TOWN OF OXFORD, MASSACHUSETTS

CONTRACT DOCUMENTS

MCKINSTRY POND DAM REPAIRS

April 2025

Town Bid # H-25-02

Prepared by:
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108 Myrtle Street
Suite 502
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COMMONWEALTH OF MASSACHUSETTS
MICHAEL V. NELSON
CIVIL
No. 49576
REGISTERED
PROFESSIONAL ENGINEER

04/16/2025

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INVITATION FOR BIDS

MCKINSTRY POND DAM REPAIRS
Town Bid Number: H-25-02

Sealed bids for the McKinstry Pond Dam Repairs for the Town of Oxford (hereinafter referred to as "The OWNER") will be received at the Oxford Department of Public Works located at 450 Main St, Town of Oxford, MA 05140 until the time specified below at which time the bids will be publicly opened and read.

Obtaining Bid Packages: Specifications and bid forms may be obtained free of charge by visiting www.oxfordma.us/bids.aspx

Bids will be opened at 450 Main Street at the Office of the Department of Public Works on Thursday May 8, 2025, at 2 p.m. Each Bid must be accompanied by a bid security consisting of a BID BOND, CASH, or, CERTIFIED CHECK issued by a responsible bank or trust company in the amount of 5% of the bid price.

Conditions of Contract: A performance bond in an amount equal to 100 percent of the total amount of the contract price with a surety company qualified to do business in the Commonwealth of Massachusetts will be required for the faithful performance of the contract, as well as a labor and materials bond in an amount equal to 100 percent of the total contract price.

All bids for this project are subject to applicable public bidding laws of Massachusetts, including, but not limited to G.L. c.30, §39M.

Wage Rates: Attention is directed to the minimum wage rates to be paid as determined by the Commissioner of Labor and Workforce Development and the weekly payroll record submittal requirements under the provisions of Massachusetts General Laws, Chapter 149, Section 26 through 27D inclusive.

Award/Rejection: Selection of the contractor will be based upon bidder qualifications, including evidence of past performance in similar projects, and bid price. The contract will be awarded to the bidder deemed by the awarding authority to be the lowest responsible and eligible bidder.

The bidder agrees that its bid shall be good and may not be withdrawn for a period of 30 days, Saturdays, Sundays and legal holidays excluded, after the opening of the bids.

The successful bidder shall demonstrate the following experience:

- Three previous dam repair/reconstruction projects requiring control of water.
- Five previous projects with a construction value of at least $250,000.
- Demonstrated experience in the type of work required.
- Record of accomplishing work on other, similar projects in the required time frame.
- Quality of work previously performed for the Town of Oxford, or other similar governmental agency.

The Town reserves the right to waive any informalities, to accept or reject, in whole or in part any or all bids, or take whatever other action may be deemed to be in the best interest of the Town.

Kevin Duffy, Director of Public Works | Town of Oxford

END OF SECTION

SECTION 00 21 13

INSTRUCTIONS TO BIDDERS

1. Receipt and Opening of Bids

The Town of Oxford Massachusetts, herein called the Owner, acting by and through its Board of Selectmen, will receive sealed Bids for the project known as the **McKinstry Pond Dam Repairs** Project.

General bids shall be addressed to Town of Oxford for the Department of Public Works at 450 Main Street, Oxford, MA 01540 and endorsed "Bid for **McKinstry Pond Dam Repairs**" will be received at the Office of Public Works until 2:00 p.m. prevailing time, on 8th (Day) of May, 2025 at which time and place said bids will be publicly opened and read aloud.

Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified will not be considered. The bidder agrees that its bid shall be good and may not be withdrawn for a period of 30 days, Saturdays, Sundays, and legal holidays excluded, after the opening of bids.

2. Location and Work to be Done

The Work consists of a culvert replacement, including cast-in-place headwalls and sluice gate structure, dam slope reconstruction, water and drainage improvements, wetlands replication, paving, and all work incidental thereto, in accordance with the Specifications and design plans attached hereto. The full scope of the work is included in Section 01 11 00 Summary of Work.

Additional drawings showing details in accordance with which the Work is to be done may be furnished by addendum from time to time during the bidding period by the Owner or its Engineer and shall then become a part of the Contract Documents.

The Contractor shall furnish all labor, services, materials, equipment, plant, machinery, apparatus, appliances, tools, supplies, and all other things necessary to do all work required for the completion of each item of the Work and as herein specified.

The Work to be done and paid for under any item shall not be limited to the exact extent mentioned or described but shall include all incidental work necessary or customarily done for the completion of that item.

3. Preparation of Bid

Each bid must be submitted on the prescribed form. All blank spaces for bid prices must filled in, in ink or typewritten, in both words and figures.

Each bid must be submitted in a sealed envelope bearing on the outside the name of the bidder, his address, and endorsed with the name of the project as specified in Receipt and Opening of Bids, above. If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed as specified in Receipt and Opening of Bids, above.

4. Bid Opening Procedure

The following list of requirements shall apply to each filed bid. Bids not meeting all the requirements for timeliness and security will be rejected; bