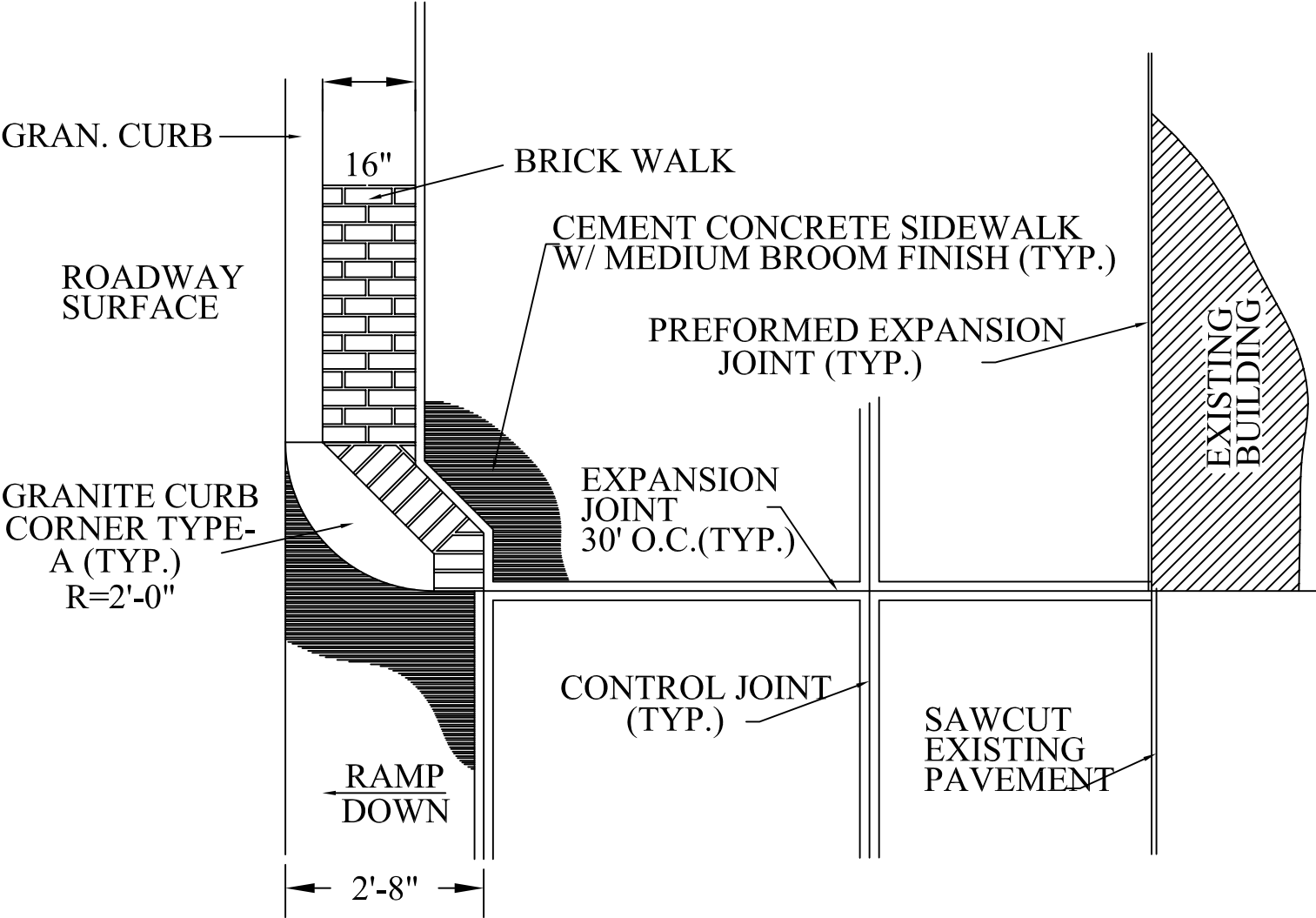
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# BRICK SIDEWALK SIDEWALK TREATMENT AT UTILITIES



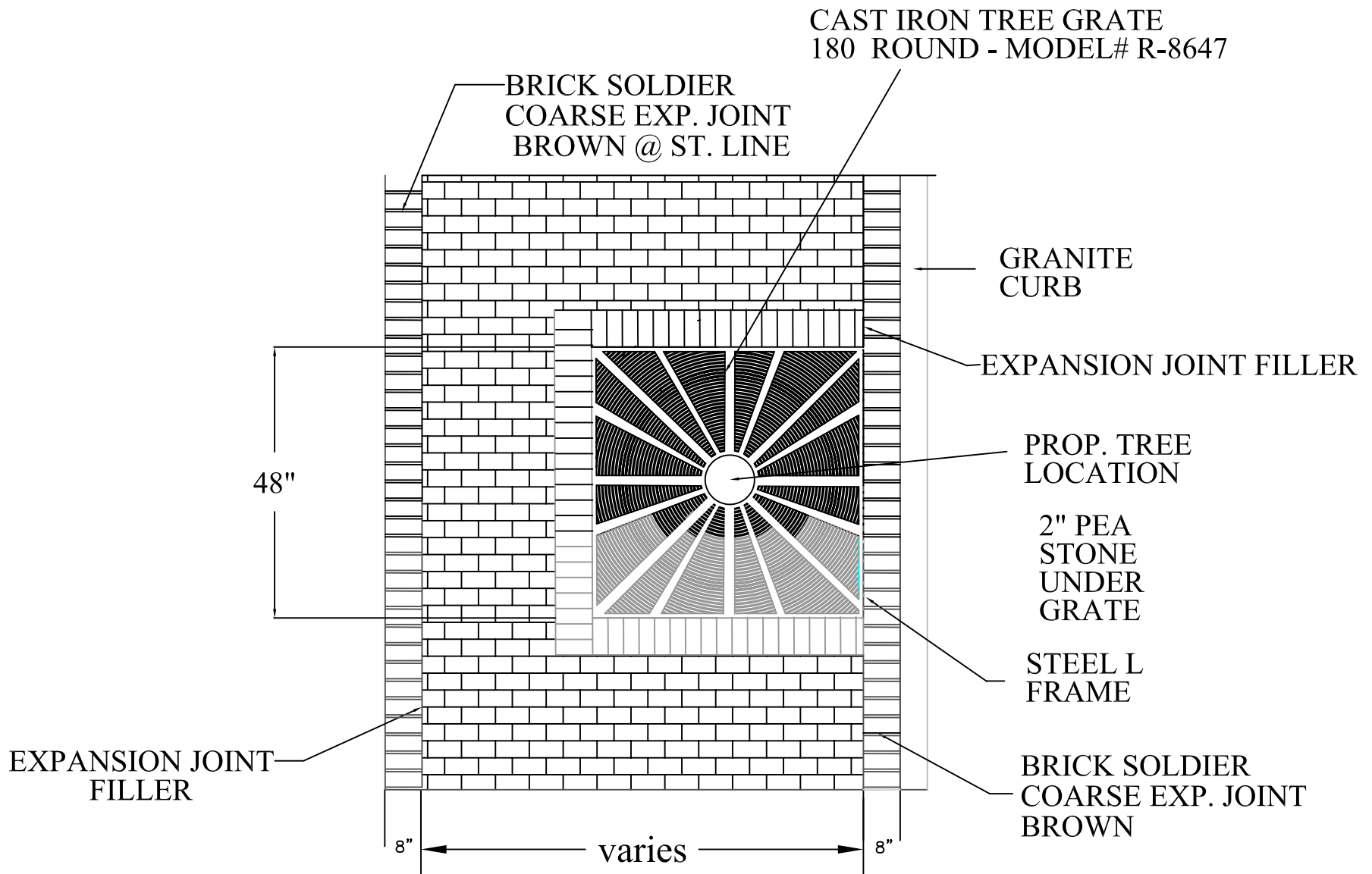
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# BRICK SIDEWALK SIDEWALK TREATMENT AT DRIVES



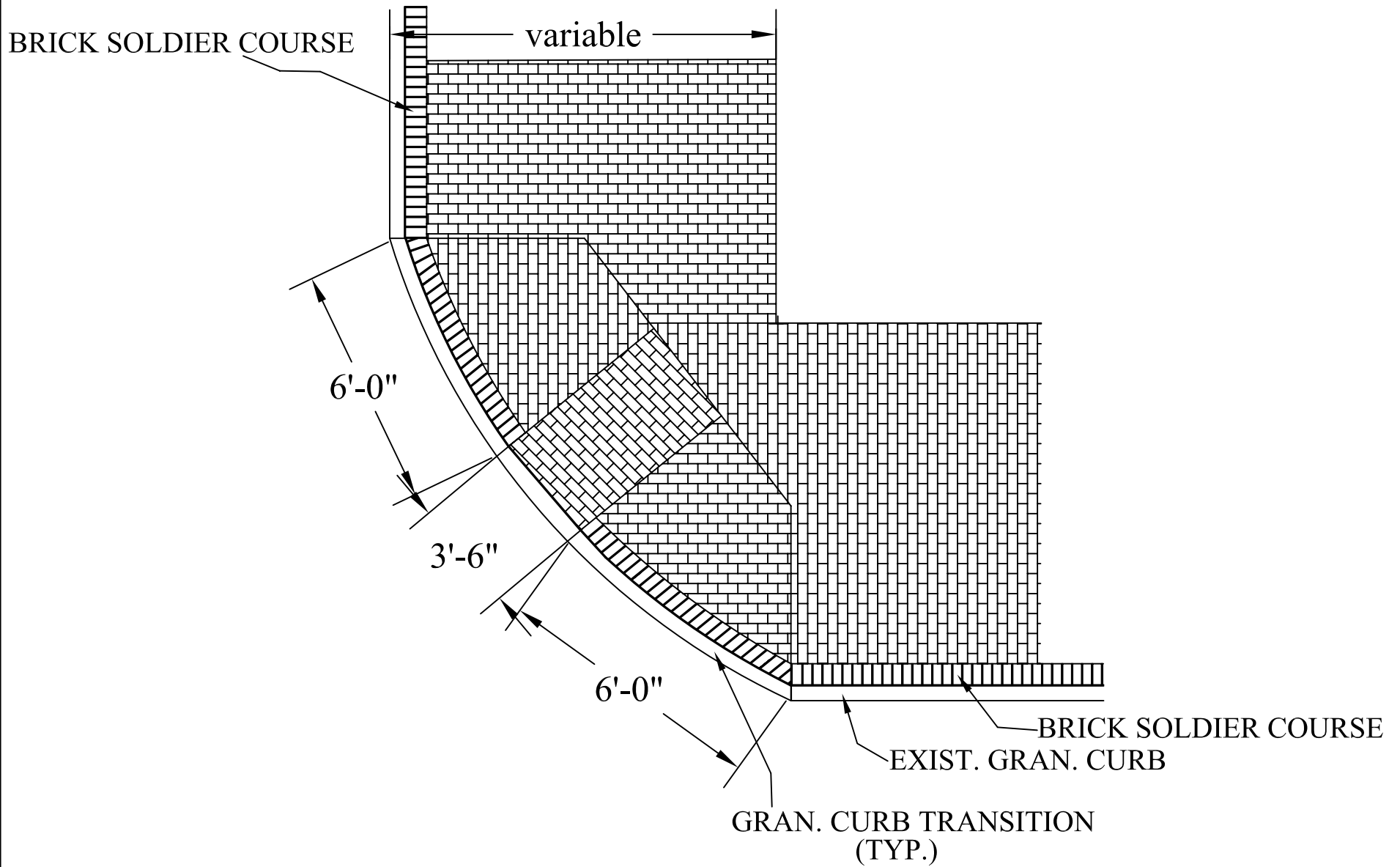
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# TREE PIT- TYPE- E



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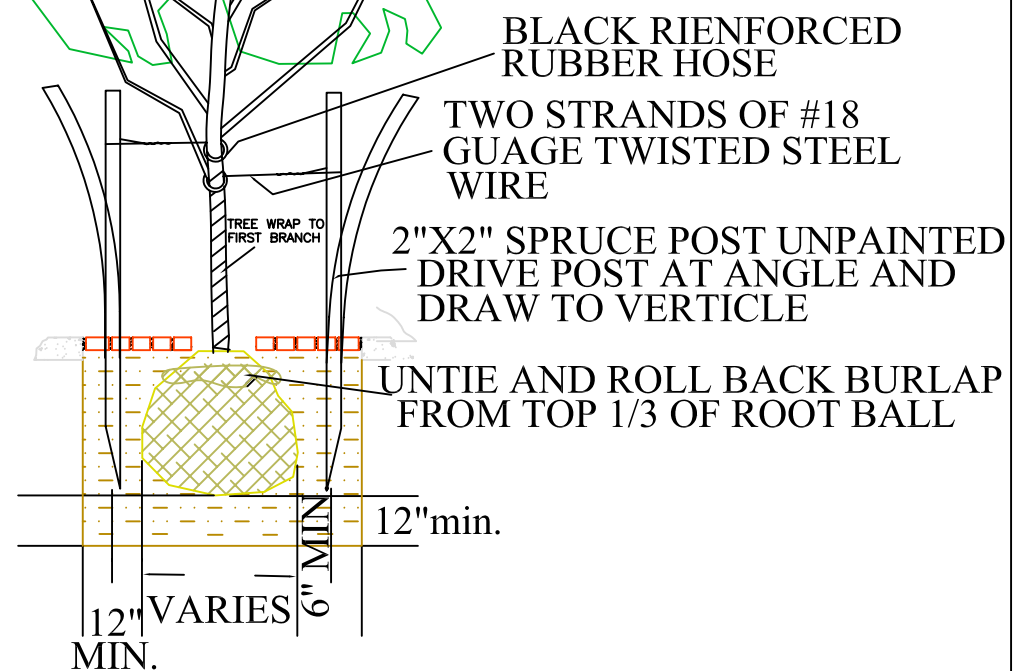
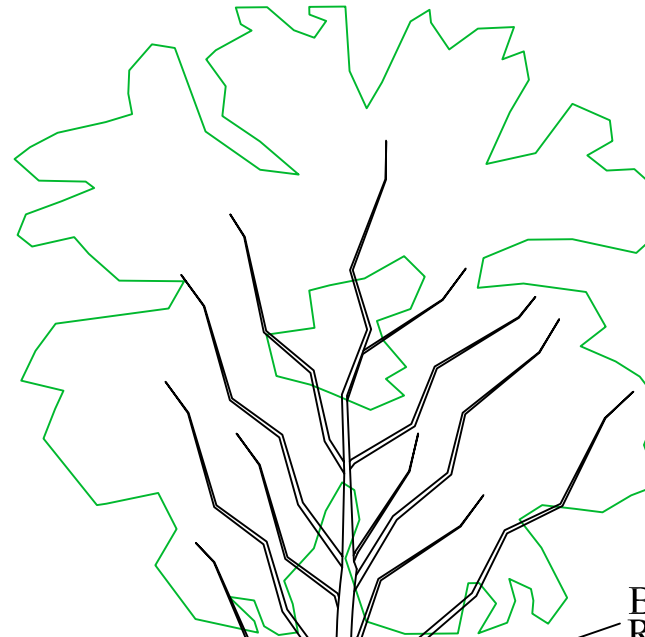
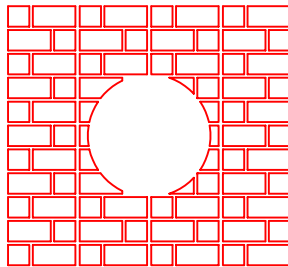
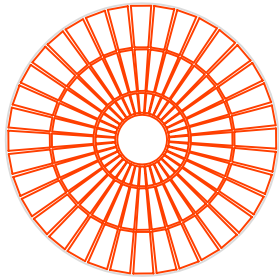
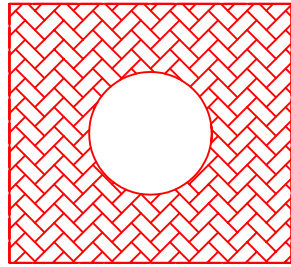
# BRICK WHEELCHAIR RAMP



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# BRICK TREE PLANTING

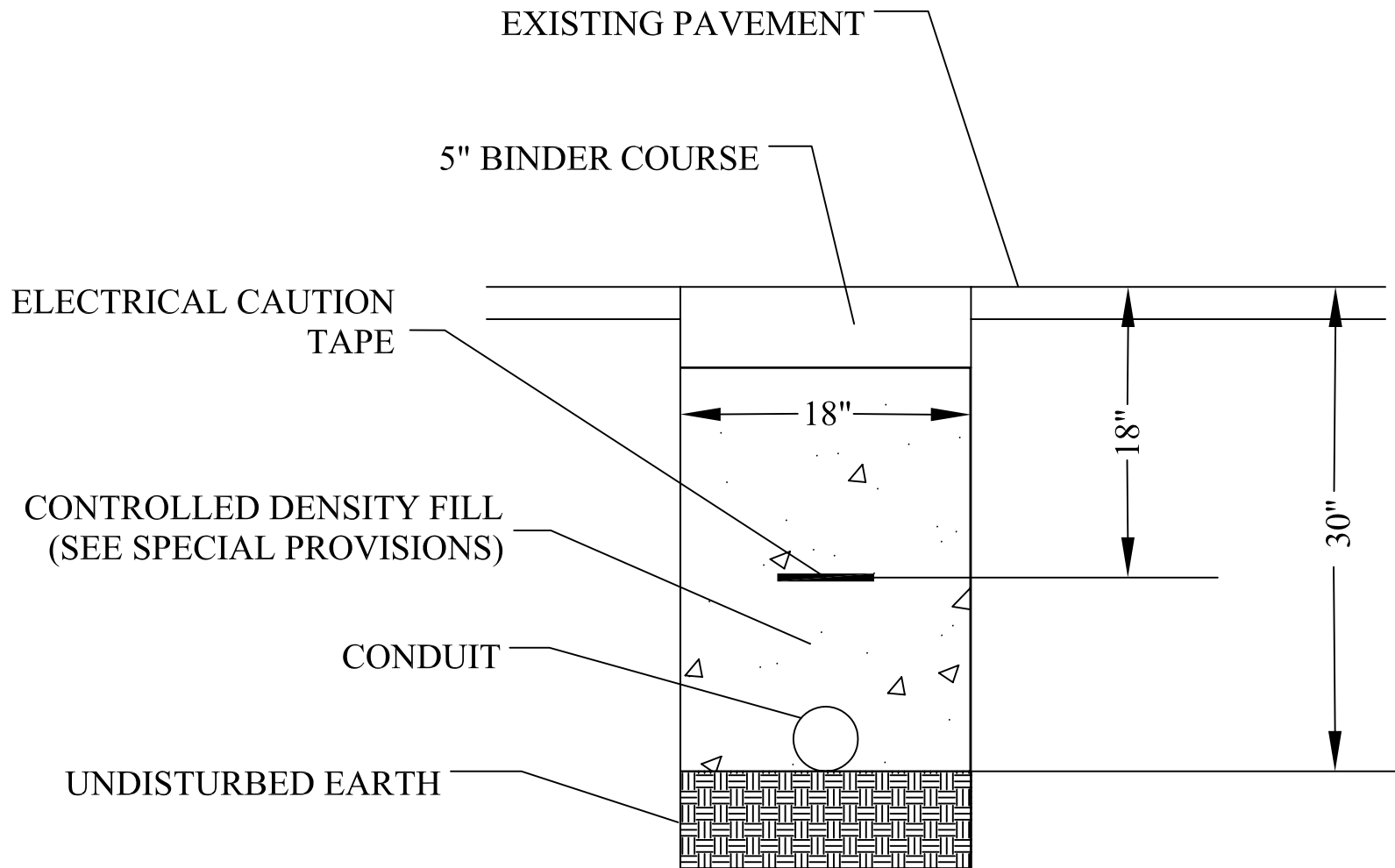


**NOTES:**

- TREES SHALL BE PLANTED PLUMB
- BRICK PAVERS SET ON A 2" LAYER OF SAND PLANTABLE SOIL MIXTURE (SEE SPECIAL PROVISIONS) COVERED BY A LAYER OF WEED BLOCKING FABRIC

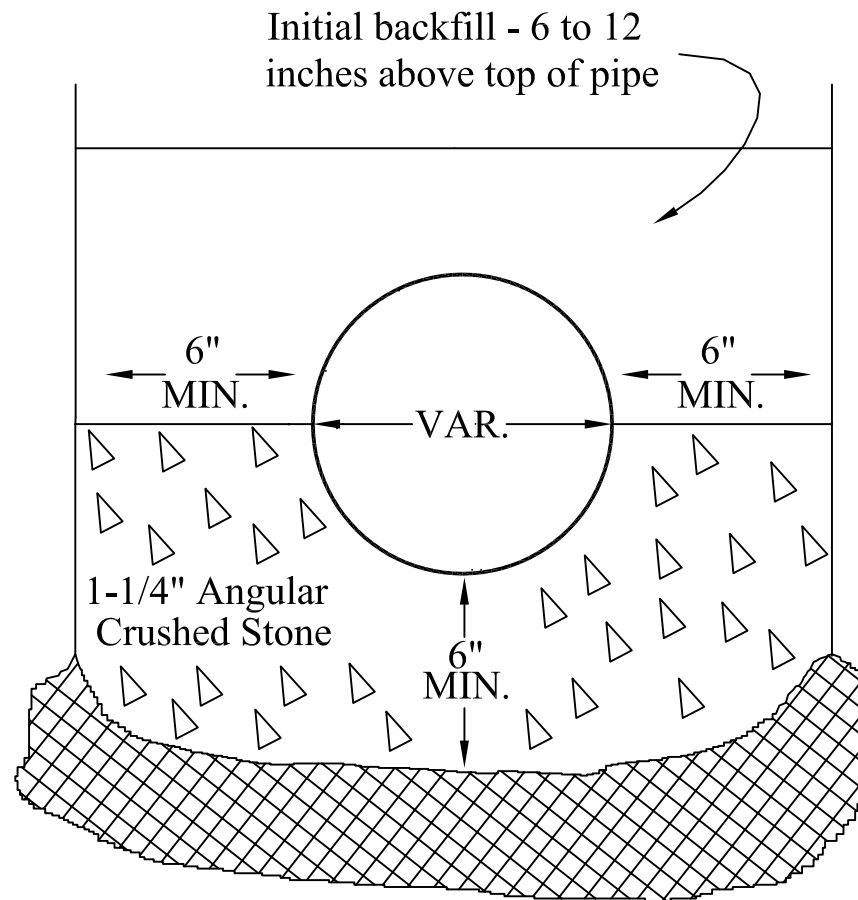
Last Modified: 04/09/2025 at 10:39AM EDT

# TRAFFIC SIGNAL CONDUIT TRENCH

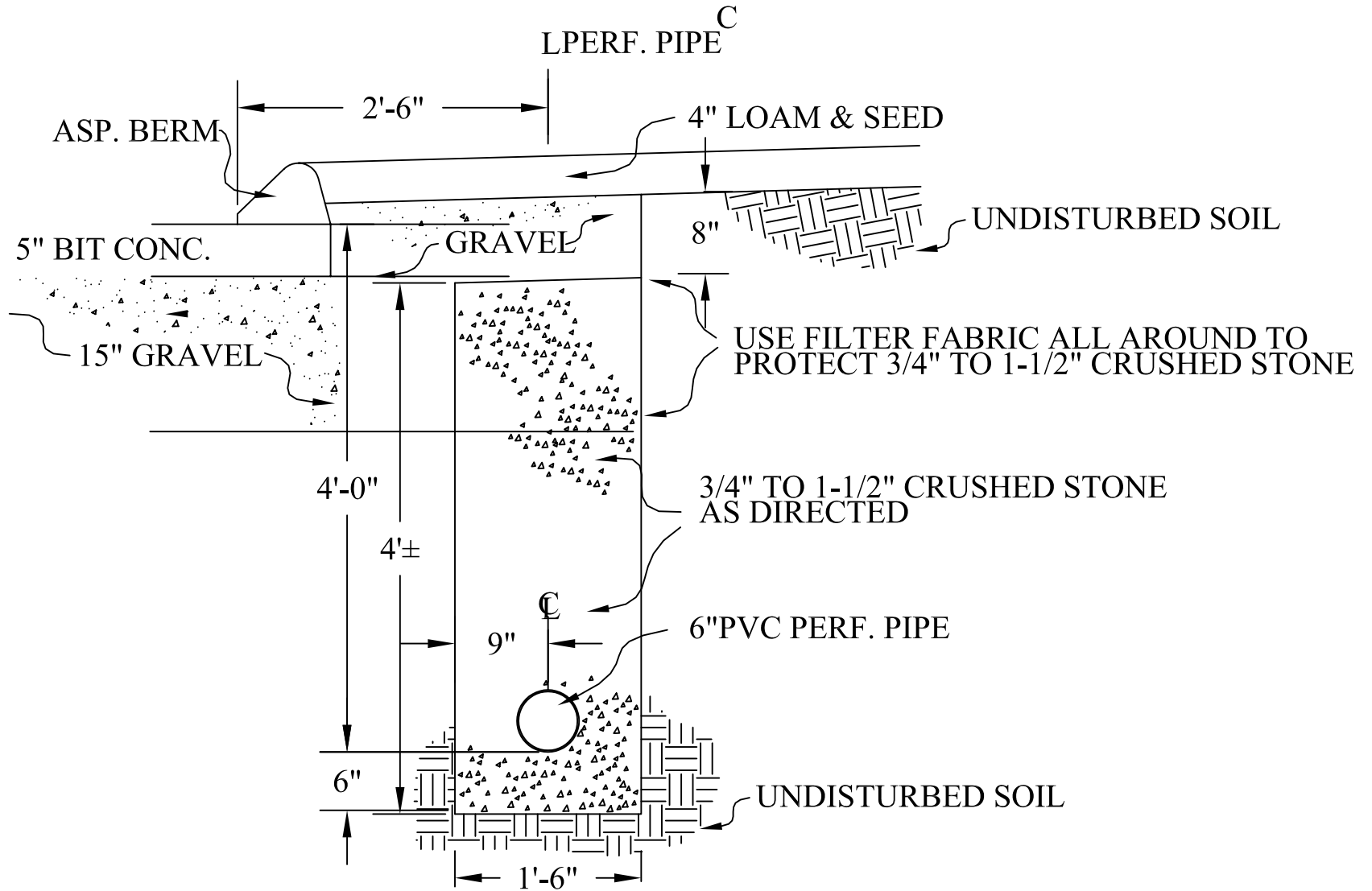


Last Modified: 04/09/2025 at 10:39AM EDT

# RCP. CLASS IV PIPE TRENCH



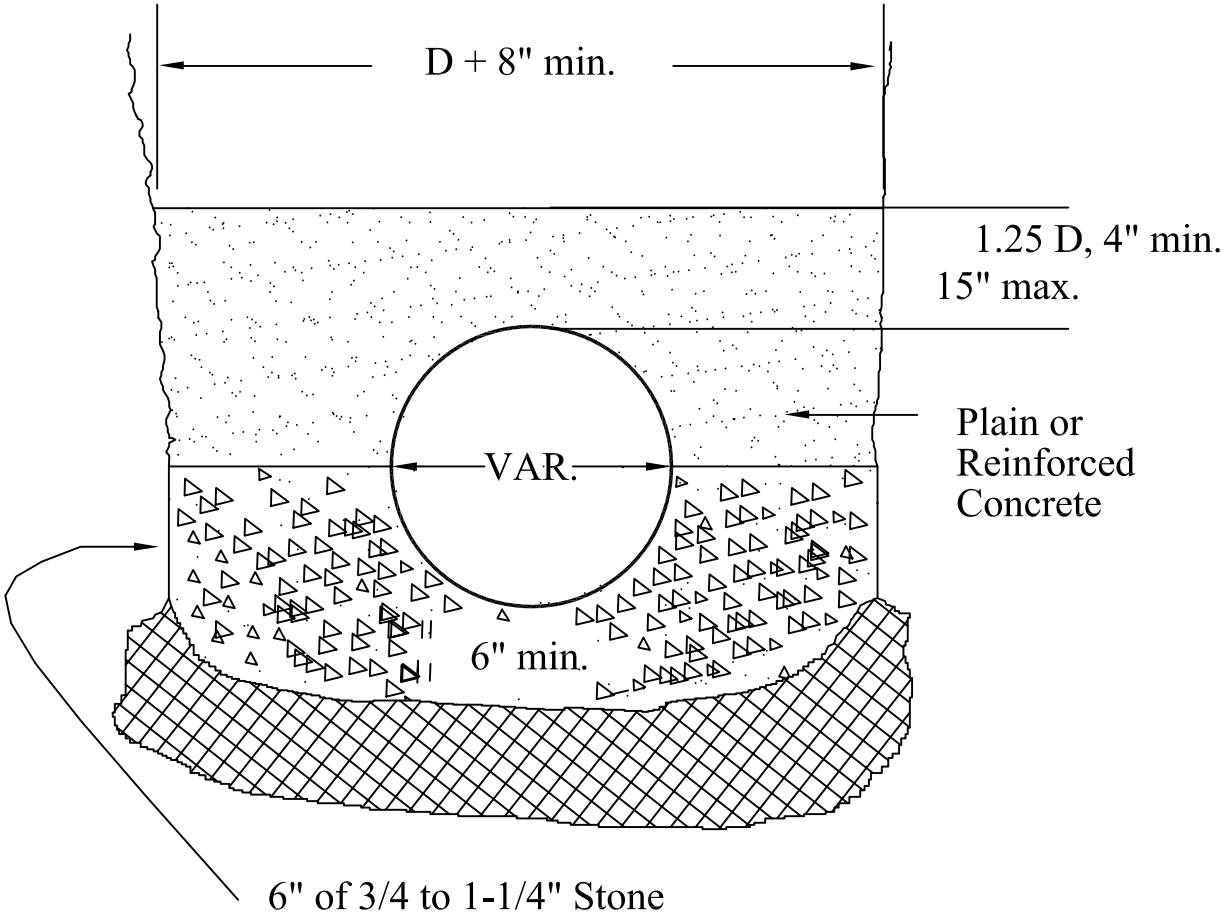
# PIPE SUBDRAIN



TYPICAL TRENCH DETAIL  
 6" SUB DRAIN  
 NOT TO SCALE  
 STA 4+50± TO 14+00±

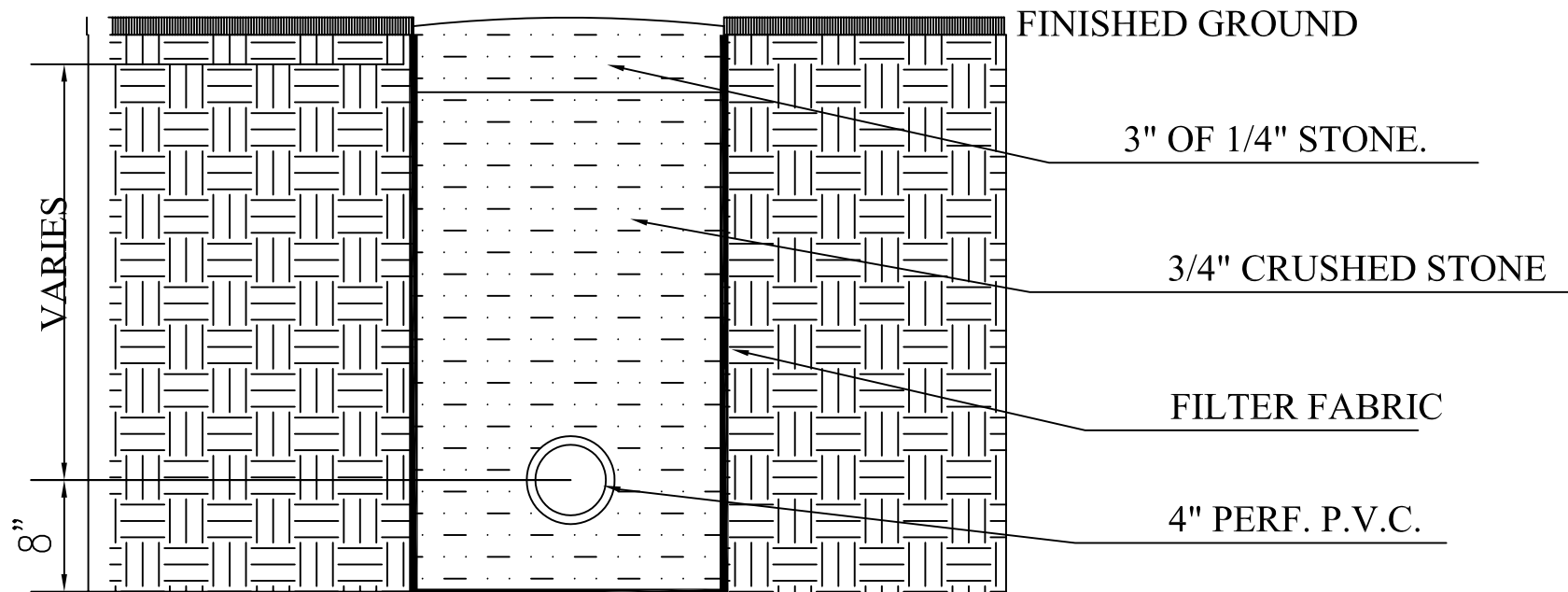
Last Modified: 04/09/2025 at 10:39AM EDT

# CLASS 'A' CONCRETE ARCH



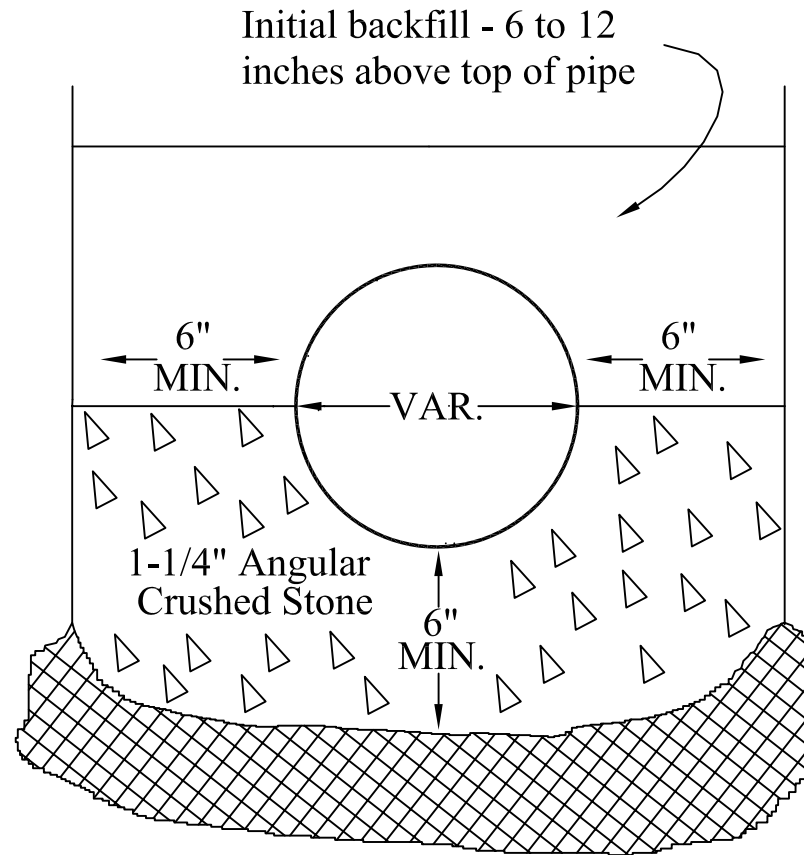
Last Modified: 04/09/2025 at 10:39AM EDT

# CURTAIN DRAIN

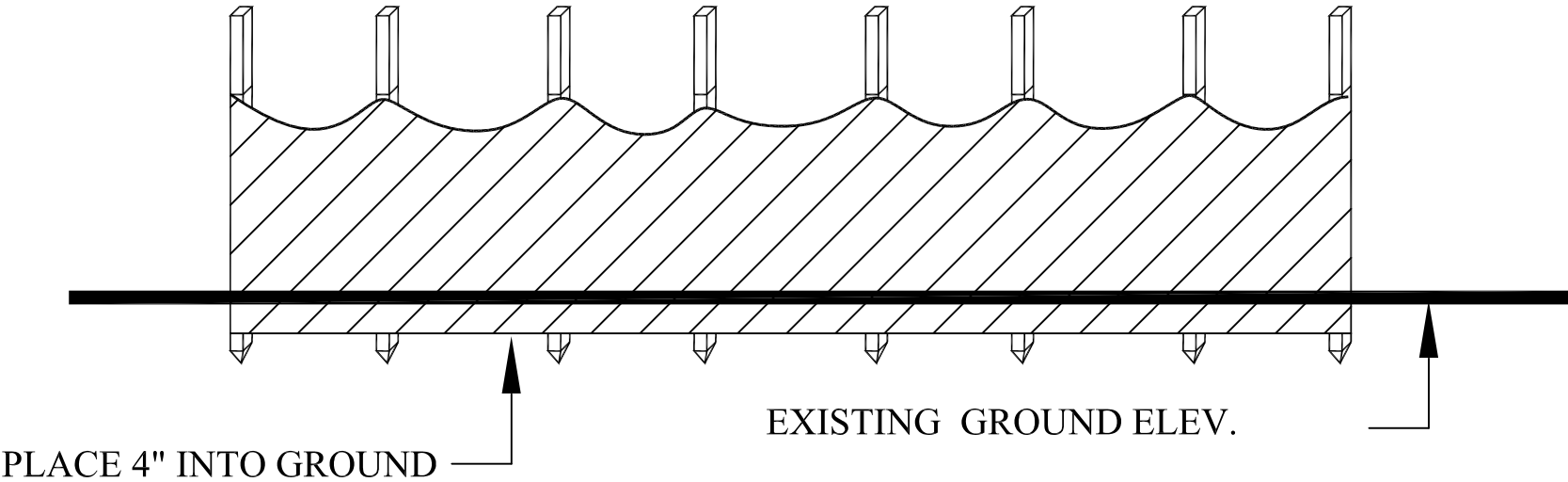


Last Modified: 04/09/2025 at 10:39AM EDT

# PVC-SDR35 PIPE TRENCH



# SILT FENCE

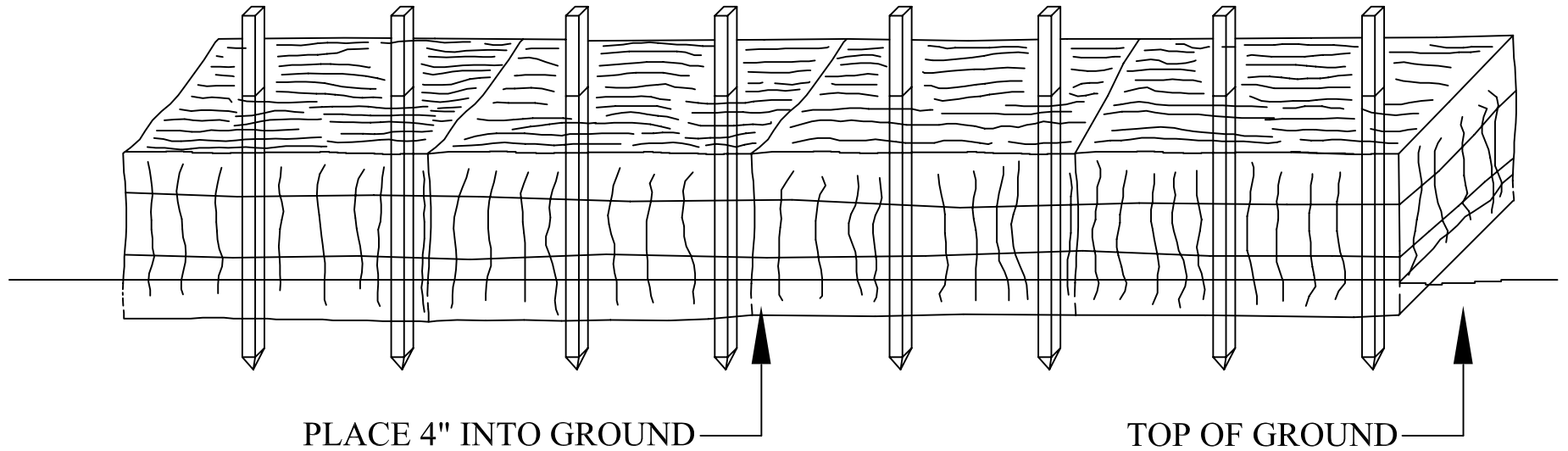


MITAGATION MEASURE

Last Modified: 04/09/2025 at 10:39AM EDT

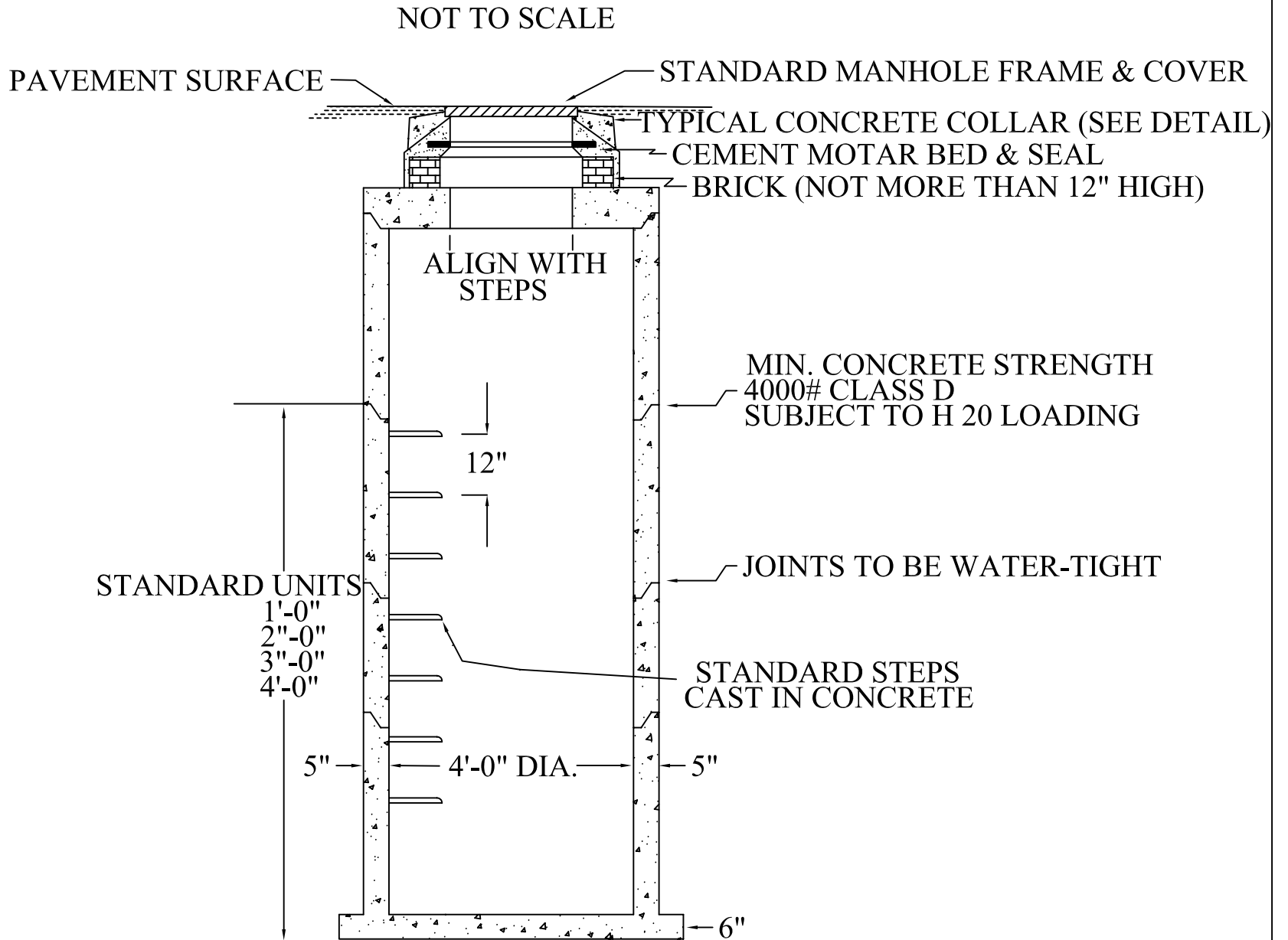


# STAKED HAY BALES



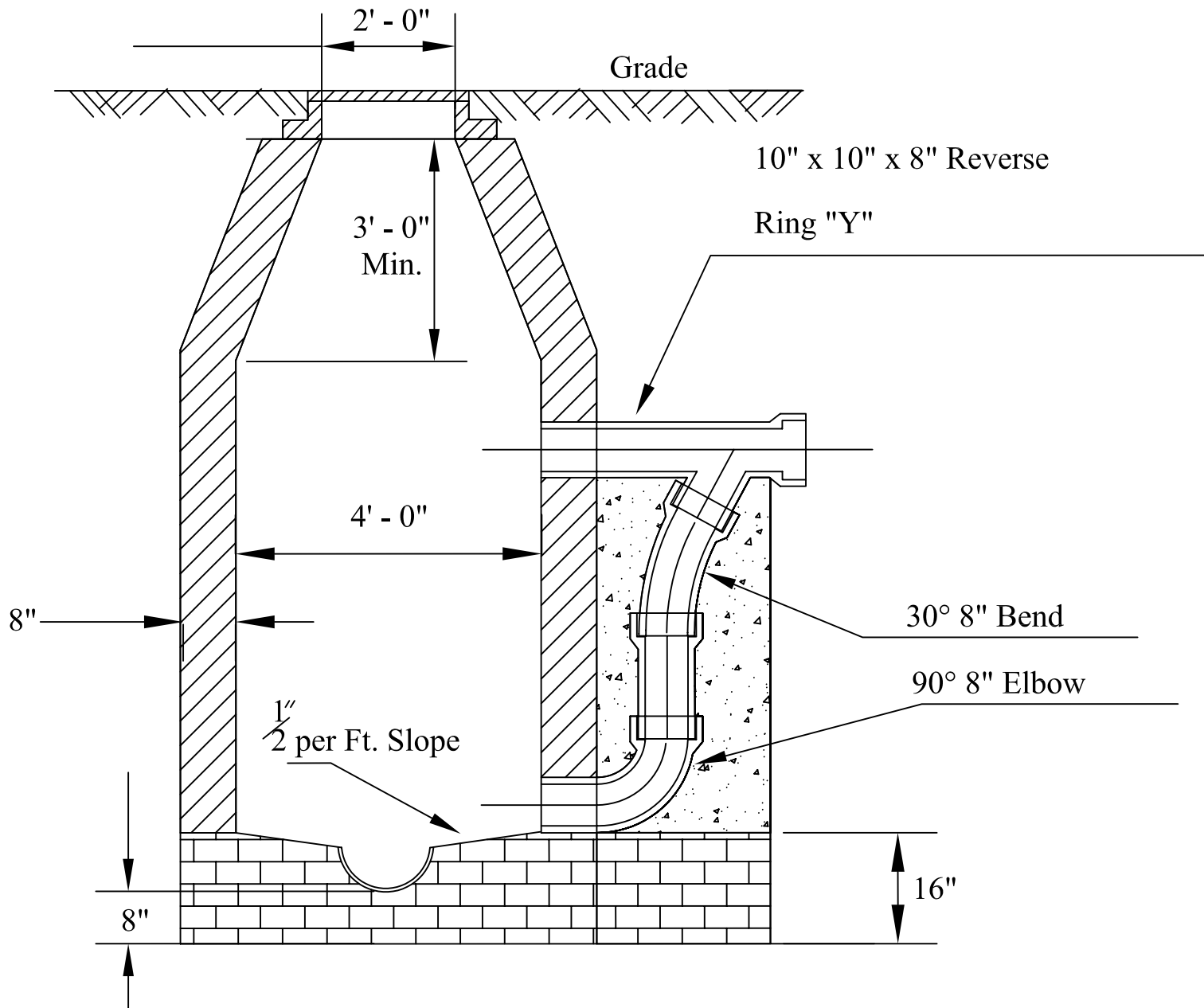
Last Modified: 04/09/2025 at 10:39AM EDT

# TYPICAL PRECAST CONCRETE MANHOLE



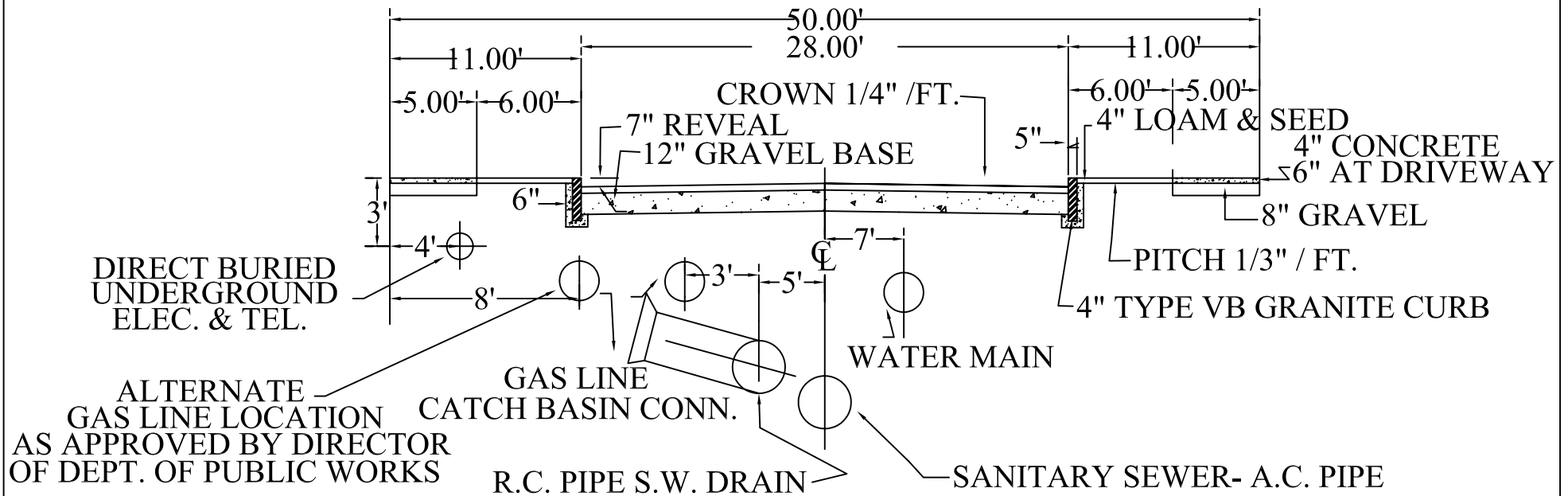
Last Modified: 04/09/2025 at 10:39AM EDT

# TYPICAL SECTION OF DROP TYPE MANHOLE



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# STREET TYPICAL SECTION FOR UTILITIES



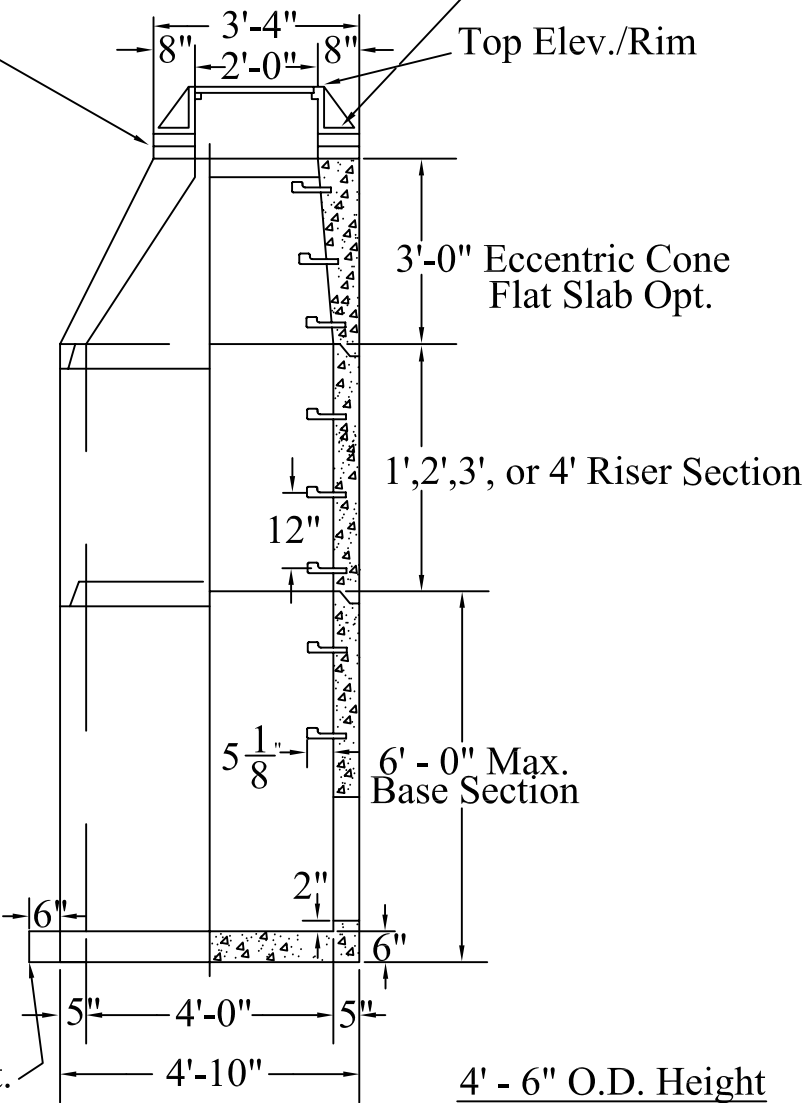
## NOTES:

- WHERE PRACTICABLE STORMWATER LINES ARE PLACED 5' OFF THE CENTER LINE ON THE SOUTH OR WEST SIDE OF THE STREET
- WATER MAINS ARE 18' OFF STREET LINE, EITHER NORTH OR EAST SIDE OF THE STREET
- CONNECTIONS FROM CATCH BASINS TO MANHOLES- V.C. PIPE- CLASS 200-64T OR EQUAL
- SURFACE COURSE 3" TYPE I BIT. CON. LAID IN TWO COURSES- 1 1/2" TOP COURSE  
1 1/2" BINDER COURSE

# PRECAST CB OFFSET

Frame & cover - by others

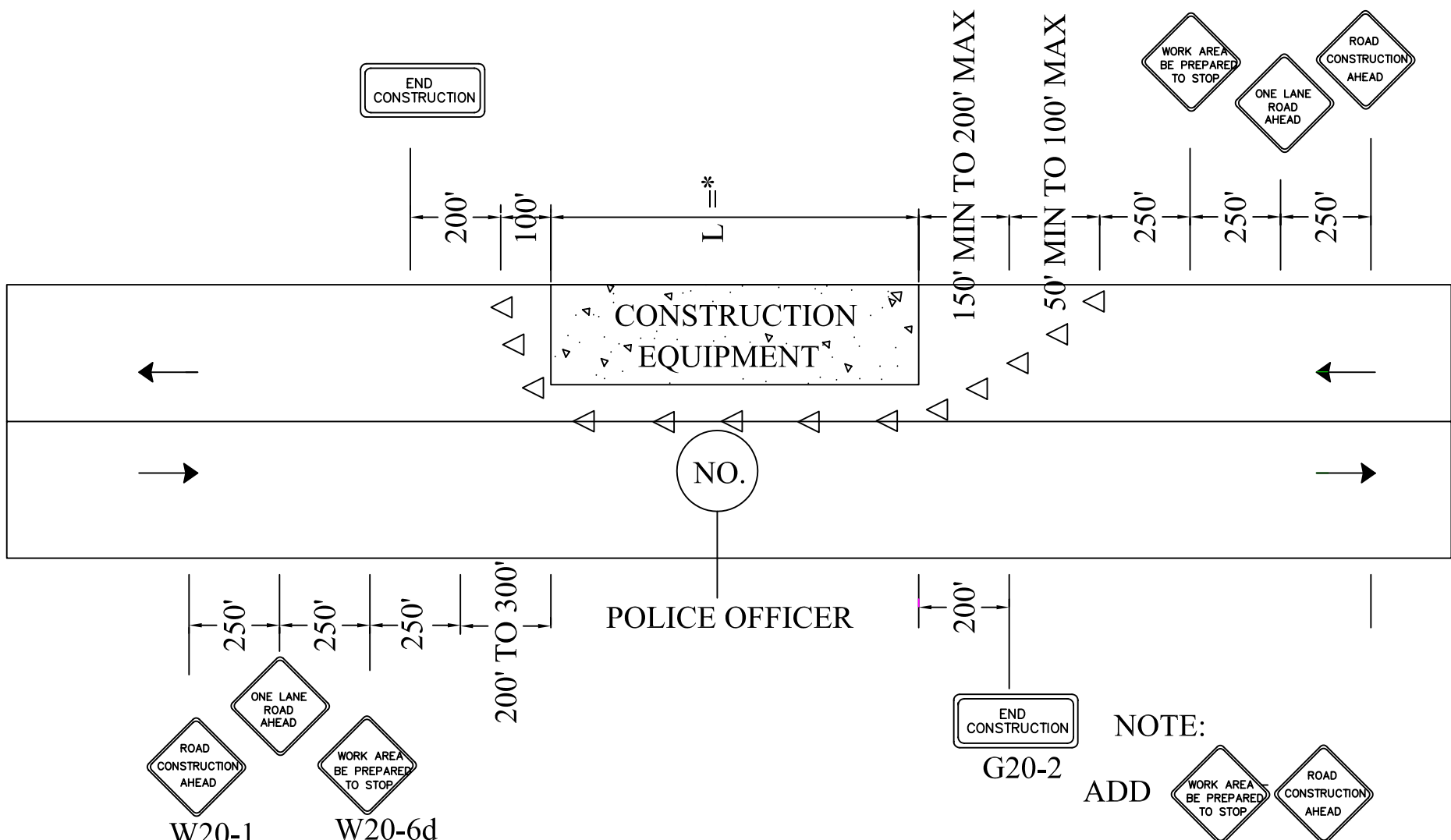
Adjust to grade w/brick - by others





Non-settling flanged foot on base - Opt.

ELEV. VIEW  
(NTS)

# TWO LANE TWO-WAY TRAFFIC CONTROL

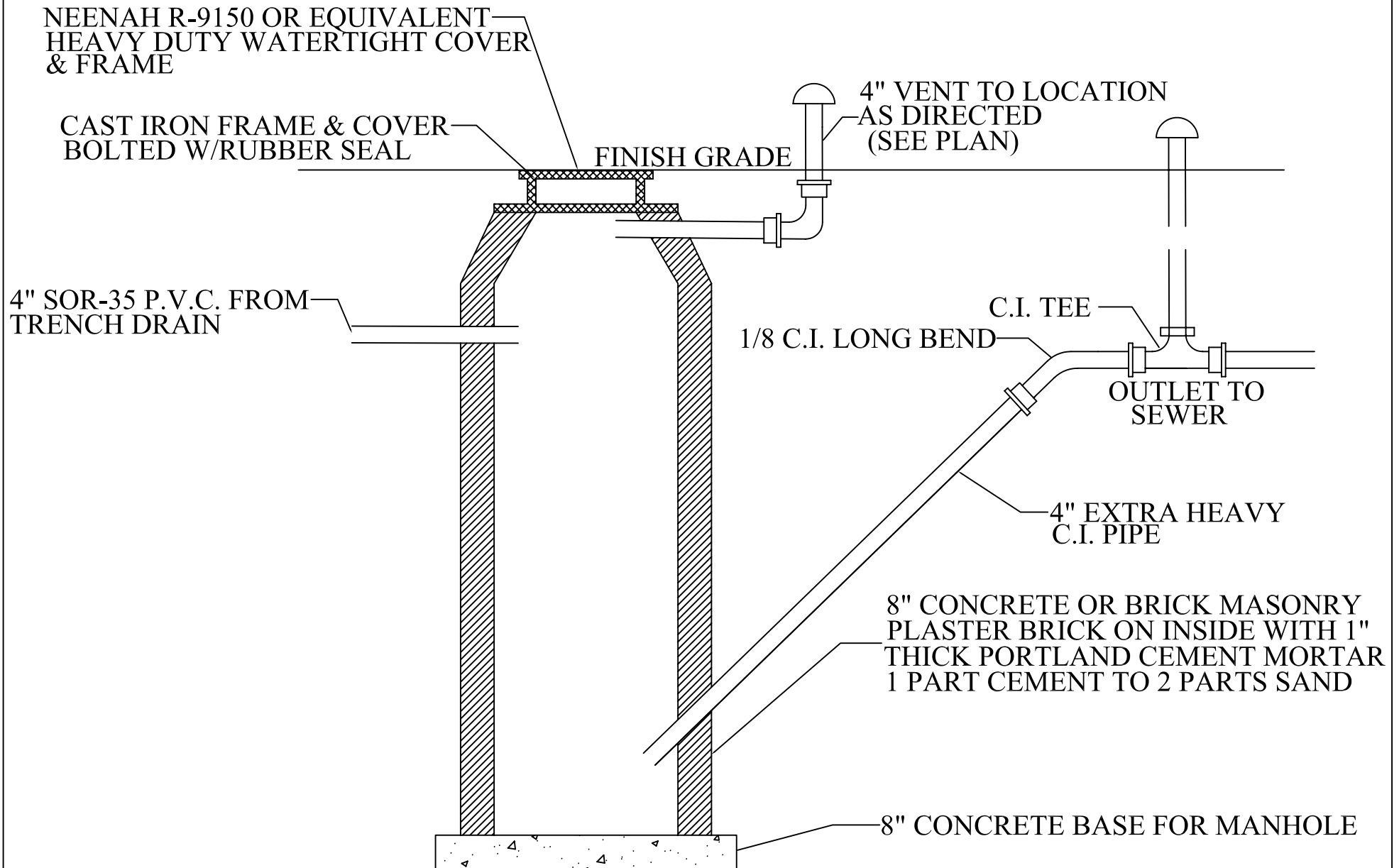


\* - WHEN APPLICABLE  
L=1/2 DAY'S LENGTH OF WORK

NOTE:  
ADD    
TO ANY SIDE STREETS THAT ENTER UPON THE WORK AREA.

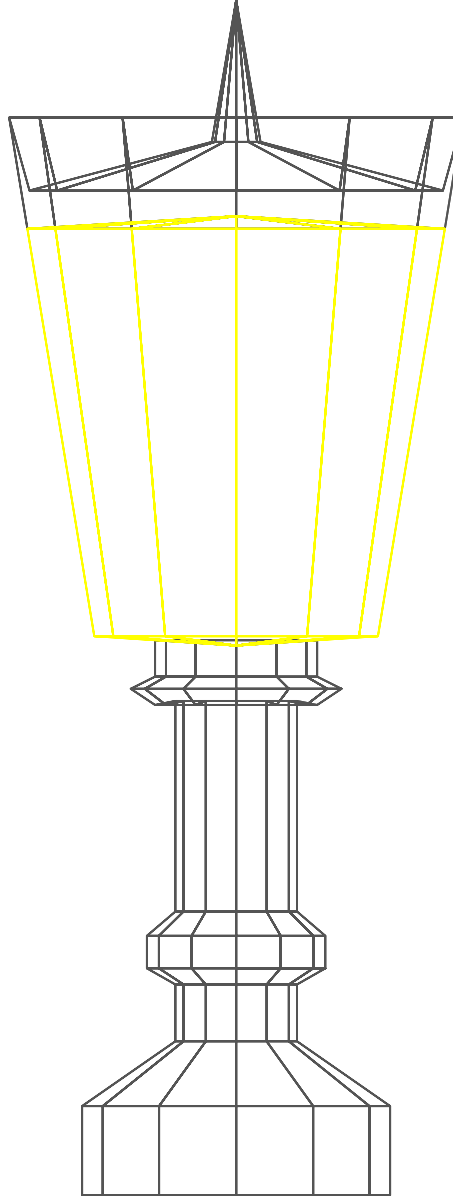
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# MDC GASOLINE TRAP MANHOLE



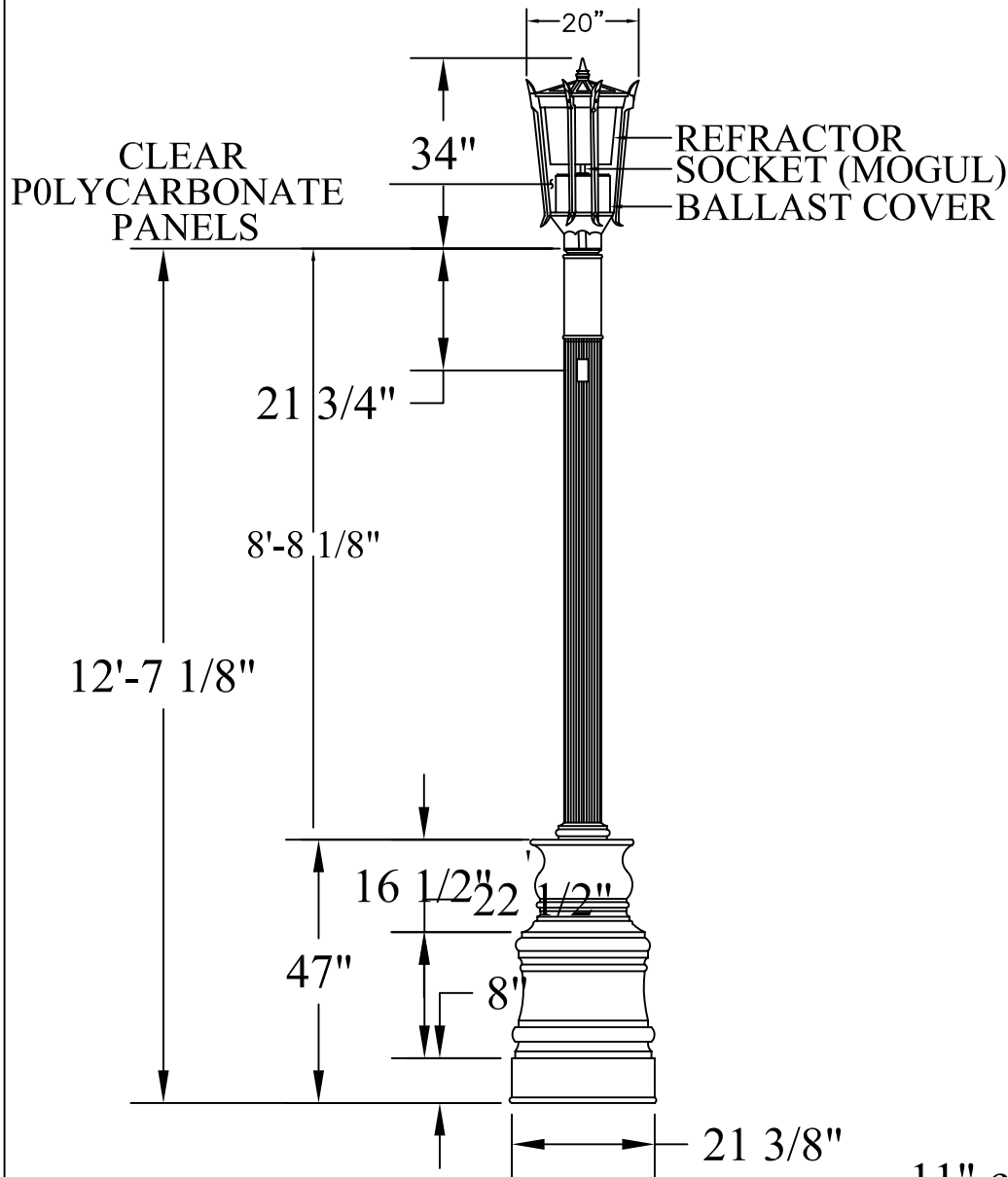
Last Modified: 04/09/2025 at 10:39AM EDT

# LIGHT POST STREETLIGHT HEAD





# DECORATIVE LIGHTING IVY STYLE

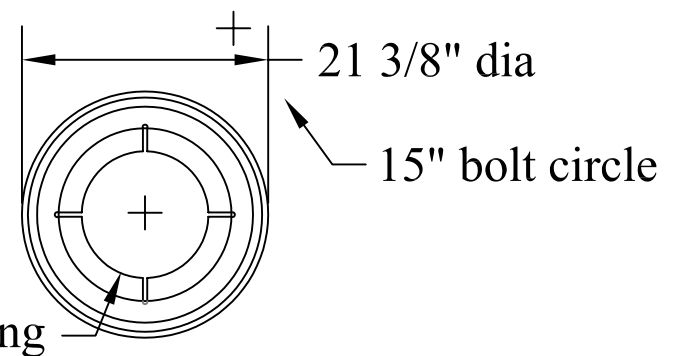


## LUMINARE SPECIFICATIONS

STYLE: EDGEWATER REFRACTIVE PANELS-7" FITTER  
 HEIGHT: 34"  
 WIDTH: 20" ACROSS POINT TO POINT  
 MATERIAL: CAST ALUMINUM  
 PANELS: CLEAR POLYCARBONATE  
 FINISH: BLACK  
 LAMPING: 70 WATT HIGH PRESSURE SODIUM  
 VOLTAGE: QUADRI- VOLTS BALLST WIRED FOR 120 VOLTS- HPF  
 REFRACTOR: TYPE5/PRISMATIC ACRYLIC  
 HARDWARE: STAINLESS STEEL  
 WEIGHT: 50 POUNDS APPROX.

## LAMP POST SPECIFICATIONS

STYLE: IVY  
 HEIGHT: 12'-7 1/8"  
 LT CENTER: 14'-0 1/8"  
 BASE: 21 3/8" DIAMETER  
 FINISH: PRIME PAINT BLACK



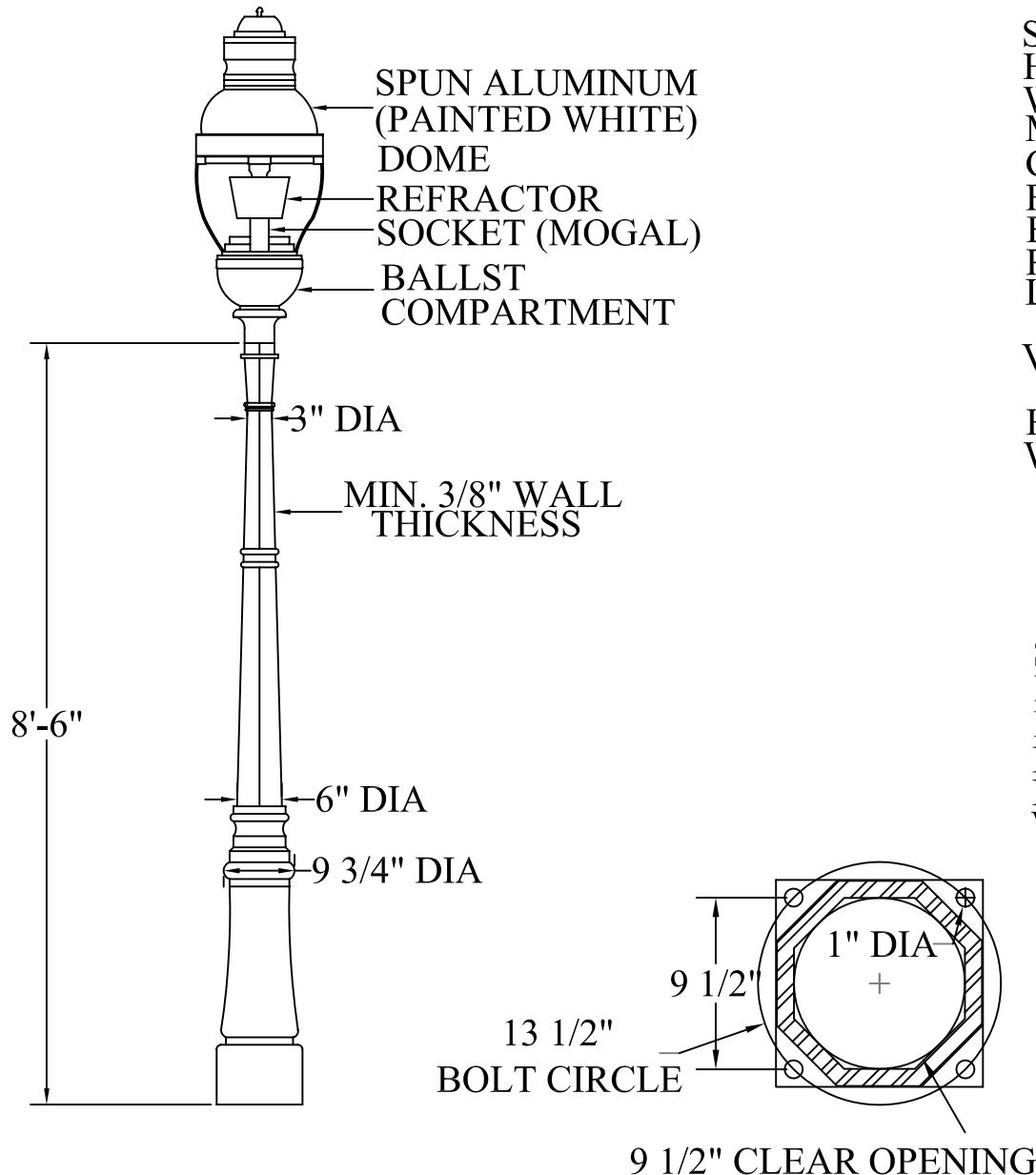
# DECORATIVE LIGHTING BOROUGH STYLE

## LUMINAIRE SPECIFICATIONS

STYLE: READING  
 HEIGHT: 43 7/8"  
 WIDTH: 17 1/8"  
 MATERIAL: CAST ALUMINUM  
 GLOBE: CLEAR POLYCARBONATE  
 FINISH: FINISH PAINT (BLACK)  
 BALLAST: INTEGRAL  
 REFRACTOR: PRISMATIC GLASS TYPE 5  
 LAMPING: 70 WATT HIGH PRESSURE  
 SODIUM  
 VOLTAGE: QUADRA-VOLT BALLAST  
 WIRED FOR 120 VOLTS  
 HARDWARE: STAINLESS STEEL  
 WEIGHT: 40 POUNDS

## LAMP POST SPECIFICATIONS

STYLE: BOROUGH  
 HEIGHT: 8'-6"  
 LIGHT CENTER: 10'-0 3/4"  
 BASE: 11 1/2" SQUARE  
 FINISH: PRIME PAINT (BLACK)  
 WEIGHT 40 POUNDS

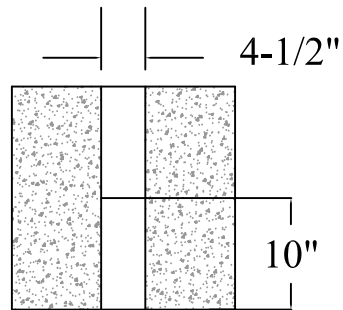


# PRECAST LIGHT POLE FOUNDATION

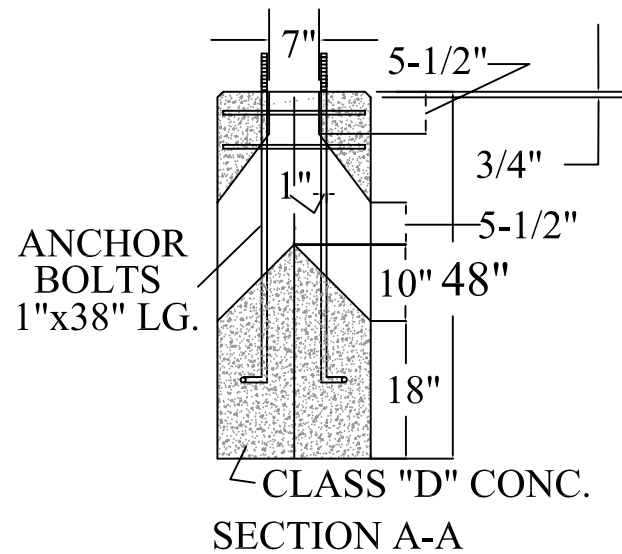
ANCHOR BOLTS TO BE SUPPLIED BY LIGHT POLE MANUFACTURER WITH NUTS & WASHERS  
 FILL WITH NONSHRINKING GROUT

BRICK SIDEWALK  
 1" MORTAR BED  
 4" CONC. SLAB  
 LEVELING NUTS  
 POLE FOUNDATION

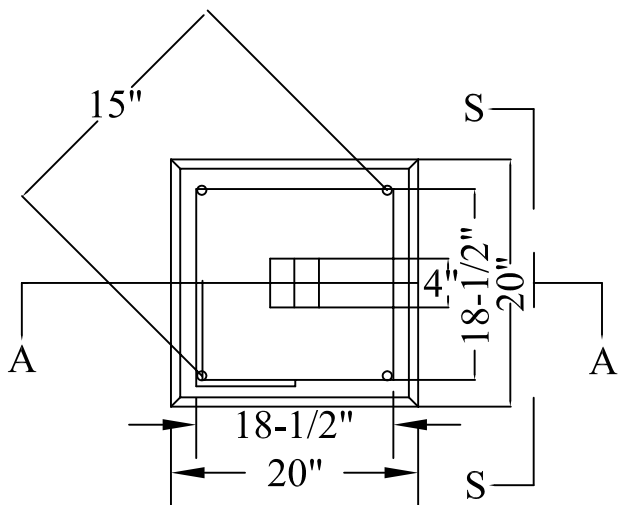
MOUNTING DETAIL



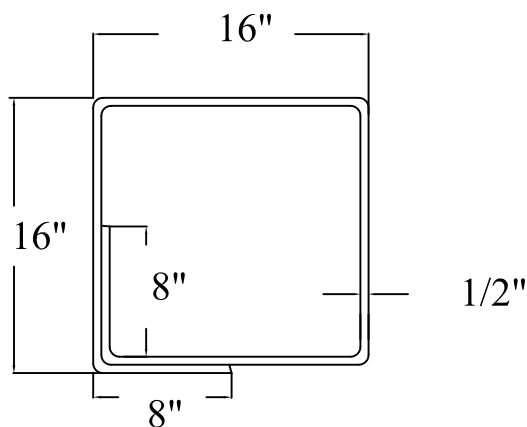
SECTION B-B



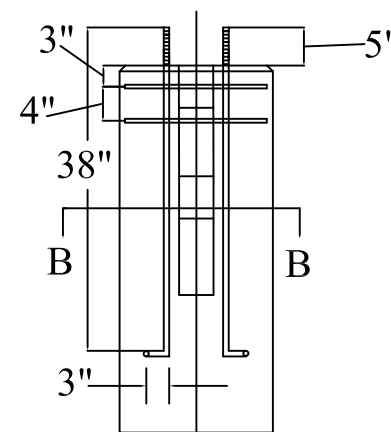
SECTION A-A



PLAN VIEW

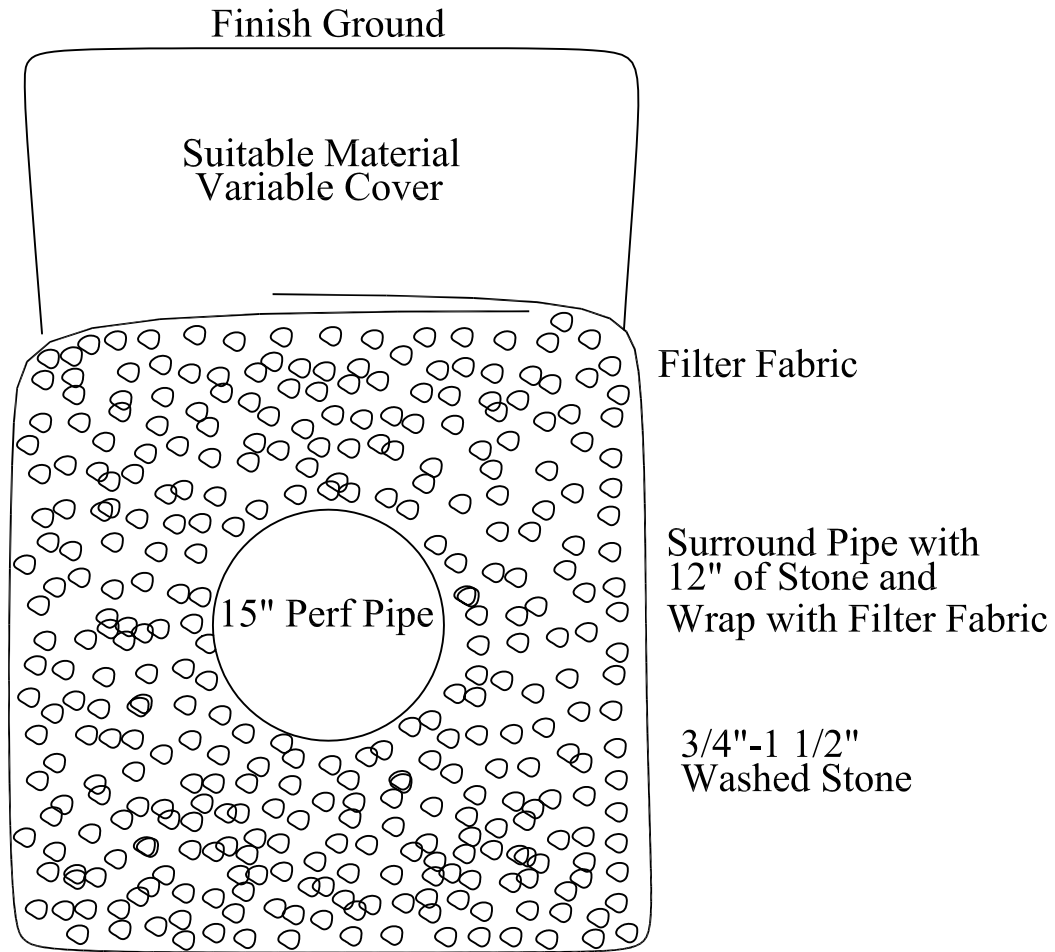


REINFORCING ROD  
 1/2" DIA.x 6'-8" LONG  
 BENT AS SHOWN



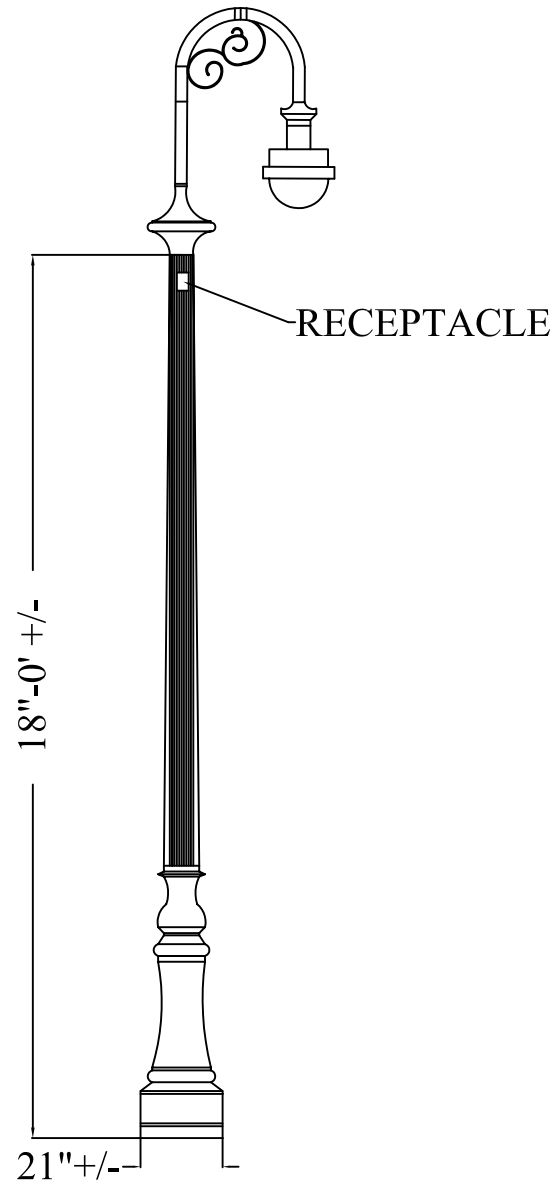
ELEVATION S-S

# TYPICAL LEACHING TRENCH



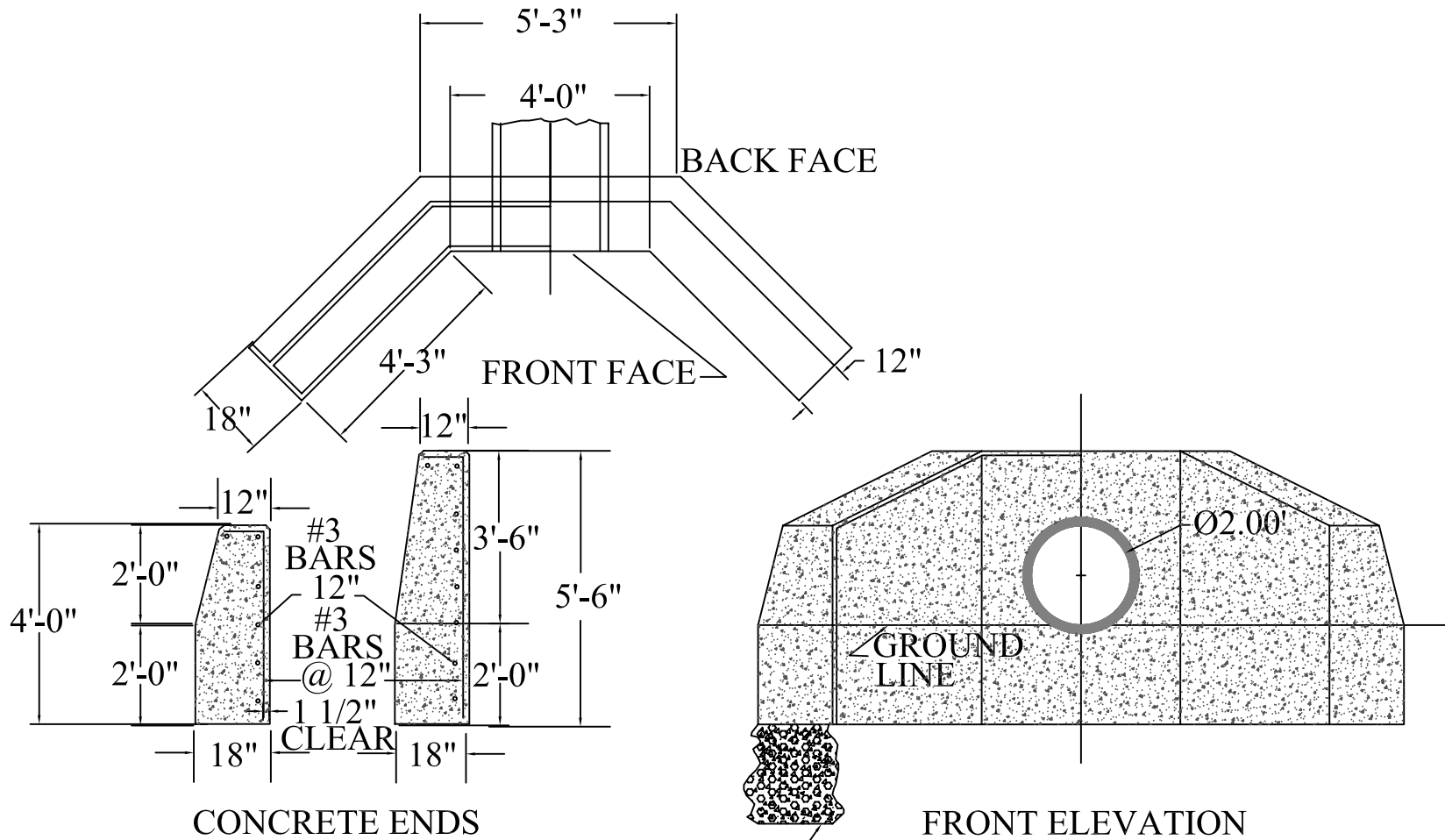
Last Modified: 04/09/2025 at 10:39AM EDT

# DECORATIVE LIGHTING BISHOP'S CROOK



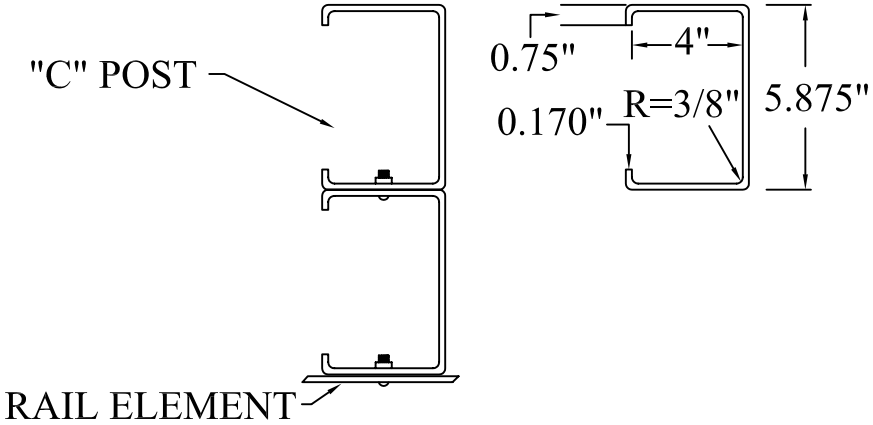
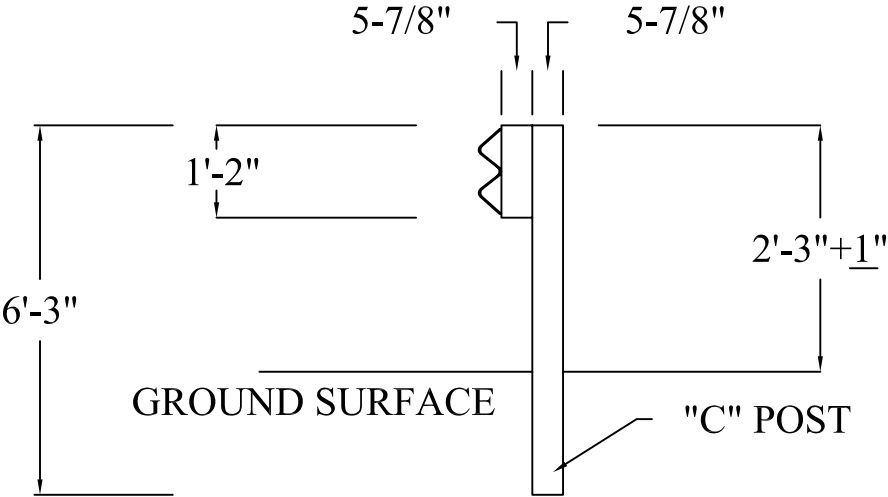
PROPOSED STREET LIGHTING  
AS PER SPECIAL PROVISIONS

# HEADWALL



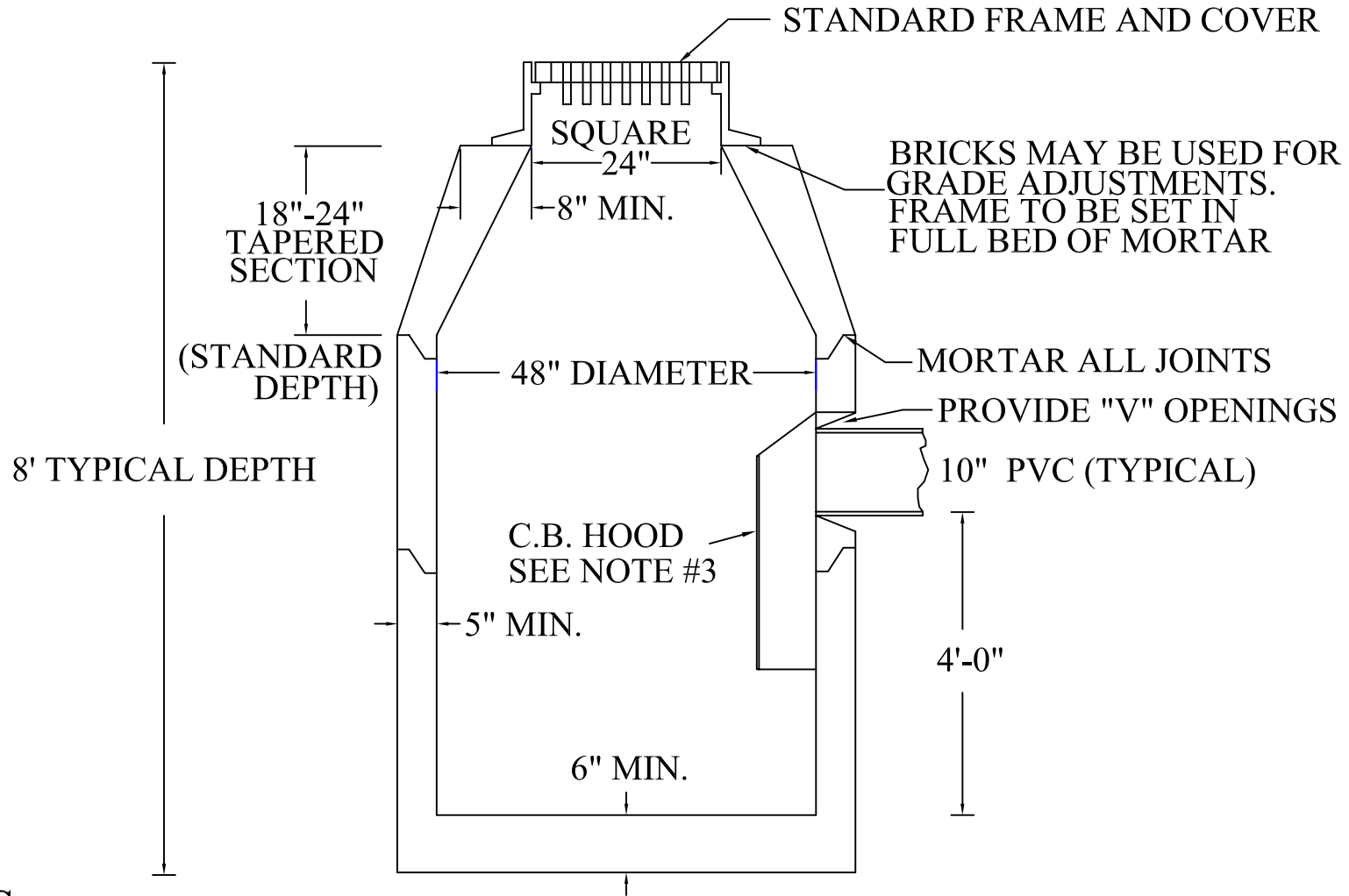
NOTE: 2' OF 3" STONE TO BE PLACED UNDER HEADWALL

# STEEL BEAM GUARD RAIL



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# PRECAST CONCRETE CATCH BASIN

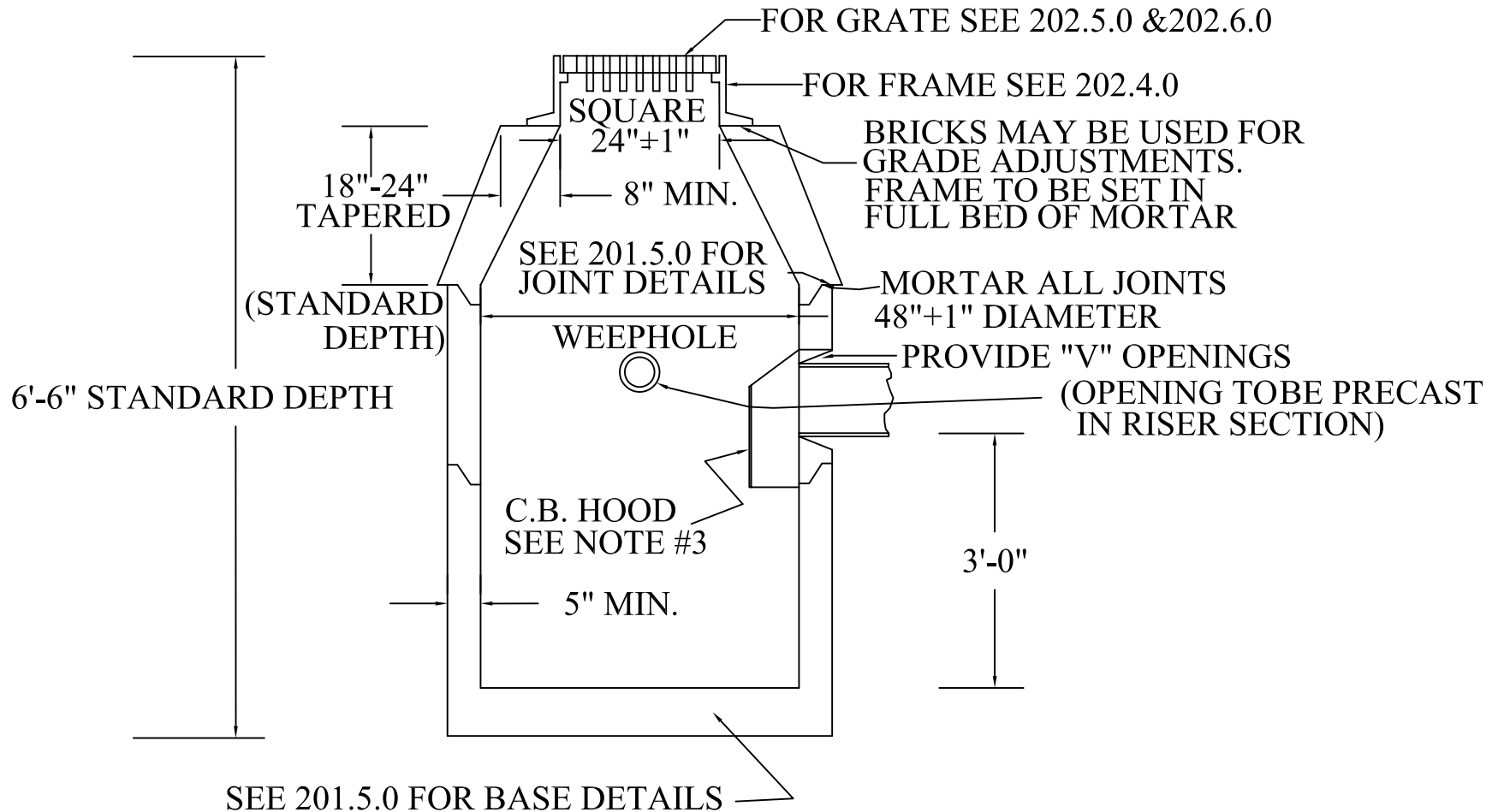


## NOTES:

1. MINIMUM CONCRETE STRENGTH 4000# CLASS D.
2. STRUCTURE SUBJECT TO H 20 LOADING.
3. MASS. HIGHWAY STANDARD CATCH BASIN HOOD SHALL BE INSTALLED ON OUTLET PIPE.
4. STRUCURE TO COMPLY WITH ALL CITY OF SPRINGFIELD DPW STANDARDS.



# PRECAST CONCRETE CATCH BASIN

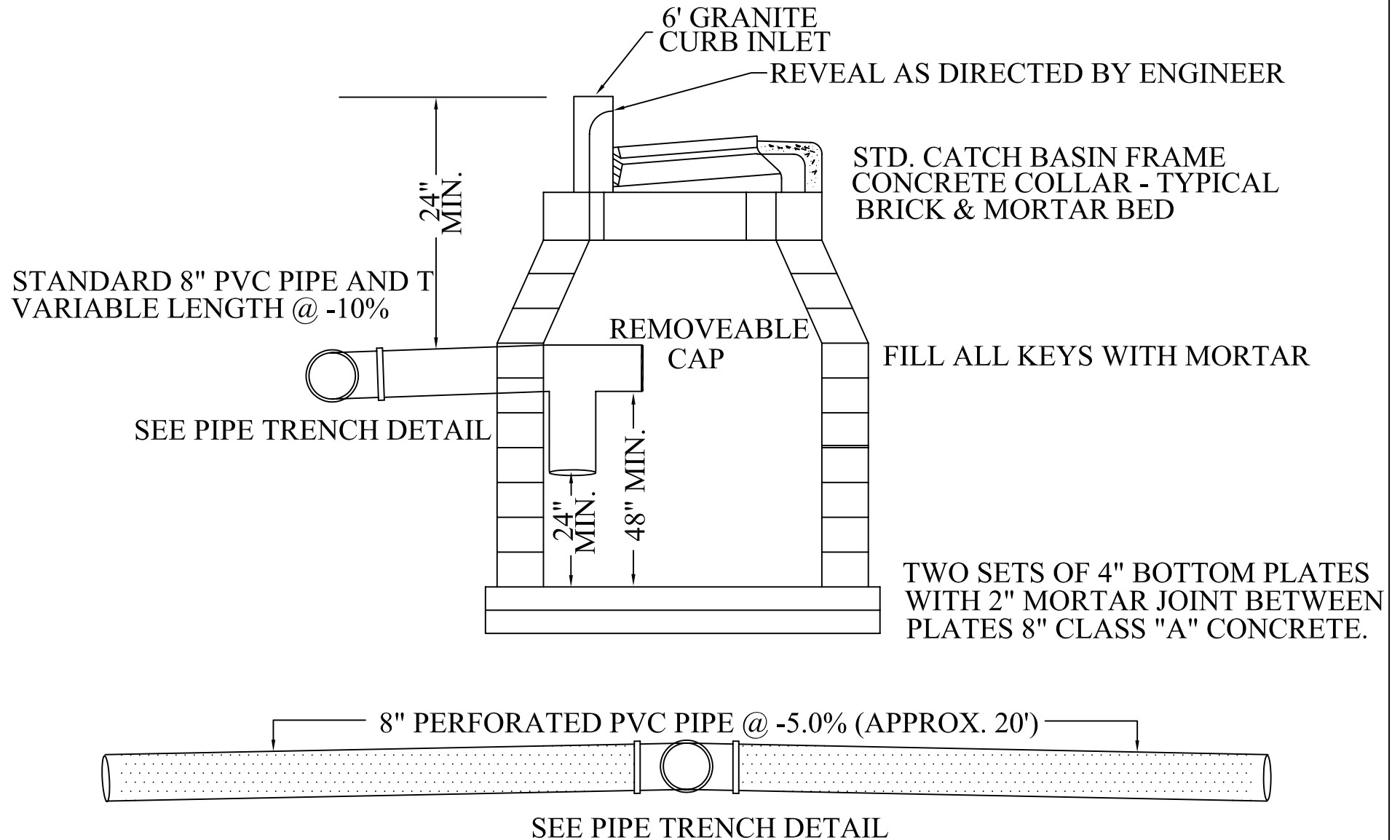


## NOTES:

\* WHEN A CURB IS INSTALLED, THE OPENING IS TO BE 24"±1"\*27"±1"

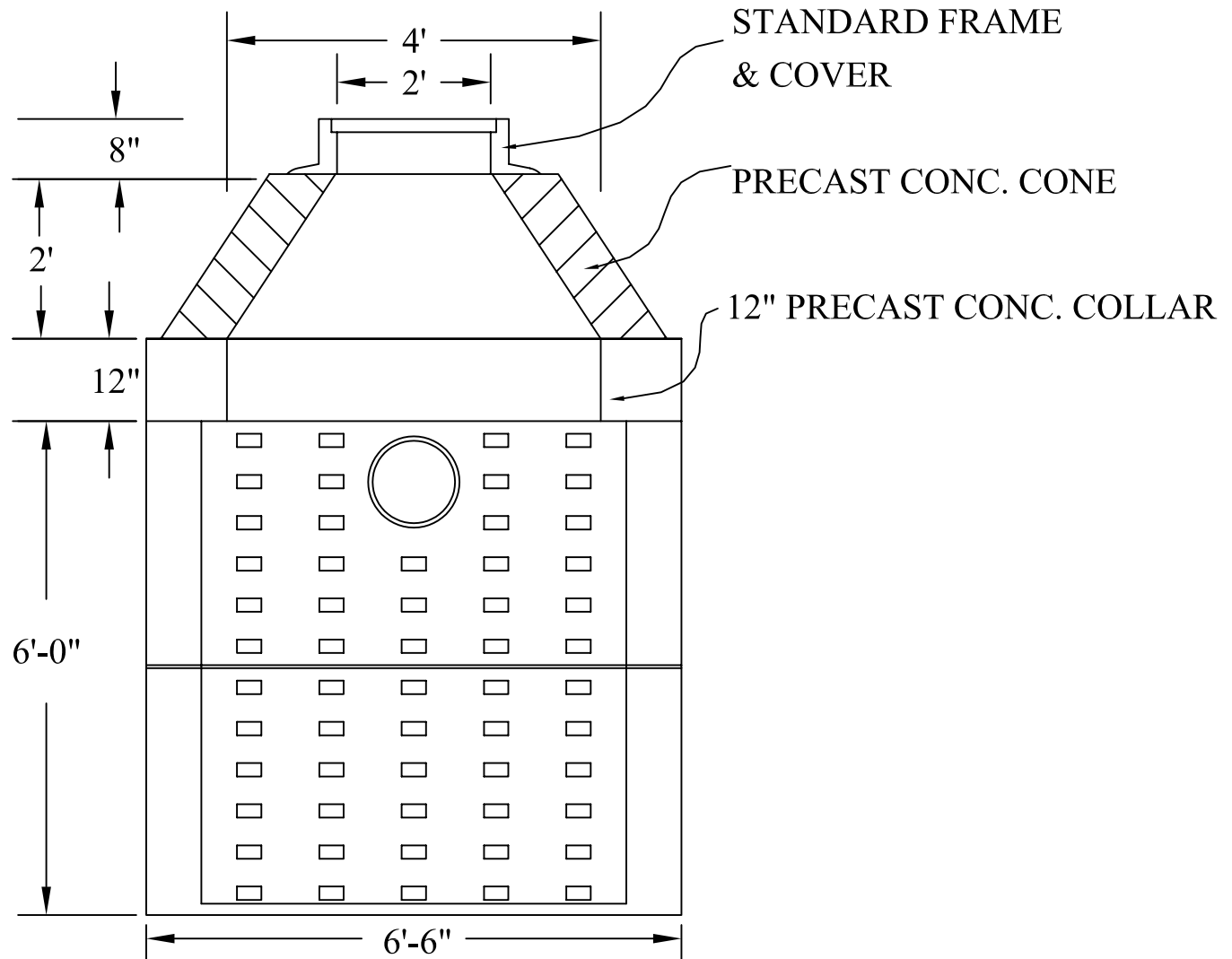
1. DETAILS NOT INDICATED ABOVE ARE TO BE SIMILAR TO THOSE SHOWN ON 202.1.0
2. FOR DESCRIPTIONS, MATERIALS AND CONSTRUCTION METHOD, SEE SPECIFICATIONS
3. MASS. STANDARD CATCH BASIN HOOD SHALL BE INSTALLED ON OUTLET PIPE (SEE 202.7.0)

# CATCH BASIN WITH PERFORATED PIPE OUTLET



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# TYPICAL LEACHING GALLEY

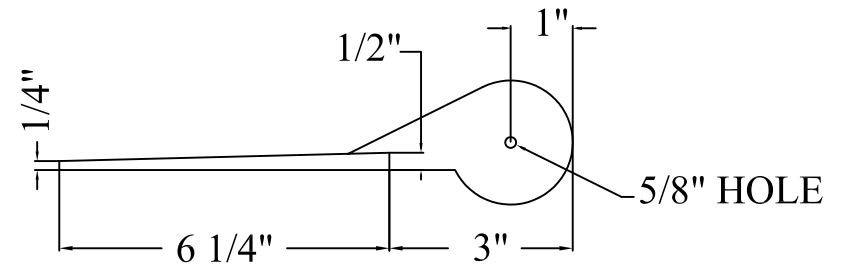
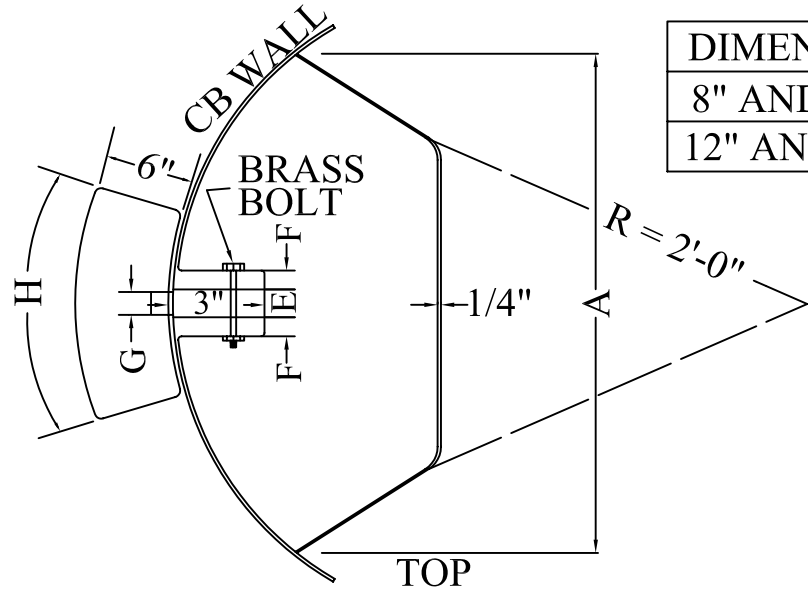


## NOTES:

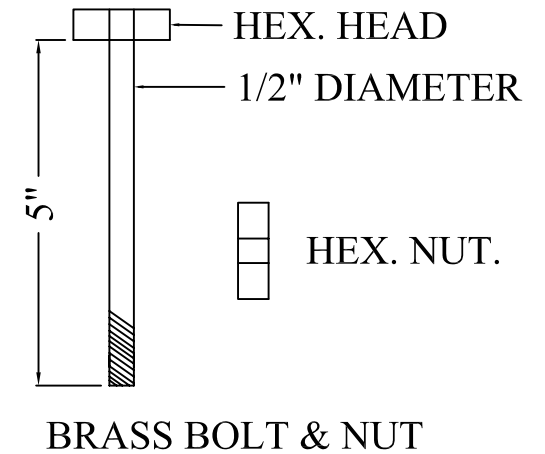
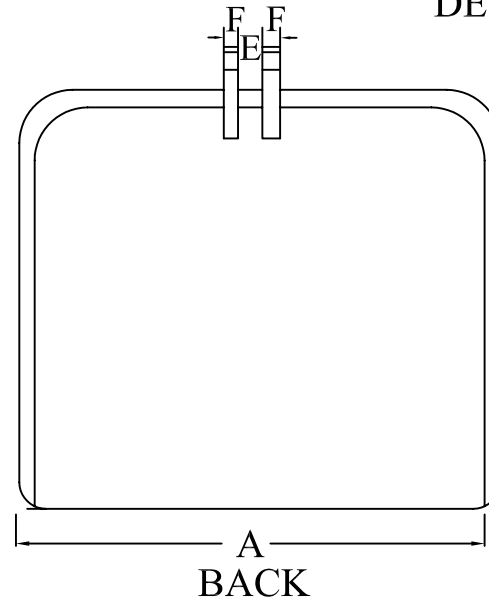
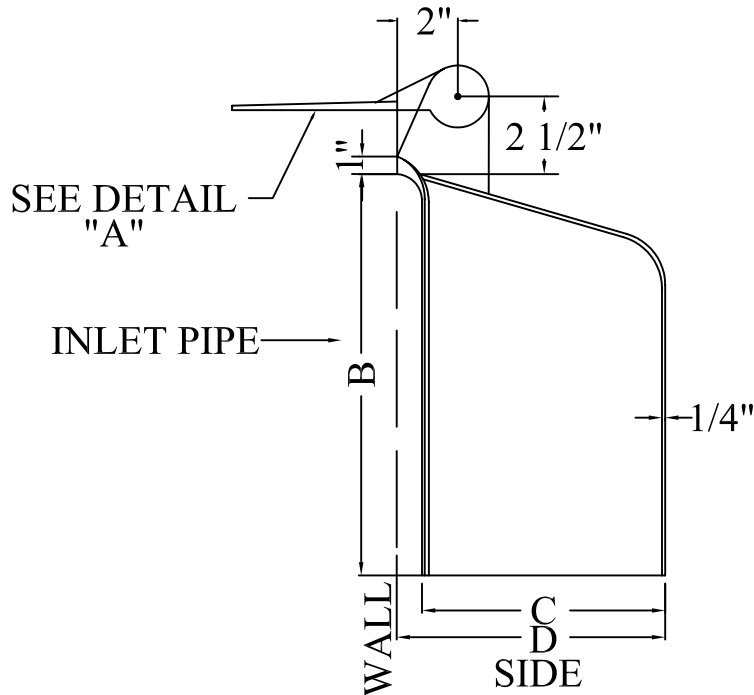
- USE 1.00' OF WASHED STONE SURROUNDING & UNDER ALL GALLEYS.
- USE FILTER FABRIC AROUND STONE.
- MIN. CONCRETE STRENGTH 4000# CLASS D ALL H-20 LOADING
- SOLID CONCRETE BOTTOM FOR CLEANING

# CATCH BASIN HOOD

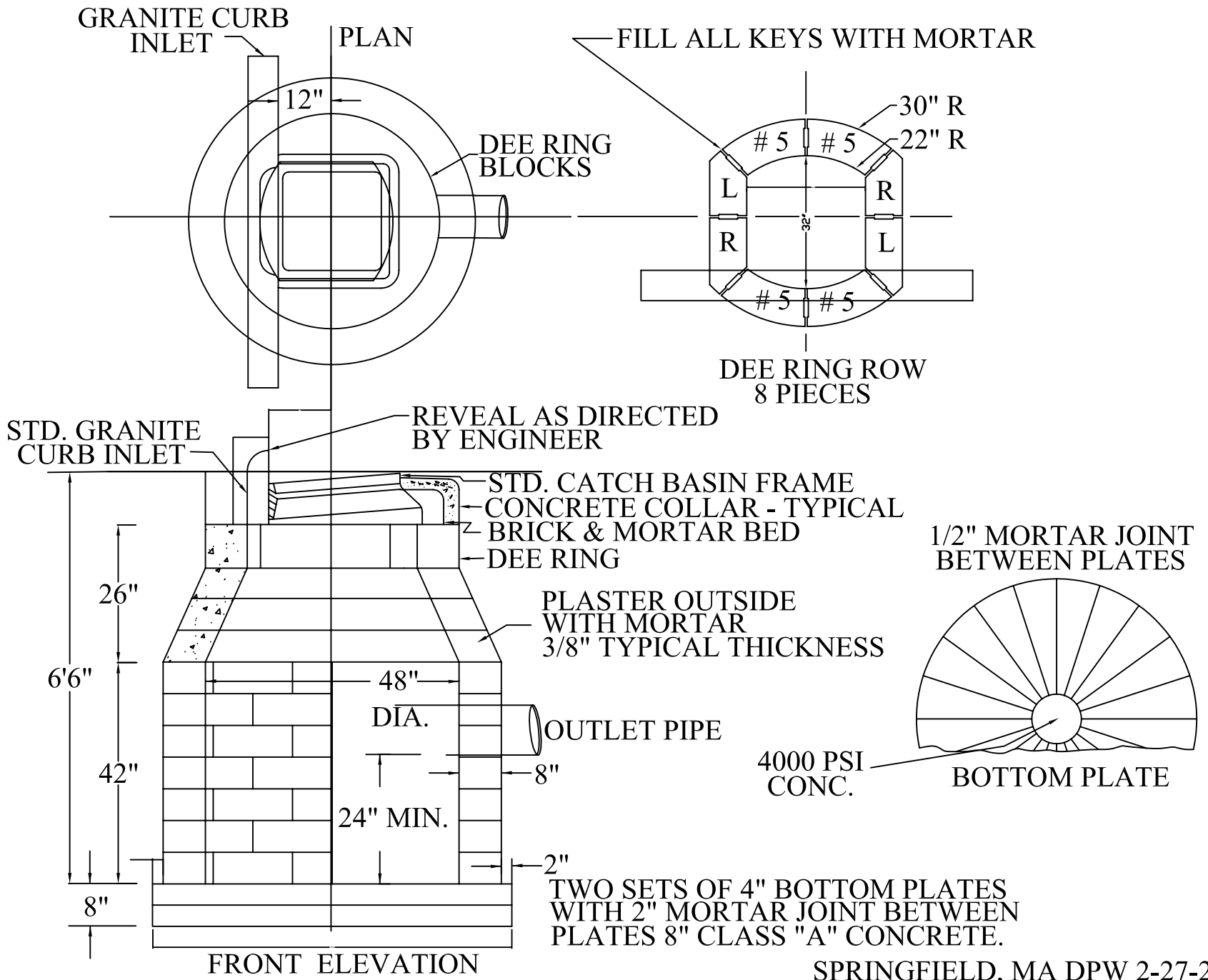
DIMENSIONS	A	B	C	D	E	F	G	H
8" AND 10" PIPE	15"	15"	8"	9"	2"	7/8"	1-7/8"	14"
12" AND 15" PIPE	18"	18"	10"	2"	1"	14"	1-7/8"	11-1/4"



DETAIL "A" HINGE



# CATCH BASIN WITH CASTING



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# SPRINGFIELD SEAL



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










# ACCEPTANCE PLAN KEY

## KEY

	FIRE HYDRANT		GUY POLE
	CATCH BASIN		UTILITY POLE
	MAIL BOX		STUMP
	DRAINAGE MANHOLE		TREE
	SANITARY MANHOLE		IRON PIN
	EXISTING SB		IRON BAR
	PROP. GSB		

# ACCEPTANCE PLAN KEY 2

















## KEY

	FIRE HYDRANT		GUY POLE
	CATCH BASIN		UTILITY POLE
	MAIL BOX		TREE
	DRAINAGE MANHOLE		WATERGATE
	SANITARY MANHOLE		GASGATE
	EXISTING SB		PROP. GSB
	IRON PIN		

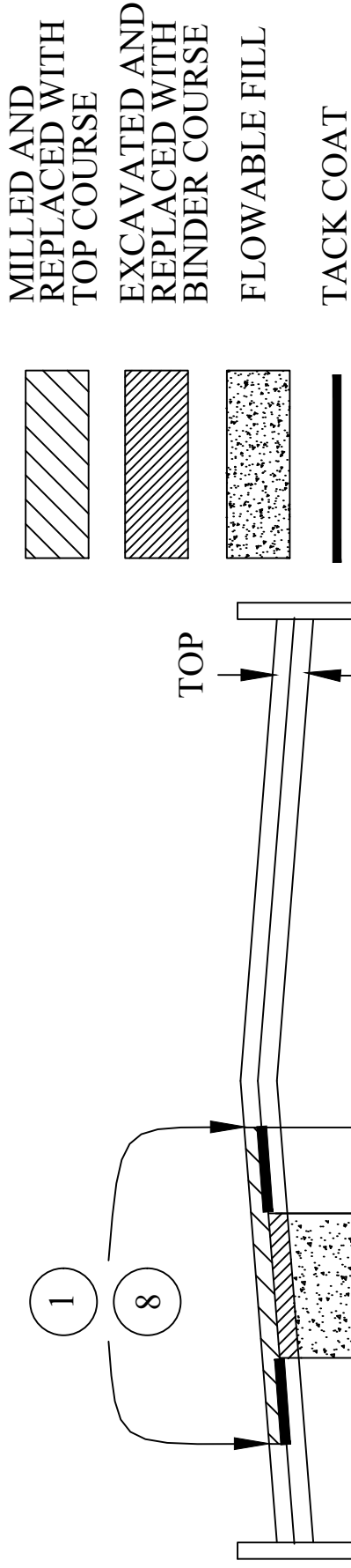


# ACCEPTANCE PLAN KEY 3

## KEY

	FIRE HYDRANT		GUY POLE
	CATCH BASIN		UTILITY POLE
	MAIL BOX		STUMP
	DRAINAGE MANHOLE		TREE
	SANITARY MANHOLE		WATERGATE
	EXISTING SB		GASGATE
	IRON PIN		IRON BAR
	WETLAND FLAGGING		PROP. GSB

# TRENCH REPAIR SPECIFICATION RESIDENTIAL STREET



MILLED AND REPLACED WITH TOP COURSE

EXCAVATED AND REPLACED WITH BINDER COURSE

FLOWABLE FILL

TACK COAT

TOP

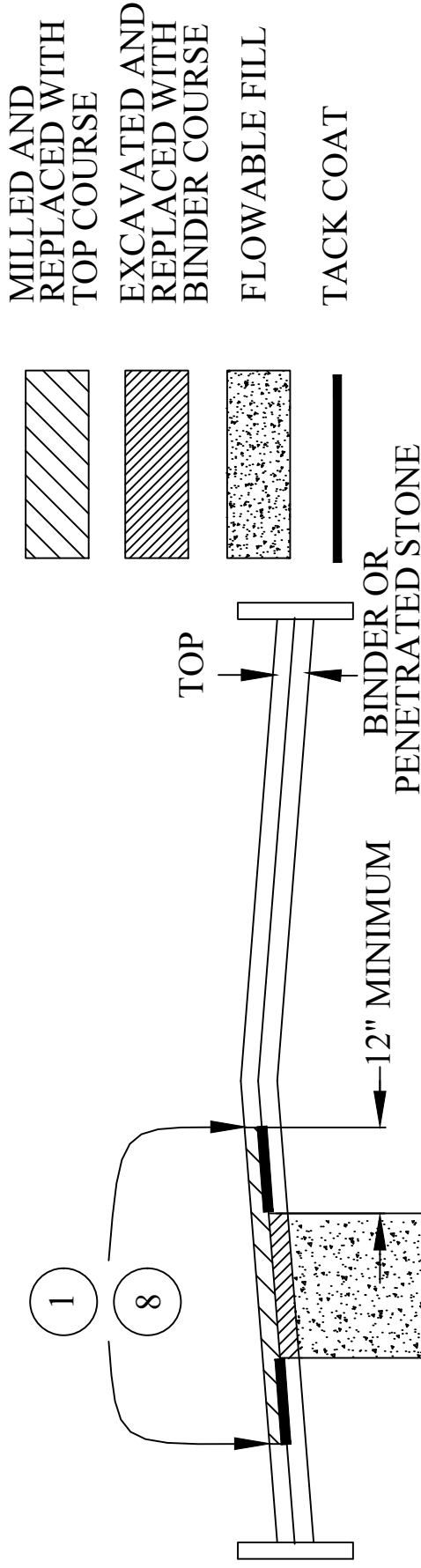
12" MINIMUM BINDER OR PENETRATED STONE

REPLACE WITH SAME DEPTH OF ASPHALT OR MINIMUM 3" - ALL MATERIALS USED TO MEET MASS. STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES

## NOTES:

1. SAW CUT OUTER EDGE OF UTILITY PATCH
  2. MILL TO REMOVE TOP COURSE
  3. LEAVE 12" MIN. LIP BETWEEN EDGE OF TOP AND EDGE OF BINDER COURSE
  4. AFTER TRENCH WORK COMPLETED, FILL AROUND PIPE TO BOTTOM
  5. REPLACE ONE LAYER OF BINDER
  6. TACK AREA OF MILLING
  7. REPLACE TOP COURSE
  8. SEAL EDGES OF UTILITY PATCH WITH HOT POURED RUBBERIZED ASPHALT SEALANT
  9. ALL ROAD CUTS 2' OR LESS FROM THE CURB MUST BE MILLED AND REPAIRED FROM THE OUTER MOST EDGE OF CUT TO THE CURB.
- 2-B SPECIFICATION FOR PATCHING BIT. CONC. ROADWAYS (CON'T.)

# TRENCH REPAIR SPECIFICATION ARTERIAL STREET



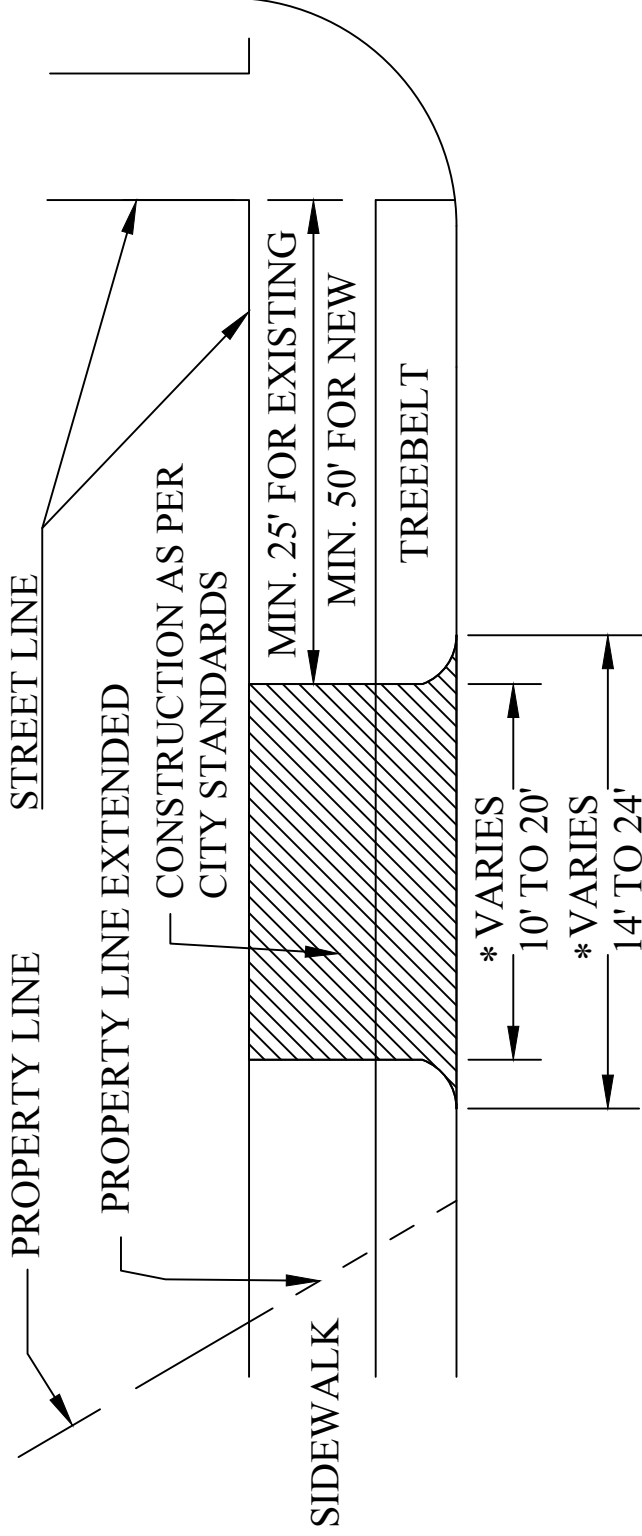
REPLACE WITH SAME DEPTH OF ASPHALT OR MINIMUM 5" - ALL MATERIALS USED TO MEET MASS. STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES

## NOTES:

1. SAW CUT OUTER EDGE OF UTILITY PATCH
2. MILL TO REMOVE TOP COURSE
3. LEAVE 12" MIN. LIP BETWEEN EDGE OF TOP AND EDGE OF BINDER COURSE
4. AFTER TRENCH WORK COMPLETED, FILL AROUND PIPE TO BOTTOM WITH FLOWABLE FILL
5. REPLACE LAYERS OF BINDER AND DEEP BASE
6. TACK AREA OF MILLING
7. REPLACE TOP COURSE
8. SEAL EDGES OF UTILITY PATCH WITH HOT POURED RUBBERIZED ASPHALT SEALANT
9. ALL ROAD CUTS 2' OR LESS FROM THE CURB MUST BE MILLED AND REPAIRED FROM THE OUTER MOST EDGE OF CUT TO THE CURB.

2-B SPECIFICATION FOR PATCHING BIT. CONC. ROADWAYS (CON'T.)

# TYPICAL RESIDENTIAL DRIVEWAY

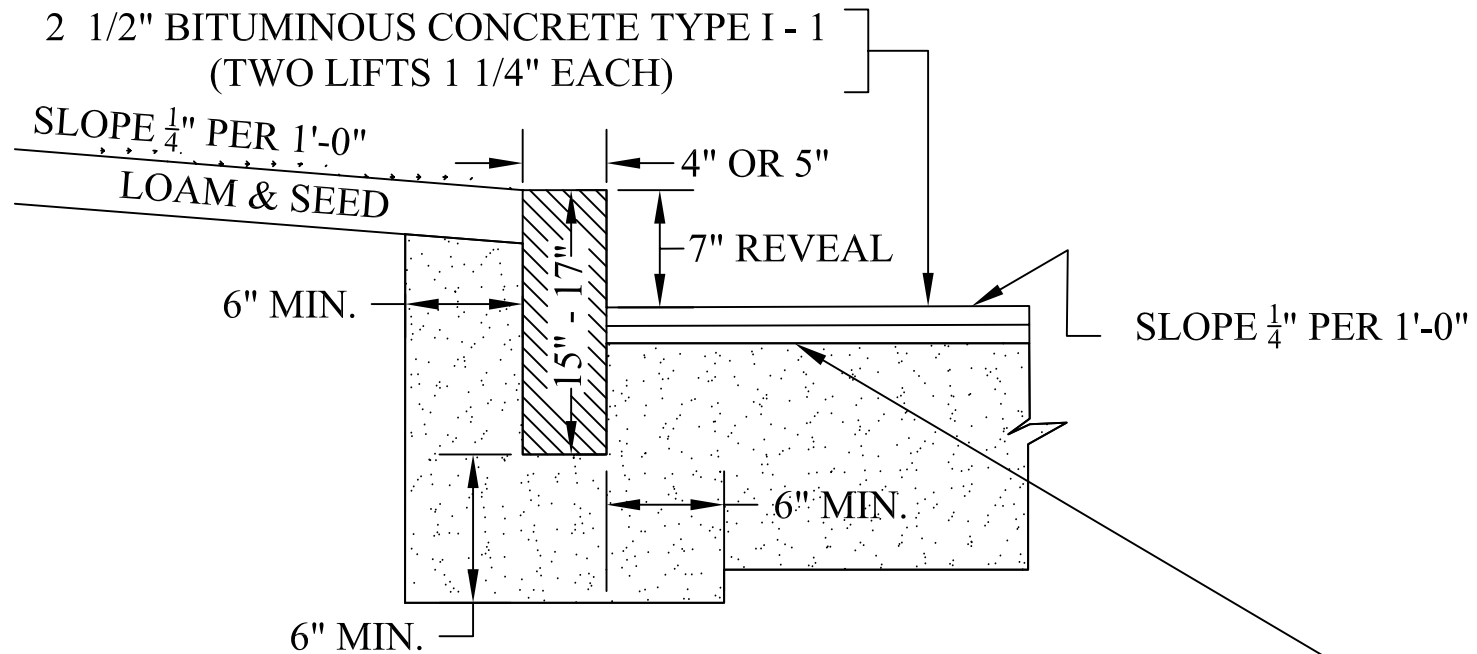


\* WIDTH OF DRIVEWAY VARIES AS GEOMETRIC CONDITIONS ALLOW, DESIRABLE WIDTHS ARE 12' FOR A SINGLE AND 20' FOR DOUBLE DRIVEWAY

## NOTES:

- STANDARD 2'-RADIUS CURB RETURNS SHALL BE UTILIZED
- ENTIRE DRIVEWAY INCLUDING 2'-RADIUS CURB RETURNS, MUST BE WITHIN THE PROP. LINES EXTENDED OF THE PROP. WHICH THE DRIVEWAY SERVES
- DRIVEWAY APRON MUST MEET SIDEWALK GRADE
- PORTION OF DRIVEWAY WITHIN THE PUBLIC WAY MUST BE CONSTRUCTED ACCORDING TO CITY SPECIFICATIONS
- IF ANY TREES, POLES, SIGNS OR UTILITIES ARE LOCATED WITHIN THE LIMITS OF THE PROPOSED DRIVEWAY, THE APPROPRIATE DEPARTMENT MUST BE NOTIFIED FOR REMOVAL OR RELOCATION OF SUCH
- CONDITIONS MAY TEND TO ALTER PROPOSED WIDTH AND LOCATION OF DRIVEWAY AND ANY VARIATIONS FROM THE STANDARDS SHOWN MUST BE APPROVED BY THE TRAFFIC ENGINEER

# GRANITE CURBS

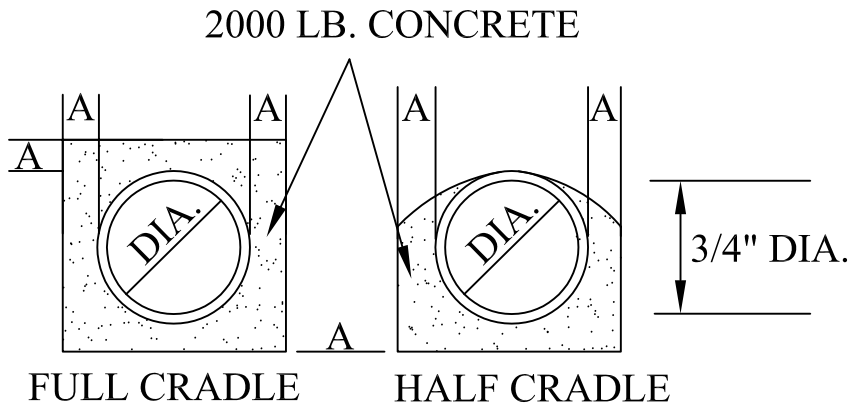


APPLICATION OF .30 TO .50 MC- 70 PER. SQ. YD. ON GRAVEL BASE OR AS DIRECTED

## NOTES:

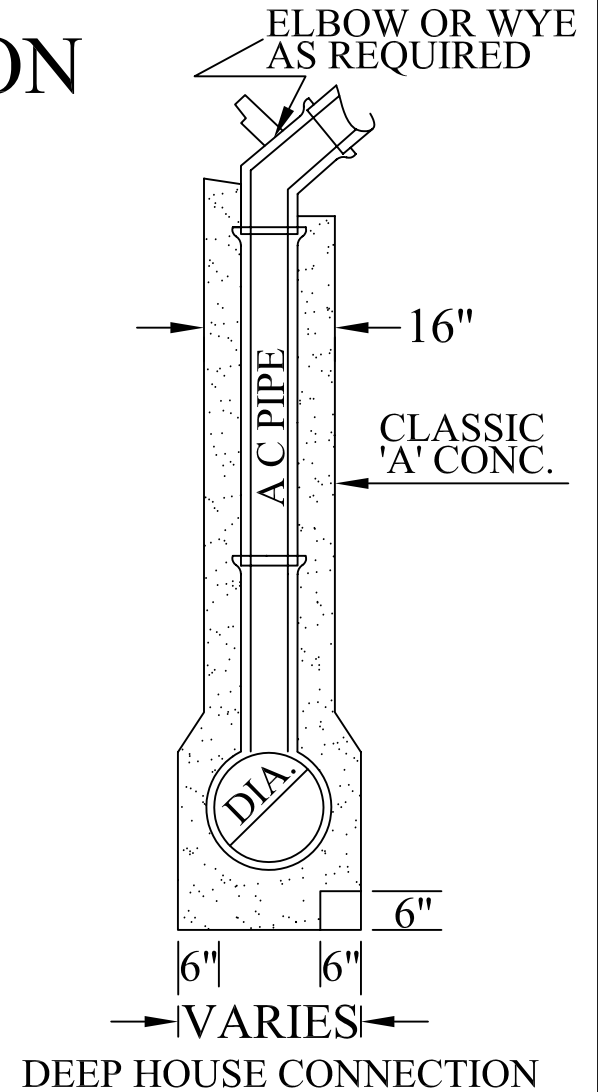
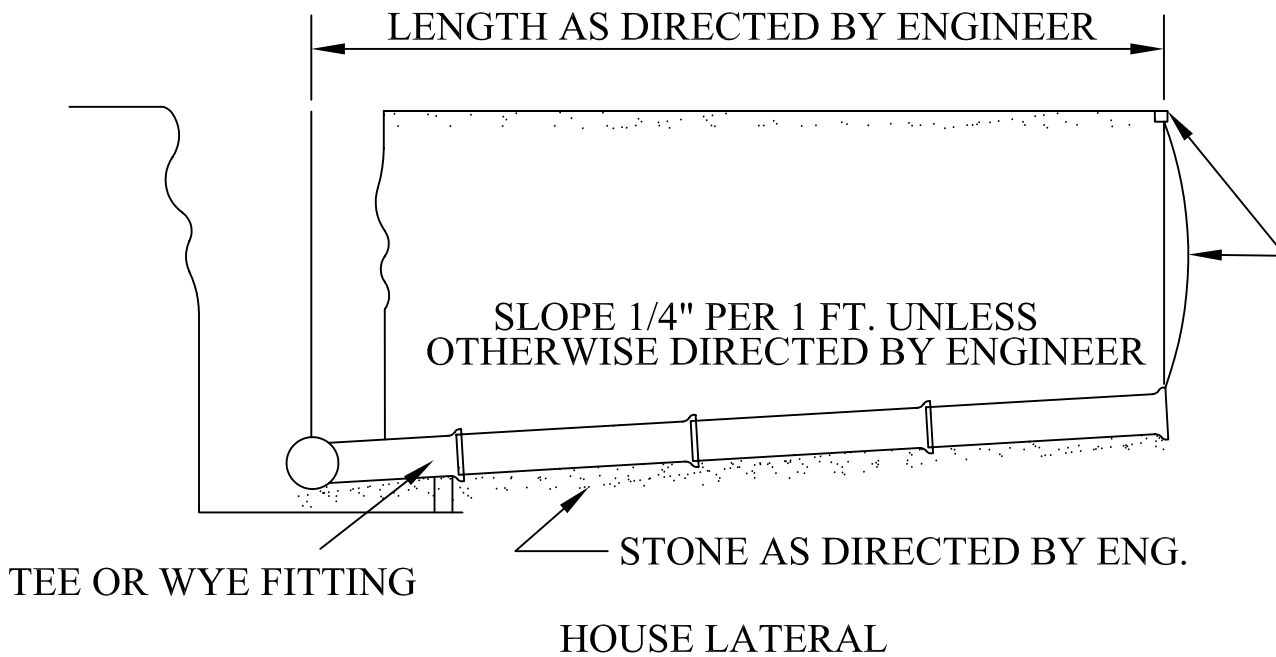
- TYPE VB, 4 " THICKNESS, MIN. OF 6' LENGTH GRANITE CURBING FOR RESIDENTIAL STREETS
- TYPE VB, 5 " THICKNESS, MIN. OF 6' LENGTH GRANITE CURBING FOR ALL OTHER TYPES OF STREETS
- TYPE "A" GRANITE CURB CORNERS FOR ALL TYPES OF SUBDIVISION EXCEPT " ROUNDED CORNER CURBING" MAY BE SUBSTITUTED AT DESCRESTION OF THE DIRECTOR OF THE DEPARTMENT OF PUBLIC WORKS

# SEWER CONNECTION



DIMENSIONS	
DIA.	A
6"	5"
8"	5 1/2"
10"	5 1/2"
12"	6"

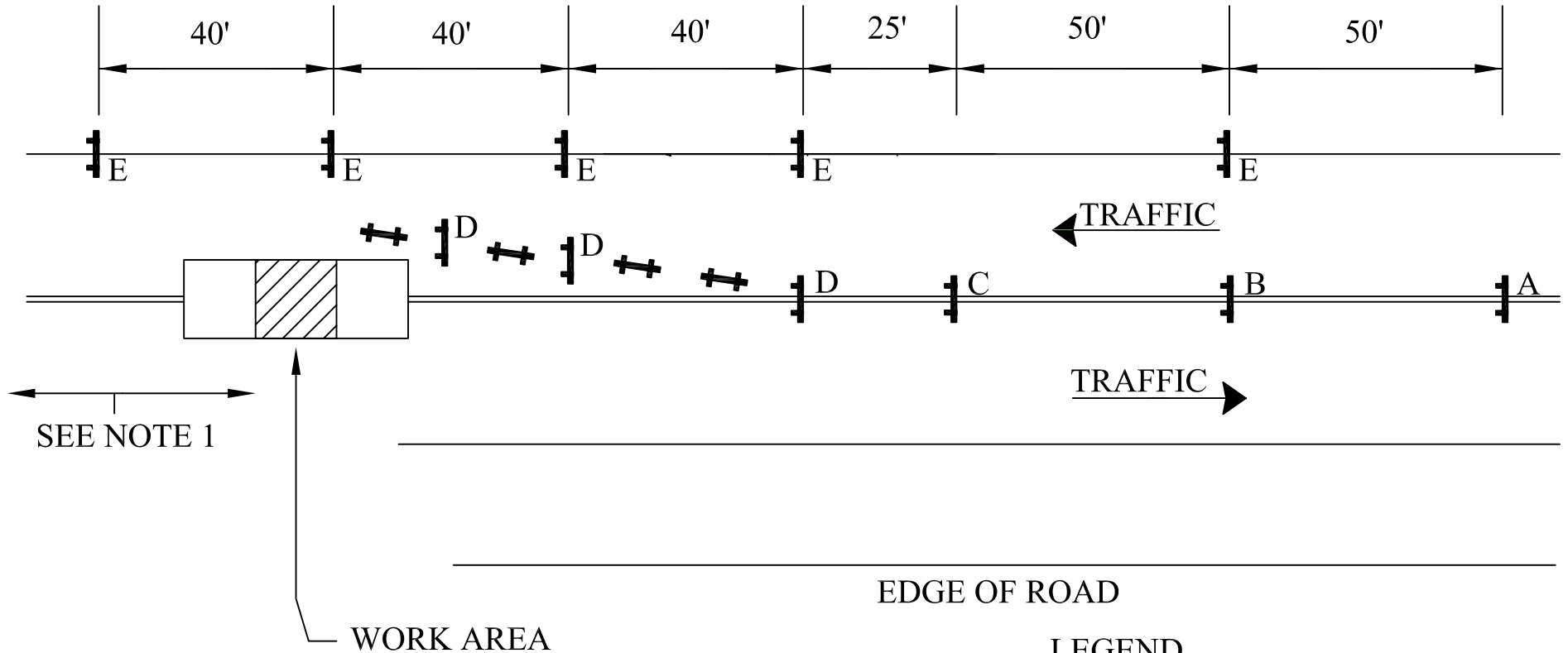
CRADLE DETAILS



MARK END OF LATERAL WITH 3" DIA. X 4" LG. BLOCK SET FLUSH WITH GROUND AND CONNECT TO LATERAL WITH WIRE

# SIGNING & BARRICADE PLAN

## TWO-WAY STREET CENTER OF ROAD WORK AREA



### NOTES

- \* - 36" DIAMOND SHAPE, BLACK LEGEND ON CONSTRUCTION ORANGE
- \*\* - 30" DIAMOND SHAPE, BLACK LEGEND ON CONSTRUCTION ORANGE
- \*\*\* - 6' LONG OR LONGER STRIPED ORANGE AND WHITE
- (1) - SIGNING & BARRICADES SHOW FOR ONE DIRECTION OF TRAFFIC ONLY. IDENTICAL SET-UP TO BE USED FOR OPPOSITE DIRECTION

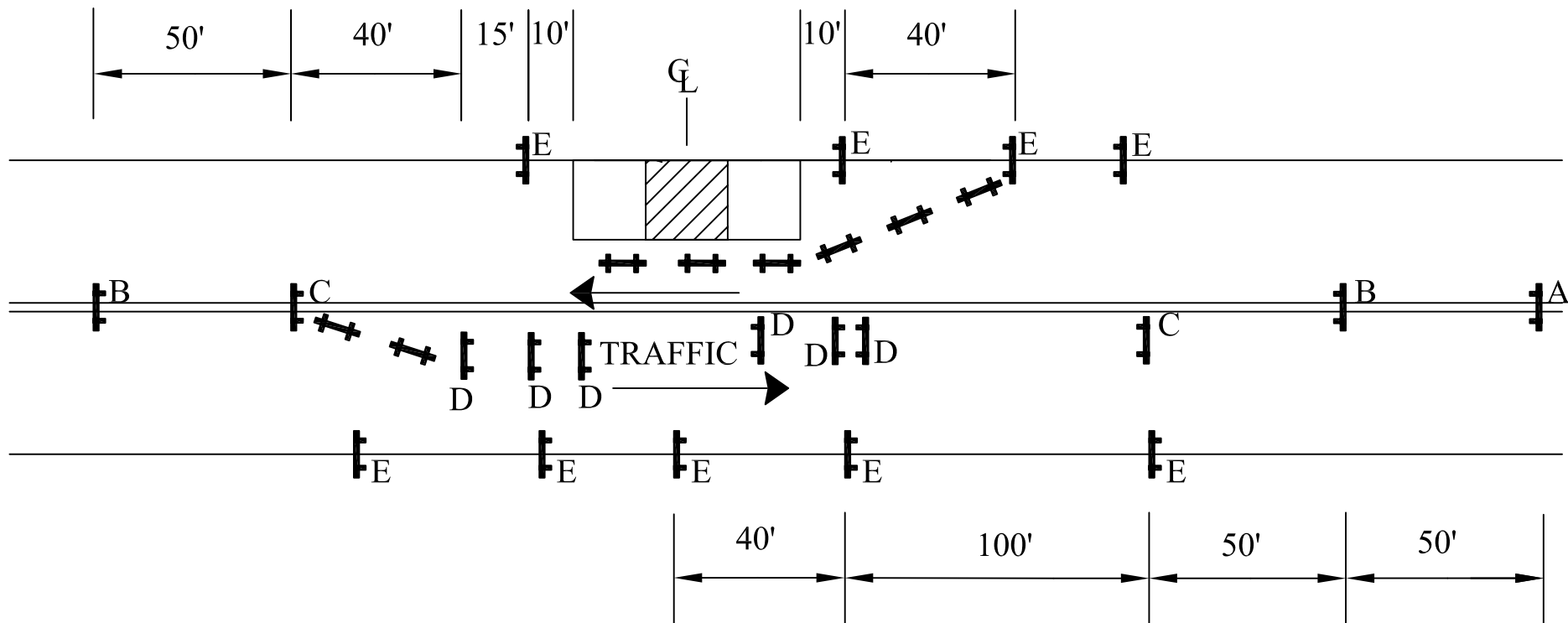
### LEGEND

- ⌚ A - "CONSTRUCTION AHEAD" SIGN\*
- ⌚ B - "20 MPH CONSTRUCTION ZONE" SIGN\*\*
- ⌚ C - "SSLOW SINGLE LANE" SIGN\*\*
- ⌚ D - "KEEP RIGHT" SIGN\*\*
- ⌚ E - "NO PARKING" SIGN\*\*
- ⌚ BARRICADE \*\*\*







TO BE USED AS A GUIDE ONLY

# SIGNING & BARRICADE PLAN

## TWO-WAY STREET SIDE OF ROAD WORK AREA



### LEGEND

-  A - "CONSTRUCTION AHEAD" SIGN\*
-  B - "20 MPH CONSTRUCTION ZONE" SIGN\*\*
-  C - "SSLOW SINGLE LANE" SIGN\*\*
-  D - "KEEP RIGHT" SIGN\*\*
-  E - "NO PARKING" SIGN\*\*
-  BARRICADE \*\*\*

### NOTES

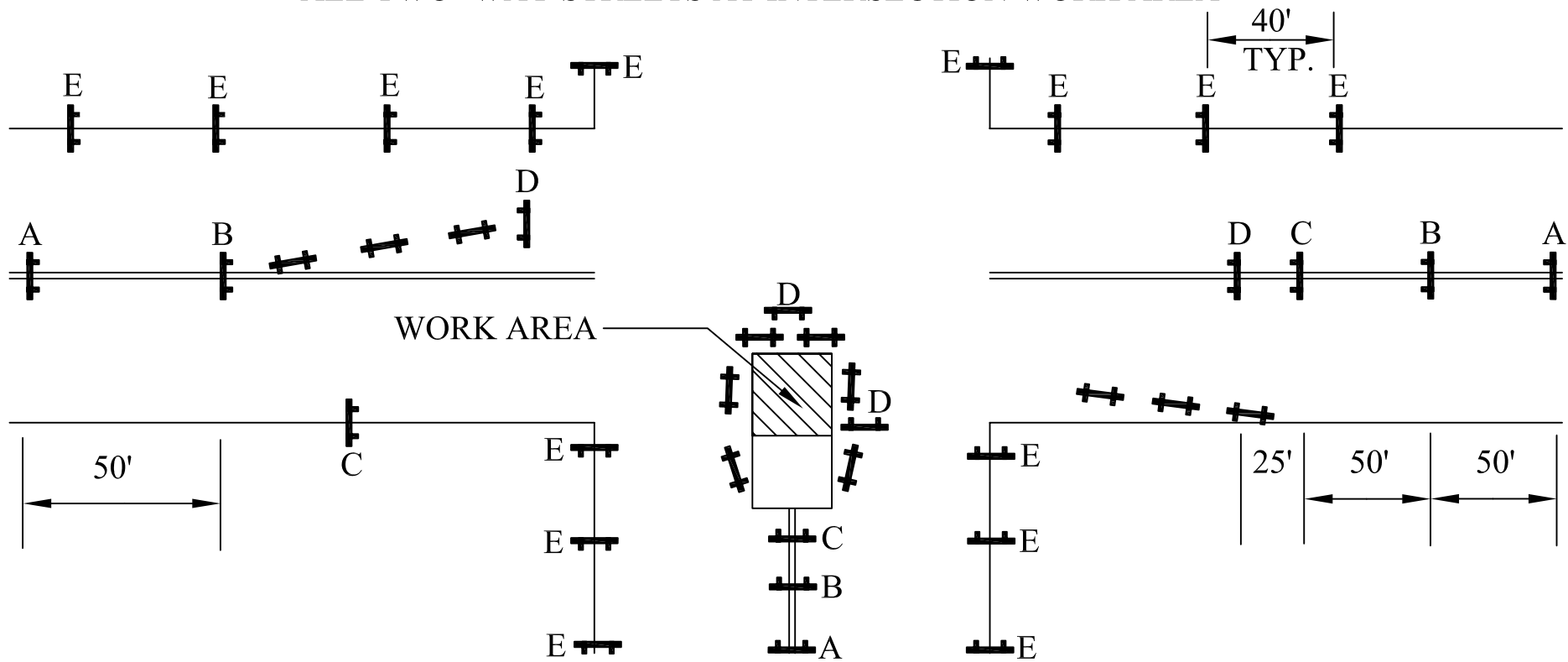
- \* - 36" DIAMOND SHAPE, BLACK LEGEND ON CONSTRUCTION ORANGE
- \*\* - 30" DIAMOND SHAPE, BLACK LEGEND ON CONSTRUCTION ORANGE
- \*\*\* - 6' LONG OR LONGER STRIPED ORANGE AND WHITE

TO BE USED AS A GUIDE ONLY



# SIGNING & BARRICADE PLAN

ALL TWO-WAY STREETS AT INTERSECTION WORK AREA



## NOTES

\* - 36" DIAMOND SHAPE, BLACK LEGEND ON CONSTRUCTION ORANGE

\*\* - 30" DIAMOND SHAPE, BLACK LEGEND ON CONSTRUCTION ORANGE

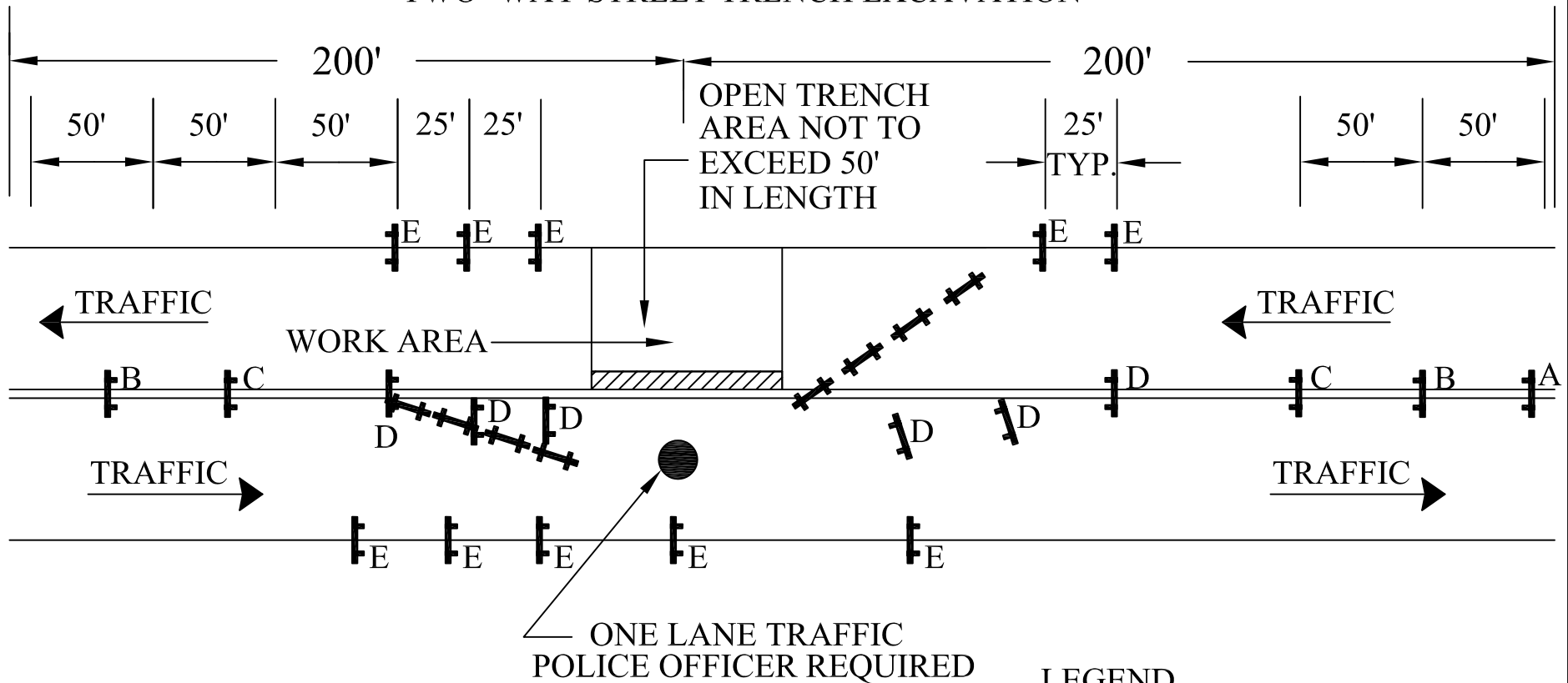
\*\*\* - 6' LONG OR LONGER STRIPED ORANGE AND WHITE

- A** - "CONSTRUCTION AHEAD" SIGN\*
- B** - "20 MPH CONSTRUCTION ZONE" SIGN\*\*
- C** - "SSLOW SINGLE LANE" SIGN\*\*
- D** - "KEEP RIGHT" SIGN\*\*
- E** - "NO PARKING" SIGN\*\*
- +** BARRICADE \*\*\*

TO BE USED AS A GUIDE ONLY

# SIGNING & BARRICADE PLAN

## TWO-WAY STREET TRENCH EXCAVATION



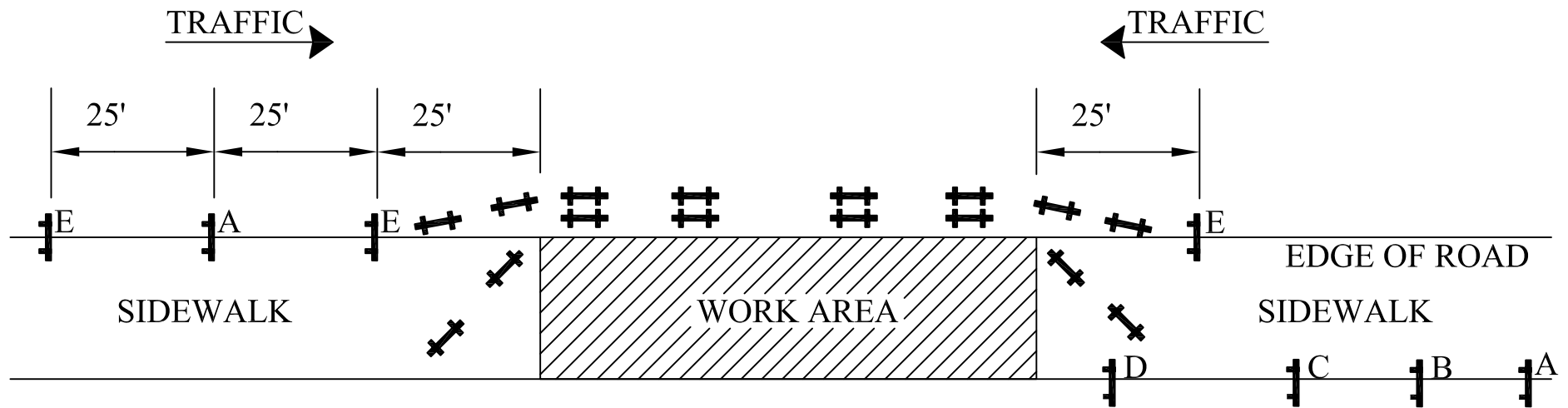
### NOTES

- \* - 36" DIAMOND SHAPE, BLACK LEGEND ON CONSTRUCTION ORANGE
- \*\* - 30" DIAMOND SHAPE, BLACK LEGEND ON CONSTRUCTION ORANGE
- \*\*\* - 6' LONG OR LONGER STRIPED ORANGE AND WHITE

TO BE USED AS A GUIDE ONLY

# SIGNING & BARRICADE PLAN

## SIDEWALK & TREEBELT AREA



### NOTES

- \* - 36" DIAMOND SHAPE, BLACK LEGEND ON CONSTRUCTION ORANGE
- \*\* - 30" DIAMOND SHAPE, BLACK LEGEND ON CONSTRUCTION ORANGE
- \*\*\* - 6' LONG OR LONGER STRIPED ORANGE AND WHITE

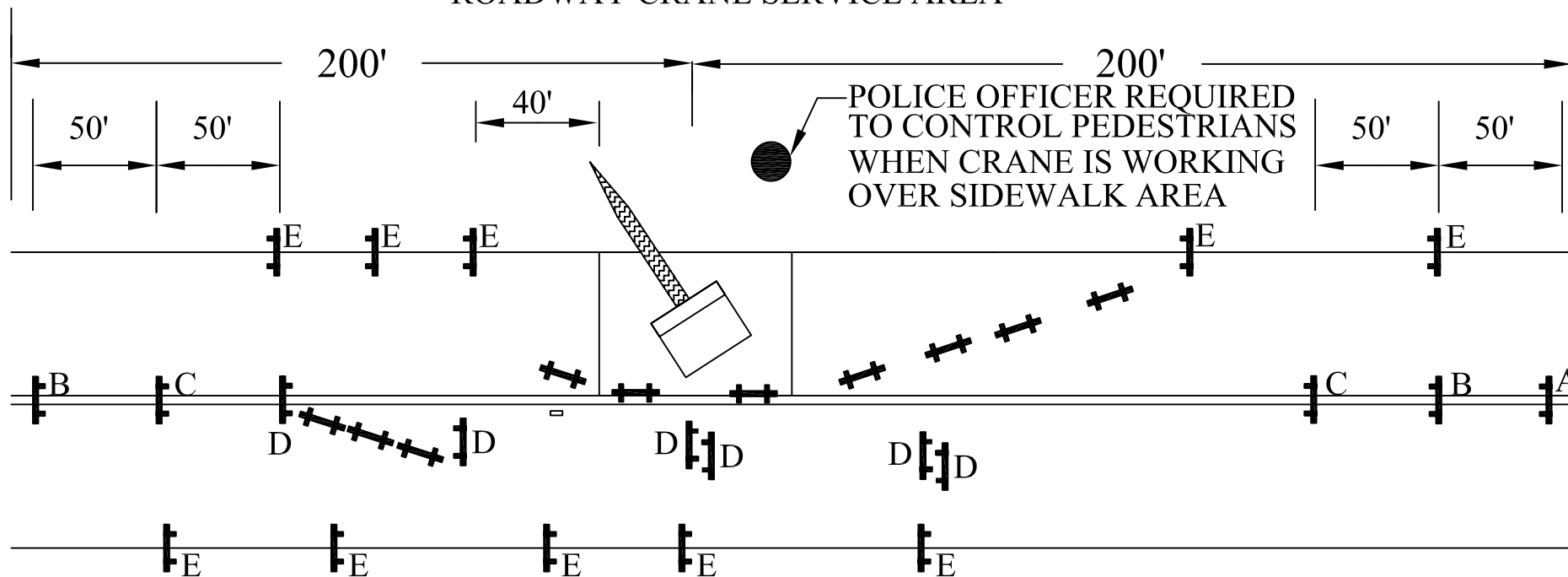
### LEGEND

- A - "CONSTRUCTION AHEAD" SIGN\*
- B - "20 MPH CONSTRUCTION ZONE" SIGN\*\*
- C - "SLOW SINGLE LANE" SIGN\*\*
- D - "KEEP RIGHT" SIGN\*\*
- E - "NO PARKING" SIGN\*\*
- BARRICADE \*\*\*

TO BE USED AS A GUIDE ONLY

# SIGNING & BARRICADE PLAN

## ROADWAY CRANE SERVICE AREA



### NOTES

- \* - 36" DIAMOND SHAPE, BLACK LEGEND ON CONSTRUCTION ORANGE
- \*\* - 30" DIAMOND SHAPE, BLACK LEGEND ON CONSTRUCTION ORANGE
- \*\*\* - 6' LONG OR LONGER STRIPED ORANGE AND WHITE

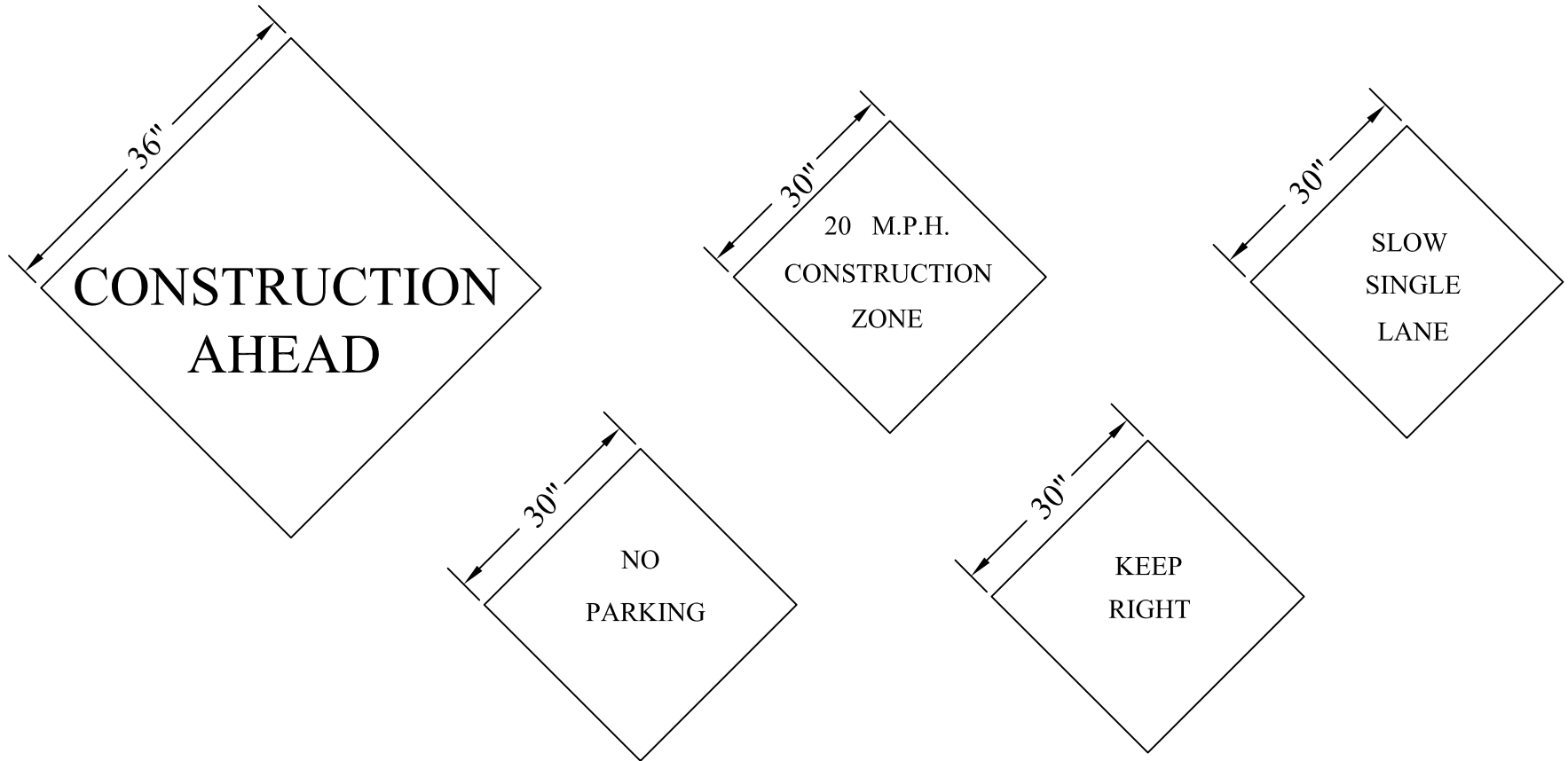
### LEGEND

- ⌋ A - "CONSTRUCTION AHEAD" SIGN\*
- ⌋ B - "20 MPH CONSTRUCTION ZONE" SIGN\*\*
- ⌋ C - "SSLOW SINGLE LANE" SIGN\*\*
- ⌋ D - "KEEP RIGHT" SIGN\*\*
- ⌋ E - "NO PARKING" SIGN\*\*
- ⌋ BARRICADE \*\*\*

TO BE USED AS A GUIDE ONLY

# SIGN FACE DETAILS

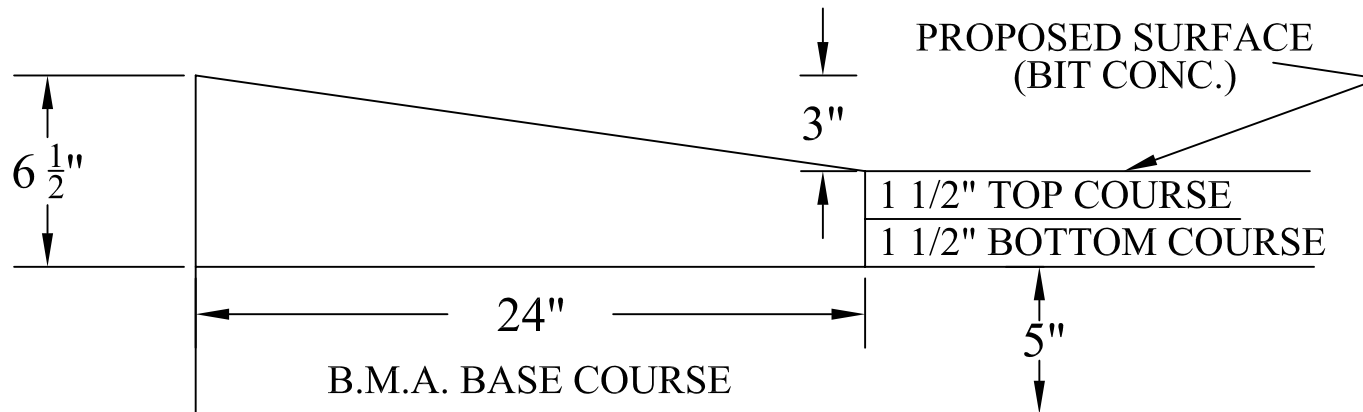
THE NOTED SIGNS ARE AS FOLLOWS:



## NOTES:

- ALL SIGNS SHALL BE BLACK LEGEND ON REFLECTORIZED CONSTRUCTION ORANGE BACKGROUND
- ALL TRAFFIC AND / OR PEDESTRIAN DETOURS SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE APPROPRIATE PLAN AS CONTAINED IN THIS SECTION

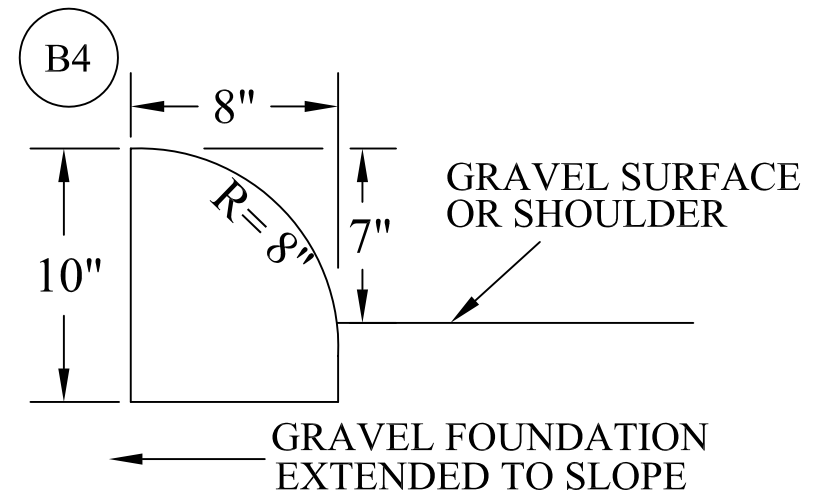
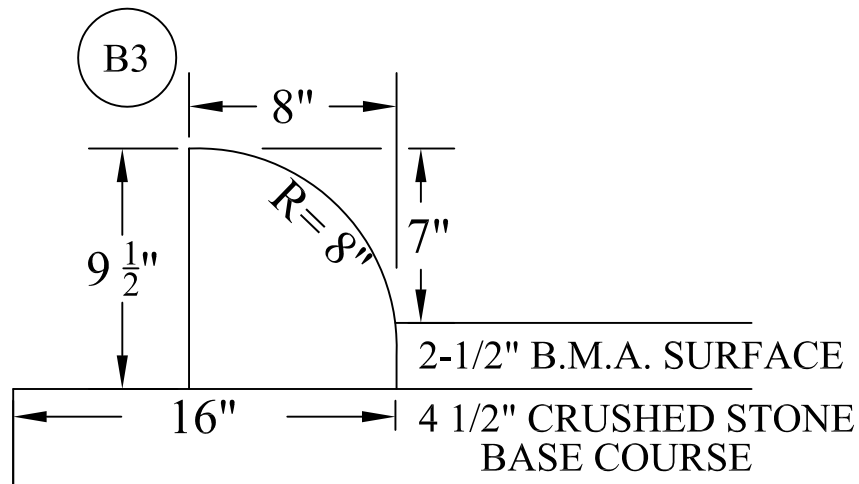
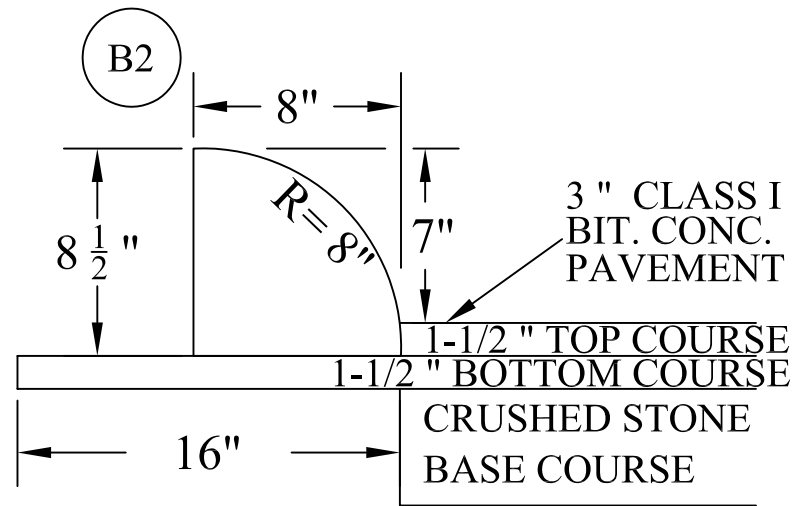
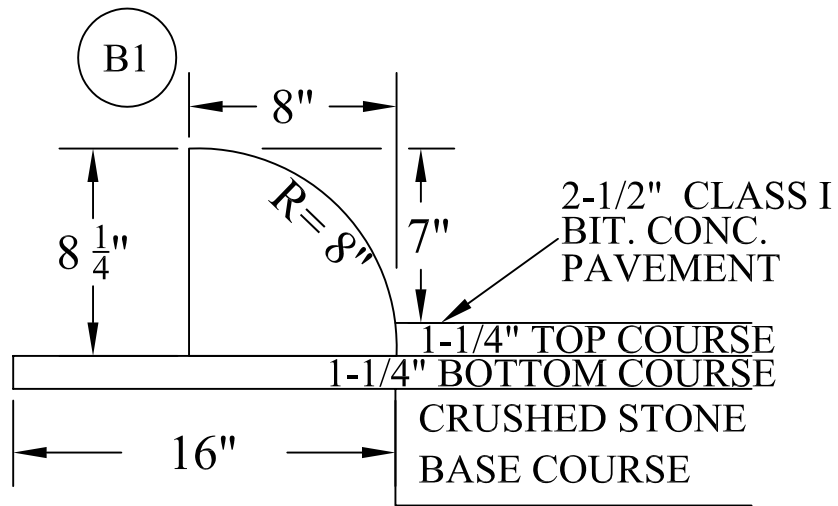
# BERM TYPE A



## NOTES:

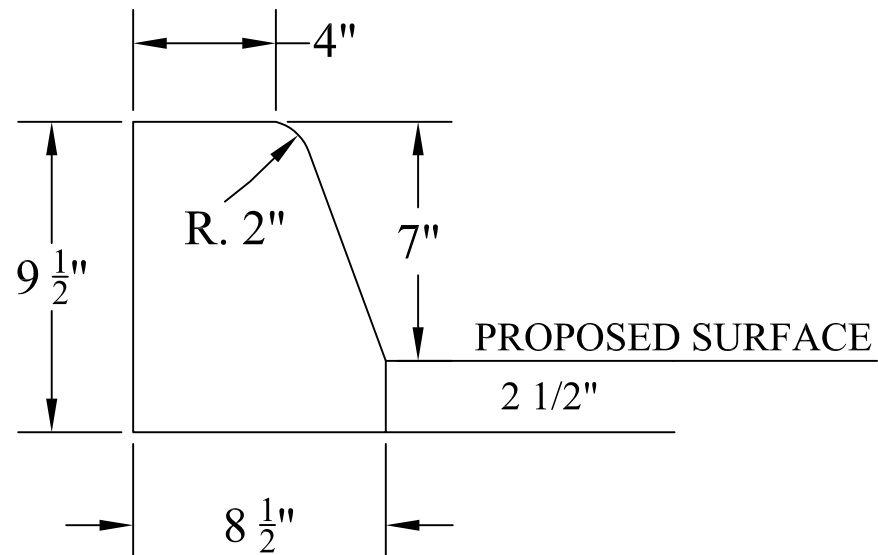
- USED PRIMARILY ON INTERSTATE PROJECTS

# BERM TYPE B



# BERM TYPE C

MOST COMMONLY USED

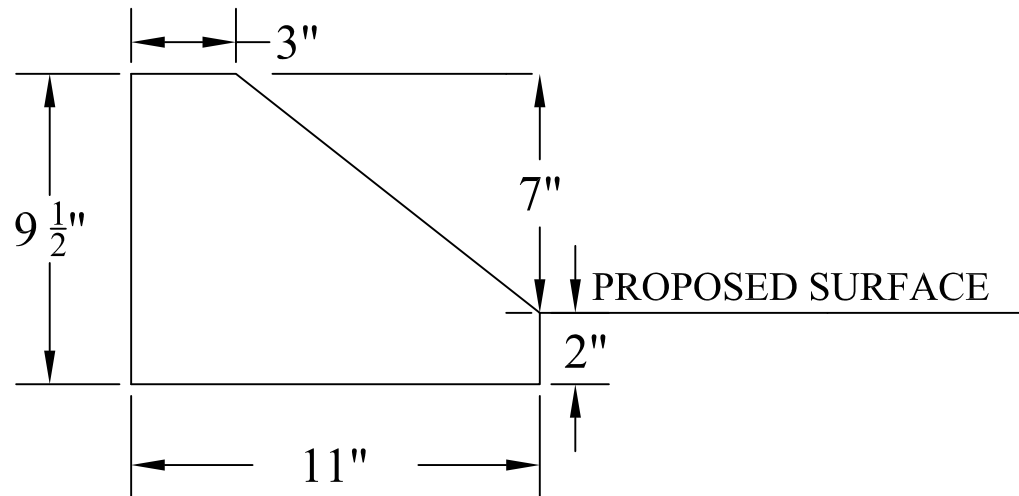


## NOTES:

- METHOD OF CONSTRUCTION OF FOUNDATION FOR TYPES C AND D SAME AS FOR TYPE B DEPENDING ON KIND OF SURFACE



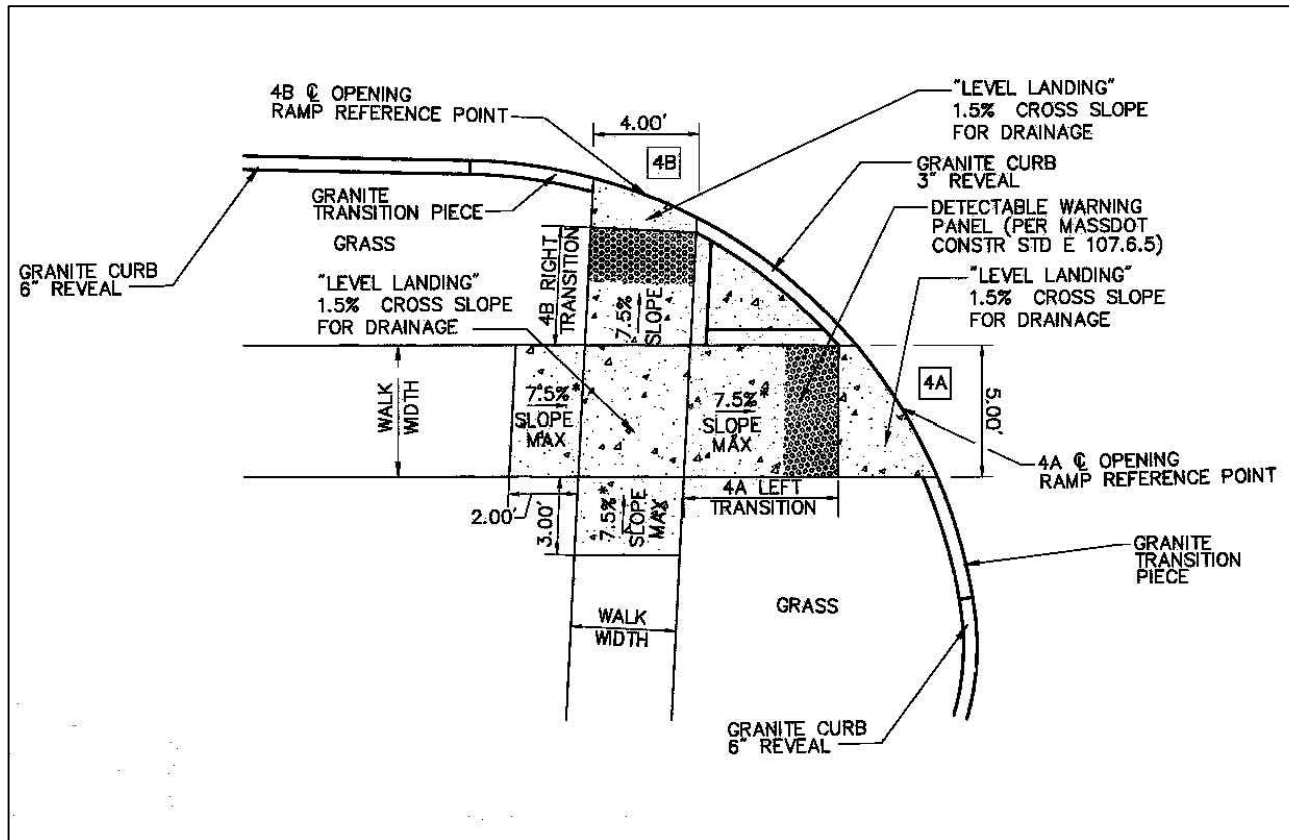
# BERM TYPE D



## NOTES:

- METHOD OF CONSTRUCTION OF FOUNDATION FOR TYPES C AND D SAME AS FOR TYPE B DEPENDING ON KIND OF SURFACE

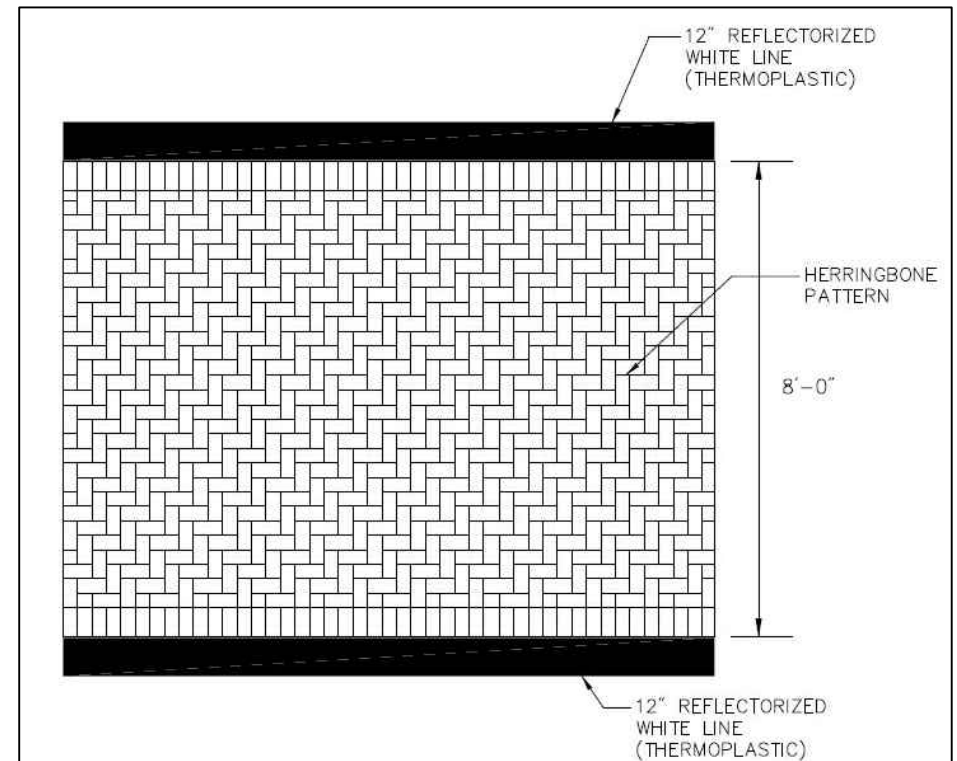
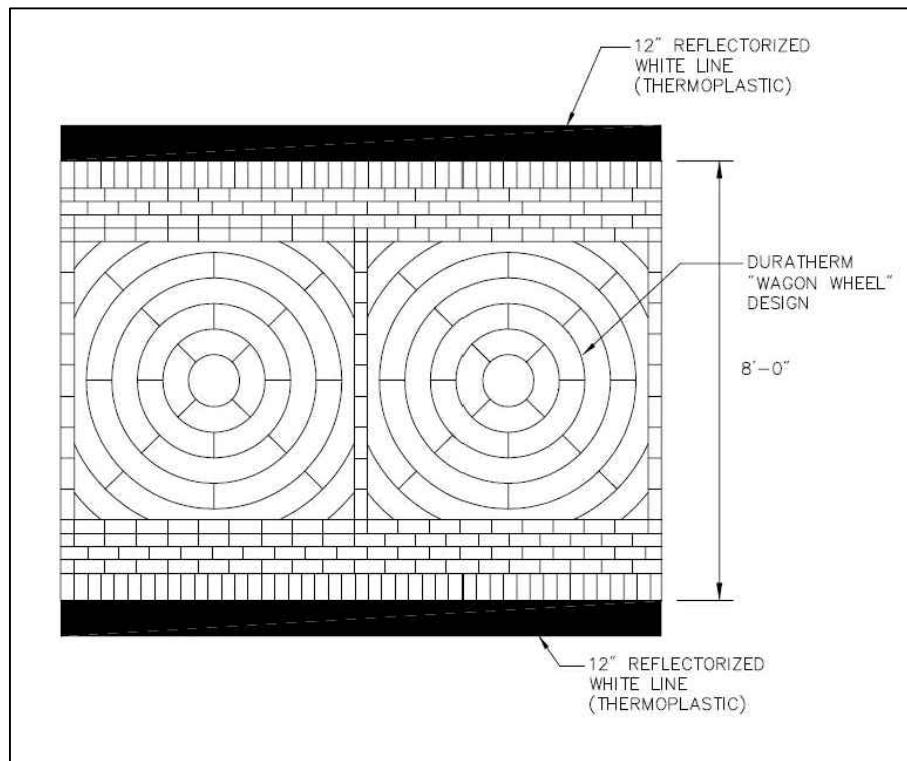
# SIDEWALK REPAIR



## NOTES:

- IF EXCAVATION OCCURS ON A SIDEWALK AT AN INTERSECTION, CONTRACTOR IS REQUIRED TO REMOVE ENTIRE SIDEWALK WHEELCHAIR RAMP, ADJUST CURB, AND REPLACE TO CURRENT MASSDOT A.D.A. GUIDELINES.
- IF NO CURRENT RAMP EXISTS, CONTRACTOR IS REQUIRED TO INSTALL RAMP AND ADJUST CURB TO MEET CURRENT MASSDOT A.D.A. GUIDELINES.
- WIRE MESH REINFORCEMENT CONFORMING TO AASHTO-M55 OR ASTM A185-79 WILL BE REQUIRED.

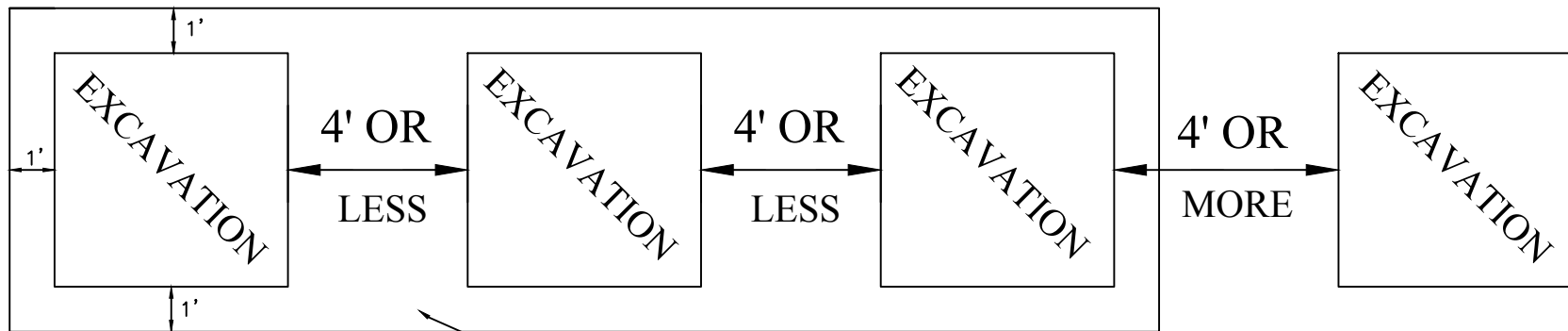
# IMPRINT OR INLAYED CROSSWALK REPAIR



## NOTES:

- IF ANY EXCAVATION OR SURFACE PAVEMENT IMPROVEMENT OCCURS OF ANY LOCATION WITHIN THE CITY OF SPRINGFIELD WHERE EXISTING IMPRINTED OR INLAYED CROSS WALKS EXIST, THE CONTRACTOR IS REQUIRED TO REPLACE INK IN KIND WITH THE EXACT MATERIAL AND COLOR AS ORIGINALLY INSTALLED.
- INSTALLATIONS MUST BE COMPLETED BY AN INSTALLER APPROVED BY THE CITY OF SPRINGFIELD.
- ABUTTING PAVEMENT MARKINGS MUST ALSO BE REPLACED.

# MULTIPLE EXCAVATION REPAIR

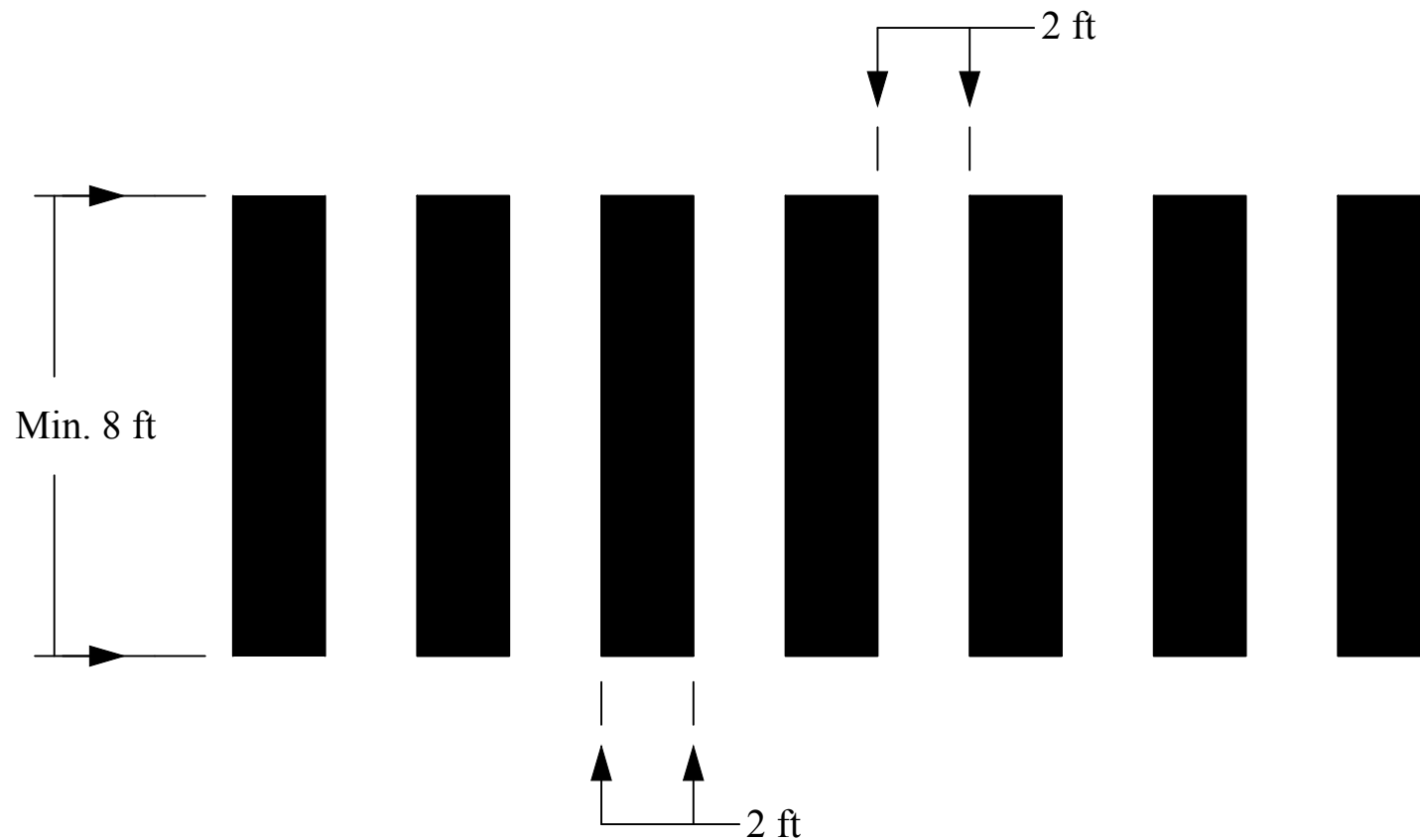


## NOTES:

- APPLIES TO ANY ROADWAY EXCAVATION THAT RESULTS IN MULTIPLE PENETRATIONS PERFORMED LESS THAN 4' OF ONE ANOTHER UNDER A SINGLE PERMIT.
- APPLIES TO ANY ROADWAY EXCAVATIONS THAT ARE PERFORMED WITHIN 2 MONTHS OF ANY OTHER PERMIT ISSUED TO THE SAME CONTRACTOR/UTILITY AT A SPECIFIC LOCATION.
- EXISTING PAVEMENT REMAINING SHALL BE MILLED AND OVERLAYED (1.5" RESIDENTIAL □ 2" ARTERIAL) AS SHOWN ABOVE.

# CROSSWALK DETAIL

## CONTINENTAL STYLE



- CITY OF SPRINGFIELD STANDARD CROSSWALK DETAIL
- THIS DETAIL TO BE USED ON ALL NEW PAVEMENT PROJECTS
- ALL CROSSWALKS SHALL HAVE A MINIMUM WIDTH OF 8 FT

## SPRINGFIELD DPW OCCUPANCY MANUAL

Last Modified: 04/09/2025 at 10:39AM EDT

***City of Springfield  
Department of Public Works  
Engineering Division***



***Manual for Occupancy of  
Public and Private Ways  
within the City of Springfield***

***June 5, 2017***

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# SECTION 1

# PERMIT OVERVIEW

# SECTION 1 – GENERAL

The City of Springfield Department of Public Works (DPW) – Engineering Division has developed this “Manual for the Occupancy of Public and Private Ways within the City of Springfield” to assist the citizens, contractors and any other entity wishing to occupy and / or excavate within the right-of-way of any City designated public or private way.

This manual includes procedural outlines for obtaining necessary permits, identifies costs for applying for permits, as well as information on safety, surface restoration and final inspections.

Our goal as a City is to ensure that all activities completed within the City’s right-of-way are done so in a safe manner and any excavations that occur include proper oversight, and that roads are properly restored to serve both the pedestrians and vehicles that use the City’s roadways on a continual basis.

## 1-A INTENDED USE OF THIS MANUAL

The use of this manual is directed to all persons (general contractors, special maintenance and service people, special organizations, utility companies and municipal utility departments, city residents, etc.) that would, from time to time, have cause to utilize or occupy city sidewalks, tree belts, public roadways, private ways, City of Springfield right-of-ways and any other municipal and/or public property under the jurisdiction and regulation of the Springfield Department of Public Works. This manual pertains to activities both within areas identified as both public and private ways within the City of Springfield.

City of Springfield Street Permits fall under two categories: Street Occupancy Permits and Street Excavation Permits. The following identifies the processes required to obtain and maintain valid permits for the intended activities.

## 1-B PERMIT OVERVIEW

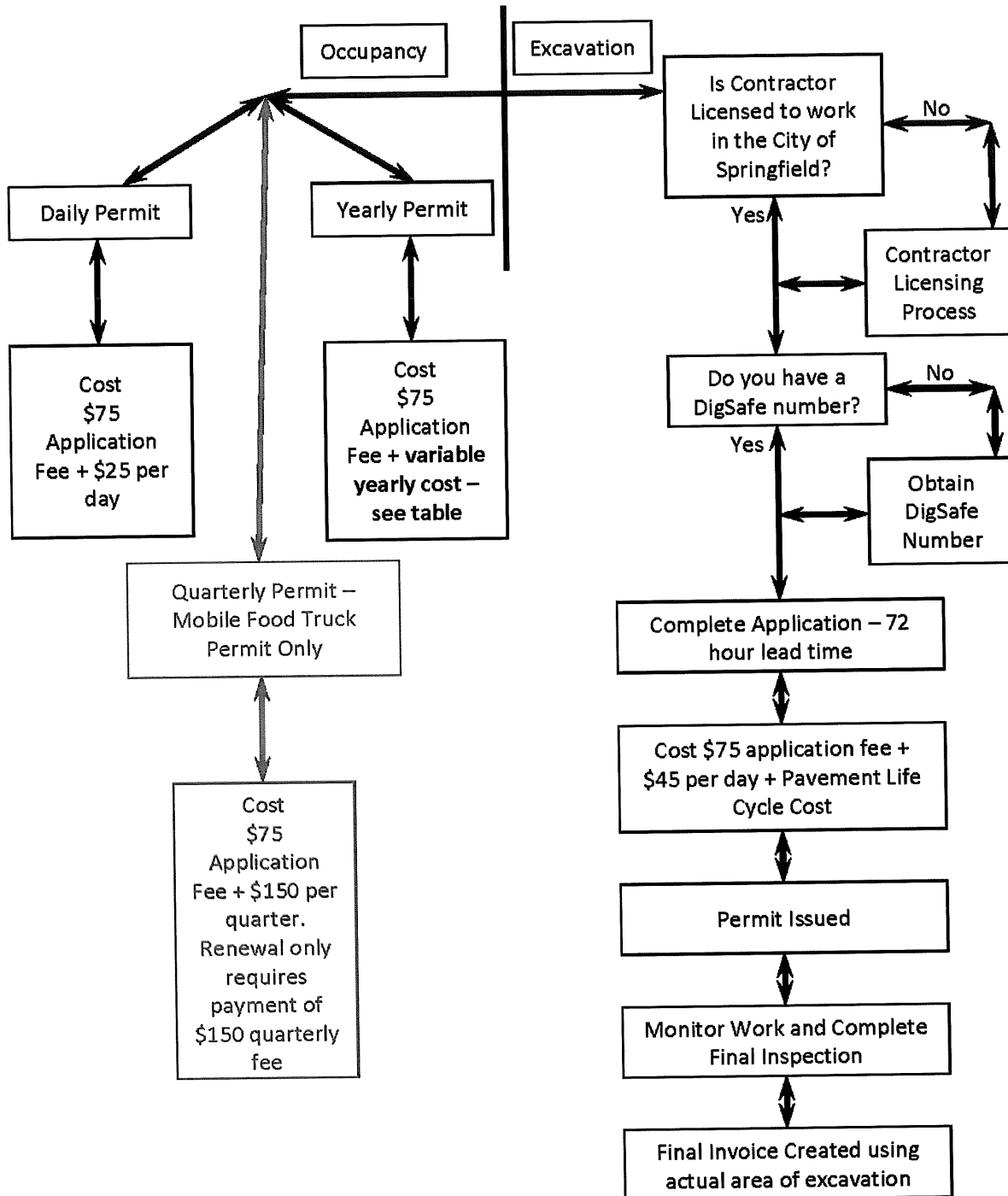
All persons who intend to occupy the public way for any reason must apply for and obtain a **Street Occupancy Permit** from the Department of Public Works – Engineering Division. All persons intending to perform excavations within public ways will require a **Street Excavation Permit**. The application requirements for each of these permits are discussed in other sections of this document. See also the Occupancy Permit Flowchart on page 6.

Section 40, Chapter 502 of the General Laws of the Commonwealth of Massachusetts requires all persons who are subject to applying for said license (Street Occupancy Permit or Street Excavation Permit) must establish at least a seventy-two (72) hour advance notification of any excavation within the public way, unless so noted for certain permits.

An information packet and appropriate applications for either a Street Occupancy or an Excavation Permit may be obtained at the Department of Public Works – Engineering Division, located at 70 Tapley Street, Springfield, MA at any time during normal working hours. An application for permit will be accepted in the DPW – Engineering Division from



## CITY OF SPRINGFIELD DPW – ENGINEERING DIVISION STREET OCCUPANCY FLOWCHART



Last Modified: 04/09/2025 at 10:39AM EDT

7:00 a.m. to 2:00 p.m. with a proper application. The **approved Colored Occupancy Permit Card** issued by the DPW - Engineering Division must be posted at the job site in a location that is visible to a City Inspector and / or City Police. In those cases where a posting is not feasible, (i.e. parade) the Permittee, or his/her representative, must be present and must have the Street Occupancy Permit on his/her person. Not properly being able to produce a valid Occupancy Permit, may cause the City to revoke any approved permit.

If, at any time during the period covered by an approved permit, emergency conditions prevail which would invalidate the requirements of the original permit, the Department of Public Works – Engineering Division must be notified immediately regarding either modifying the existing permit or issuance of a new permit.

If, at the discretion of the Department of Public Works – Engineering Department, a sketch and/or detailed survey plan may be required to properly define the area and extent of the occupancy including roadway or pedestrian detour routes, the applicant shall furnish same accompanying the information sheet for street occupancy license.

## **1-C APPLYING FOR A STREET OCCUPANCY PERMIT**

All individuals, companies, businesses, contractors, or any other entity that wishes to occupy any portion of the City designated right-of-way on a public or private way, must apply for a “Street Occupancy Permit”. Appendix A within this document includes a “Street Occupancy Permit Application Form”. This form is also available at the DPW – Engineering Division at 70 Tapley Street in Springfield.

Events such as parades, block parties, political rallies, religious events, road races, etc., fall under our event permit category, while placement of dumpsters, cranes / lifts, delivery of materials or building services fall under our work permit category. Contractors, individuals, etc. who apply for a work permit must submit copies of Certificates of Insurance as part of the permit application process. In applying for both types of permits, the permit application fee is \$75, and an additional fee of \$25 per day of occupancy. In both instances it is the permittee’s responsibility to ensure that the DPW - Engineering Division is notified if occupancy extends past the dates identified on the granted permit. It is also the permittee’s responsibility to notify the DPW – Engineering Division that the permitted activities are complete so that a final inspection can take place.

Individuals and / or entities who wish to apply for a Mobile Food Truck Vendor permit will be required to fill out an application located in Appendix E of this document. Specific requirements and / or restrictions for the approval of a Mobile Food Truck Vendor permit and discussed in Section 1-D-1 and 1-F of this document.

For street occupancies that occur on a more regular or constant basis, the City has included an option of obtaining a yearly permit. This permit would allow utility companies, contractors, etc. to perform work within manholes and / or vaults that do not require excavation, without having to obtain an individual permit. These entities still have a requirement to notify the Department of Public Works to obtain specific approval for a proposed location, and provide the Department with a traffic control, if necessary. Businesses, companies, etc. that have

overhangs, signage, kiosks, etc. that occupy a public way must also apply for a yearly permit. The cost for various types of Yearly Occupancy Permits is shown on page 15 of this document.

In all cases, the entity that will be occupying the public way is the entity that is required to obtain the permit. For example, a building owner or property manager cannot obtain a permit for a contractor performing work at their site. Mobile Food Truck Vendor Permits do not qualify under the yearly permit category.

## **1-D-0 STREET EXCAVATION PERMITS**

The City of Springfield has updated its requirements for street excavation permits. Applicants must meet all requirements prior to applying for a street excavation permit.

### **1-D-1 BECOMING A LICENSED CONTRACTOR IN THE CITY OF SPRINGFIELD**

Prior to being able to apply for a street excavation permit, applicants are required to become a “licensed contractor” in the City. Application forms and required submission material are located in Appendix B of this Document. No excavation permits can be processed until a contractor is determined to be fully licensed. Applications for contractor licensing approval and excavation permits applications for the same contractor will not be processed simultaneously.

Licensed contractor status is in place for a given calendar year only and every contractor must re-apply for approved status each year. It is the City’s intent to notify all licensed contractors in the fall of each year to remind them to re-apply for the upcoming year, however, it is the Contractor’s responsibility to ensure that all required submissions are made, and all material on file with the City is up to date. Contractor’s submitted insurance certificates and or/ bonds that expire during the course of a calendar year must be updated as required showing compliance for the remainder of the calendar year. A contractor whose insurance certificate/ bond that is out of date will not be considered to be in approved status.

Please be advised that the DPW – Engineering Division does not have the ability to waive any of the requirements outlined in the application process, especially related to insurance and / or bonding requirements. Given the material required to be submitted, the process involved for approving a given contractor may take an extended period of time. Please consider applying early in a given year to ensure that excavation permits can be issued in a timely basis.

Please be advised that contractor’s who continuously fail to follow required standards or any requirements of a particular permit, may have their “approved contractor” status revoked by the Department of Public Works that will bar them from performing work within the City of Springfield until approved by the Director.

Mobile Food Truck Vendors applying for a permit will be required to submit Certifications that the vehicle has passed all necessary inspections required by the Springfield Fire Department, City’s Health and Human Services Department, obtained a Hawker and Peddlers license from the Springfield Police Department, and has a valid Certificate of

Insurance providing general liability insurance listing the City as an additional insured, and a copy of the Vehicle's Registration. Vehicles must be registered in the State of Massachusetts. Out of State registrations will not be allowed. Other required materials needed as part of the application are listed on the application in Appendix E of this document.

## **1-D-2 DIGSAFE**

All excavations occurring in the City of Springfield require that DigSafe notification be completed. The City of Springfield is now part of the DigSafe notification program and will have access to all notices applied for in the City. Contractors will not be able to apply for an excavation permit until a DigSafe number has been applied for and obtained. It should be noted that the Springfield Water & Sewer Commission is not part of the DigSafe program, and will have to be notified directly by the applicant regarding mark-out of those utilities.

## **1-D-3 APPLYING FOR A STREET EXCAVATION PERMIT**

Once a contractor has obtained "licensed contractor" approval status, a street excavation permit can be applied for. Applicants should be made aware that applications for contractor licensing approval and excavation permits applications for the same contractor will not be processed simultaneously.

Permits must be applied for by the entity that is performing the actual excavation. An owner, property manager, construction manager, etc., cannot apply for a permit on behalf of another entity. Any entity who obtains a permit, then has a different entity perform the actual work, will cause both entities to be in violation of the City's Occupancy Permit program and both entities will be subject to fines. Under no circumstances will the City process separate permits for contractors to perform separate segments of work at a single location. (i.e. One contractor performs excavations and pipe repair, and another contractor perform surface restoration). The contractor applying for an excavation permit must be the contractor responsible for trench repair and surface restoration.

Any and all utility companies who perform their own work will apply for the permit in the name of the utility company. Utility companies who have contractors perform work for them are required to apply for, and obtain the permit in the name of the contractor performing the work. All non-emergency activities will require that an actual permit be on site at the time of the excavation and 72-hour application notification be adhered to. Any utility company that applies for a permit in the utility's name then has a contractor perform the work, must notify the City prior to the work in order that the permit can be modified. If the City is not notified, the contractor in the field will be issued a stop work order and be subject to fines until a proper permit can be obtained.

The City of Springfield has been part of the DigSafe notification program since 2012 and will have access to all notices applied for in the City. Contractors will not be able to apply for an excavation permit until a DigSafe number has been applied for and obtained. The City of Springfield under Section 40, Chapter 502 of the General Laws of the Commonwealth of Massachusetts, requires all persons who are subject to applying for an excavation permit

must apply for a permit at least a seventy-two (72) hour advance for any excavation within the public way.

Appendix C of this document outlines the requirements for obtaining an excavation permit in the City of Springfield. The City requires a completed application form, a location map / sketch to best identify the location, as well as a sketch that shows the approximate limit of excavation in order to determine life cycle pavement cost. A final sketch will be prepared by the City of Springfield and a revised bill will be sent to the contractor if the actual excavation ends up being larger than stated in the application. Applications that do not include a sketch cannot be processed and sketches must show limit of excavation along with limit of "T" patch.

Contractors are required to notify the DPW – Engineering Division if excavation extends past the dates specified on the permit. The Contractor is also responsible for contacting the DPW – Engineering Division for notification that work is complete. Failure to notify the DPW – Engineering Division will result in additional "per day" fees being charged to the contractor. If the contractor fails to notify the DPW – Engineering Division that a project has extended past the closing date of an existing permit, will be required to apply for a new permit and pay new fees, at a minimum, or at the discretion of the Director, may be issued a fine for working without an approved permit.

## **1-E PROCEDURE FOR YEARLY PERMIT APPLICATIONS**

In order to more easily facilitate occupancies that occur on a more regular or permanent basis, the City of Springfield Department of Public Works – Engineering Division has developed a yearly permit that will allow a person / company and / or utility to obtain a blanket permit on a yearly basis. Items such as signs or awnings, permanent monitoring wells, Valet Parking, overhead utility related work, tree work, etc., all fall under the City's Yearly Occupancy Permit requirement. The process for applying for and obtaining a yearly permit is as follows:

1. Letter of Application: Submit a letter of application to the Director of the Department of Public Works. If opening a new business, the applicant must also register at the City Clerk's Office. For example, the letter of application must state the location, size, color, height and type of mounting, etc, for a proposed sign occupancy permit.
2. Necessary Forms: When the Director, or his designee, approves the application letter, the Department supplies Bond Forms and Application Forms to be completed by the person applying for the permit. Sample copies of both these forms may be obtained from the Department of Public Works, 70 Tapley Street.
3. Permit to Place and Maintain a Canopy Projecting Over a Public Way: The application forms for this permit must be submitted to the City Council for approval.

The Bond Forms must be completed by the applicants' insurance company and returned to the Department with a record of the Bond Number (actual Bond remains with the insurance Company).



4. Yearly License Permit and Bill: When the above steps 1, 2, and 3 have been completed, both a Yearly License Permit and the bill for this permit can be obtained from the Department of Public Works – Engineering Division, 70 Tapley Street. A sample copy of the permit or license may be obtained from the Department of Public Works – Engineering Division.
5. Annual Renewal of Yearly License: Once a yearly Permit or License has been issued, it must be renewed each year and a new Permit or License Forms completed by the Applicant. The annual renewal process is automatically done by the Department upon expiration of each License. Copies of the renewal letters may be obtained from the Department upon expiration of each License. Copies of the renewal letters may be obtained from the Department of Public Works – Engineering Division.
6. Blanket Manhole Yearly Permit: Any holder of such permit will notify the Department at least 72 hours in advance of occupying any primary or secondary arterial street. Failure to do so may result in the blanket permit being revoked. A street occupancy permit would then have to be applied for on a day-by-day basis for each location subject to the daily rate. Any entity that obtains a yearly permit to work in any location within a street is still required to contact the DPW – Engineering Division to inform that City that work will be occurring and a determination will be made if additional signage and / or detours may be required. The 72-hour notification rule also applies to this work.

## **1-F Mobile Food Truck Vendor Permit**

The general goal of this section of the manual is to provide guidelines for Mobile Food Truck Vendors to operate on a regular and legal basis throughout the City of Springfield. The following outlines how occupancy permits will be issued, managed and what requirements the individual vendors will be required to adhere to. The requirements are as follows:

1. Items listed in this document are under the control of the City of Springfield Code, Article VII of Chapter 279: Mobile Food Trucks of the City Ordinances.
2. The provisions of this section shall not apply to canteen, coffee, or ice cream trucks that move from place to place and are stationary in the same location for no more than thirty (30) minutes at a time or food vending push carts and stands.
3. The provisions of this section shall not apply to mobile food operations that receive a temporary one-time event permit issued by the Health and Human Services Department or any other Department within the City.
4. A Mobile Food Truck shall mean a food establishment that is located upon a vehicle, or which is pulled by a vehicle, where food or beverage is cooked,

prepared and served for individual portion service, such as a mobile food kitchen. Independent push cart entities that are not towed are not allowed to occupy and roadways for the sale of any items at any times

5. Hours of Operation: 7:00 a.m. to 1:00 a.m.. No sale or giving away of any product may occur outside of the hours of operation. Mobile Food Trucks may occupy the permitted space no more than one-hour prior to and / or one-hour after the stated hours of operation. Under no circumstance shall any mobile food vendor be allowed to leave / park any Mobile Food Truck on the street in the City of Springfield in the approved space or at any other location outside of the hours stated above. The mobile food truck will not be allowed to occupy a permitted space if it is not open for business.
6. Location:
  - a. Mobile Food Truck Vendors will be only be allowed to operate within a paved roadway, unless otherwise approved by the Director. Under no circumstance will a mobile food truck vendor be allowed to operate on other areas of City Rights of Way including sidewalks and non- paved areas.
  - b. Mobile Food Truck Vendors will not be allowed to operate within or abutting any residentially zoned area, or within 500' of any residentially zoned area.
  - c. Mobile Food Truck Vendors will only be located within existing designated parking spaces and vehicles cannot exceed 20' in length in non-stripped parking spaces and vehicles cannot exceed the designated length in striped parking spaces.
  - d. Mobile Food Truck Vendors will not be able to be located within 500' of any "bricks and mortar" food establishment properly permitted and regulated within the City.
  - e. The City will designate specific areas within the downtown area when specific locations and / or limitations of locations for the use of food trucks are deemed appropriate. The listed requirements on locations apply for all proposed locations within the City.
  - f. A vendor can apply for a specific location (currently approved parking space) within the City, or for one of the designated locations (currently approved parking space) within the Downtown Area at any time. The DPW will act on an application within 21 days. Reviews of applications may also be required by the Fire Department, Police Department, Park Department and / or the Health and Human Services Department. The applicant is required to obtain all other permits prior to submitting application to the DPW. Permits will be issued in 3 month increments (June - August; September - November; December – February; & March - May). If a location is approved, the DPW will install specific signs for that parking space indicating "Mobile Food Truck Vendor Parking Only".

g. The Downtown Area shall mean the area of the City of Springfield whose western boundary is the Connecticut River, whose eastern boundary Chestnut Street, whose northern boundary is Liberty Street and whose southern boundary is Union Street. Within the Downtown Area there shall be no more than ten (12) permits granted at any one time pursuant to this chapter. The permits shall be issued in the following manner:

- I. Six (6) permits may be issued for the parking spaces located at Riverfront Park
- II. Six (6) permits may be issued for the parking spaces located on Lyman Street and Kaynor Street.

h. Vendors who obtain a permit will have "first rights" to their existing permitted space as long as a new permit or permit extension is applied for at least 30 days prior to the expiration of an existing permit. This new permit or extension will require resubmission of all previously submitted documentation as well as payment of additional fees.

i. If a the mobile food truck is towed to the location by another vehicle, the mobile food truck must be detached immediately and any vehicle towing the mobile food truck must then adhere to all parking rules and regulations of the City of Springfield. The towing vehicle is not covered as part of the permit and cannot be parked in the permitted space.

7. Utilities: All utilities required by the Mobile Food Truck must be self-contained and / or mounted to the vehicle and under no circumstances will any external connections be allowed (i.e. power extension cords, portable lighting, etc.) to any remote or adjacent location. Power generators must be contained in, or attached to the mobile food truck. Portable generators will not be allowed to be placed on the street, road, sidewalk, etc.

8. Condiments, plates, silverware, cartons, napkins, etc. must be stored at all times on or within the mobile food truck. Free standing tables, kiosks, etc. for placement of items list is not allowed.

9. All trash generated by the mobile food truck or any patron of the mobile food truck is the responsibility of the mobile food truck vendor. Proper trash receptacles must be provided by the vendor. The vendor has the responsibility to keep the immediate area, including street and sidewalks, of the permitted space clean of trash at all times. Trash must be properly bagged and must be removed from the location by the vendor at the close of business every day. The City of Springfield will not be responsible for the removal of any trash generated by the vendor. The vendor is not allowed to pile trash, bagged or otherwise, on the street or sidewalk at any time. Vendor who do not properly dispose of trash at the end of every day may have their permit either suspended or revoked.

10. Mobile Food Truck Vendors will not be allowed to place any chairs, tables, kiosks, or other items around their vehicles.
11. No external speakers for announcements, playing of music, etc. will be allowed. Any and all noise generated by the mobile food truck will be monitored for proper compliance.
12. Mobile Food Truck Vendors must also comply with any and all Temporary Parking Restrictions imposed by the City of Springfield. (i.e. Street Cleaning, Construction, Snow Emergencies, etc.) Depending upon the Circumstance, the City may provide an alternate location for the vendor.

**1-G-0 PERMIT FEES AND REQUIREMENTS**

The following section details the City of Springfield’s permit fees and requirements.

**1-G-1 PERMIT FEE CALCULATIONS**

In order for the City to be able to maintain our streets and avoid un-necessary excavations, the City has established the following that outlines the cost of obtaining a permit.

**OCCUPANCY PERMITS**

	Item	Cost
<b>Daily Permit</b>	Permit Application Fee	\$75 per application
	Daily Occupancy Fee	\$25 per day
<b>Yearly Permit</b>	Public Utility	\$1,000 per year
	Awning/ Canopy/ Sign	\$75 per year
	Parking / Delivery/ Emergency Services	\$75 per year
	Permanent Monitoring Well	\$40 per year
	General Obstruction (Yearly)	\$75 per year
	Public Services	No Charge
	Marvin Street Residential Parking	\$100 per year
	Valet Parking	\$2.50 per LF plus meter fees
<b>Quarterly Permits</b>	Mobile Food Truck Vendor Permit	\$75 Permit Fee +\$150 per quarter or portion thereof.
		\$150 per quarter Permit Renewal if application submitted 30 days or more prior to end date of existing permit

**EXCAVATION PERMITS**

Item

Cost

<b>DPW Contractor License</b>	Application Fee to become DPW Licensed Contractor	\$125 per application
<b>Daily Permit</b>	Permit Application Fee	\$75 per application
	Daily Inspection Fee	\$45 per day
<b>Yearly Permit</b>	Private Property Trenching	\$75 per year
<b>Life Cycle Fee</b>	Pavement 3 years old or less No Excavation Allowed except on an emergency basis or with DPW Director / Designee Approval	\$120 per sf if allowed
	Pavement 4 or 5 years old.	\$65 per sf
	Pavement greater than 5 years old but less than 10 years old	\$30 per sf
	Pavement more than 10 years old	\$15 per sf

**Notes:**

- 1. The City of Springfield has a 3 year moratorium on excavation within all city streets and a 5 year moratorium on excavation within City, State or Federal funded roadway reconstruction projects. The designation of a particular street as to a 3-year or 5-year excavation moratorium is at the sole discretion of the Department of Public Works.**
- 2. The City of Springfield will use a date of September 1 as a paving date for all roadways paved / overlaid in a given year, if an exact date is not available.**
- 3. Square foot calculation for life cycle fee will be based upon information / sketch provided by the applicant. Calculation of square footage will include area for overlap "T" joint repair. Final Calculation of pavement area to occur at final inspection**

The Director of Public Works or his designee possesses the ability to waive the Life Cycle Payment Fee for any utility company or other party if the utility, or other party, can demonstrate to the Director their ability to satisfactorily maintain the pavement in question. For the purpose of this ordinance, a "Utility Company" is defined in Massachusetts General Law Chapter 25, Section 3.

1. The Utility Company or other party must have real property and/or facilities located in Springfield assessed at \$5,000,000 or greater.
2. The Utility Company or other party shall possess or prove the ability to obtain the necessary personnel and equipment to satisfactorily repair and/or maintain the roadway surface in accordance with this and all other pertinent ordinances.
3. Any Utility Company that has a Pavement Life Cycle Fee waived for any reason, will be responsible for the maintenance and repair of the excavation and surface roadway moving forward until a point in time where the City resurfaces / paves / repairs the roadway.

If a contractor does not meet the above stated criteria and, seeks a waiver of the Life Cycle Pavement Fee the following must be complied with:

- I. A roadway reconstruction plan must be submitted and approved by the Engineering Division.
- II. The roadway area affected by the excavation, curb to curb, must be removed and properly discarded.
- III. The gravel base must be brought to grade and properly compacted.
- IV. 3 inches of bituminous concrete (or other thickness designated by the Department of Public Works) shall be placed by machine and properly rolled according to Massachusetts Department of Public Works Standards.

## **1-G-2 CONTINUITY OF VEHICULAR / PEDESTRIAN TRAFFIC**

Under normal conditions (i.e. any occupancies between the hours of 6:00 a.m. and 5:00 p.m., Monday through Friday) at least one normal travel lane for moving traffic must be maintained at all times, unless otherwise noted on permit. The licensee will be required to coordinate activities with the Springfield Police Department to determine if police services are required for the safety of pedestrians and the driving public, over and above any requirements stated by the Engineering Division as part of the permit. Occupancies of City Rights-of-way that require total or partial closing of the roadway to vehicular traffic may, at the discretion of the Department of Public Works, be restricted to hours outside of the “normal conditions” to ensure public safety. If it becomes necessary to close a road for excavation and / or repair at any time, the contractor is required to contact the Department of Public Works – Engineering Division to initiate the road closure process. The contractor must provide the DPW with a copy of the road closure notice prior to the intended closure to ensure that proper coordination with other departments can be made. Additionally, the contractor may be required to submit a “Detour Plan” for approval by the DPW – Engineering Division. Please be advised that a minimum of 72 hour notice must be given by Contractor to the City prior to the closure of any roadway so that proper notification to the public can be made. Please be aware that a Police Officer working the detail does not have the authority to close a roadway without the approval of the Department of Public Works.

Unless otherwise approved or in the case of an emergency situation, all work to be performed within the public way in the “Downtown Business District” and the “X” Business District shall be performed between the hours of 6:00 p.m. and 6:00 a.m. The “Downtown Business District: is defined as the area that is bounded by the “Arch” on the northerly side, State Street on the southerly side, East Columbus Avenue on the westerly side and Dwight Street on the easterly side. The “X” Business District is the area defined by Sumner Avenue from Cliftwood Street to Ormond Street, Dickinson Street from Grenada Terrace to Cliftwood Street, Belmont Avenue from Burlington Street to Ormond Street. Work in other areas may also be restricted to the above mentioned hours at the discretion of the Director of Public Works.

Wherever sidewalks exist, pedestrian passage ways (unless otherwise approved or in an emergency situation) must be maintained at all times via either existing sidewalks or approved methods of detours. If sidewalk must be closed for any reason, proper signage and barricades as discussed in section 2-H of this document must be followed.

### **1-G-3 POLICE OFFICERS**

Whenever required by either the Director of Public Works, or his designee, or as a condition of the Street Occupancy / Excavation Permit, police officers for traffic and/or pedestrian control are to be furnished **at the expense of the Permittee.**

Upon arriving on any occupancy / excavation work within the City right-of-way in which police services are required, the police officer assigned will be required to inspect the permit issued by the Department of Public Works – Engineering Division. If a proper permit has not been obtained, the work area will be shut down and secured until a proper permit is obtained. Fees for police services will still be required to be paid based upon the hours requested by the permittee / contractor.

Please be aware that detail police officers do not have the authority to close roadways. If an officer requests that a roadway be closed, it is the contractor's responsibility to contact the Department of Public Works and obtain the necessary approvals.

### **1-G-4 REVOCATION OF PERMIT AND OR LICENSE**

A Street Occupancy Permit may be revoked at any time by the Director of the Department of Public Works, or by his designee, if the Permittee is in violation of any of the rules and regulations either set forth herewith or as a condition of the permit, or if a dangerous and / or unsafe condition arises that would jeopardize the safety of the general public resulting from poor construction procedures and practices, or if the Licensee does not resolve a hazardous condition in a reasonable length of time, after being instructed to do so by the Department of Public Works, the issued license may be revoked..

The license revocation may be appealed by the Permittee through a hearing and review by the Director of Public Works or his designee.

If a permit is revoked, the contractor is required to stop work immediately, and secure the work site. The permit will be reissued once the site, in the opinion of the DPW Director or his designee, has been deemed safe for work to continue. The contractor will be liable for all "per-day" fees during the time of any work shutdown.

### **1-G-5 DURATION OF LICENSE / PERMIT**

The Permittee shall not allow his original Street Occupancy License to expire before the work area in the public way is completely clear of all construction material and equipment so as to be safe for normal use by traffic and pedestrians, and/or the public way has been restored to its condition prior to execution of any work authorized by said Permittee.

The Department of Public Works – Engineering Division shall charge a fee for the occupancy of a public way. The fee is based on a per-day rate as established, approved and passed by the Springfield City Council. Each day that the occupancy is in effect shall be calculated in the total amount, including Saturday, Sundays and all Holidays. The number of days required for the occupancy must be estimated by the applicant as close as possible. Extensions of the original permit may be applied for, but no abatements or refunds for over estimating will be issued. Permittees whose occupancy are not completed within the period of times identified on their permit, and who have not notified the Department of Public Works – Engineering Division of the extension, will be charged will be charged at the day rate, and / or may be liable for additional permit fees if so determined by the Director.

Mobile Food Truck Vendor permit will be issued for three month period as follows:

- June 1 – August 31
- September 1 - November 30
- December 1 – February 28 (29)
- March 1 – May 31

Mobile Food Truck Vendor permits will not be issued for any partial periods less than three months and extensions for permits will not be issued for partial time frames less than three months.

Mobile Food Truck Vendors who obtain permits but do not occupy the designate space for any 30 day period will have the permit voided and an entire new application will be required.

## **1-G-6 FINAL INSPECTION**

Upon completion of any excavation, replacement of concrete sidewalk and/or roadway or driveway, or any other permitted occupancy / excavation, the Permittee shall notify the Department of Public Works to make a final inspection of the area / construction to determine that all permit requirements have been complied with. The Street Occupancy Permit and associated fees shall continue in effect until such inspections are made and approval is obtained. Permittees who do not notify the Department of Public Works – Engineering Division regarding completed work will be held liable for all daily fees until notification is completed.

Any deficiencies found during this inspection shall be corrected by the Permittee. Should any deficiencies not be corrected by the Permittee, the Director of Public Works or his designee may, at his discretion, cause any repairs to be made with city forces at the full expense of the Permittee. Any permittee whose work must be completed by City forces, will not be able to apply for any additional permits, or have their yearly status renewed until full payment for required services has been received by the City.

All work shall be done in accordance with the Department of Public Works – Engineering Division’s “*Manual for Occupancy of Public Ways within the City of Springfield*” and the Massachusetts Highway Department and / or Massachusetts Department of Transportation Standard Specifications. Additional requirements may be specified at the discretion of the



Director of Public Works or his designee. Standard repair details are attached to this document in Appendix D.

### **1-G-7 WINTER PERMIT RESTRICTIONS**

Any construction involving excavation of roadway surfaces shall not be permitted during the period of December 1 of one year to April 1 of the next year. Any exceptions to the above may be granted only by the Director of Public Works, or his designee. Any emergency excavation that is required must include immediate notification of the City of Springfield DPW – Engineering Division and will require the submission of Application for Excavation Permit. The contractor is responsible for the maintenance of any and all excavations until final approved pavement patching is completed. Temporary winter patching (cold patch, etc.) must be maintained by the contractor throughout the winter season. The Contractor must immediately address any pavement issues that occur due to rain, sanding or salting operations, snow, snow plowing, etc. that may result in water ponding, potholes, or etc or any other unsafe roadway condition. When the City determines that a particular excavation requires attention, per-day rates will be charged to the contractor until the situation is addressed. The Contractor is required to notify the DPW – Engineering division when final paving will occur in the spring.

### **1-G-8 PENALTIES / FINES**

Any person, company, and / or utility, found to be occupying any City Right-of-way without an appropriate permit, will be required to stop work immediately, secure the project site, and obtain a permit from the Department of Public Works – Engineering Division. When applying for the appropriate permit, a penalty fee / fine of \$750 will be charged and the start date of occupancy / excavation will be retroactive to the date found to be occupying the right-of way illegally. It may take as long as 72 hours to issue a permit, during which time the violator will be responsible for securing work location and will be held liable for any and all accident occurring due to work within right-of-way. Any person / company and / or utility who has obtained a yearly contractor approval, and is found to be working within the City's right-of-way without appropriate permits, will have their yearly approval contractor status revoked, and will be required to reapply for contractor approval and will be required to pay appropriate application fees. During this period the person / company and / or utility will be required to secure all work and will be liable for all incidents occurring due to the work. If it is determined by the City that a dangerous condition exists, the City may repair the area, and charge services back to said person / company and / or utility.

Continuous violations of said regulations by the same person, firm or corporation shall result in the denial of any further Street Occupancy Licenses. Mobile Food Truck vendors who operate without a proper Occupancy Permit issued by the DPW, or who operate in a non-approved location will be subject to a \$750 fine along with a \$100 per day fine as long as the vendor continues to operate illegally. Vendors who continue to operate illegally will also have the Certification issued by the City's Health and Human Services Department, Police Department and Fire Department revoked.

Mobile Food Truck Vendors who do not comply with the regulations listed in section 1-F of the manual will be subject to a \$100 per day or per instance fine, and subject to the

discretion of the Police Department and the Director, and will have the issued occupancy permit revoked and the vendor will not be eligible for any new permits until the next quarterly time period for permits begins.

Mobile Food Truck Vendors who continuously fail to comply with the rules and regulations of this manual will no longer be issued any occupancy permits.



## SECTION 2

# CITY SPECIFICATIONS FOR THE REPAIR OF VARIOUS PARTS OF THE PUBLIC WAY

## **2-A GENERAL**

The Permittee will be required to furnish all materials and will be responsible for excavation and repair work to be done in a workman-like manner. Before any work will be acceptable to the City, all improvements must be placed in a condition as good or better than before the work was started, as determined by the Director of Public Works or his designee. Contractors will be required to adhere to the surface restoration details for specific excavations as shown in Appendix D

## **2-B SPECIFICATIONS FOR PATCHING BITUMINOUS CONCRETE ROADWAYS**

Backfill: The material shall be a good quality as determined by the inspector. The base shall consist of good clean bank gravel equal in depth to the gravel excavated, but not less than 18 inches. All material shall be laid in eight (8) to ten (10) inch layers and thoroughly compacted by mechanical compactors. "The material shall be compacted to a minimum density of ninety-five percent (95%) for the full depth of the trench."

Temporary Patch: Conditions may warrant the necessity of a temporary patch due to extenuating circumstances. If the Director or his designee so orders the excavation shall be backfilled in accordance with the preceding paragraphs and the top surface shall be covered with two (2) inches of bituminous concrete Type-I. The Licensee shall be required to maintain this temporary patch until a permanent patch is placed. The patch shall be such that all vehicular and pedestrian traffic are able to pass over safely at a legal rate of speed.

Permanent Patch: All pavement joints shall be saw cut straight and vertical, as shown on the Surface Restoration Details in Appendix D, cleared of all foreign material, dry, tacked with emulsion and sealed after completion of the pavement patch with emulsion.

Replacement of Bituminous Concrete Roadways: The following minimum specifications shall be met:

Residential Streets: Twelve (12) inches of gravel and three (3) inches of bituminous concrete to be installed in two (2) equal lifts.

Main Arterials: Twelve (12) inches of gravel, two (2) inches of bituminous dense base, and three (3) inches of bituminous concrete surface course to be used. The three (3) inch bituminous layer shall be installed in two (2) equal lifts.

All work to be done in accordance with the "Standard Specifications for Highways and Bridges of the Massachusetts Highway Department or Massachusetts Department of Transportation", current edition.

The contractor shall be required to correct trench settlement and faulty pavement patches, for a period of two (2) years after permanent patch is placed, at the direction of the Department of Public Works, regardless if a pavement life-cycle fee has been paid.

## **2-C INLAYED OR IMPRINTED CROSSWALKS**

Throughout the City of Springfield, most specifically in the downtown area, many roadways have been improved and contain either inlaid or imprinted pedestrian crosswalks. If any excavation occurs that disturbs or removes any of the existing inlaid or imprinted crosswalks, the contractor will be required to replace the inlay or imprint, as directed by the DPW Director or his designee. The exact limits of replacement will be determined at the time of application and the contractor will be required to match patterns, pavement types, colors, etc. Contractor may be required to submit samples and / or installation procedures prior to the actual construction.

## **2-D GRASSED AREAS**

All unpaved areas disturbed as part of any excavation, shall be graded, loamed with at least four (4) inches of loam, after compacting, and seeded with a suitable cover of seed as specified in the "Standard Specifications for Highways and Bridges of the Massachusetts Highway Department or Massachusetts Department of Transportation", current edition.

Whenever a slope condition exceeds 30% in an area where seeding is necessary, a covering of tobacco netting or similar soil stabilization technique shall be utilized to prevent soil erosion.

The licensee shall be required to maintain grassed areas until a substantial cover has been achieved. A substantial cover is obtained when all areas are completely covered and a vigorous growth of four (4) inches has been obtained and at least one mowing has occurred.

## **2-E SIDEWALK CONSTRUCTION**

Sidewalks shall be pitched at the rate of three-sixteenth (3/16) inch to the foot, from the right-of-way line to the top of the curb.

Partial patching of concrete walks shall not be allowed. If any part of a concrete walk is broken or damaged in any way, the entire slab to the nearest expansion joint (actual or visual) shall be removed and replaced with concrete. A slab is defined as that portion of a concrete walk outlined by a scoring pattern. If an expansion joint is not present then the concrete shall be cut by use of a concrete saw along the nearest scoring line. Jack hammers or other impact cutting tools shall not be allowed for this purpose. The saw cut shall be made prior to any attempt to break up or remove the slab.

Wherever sidewalks or curbs are being constructed or reconstructed, handicapped access and curb cuts must be provided. Further, whenever one corner of an intersection is being constructed or reconstructed, handicapped access shall be provided on ALL other corners at the same time.

Proper reinforcement of sidewalk will be required as shown on the Surface Restoration Details in Appendix D.

See Section 4-C of the manual for further specifications on this item.

## **2-F RESIDENTIAL DRIVEWAYS**

1. Driveway to be located a minimum of 25 feet from any corner radius of intersecting street.
2. Driveway to have a minimum width of 10 feet and a maximum width of 20 feet between curb return corners.
3. Standard 2-foot granite curb returns shall be utilized unless otherwise approved in writing by the Director of Public Works or his/her designee.
4. Entire driveway, including 2-foot curb returns, must be within the property lines extended from the property, which the driveway serves except as approved in writing by the Director of Public Works or his/her designee.
5. Driveway apron must meet sidewalk grade.
6. Portion of driveway within the public way must be constructed according to City specifications.
7. If any trees, poles, signs or utilities are located within the limits of the proposed driveway, the appropriate City Department and/or Utility Company shall be notified for the removal or relocation of such at the applicant's expense.
8. Conditions may tend to alter proposed width and location of driveway. Any variations from the Standards shown must be approved by the Director of Public Works or his designee.
9. Patching of bituminous concrete and/or cement concrete driveways (sidewalks) shall be done in accordance Standard Specification for Highways and Bridges of the Massachusetts Highway Department / Massachusetts Department of Transportation. Where a new driveway meets the existing roadway, roadway pavement must be "saw-cut" to match new pavement.
10. The rate of change of grade from the property line to the pavement line shall not be over one (1) foot per ten (10) feet of distance. There should be a minimum of eleven (11) inches pitch from gutter line to street line except as approved in writing by the Director of Public Works or his designee.
11. In those instances where a driveway crosses over a concrete sidewalk, refer to Section 2-D of this manual (Standard Sidewalk Construction at Driveways).

## **2-G DAMAGE TO PRIVATE PROPERTY**

If at times during the course of any occupancy / excavation work, private property becomes damaged, it will be the responsibility of the contractor to repair the area to the satisfaction of the impacted property owner and / or the City of Springfield.

## **2-H SIGNAGE AND BARRICADES**

Any signage, barricades, directional or safety devices required to properly identify the work zone or alternate routes, etc., must comply with all standards and requirements of the Massachusetts Highway Department / Massachusetts Department of Transportation and with the Manual of Uniformed Traffic Control Devices (MUTCD).

If directed by the Director of Public Works or his designee, the contractor may be required to submit a traffic control plan or detour plan that would specifically locate all signs, barricades, etc.

## **2-I PAVEMENT MARKINGS**

The contractor is required to re-apply any and all pavement markings that are removed and/or damaged as part of any excavation, regardless of the size / length of the removal. Pavement marking replacement type must match existing type, style, width, color, etc., including pavement legends.



# **SECTION 3**

# **AUTHORITY**



**3-A. GENERAL LAWS OF THE COMMONWEALTH OF MASSACHUSETTS**

THE COMMONWEALTH OF MASSACHUSETTS

Advance Copy

1980

Acts and Resolves

MICHAEL JOSEPH CONNOLLY, State Secretary

CHAP. 502. AN ACT FURTHER REGULATING EXCAVATIONS IN PUBLIC WAYS.

Be it enacted, etc., as follows:

SECTION 1. Chapter 82 of the General Laws is hereby amended by striking out section 40, as amended by section 1 of chapter 403 of the acts of 1968, and inserting in place thereof the following section:-

SECTION 40. No person shall, except in an emergency, contract for, or make an excavation, which shall include, but not be limited to, the discharge of explosives and the demolition of any structure by which shall not be deemed to include gardening or tilling the soil in the case of privately owned land, in any public way, any public utility company right of way or easement, or any privately owned land under which any public utility company, municipal utility department, or natural gas pipeline company maintains underground facilities, including pipes, mains, wires or conduits, unless at least seventy-two hours, exclusive of Saturdays, Sundays and legal holidays, but not more than sixty days, before the proposed excavation is to be made such person has given an initial notice in writing of the proposed excavation to such natural gas pipeline companies, public utility companies, and municipal utility departments as supply gas, electricity, or telephone service in or to the city or town where such excavation is to be made. Such notice shall set forth the name of the street or the route number of said way and a reasonably accurate description of the location in said way or on private property the excavation is to be made. If such notice cannot be given as aforesaid because of an emergency, it shall be given as soon as may be practicable. Copies of such notices together with a statement certifying that they have been mailed or delivered to such public utility companies as required by the preceding provisions of this section shall be filed with the officer or board having charge of any such public way before a permit to excavate may be approved or issued, except in case of an emergency.

Where an excavation is to be made by a contractor as part of the work required by a contract with the commonwealth or with any political subdivision thereof or other public agency, for the construction, reconstruction, relocation or improvement of a public way or for the installation of a railway track, conduit, sewer or water main, such contractor shall be deemed to have complied with the requirements of this section by giving one such notice setting forth the location and the approximate time required to perform the work involved to each of said companies.

## ACTS 1980 – CHAP. 502

Within seventy-two hours, exclusive of Saturdays, Sundays and legal holidays, from the time said notice is received or at such time as said company and the excavator agree in writing, said company shall respond to the original written notice or to subsequent oral or written notice by designating at the locus, the location of pipes, mains, wires or conduits, in that portion of the public way, public utility company right-of-way or easement or privately owned land in which the excavation is to be made, and the providing of such designation by the company shall constitute prima facie evidence of an exercise of reasonable precaution by the company as required by this section.

Any such excavation shall be performed in such manner, and such reasonable precautions taken to avoid damage to the pipes, mains, wires or conduits in use under the surface of said public way, public utility company right-of-way or easement, or privately owned land, including, but not limited to, any substantial wire, or conduit, penetration or destruction of any pipe, main, wire or conduit or the protective coating thereof, or the severance of any pipe, main or conduit.

When any damage to any pipe, main wire or conduit or its protective coating occurs, the public utility company, natural gas pipeline company, or municipal utility department shall be notified immediately by the person or public agency responsible for the excavation causing the damage.

The making of an excavation without providing notice or notices required by this section with respect to any proposed excavation which results in any damage to a pipe, main, wire or conduit or its protective coating shall be prima facie evidence in any legal or administrative proceeding that such damage was caused by the negligence of such person.

Notice to the public utility underground plant damage prevention system pursuant to section seventy-six D of Chapter one hundred and sixty-four, which notice provides the information required by this section with respect to any proposed excavation and which is given at least seventy-two hours, exclusive of Saturdays, Sundays and legal holidays, but not more than sixty days, before the proposed excavation is to be made, shall constitute compliance with the notice requirement of this section.

Nothing contained in this section shall be construed to affect or impair local ordinances or by-laws requiring permits to be obtained before excavating in a public way, except that, notwithstanding any contrary provision of local ordinances or bylaws, no permit to excavate in a public way shall be approved or issued by the officer or board having charge of any such way, except in an emergency, until such time as copies of such notices to public utility companies are filed by the applicant for a permit as required by this section.

ACTS 1980 – Chap. 502

Whoever violates any provision of this section shall be punished by a fine of two hundred dollars for the first offense and not less than five hundred dollars nor more than one thousand dollars for any subsequent offense.

SECTION 2. Section forty-one and forty-two of said Chapter eighty-two are hereby repealed.

SECTION 3. Chapter 164 of the General Laws is hereby amended by inserting after Section 76C, inserted by Chapter 645 of the acts of 1968, the following section:-

SECTION 76D. All natural gas pipeline companies and public utility companies, as defined in section three of chapter twenty-five, shall create, participate in and be responsible for the administration of a utility underground plant damage prevention system. Said system shall be operated during normal business hours each day of the year, exclusive of Saturdays, Sundays and legal holidays, for the purpose of receiving notices of proposed excavations in public ways, utility rights-of-ways, and in privately owned land under which any public utility company, municipal utility department or natural gas pipeline company maintains underground facilities, including pipes, mains, wires or conduits, as are required by the provisions of section forty of chapter eight-two. Said system shall be responsible, upon receipt of such notices, for immediately notifying such natural gas pipeline companies, public utility companies, and municipal utility departments as supply gas, electricity or telephone service in or to such city or town where such excavation is to take place of such proposed excavation. The cost of operating the utility underground plant damage prevention system shall be apportioned equitably among all natural gas pipeline companies, public utility companies and municipal utility departments as supply gas, electricity or telephone service within the commonwealth according to a formula to be fixed by agreement of the companies.

The department is authorized to investigate the operation of said system and to adopt procedures necessary and appropriate to hear and resolve complaints for failure and appropriate to hear and resolve complaints for failure to comply with the provisions of section forty of chapter eighty-two.

Approved July 14, 1980

**3-B. REVISED ORDINANCES OF THE CITY OF SPRINGFIELD**

Sec. 22-45 DIGGING UP STREETS AND SIDEWALKS: PLACING MATERIAL THEREON.

No person, except the superintendent of streets and engineering, in the performance of his duties, shall break or dig up or cause to be broken or dug up the pavement or ground in any public street, or any sidewalk or common in the city, or erect or cause to be erected any staging for building thereon, or place or cause to be placed any materials or rubbish thereon, without first obtaining from the superintendent of streets and engineering a written

license stating the space in the street or other public place that may be occupied, and the time allowed for such occupancy, and such other provisions as they may deem best, and filing with the superintendent of streets and engineering a written agreement under seal, approved by the superintendent of streets and engineering, to comply strictly with the terms of the license and indemnify the city from all loss, cost or expense that it may suffer by reason of such occupancy.

(R. O. 1956, ch. 26, & 49.)

### 3-C. ARCHITECTURAL ACCESS BOARD

A. APPLICABLE TO ALL FACILITIES: the following Regulations shall apply to all facilities:

#### SITE CONDITIONS

Curb cuts: Curb cuts are required wherever sidewalks or curbs are being construct-ed or reconstructed, and they shall comply with the following:

Location: Curb cuts shall be located, one (1) at each corner of each intersection, adjacent to the radius of the corner and at all street crossings; and in no case at a distance greater than fifteen (15) feet from the intersection of the curb lines. When curbs or sidewalks are constructed or reconstructed on only one side of the street, curb cuts shall be installed on the opposite side(s) of the street.

Slope: Slope of curb cuts shall not exceed one in twelve (1 in 12), and slope shall blend to a common level with the street. Where sidewalks are too narrow to install a straight-line curb cut at a slope of one in twelve (1 in 12), the flared or fanned sides of the curb cut shall also slope at one in twelve (1 in 12).

Width: Width of curb cuts shall be not less than forty (40) inches, not including sloped sides.

Sides: The sides of curb cuts shall be sloped no less than eighteen (18) inches in width at the curb.

Curb Height: Curb height at intersections shall not exceed six (6) inches.

Texture: Detectable warning panels are required for all wheelchair ramps.

### 3-D INSTALLATION OF WHEELCHAIR RAMPS

As part of some excavations, existing wheelchair ramps may be impacted. If any portion of any existing ramp is impacted, the Contractor will be required to replace the ramp in its entirety and comply with all current rules and regulation. The contractor will be responsible for obtaining all of the current detail and specifications required to replace the ramp. Some of the current rules and regulations in place include:

1. THE SIDEWALK CROSS-SLOPE MUST NOT EXCEED  $\frac{1}{4}$ " PER FOOT FOR BRICK AND CEMENT CONCRETE AND  $\frac{3}{16}$ " PER FOOT FOR BITUMINOUS CONCRETE. (REFER TO **STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES**, SECTION 700.) IN NO INSTANCE SHALL THE SIDEWALK CROSS SLOPE EXCEED 3% EXCEPT THE RAMP AREA PROPER WHICH IS EXEMPT.
2. AN UNOBSTRUCTED PATH OF TRAVEL WITH A MINIMUM WIDTH OF 36" SHALL BE MAINTAINED.
3. THE WHEELCHAIR RAMP SLOPE AND SIDE SLOPES (TRANSITIONS), MUST NOT EXCEED 1:12, HOWEVER THESE SLOPES MAY BE FLATTER THAN 1:12 WHEN WARRANTED BY SURROUNDING CONDITIONS.
4. WHERE THE ROAD PROFILE EXCEEDS 5% THE HIGH SIDE TRANSITION LENGTH (L<sub>fh</sub>) WILL BE A MAXIMUM OF 15'.
5. IN NO CASE, WHERE A STOP LINE IS WARRANTED, SHALL A RAMP BE PLACED BEHIND THE STOP LINE.
6. FIXED OBJECTS – UTILITY POLES, HYDRANTS, ETC. – MUST NOT EN-CROACH ON WHEELCHAIR RAMPS.
7. AT NO TIME IS ANY PART OF THE WHEELCHAIR RAMP TO BE LOCATED OUTSIDE OF THE CROSSWALK AND IT IS TO BE CENTERED WHENEVER POSSIBLE.
8. CATCH BASINS WHICH ARE TO BE LOCATED IN THE VICINITY OF A WHEELCHAIR RAMP SHOULD BE LOCATED UP-GRADE WHENEVER POSSIBLE.
9. THE ENTRANCE OF THE WHEELCHAIR RAMP SHALL BE FLUSH WITH THE ROADWAY.
10. TESTING SURFACE: WHEN TESTING WITH A STRAIGHTEDGE PLACED PARALLEL TO THE LINE OF SLOPE, THERE SHALL BE NO DEVIATION FROM A TRUE SURFACE IN EXCESS OF  $\frac{1}{4}$  OF AN INCH.
11. A MID-BLOCK TYPE WHEELCHAIR RAMP WILL NOT BE CONSTRUCTED ON BRIDGES DUE TO THE REQUIRED 12" CURB REVEAL, BUT ACCESSIBILITY WILL BE PROVIDED ALONG THE BRIDGE SIDEWALK.
12. WHEN IT IS TECHNOLOGICALLY UNFEASIBLE TO CONSTRUCT WHEEL-CHAIR RAMPS IN COMPLIANCE WITH THE ARCHITECTURAL ACCESS BOARD'S REGULATIONS, A VARIANCE WILL NEED TO BE SUBMITTED. THE DEPARTMENT'S HANDICAPPED ACCESSIBILITY SECTION SHOULD BE CONTACTED UNDER THESE CIRCUMSTANCES.
13. ANY WHEELCHAIR RAMP THAT IS DISTURBED AND IS NOT CURRENTLY CONSTRUCTED TO THE CURRENT ADA / AAB STANDARD SHALL HAVE THE

RAMP AND ANY AND ALL RAMPS AT THAT INTERSECTION MUST BE BROUGHT UP TO CURRENT STANDARD.

Last Modified: 04/09/2025 at 10:39AM EDT



# APPENDIX A

# STREET OCCUPANCY PERMIT APPLICATION FORM

**CITY OF SPRINGFIELD DPW / ENGINEERING DIVISION  
STREET OCCUPANCY PERMIT APPLICATION FORM**



Required Information:

Date of Application: \_\_\_\_\_

1. Type of Permit (Circle One): Daily Yearly

2. Name of Responsible Person  
Applying for Permit: \_\_\_\_\_

3. Applicant / Company / Name  
Organization (If applicable): \_\_\_\_\_

4. Applicant Address: \_\_\_\_\_

5. Phone Number: Office / Home: \_\_\_\_\_  
Cell: \_\_\_\_\_

6. Start Date: \_\_\_\_\_

7. End Date: \_\_\_\_\_

8A. Street Permit Location, Attach  
Map, if required or requested: \_\_\_\_\_

8B. List Two adjacent Side Streets  
(Example Main Street between  
Bridge St and Worthington St.): \_\_\_\_\_

9A. Reason for Issuing Work Permit (New  
Installation, Crane, Dumpster, Delivery, etc.) \_\_\_\_\_

9B. Reason for Issuing Event Permit (Parade,  
Block Party, Walk, etc.) \_\_\_\_\_

10. Describe Work Event:

11. Fee Calculation:	Application Fee:	\$75
	Daily Fee ( _____ days X \$25/day )	\$ _____
	Annual Fee	\$ _____
	Estimated Total:	\$ _____

**INVALID WITHOUT APPLICANT SIGNATURE**

Authorized Signature: \_\_\_\_\_

Person above agrees to abide by all DPW permit regulations and fees as outlined in the "Manual for Occupancy of Public Ways within the City of Springfield" – Latest Edition

Applicant Check Number: \_\_\_\_\_

Last Modified: 04/09/2025 at 10:39AM EDT





## APPENDIX B

# YEARLY LICENSED CONTRACTOR APPLICATION FORM

**For Office Use Only**

**YEARLY LICENSED CONTRACTOR SUBMISSION CHECKLIST**

<b><u>Submitted and Approved</u></b>	<b><u>Task</u></b>
--------------------------------------	--------------------

Original Completed Annual License Application Form

Pay a \$125 application fee (no cash) – copy of check for file

Produce a \$10,000 Permit Bond (must be original – no fax copies accepted)

Provide a Certificate of Liability Insurance that meets all requirements of sample form. Certificate can be faxed or e-mailed

Supply three (3) recent, local references from other municipalities on municipal letterhead or approved alternate references.

Reference Letters can be hand delivered or mailed to:

City of Springfield  
Engineering Division  
Permit Coordinator  
70 Tapley Street  
Springfield ,MA 01104

Supply copies of the operators MA Hoisting Equipment License as well as an original signature of each excavator for our file as per OSHA Regulations, G.L. c. 82A, 520 CMR 7.00 et seq.

Supply OSHA Competent Worker Training Certificate

**Comments:**

**NOTE:**

**Contractors will not be allowed to begin any work until all above material has been submitted and accepted, and an approval letter has been received.**

**CITY OF SPRINGFIELD DPW / ENGINEERING DIVISION**



**YEARLY LICENSED CONTRACTOR APPLICATION FORM**

Required Information:

1. *Date of Application:* \_\_\_\_\_
2. *Name of Contractor:* \_\_\_\_\_
3. *Contractor Address:* \_\_\_\_\_  
\_\_\_\_\_
4. *Phone Number:*    *Office / Home:* \_\_\_\_\_  
*Cell:* \_\_\_\_\_  
*Fax:* \_\_\_\_\_
5. *Primary Contact Name, Phone # and e-mail address*  
\_\_\_\_\_
6. *Please describe your company's experience in street excavation, pavement restoration and trench safety:*  
\_\_\_\_\_

7. *Recommendation Summary ( List 3 References):*

- A.
- B.
- C.

**OFFICIAL USE ONLY**

The Department of Public Works / City Engineer:

Date: \_\_\_\_\_

1. **Has No Objection to the issuance of a license:**
2. **Objects to the issuance of a license:**
3. **Has not been provided with enough information:**

Other Comments:

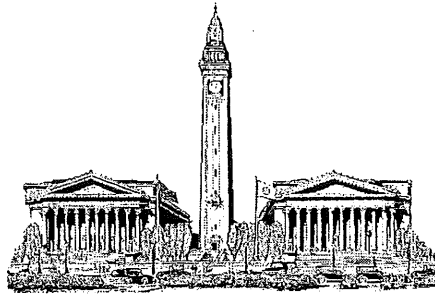
Last Modified: 04/09/2025 at 10:39AM EDT

**DEPARTMENT OF  
PUBLIC WORKS**

**ENGINEERING DIVISION**

70 TAPLEY STREET  
SPRINGFIELD, MA 01104

413-787-6210 413-787-6029 FAX



CITY OF SPRINGFIELD  
MASSACHUSETTS

Date:

Contractor Name  
Address

Dear Sirs:

Your application to be a licensed contractor under the City of Springfield's Occupancy Permit Program has been approved. Your approval is active for the calendar year \_\_\_\_\_.

You can re-apply for your approval for the next calendar year beginning October 1 of this year. We recommend that you apply early to ensure no lapse in approval status.

Thank You very much for working in the City of Springfield.

Very Truly Yours,

**Matthew J. Sokop, P.E.**  
City Engineer

This letter will be issued by the DPW –  
Engineering Division upon obtaining  
approval status.

CONTRACTOR LETTERHEAD  
Address, Telephone #, etc.

Date:

Mr. Matthew J. Sokop, P.E  
City Engineer  
Springfield Department of Public Works – Engineering Division  
70 Tapley Street  
Springfield, MA 01104

Dear Mr. Sokop:

Re: OSHA Excavation Competent Person Training

I certify that the following employees are OSHA Excavation Competent Persons and that they are responsible for overseeing the trench excavation safety requirements of the Commonwealth of Massachusetts (520 CMR 14.00, et. Al.) and the applicable Federal OSHA general industry and construction health & safety regulations:

Name 1  
Name 2  
Name 3  
Etc.

Supporting OSHA training certificate(s) are attached.

Please contact me at XXX-XXX-XXXX or via e-mail at xxxx@xxxxxxxxx if you have any questions.

Sincerely,

Contractor Authorized Signature

This sample letter should be sent by the contractor to the City of Springfield identifying OSHA approved personnel

**SAMPLE INSURANCE CERTIFICATE - CONTRACTOR MUST COMPLY WITH ALL SECTIONS**



**CERTIFICATE OF LIABILITY INSURANCE**

DATE (MM/DD/YYYY)  
12/3

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

**IMPORTANT:** If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER 4 <b>Insurance Co. name here</b>	CONTACT NAME: Ro PHONE (A/C, No, Ext): 413 E-MAIL ADDRESS: rom PRODUCER CUSTOMER ID #: ADJ	FAX (A/C, No): 413-
INSURED <b>Insured Name Must match name exactly as stated on Application Form</b>	INSURER(S) AFFORDING COVERAGE INSURER A: Oh INSURER B: Peo INSURER C: Nat INSURER D: INSURER E: INSURER F:	NAIC # 2419 <b>Insert Firm actually providing Insurance "Workers Comp Bureau" not acceptable</b>

COVERAGES CERTIFICATE NUMBER: REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDITIONAL SUBSCRIBER	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	GENERAL LIABILITY <input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR		BAW53153900	12/31/10	12/31/11	EACH OCCURRENCE \$ 1,000,000 DAMAGE TO RENTED MISFS (Per occurrence) \$ 100,000 MED EXP (Any one person) \$ 5,000 PERSONAL & ADV INJURY \$ 1,000,000 GENERAL AGGREGATE \$ 2,000,000 PRODUCTS - COMP/OP AGG \$ 2,000,000
A	AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> ANY AUTO <input checked="" type="checkbox"/> ALL OWNED AUTOS <input checked="" type="checkbox"/> SCHEDULED AUTOS <input checked="" type="checkbox"/> HIRED AUTOS <input checked="" type="checkbox"/> NON-OWNED AUTOS		BAW53153900	12/31/10	12/31/11	COMBINED SINGLE LIMIT (Per accident) \$ 1,000,000 MED EXP (Per person) \$ 5,000 BODILY INJURY (Per accident) \$ 500,000 PROPERTY DAMAGE (Per accident) \$ 1,000,000 \$ 300,000
A	UMBRELLA LIAB EXCESS LIAB DEDUCTIBLE <input checked="" type="checkbox"/> RETENTION \$ 10,000		USO53153890	12/31/10	12/31/11	EACH OCCURRENCE \$ 5,000,000 AGGREGATE \$ 5,000,000
B	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	Y/N <input type="checkbox"/>	N/A	12/31/10	12/31/11	WC STATUTORY LIMITS OTHER EACH ACCIDENT \$ 1,000,000 DISEASE - EA EMPLOYEE \$ 1,000,000 DISEASE - POLICY LIMIT \$ 1,000,000 Ess Um \$ 5,000,000
C	Excess Umbrella		BE	12/31/10	12/31/11	

**Policy Must be checked—not Project**

**Policy must comply with either limits**

**Preferable that effective dates are calendar year, but not required.  
Contractor must submit updated policy following expiration**

**All sections must have a policy number, not "Policy number TBD"**

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if the City of Springfield, MA is named as an additionally Insured.  
XCU Coverage Included

CERTIFICATE HOLDER City of Springfield Department of Public Works 70 Tapley Street Springfield, MA 01104	Required for all certificates	CANCELLATION SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.
		AUTHORIZED REPRESENTATIVE <i>Joseph M. Phillips</i>

Last Modified: 04/09/2025 at 10:39AM EDT



The Hanover Insurance Company | 440 Lincoln Street, Worcester, MA 01653  
 Citizens Insurance Company of America | 645 West Grand River Avenue, Howell, MI 48843  
 Massachusetts Bay Insurance Company | 440 Lincoln Street, Worcester, MA 01653

**STREET PERMIT BOND**

Bond No. [REDACTED]

KNOW ALL MEN BY THESE PRESENTS, that we, [REDACTED]

of [REDACTED],

as Principal, and  The Hanover Insurance Company (A New Hampshire Corporation)  Massachusetts Bay Insurance Company (A New Hampshire Corporation), as Surety, are held and firmly bound unto

City of Springfield DWP, as Oblige, in the penal sum of

Ten Thousand Dollars, good and lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, and our heirs, executors, administrators, jointly and

**SAMPLE PERMIT BOND**

WHEREAS the said principal has applied to said Oblige for a license to [REDACTED] open, occupy, cross by vehicles and obstruct a certain portion of a public sidewalk/berm, curbing, street or way in said Town or City of Springfield

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, That if Principal shall faithfully observe and honestly comply with the provisions of all Laws or Ordinances of Oblige regulating the business for which license is issued, then this obligation shall be void; otherwise to be and remain in full force and virtue.

PROVIDED, THE LIABILITY OF THE SURETY upon this bond shall be and remain in full force and effect for the full period of the license, and renewals thereof, issued to the principal above named, or until ten days after receipt by the Oblige of a written notice signed by such Surety, or its authorized agent, stating that the liability of such Surety is thereby terminated and canceled; and provided further, that nothing herein shall affect any rights or liabilities which shall have accrued under this bond prior to the date of such termination.

Signed, sealed and dated the 28th day of April, 2009.

[REDACTED] Principal

By: [REDACTED] (Seal)

THE HANOVER INSURANCE COMPANY  
 MASSACHUSETTS BAY INSURANCE COMPANY

By: [REDACTED]



Last Modified: 04/09/2025 at 10:39AM EDT

THE HANOVER INSURANCE COMPANY  
MASSACHUSETTS BAY INSURANCE COMPANY  
CITIZENS INSURANCE COMPANY OF AMERICA

POWERS OF ATTORNEY  
CERTIFIED COPY

KNOW ALL MEN BY THESE PRESENTS: That THE HANOVER INSURANCE COMPANY and MASSACHUSETTS BAY INSURANCE COMPANY, both being corporations organized and existing under the laws of the State of New Hampshire, and CITIZENS INSURANCE COMPANY OF AMERICA, a corporation organized and existing under the laws of the State of Michigan, do hereby constitute and appoint

Jillian A. Gustavis

of Chicopee, MA

and each is a true and lawful Attorney(s)-in-fact to sign, execute, seal, acknowledge and deliver for, and on its behalf, and as its act and deed any place within the United States, or, if the following line be filled in, only within the area therein designated

any and all bonds, recognizances, undertakings, contracts of indemnity or other writings obligatory in the nature thereof, as follows:

Street Permit

in the amount of \$10,000.00  
and said companies hereby ratify  
These appointments are made  
resolutions are still in effect:

**SAMPLE PERMIT BOND**

of these presents.  
companies which

"RESOLVED, That the President or any Vice President, in conjunction with any Assistant Vice President, be and they are hereby authorized and empowered to appoint Attorneys-in-fact of the Company, in its name and as its acts, to execute and acknowledge for and on its behalf as Surety any and all bonds, recognizances, contracts of indemnity, waivers of citation and all other writings obligatory in the nature thereof, with power to attach thereto the seal of the Company. Any such writings so executed by such Attorneys-in-fact shall be as binding upon the Company as if they had been duly executed and acknowledged by the regularly elected officers of the Company in their own proper persons." (Adopted October 7, 1981 - The Hanover Insurance Company; Adopted April 14, 1982 - Massachusetts Bay Insurance Company; Adopted September 7, 2001 - Citizens Insurance Company of America)

THE HANOVER INSURANCE COMPANY  
MASSACHUSETTS BAY INSURANCE COMPANY  
CITIZENS INSURANCE COMPANY OF AMERICA



*Mary Jeanne Anderson*  
Mary Jeanne Anderson, Vice President

*Robert K. Grennan*  
Robert K. Grennan, Assistant Vice President

IN WITNESS WHEREOF, THE HANOVER INSURANCE COMPANY, MASSACHUSETTS BAY INSURANCE COMPANY and CITIZENS INSURANCE COMPANY OF AMERICA have caused these presents to be sealed with their respective corporate seals, duly attested by a Vice President and an Assistant Vice President, this 28th day of April 2009

THE COMMONWEALTH OF MASSACHUSETTS )  
COUNTY OF WORCESTER ) ss.

On this 28th day of April 2009, before me came the above named Vice President and Assistant Vice President of The Hanover Insurance Company, Massachusetts Bay Insurance Company and Citizens Insurance Company of America, to me personally known to be the individuals and officers described herein, and acknowledged that the seals affixed to the preceding instrument are the corporate seals of The Hanover Insurance Company, Massachusetts Bay Insurance Company and Citizens Insurance Company of America, respectively, and that the said corporate seals and their signatures as officers were duly affixed and subscribed to said instrument by the authority and direction of said Corporations.



*Barbara A. Gault*  
Notary Public

My commission expires on November 3, 2011

I, the undersigned Assistant Vice President of The Hanover Insurance Company, Massachusetts Bay Insurance Company and Citizens Insurance Company of America, hereby certify that the above and foregoing is a full, true and correct copy of the Original Power of Attorney Issued by said Companies, and do hereby further certify that the said Powers of Attorney are still in force and effect.

This Certificate may be signed by facsimile under and by authority of the following resolution of the Board of Directors of The Hanover Insurance Company, Massachusetts Bay Insurance Company and Citizens Insurance Company of America.

"RESOLVED, That any and all Powers of Attorney and Certified Copies of such Powers of Attorney and certification in respect thereto, granted and executed by the President or any Vice President in conjunction with any Assistant Vice President of the Company, shall be binding on the Company to the same extent as if all signatures therein were manually affixed, even though one or more of any such signatures thereon may be facsimile." (Adopted October 7, 1981 - The Hanover Insurance Company; Adopted April 14, 1982 - Massachusetts Bay Insurance Company; Adopted September 7, 2001 - Citizens Insurance Company of America)

GIVEN under my hand and the seals of said Companies, at Worcester, Massachusetts, this 28th day of April 2009

THE HANOVER INSURANCE COMPANY  
MASSACHUSETTS BAY INSURANCE COMPANY  
CITIZENS INSURANCE COMPANY OF AMERICA

*Stephen L. Brown*  
Stephen L. Brown, Assistant Vice President

Last Modified: 04/09/2025 at 10:39AM EDT





The Hanover Insurance Company | 440 Lincoln Street, Worcester, MA 01653  
 Citizens Insurance Company of America | 645 West Grand River Avenue, Howell, MI 48843  
 Massachusetts Bay Insurance Company | 440 Lincoln Street, Worcester, MA 01653

**ONLINE MISCELLANEOUS SURETY BOND APPLICATION**

**PRIOR TO RELEASING BOND, THE APPLICATION MUST BE SIGNED BY THE PRINCIPAL/APPLICANT AND, IF REQUIRED, BY ANY ADDITIONAL INDEMNITOR(S) WITH EACH SIGNATURE WITNESSED**

**BASIC MISCELLANEOUS SURETY APPLICATION INFORMATION**

Surety Company: [REDACTED] Bond Number: E [REDACTED]  
 Name of Principal or Applicant: [REDACTED]  
 Name of Oblige: [REDACTED]  
 Type of Bond: [REDACTED] Bond Amount: \$10,000.00  
 Effective Date: April 28, 2009

**AGREEMENT OF INDEMNITY**

The undersigned applicant and indemnitors hereby request the Company to become surety for the above bond. The undersigned hereby certify the truth of all statements in the application and attachments and jointly and severally agree:

- 1) to pay the usual premiums, including continuations and/or renewals;
- 2) to completely INDEMNIFY the Company from and against any liability, loss, costs, attorney's fees, and expenses whatsoever which the Company shall at any time sustain as surety on this bond or any other bond, or for the enforcement of this agreement;
- 3) that the Company shall, without notice, have the right to amend the penalty terms and conditions of any bond issued for the undersigned and this agreement shall apply to any such amended bond;
- 4) that the Company shall have the right to adjust, settle or compromise any claim, demand, suit or judgment upon said bond(s) and its decision in good faith to make any payment shall be final and conclusive as to the fact and extent of the liability of the undersigned;
- 5) upon demand by the Company, to deposit current funds with the Company in amount sufficient to satisfy any claim against the Company by reason of such suretyship;
- 6) that if said bond is cancelable, this agreement may be terminated as to subsequent liability, upon written notice to the Company and with written confirmation from the Company stating when such termination will take effect.

NOTE: Full Collateral may be required for certain types of bonds.

**APPLICABLE IN NEW YORK**  
 Any person who knowingly and with intent to mislead, information concerning any fact

**SAMPLE PERMIT BOND**

conceals for the purpose of

Please sign below in the appropriate section and have your signature(s) witnessed.

Signed and Dated: April 28, 2009

(Name of Applicant)

Witness: _____	By: _____ (Individual)
Witness: _____	By: _____ (Partner)
Witness: _____	By: _____ (Partner)
Witness: _____	By: _____ (Managing Member)
Witness: _____ (Corporate Secretary)	By: _____ (President)

In consideration of the execution by the Company of the bond herein applied for, the undersigned, jointly and severally, join in the foregoing indemnity agreement.

**SIGNATURE OF INDEMNITORS**

Witness: _____	_____ (Indemnitor)
Witness: _____	_____ (Indemnitor)
Witness: _____	_____ (Indemnitor)
Witness: _____	_____ (Indemnitor)

Last Modified: 04/09/2025 at 10:39AM EDT



# APPENDIX C

# STREET EXCAVATION PERMIT APPLICATION FORM

**CITY OF SPRINGFIELD DPW / ENGINEERING DIVISION  
STREET EXCAVATION PERMIT APPLICATION FORM**



Required Information:

Date of Application: \_\_\_\_\_

1. Location of Excavation (Circle One): Public Way Private Way / Property

2. Name of Responsible Person Applying for Permit: \_\_\_\_\_

3. Applicant / Company Name (must be a licensed contractor): \_\_\_\_\_

4. Applicant Address: \_\_\_\_\_

5. Phone Number: Office: \_\_\_\_\_

Cell: \_\_\_\_\_

6. Start Date: \_\_\_\_\_

7. End Date: \_\_\_\_\_

8. DigSafe Number (No permit issued without DigSafe Number) \_\_\_\_\_

9. Street Permit Location, Attach Map, if required or requested: \_\_\_\_\_

10. List Two adjacent Side Streets (Example Main Street between Bridge St and Worthington St.): \_\_\_\_\_

11. Describe Work Event:

11. Fee Calculation: Application Fee: \$75  
 Daily Fee ( \_\_\_\_\_ days X \$45 / day) \$ \_\_\_\_\_  
 Life Cycle pavement Fee \$ \_\_\_\_\_

Estimated Total: \$ \_\_\_\_\_

**INVALID WITHOUT APPLICANT SIGNATURE**

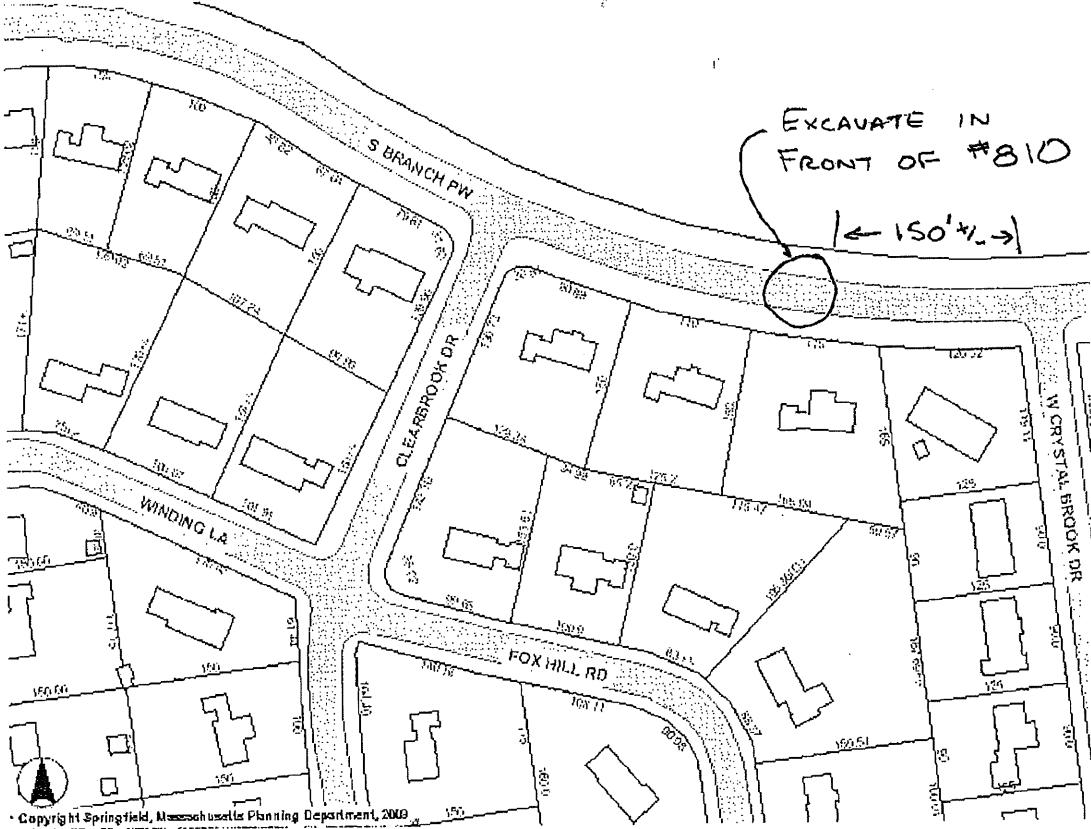
Authorized Signature: \_\_\_\_\_

The applicant agrees to abide by all DPW- Engineering Div. permit regulations and fees as outlined in the "Manual for Occupancy of Public Ways within the City of Springfield" – Latest Edition

Applicant Check Number: \_\_\_\_\_

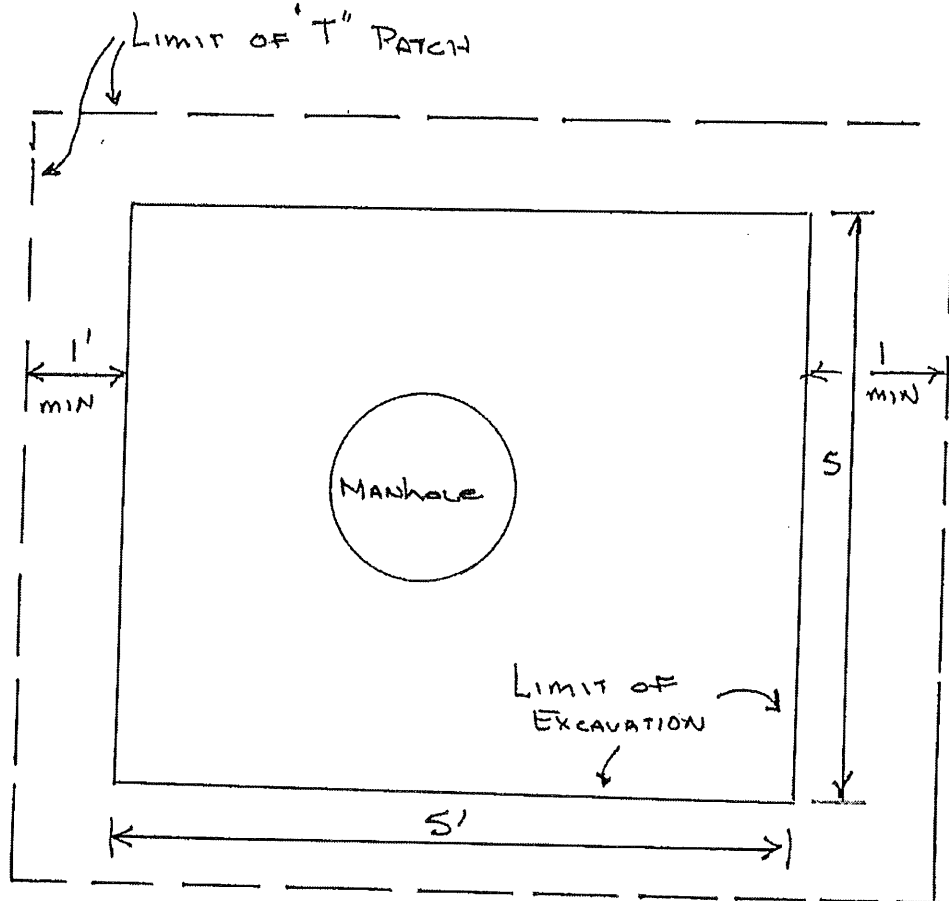
Last Modified: 04/09/2025 at 10:39AM EDT

# STREET EXCAVATION PERMIT SKETCH



**SAMPLE SKETCH**

# STREET EXCAVATION PERMIT SKETCH

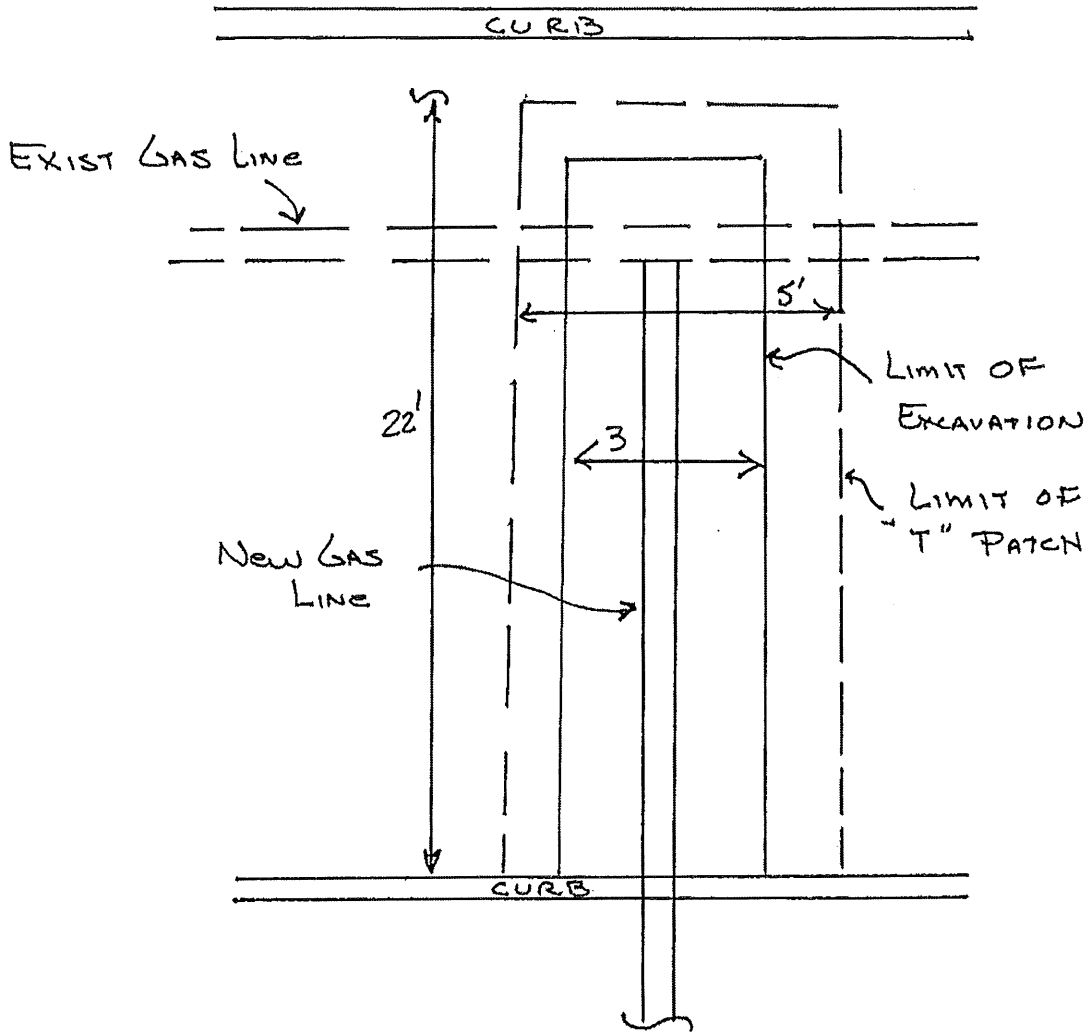


Last Modified: 04/09/2025 at 10:39AM EDT

**Manhole Repair**  
**Life Cycle Calculation**  
Pavement 4 years old = \$65 / sf  
Cost = 7' x 7' x \$65 / sf = \$3,185

**SAMPLE SKETCH**

# STREET EXCAVATION PERMIT SKETCH



Last Modified: 04/09/2025 at 10:39AM EDT

**Trench Excavation**  
**Life Cycle Calculation**  
Pavement 7 years old = \$30 / sf  
Cost = 5' x 22' x \$30 / sf = \$3,300

**SAMPLE SKETCH**

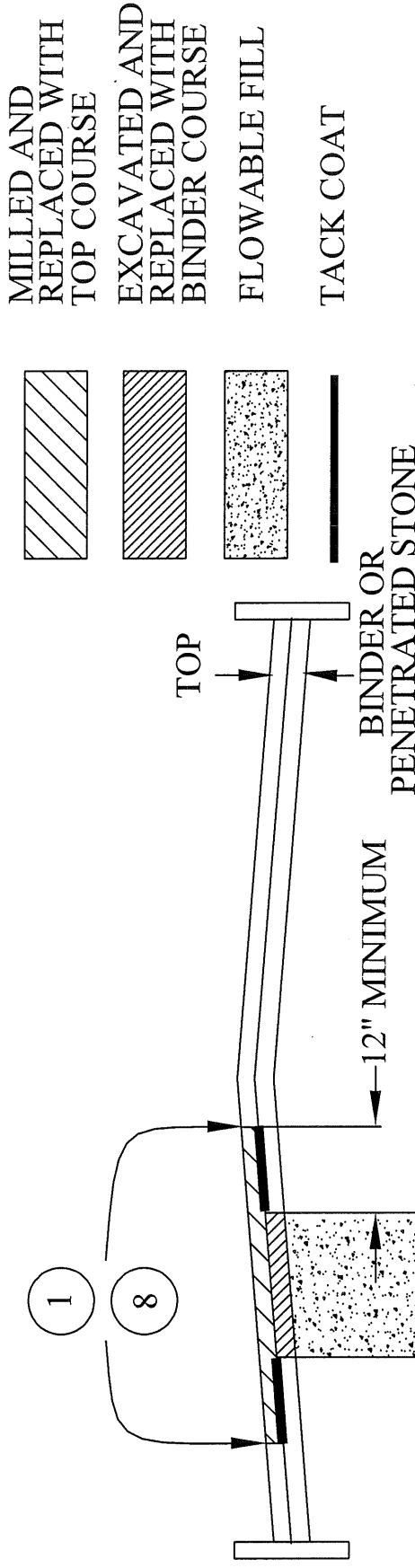


## APPENDIX D

# RESTORATION DETAILS

- Arterial Street Trench and Pavement Repair
- Residential Street Trench and Pavement Repair
- Sidewalk / Driveway Repair
- Multiple Excavation Repair
- Inlay or Imprinted Pavement Repair

# TRENCH REPAIR SPECIFICATION ARTERIAL STREET



REPLACE WITH SAME DEPTH OF ASPHALT OR MINIMUM 5" - ALL MATERIALS USED TO MEET MASS. STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES

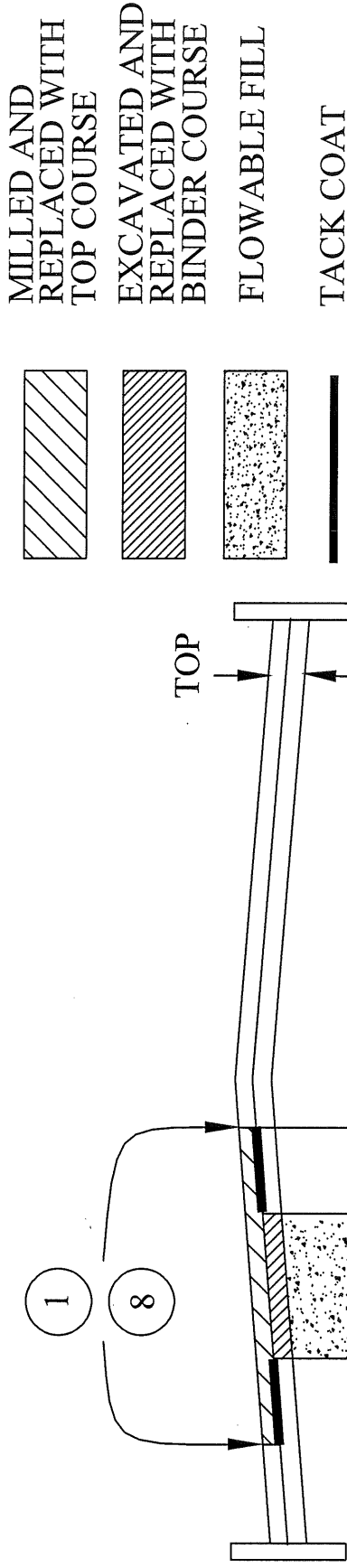
## NOTES:

1. SAW CUT OUTER EDGE OF UTILITY PATCH
2. MILL TO REMOVE TOP COURSE
3. LEAVE 12" MIN. LIP BETWEEN EDGE OF TOP AND EDGE OF BINDER COURSE
4. AFTER TRENCH WORK COMPLETED, FILL AROUND PIPE TO BOTTOM WITH FLOWABLE FILL
5. REPLACE LAYERS OF BINDER AND DEEP BASE
6. TACK AREA OF MILLING
7. REPLACE TOP COURSE
8. SEAL EDGES OF UTILITY PATCH WITH HOT POURED RUBERIZED ASPHALT SEALANT
9. ALL ROAD CUTS 2' OR LESS FROM THE CURB MUST BE MILLED AND REPAIRED FROM THE OUTER MOST EDGE OF CUT TO THE CURB.

2-B SPECIFICATION FOR PATCHING BIT. CONC. ROADWAYS(CONT.)



# TRENCH REPAIR SPECIFICATION RESIDENTIAL STREET



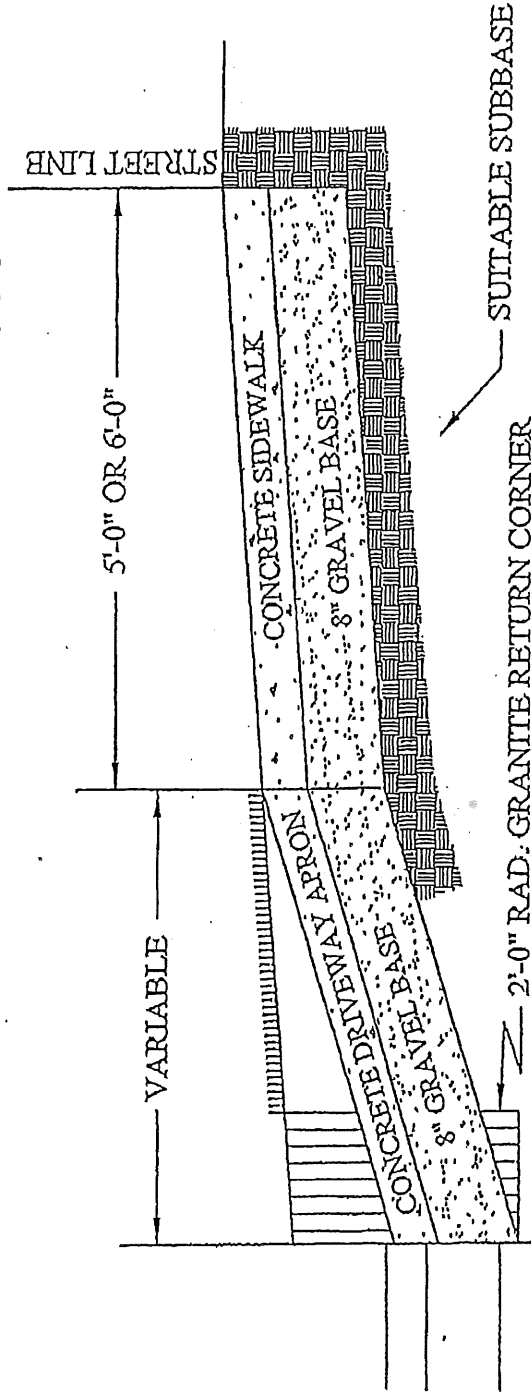
REPLACE WITH SAME DEPTH OF ASPHALT OR MINIMUM 3" - ALL MATERIALS USED TO MEET MASS. STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES

## NOTES:

1. SAW CUT OUTER EDGE OF UTILITY PATCH
2. MILL TO REMOVE TOP COURSE
3. LEAVE 12" MIN. LIP BETWEEN EDGE OF TOP AND EDGE OF BINDER COURSE
4. AFTER TRENCH WORK COMPLETED, FILL AROUND PIPE TO BOTTOM
5. REPLACE ONE LAYER OF BINDER
6. TACK AREA OF MILLING
7. REPLACE TOP COURSE
8. SEAL EDGES OF UTILITY PATCH WITH HOT POURED RUBERIZED ASPHALT SEALANT
9. ALL ROAD CUTS 2' OR LESS FROM THE CURB MUST BE MILLED AND REPAIRED FROM THE OUTER MOST EDGE OF CUT TO THE CURB.

2-B SPECIFICATION FOR PATCHING BIT. CONC. ROADWAYS(CONT.)

# STANDARD SIDEWALK CONSTRUCTION AT COMMERCIAL DRIVEWAYS



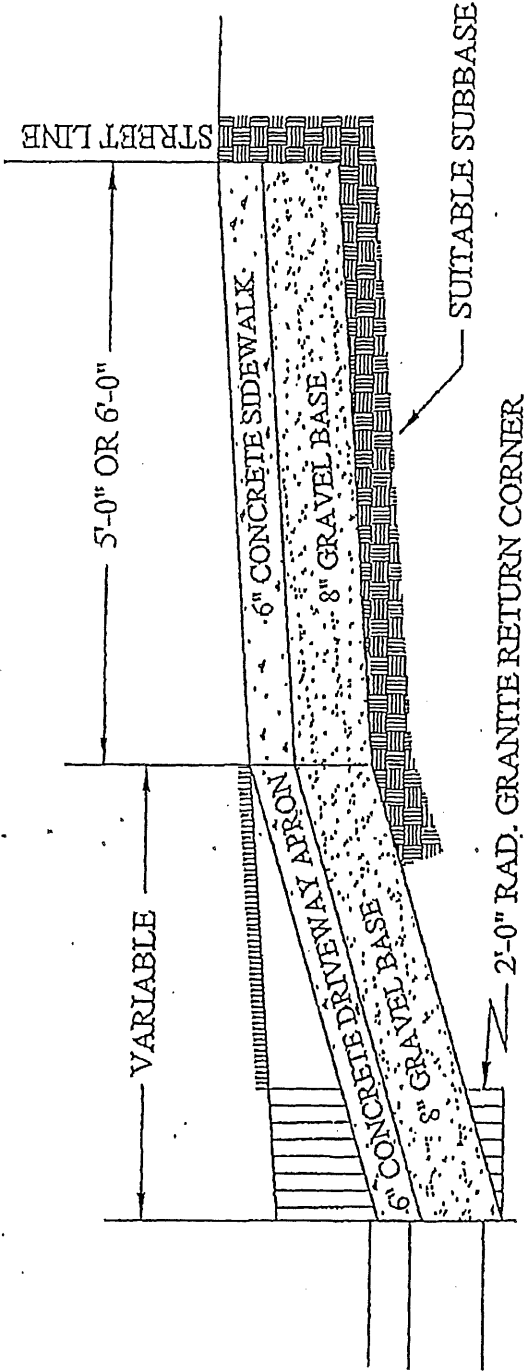
## NOTES:

- 9" CONCRETE MAY BE REPLACED BY 6" ASPHALT IF APPROVED
- STANDARD SIDEWALK SLOPE IS 3/16 PER FT.
- MAXIMUM DRIVEWAY WIDTH IS 40' WITH TWO 2' CURB RETURNS (36' OPENING)
- #3 REINFORCING BARS SHALL BE PLACED 12" O.C., 3" FROM GRAVEL BASE
- MINIMUM CONCRETE STRENGTH WILL BE 4,000#, CLASS D

ID# 0007

SPRINGFIELD, MA DPW 2-27-2006

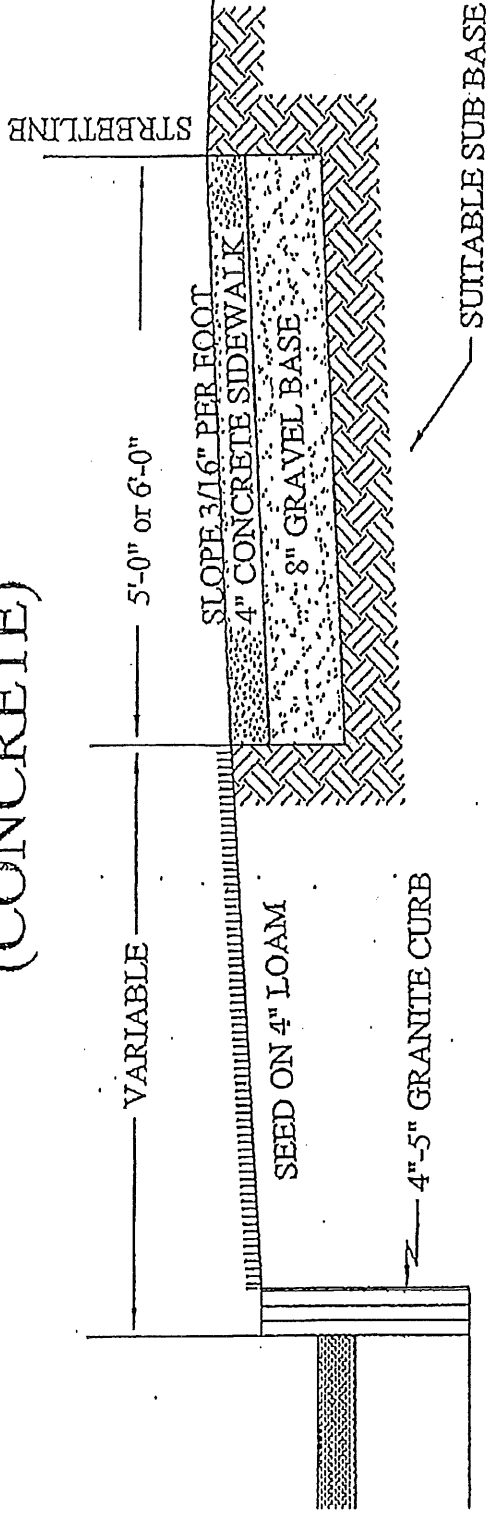
# STANDARD SIDEWALK CONSTRUCTION AT RESIDENTIAL DRIVEWAYS



## NOTES:

- 6" CONCRETE DEPTH TO BE REPLACED BY 3-1/2" ASPHALT(2" BINDER, 1- 1/2 TOP) AS DIRECTED BY THE ENGINEER
- STANDARD SIDEWALK SLOPE IS 3/16 PER FT.
- MAXIMUM DRIVEWAY WIDTH IS 24' WITH TWO 2' CURB RETURNS (20' OPENING)
- WIRE WELDED FABRIC PLACED 1-1/2" ABOVE GRAVEL BASE
- MINIMUM CONCRETE STRENGTH WILL BE 4,000#, CLASS D

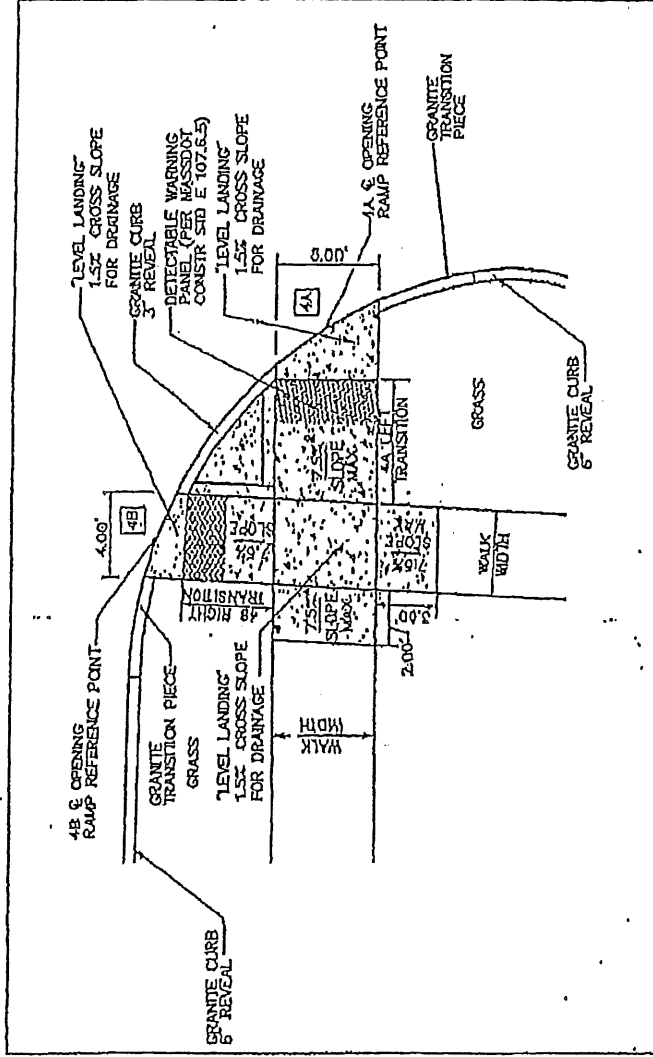
# TYPICAL STANDARD SECTION FOR SIDEWALK CONSTRUCTION (CONCRETE)



**NOTES:**

- STANDARD SIDEWALK SLOPE IS 3/16 PER FT.
- MINIMUM CONCRETE STENGTH WILL BE 4,000#, CLASS D

# SIDEWALK REPAIR



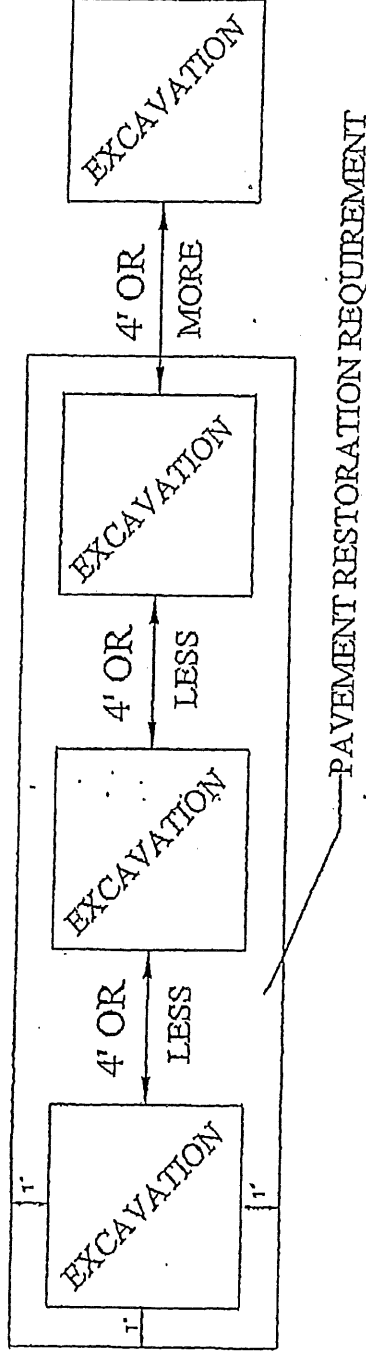
**NOTES:**

- IF EXCAVATION OCCURS ON A SIDEWALK AT AN INTERSECTION, CONTRACTOR IS REQUIRED TO REMOVE ENTIRE SIDEWALK WHEELCHAIR RAMP, ADJUST CURB, AND REPLACE TO CURRENT MASSDOT/A.D.A. GUIDELINES.
- IF NO CURRENT RAMP EXISTS, CONTRACTOR IS REQUIRED TO INSTALL RAMP AND ADJUST CURB TO MEET CURRENT MASSDOT/A.D.A. GUIDELINES.
- WIRE MESH REINFORCEMENT CONFORMING TO AASHTO-M55 OR ASTM A185-79 WILL BE REQUIRED.

ID# 0070

SPRINGFIELD, MA DPW 1-09-2012

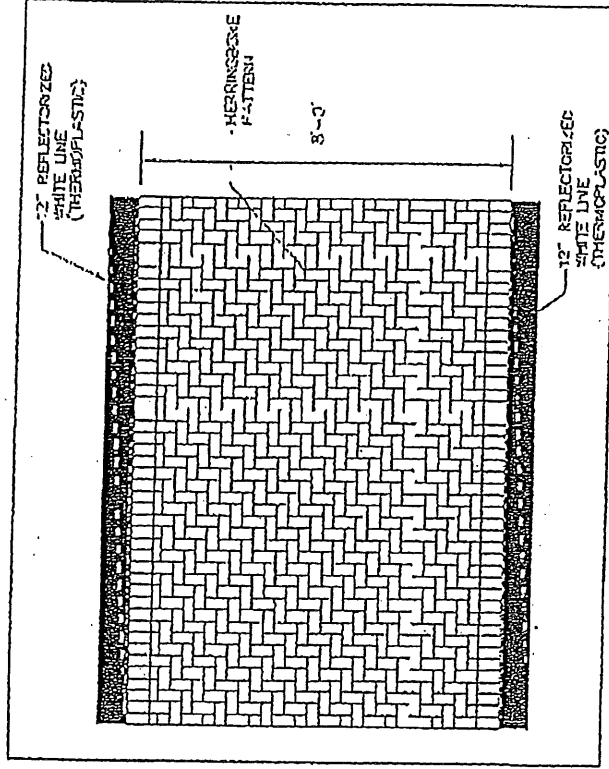
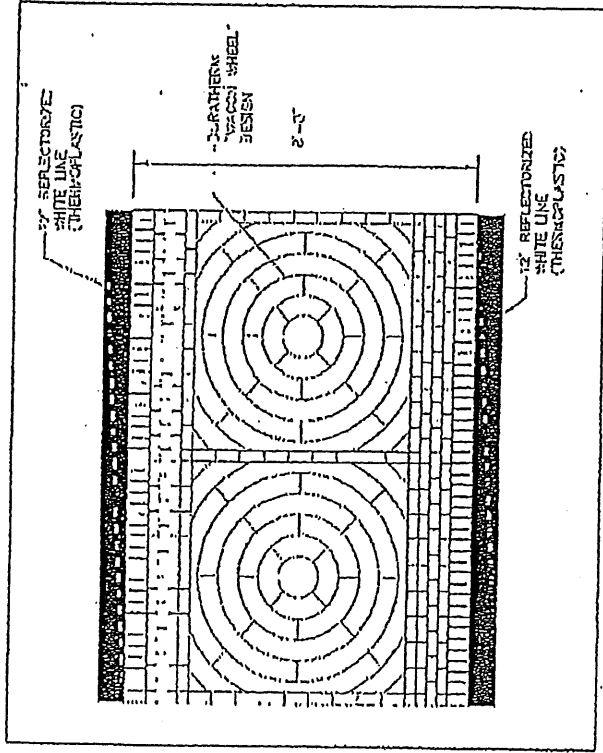
# MULTIPLE EXCAVATION REPAIR



### NOTES:

- APPLIES TO ANY ROADWAY EXCAVATION THAT RESULTS IN MULTIPLE PENETRATIONS PERFORMED LESS THAN 4' OF ONE ANOTHER UNDER A SINGLE PERMIT.
- APPLIES TO ANY ROADWAY EXCAVATIONS THAT ARE PERFORMED WITHIN 2 MONTHS OF ANY OTHER PERMIT ISSUED TO THE SAME CONTRACTOR/UTILITY AT A SPECIFIC LOCATION.
- EXISTING PAVEMENT REMAINING SHALL BE MILLED AND OVERLAYED (1.5" RESIDENTIAL + 2" ARTERIAL) AS SHOWN ABOVE.

# IMPRINT OR INLAYED CROSSWALK REPAIR



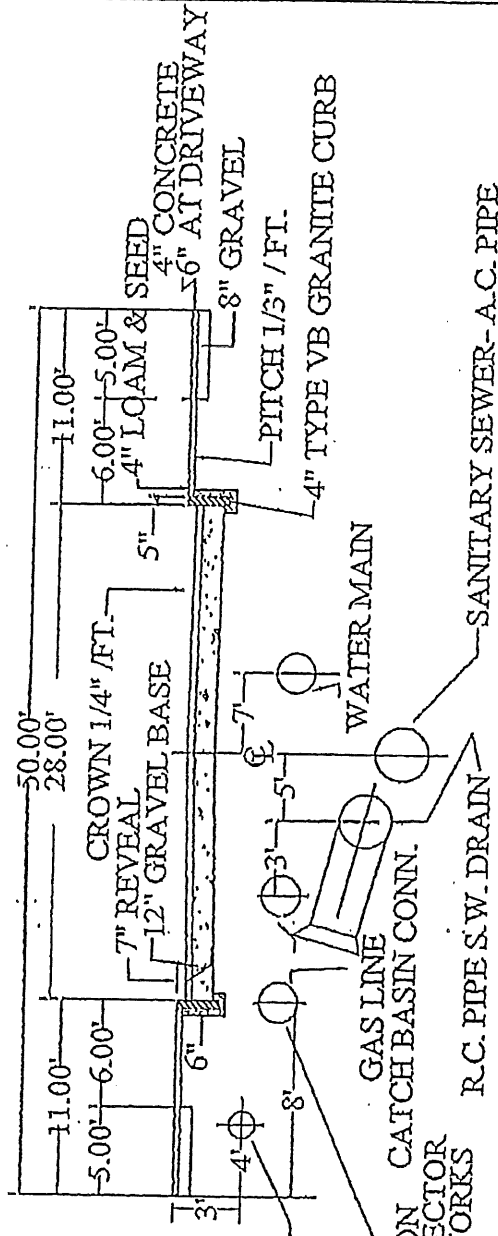
### NOTES:

- IF ANY EXCAVATION OR SURFACE PAVEMENT IMPROVEMENT OCCURS OF ANY LOCATION WITHIN THE CITY OF SPRINGFIELD WHERE EXISTING IMPRINTED OR INLAYED CROSS WALKS EXIST, THE CONTRACTOR IS REQUIRED TO REPLACE INKIND WITH THE EXACT MATERIAL AND COLOR AS ORIGINALLY INSTALLED.
- INSTALLATIONS MUST BE COMPLETED BY AN INSTALLER APPROVED BY THE CITY OF SPRINGFIELD.
- ABUTTING PAVEMENT MARKINGS MUST ALSO BE REPLACED.

ID# 0072

SPRINGFIELD, MA DPW 1-09-2012

# STREET TYPICAL SECTION FOR UTILITIES



DIRECT BURIED UNDERGROUND ELEC. & TEL.

ALTERNATE GAS LINE LOCATION CATCH BASIN CONN. AS APPROVED BY DIRECTOR OF DEPT. OF PUBLIC WORKS

WATER MAIN

R.C. PIPE S.W. DRAIN

SANITARY SEWER- A.C. PIPE

- NOTES:
- WHERE PRACTICABLE STORMWATER LINES ARE PLACED 5' OFF THE CENTER LINE ON THE SOUTH OR WEST SIDE OF THE STREET
  - WATER MAINS ARE 18' OFF STREET LINE, EITHER NORTH OR EAST SIDE OF THE STREET
  - CONNECTIONS FROM CATCH BASINS TO MANHOLES- V.C. PIPE- CLASS 200-64T OR EQUAL
  - SURFACE COURSE 3" TYPE I BIT. CON. LAID IN TWO COURSES- 1 1/2" TOP COURSE 1 1/2" BINDER COURSE

ID # 0032

SPRINGFIELD, MA DPW 2-27-2006





# APPENDIX E

# MOBILE FOOD TRUCK VENDOR PERMIT APPLICATION FORM

Last Modified: 04/09/2025 at 10:39AM EDT

**CITY OF SPRINGFIELD DPW / ENGINEERING DIVISION**  
**MOBILE FOOD TRUCK VENDOR PERMIT APPLICATION FORM**



Required Information:

1. Date of Application: \_\_\_\_\_
2. Name of Responsible Person  
Applying for Permit: \_\_\_\_\_
3. Applicant / Company / Name  
Organization (If applicable): \_\_\_\_\_
4. Applicant Address: \_\_\_\_\_
5. Phone Number: Office / Home: \_\_\_\_\_  
Cell: \_\_\_\_\_
6. Start Date: \_\_\_\_\_
7. End Date: \_\_\_\_\_
8. Street Permit Location, Attach  
Map, SPECIFIC PARKING  
SPACE LOCATION MUST BE  
IDENTIFIED: \_\_\_\_\_
9. List Two adjacent Side Streets  
(Example Birnie Ave. between  
Walther St and Wason Ave.): \_\_\_\_\_
10. Required Information : To be submitted with  
initial application and  
all renewals
 

	Vehicle Registration:
	Vehicle Insurance:
	Springfield Fire Department Permit (if required):
	Springfield Health and Human Services Permit:
	Springfield Police Department (Hawkers and Peddlars):
11. Fee Calculation:
 

	Application Fee (not required if renewal):	\$ 75	
	Quarterly Fee	\$ 150	
	Total:		\$ 225 Initial application - \$ 150 if renewal

**INVALID WITHOUT APPLICANT SIGNATURE AND FULL PAYMENT**

Authorized Signature: \_\_\_\_\_

Person above agrees to abide by all DPW permit regulations and fees as outlined in the "Manual for Occupancy of Public Ways within the City of Springfield" – Latest Edition

Applicant Check Number: \_\_\_\_\_

Last Modified: 04/09/2025 at 10:39AM EDT

## ACCESS AGREEMENT FIGURES

Last Modified: 04/09/2025 at 10:39AM EDT



Last Modified: 04/09/2025 at 10:39AM EDT



0 120 240  
SCALE: 1" = 120' SCALE IN FEET

APPROXIMATE LIMITS OF PAVEMENT REPAIR AND BYPASS PIPING ACROSS ROAD		EXISTING SANITARY SEWER PIPE	
APPROXIMATE LIMITS OF DISTURBANCE FOR STAGING AREA, ACCESS ROAD, PIPELINE REHAB, BYPASS EQUIPMENT AND SITE RESTORATION		PROPOSED APPROXIMATE LIMITS OF WORK	
APPROXIMATE LIMITS OF DISTURBANCE FOR PIPELINE REHAB, STAGING AREA, AND SITE RESTORATION		PROPERTY LINE	
APPROXIMATE LIMITS OF PAVEMENT REPAIR AND EQUIPMENT STAGING AREA		EXISTING SANITARY SEWER MANHOLE	
		REQUIRED VEHICLE ACCESS LIMITS	

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**CIPP LINING ACCESS AND LIMITS OF DISTURBANCE**

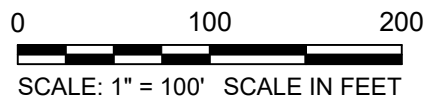
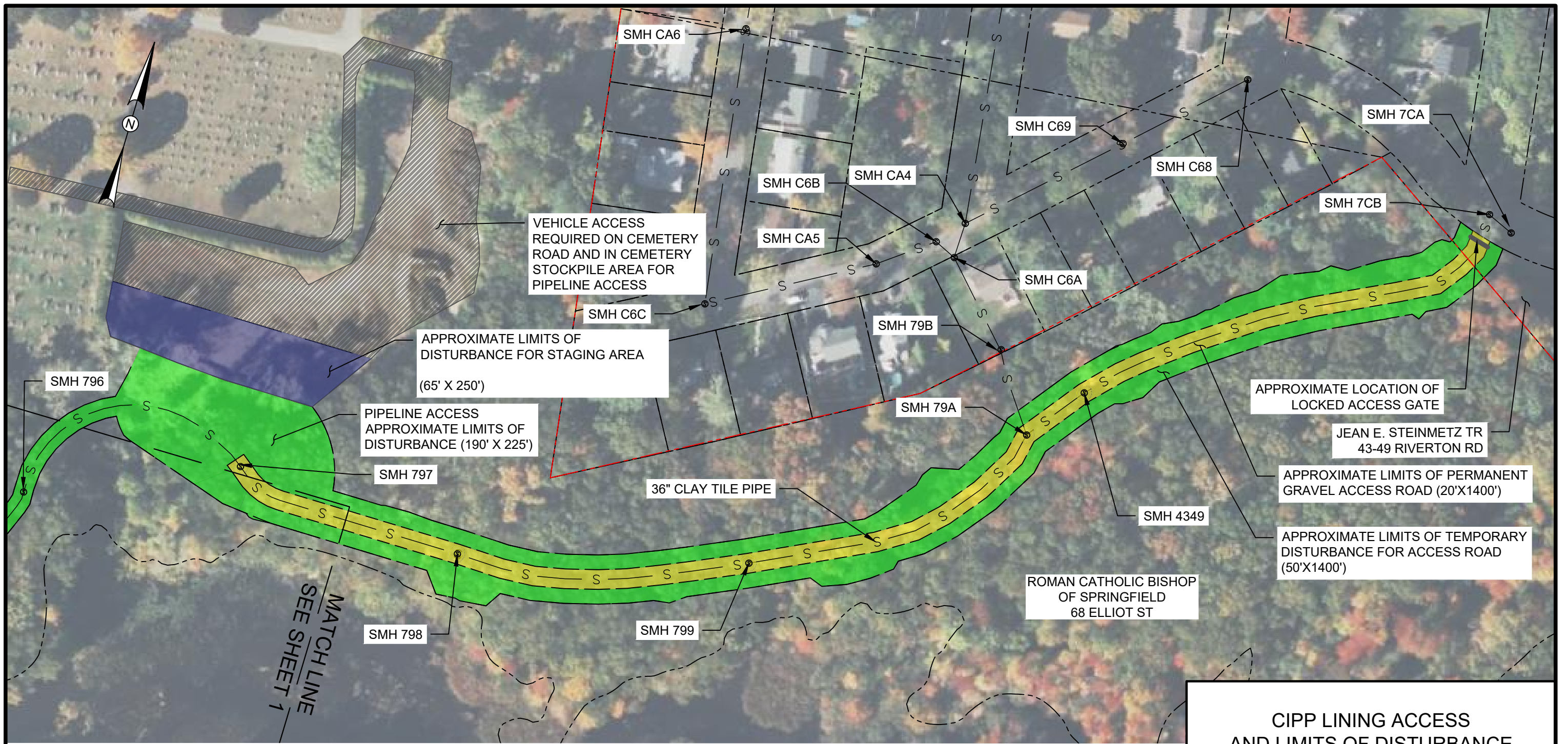
NORTH BRANCH INTERCEPTOR PROJECT

SPRINGFIELD WATER AND SEWER COMMISSION

PROJECT NO. 20221293.051A	Page	1 of 2
DATE: FEBRUARY 2025		
REVISED: -		<b>1</b>
DRAWN BY: RG		
CHECKED BY: GSH		



Last Modified: 04/09/2025 at 10:39AM EDT



APPROXIMATE LIMITS OF GRAVEL ACCESS ROAD	
APPROXIMATE LIMITS OF DISTURBANCE FOR STAGING AREA, ACCESS ROAD, PIPELINE REHAB, BYPASS EQUIPMENT AND SITE RESTORATION	
APPROXIMATE LIMITS OF DISTURBANCE FOR STAGING AREA	
EXISTING SANITARY SEWER MANHOLE	
EXISTING SANITARY SEWER PIPE	
PROPOSED APPROXIMATE LIMITS OF WORK	
PROPERTY LINE	
REQUIRED VEHICLE ACCESS LIMITS	

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**CIPP LINING ACCESS AND LIMITS OF DISTURBANCE**

**NORTH BRANCH SEWER INTERCEPTOR REHABILITATION PROJECT  
SPRINGFIELD WATER AND SEWER COMMISSION**

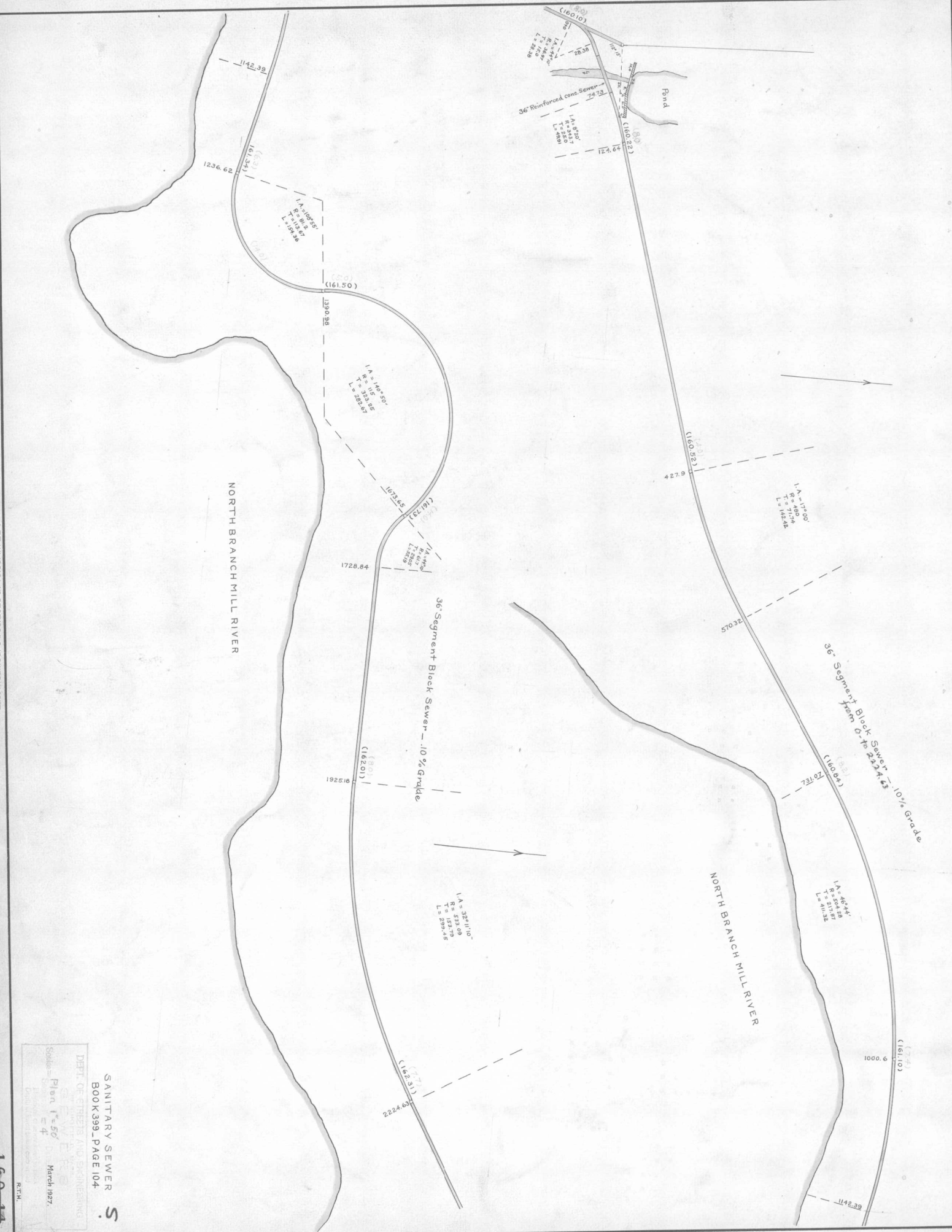
PROJECT NO. 20221293.051A	Page	2 of 2
DATE: FEBRUARY 2025		
REVISED: -		<b>2</b>
DRAWN BY: RG		
CHECKED BY: GSH		



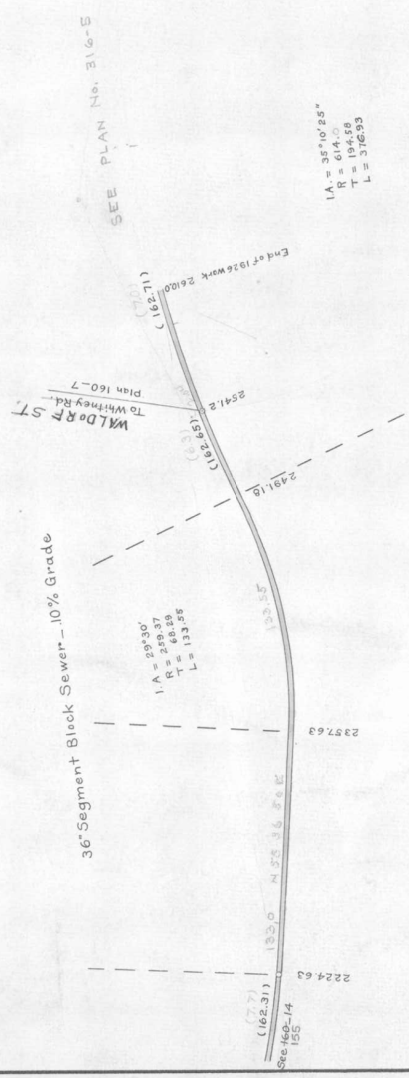
## RECORD DRAWINGS

DEPT. OF STREETS AND ENGINEERING  
 SANITARY SEWER  
 BOOK 399, PAGE 104  
 Scale = Plan 1" = 50'  
 March 1937  
 R.T.M.

SANITARY SEWER  
BOOK 399, PAGE 104







S.  
SANITARY SEWER  
BOOK 399-PAGE 112

DEPT. OF STREET AND WATERWORKS  
CITY OF ST. LOUIS, MISSOURI  
Scale: \_\_\_\_\_  
Date: March 1927.  
R.T.H.



Easting: 10699255 at 10:59 AM EDT

1-651 1-751



Laid in 1925  
 BOOK 396 - PAGE 88  
 Graded by Hunter Daily  
 Plan by Higgins  
 Survey for location - Tracing 96-13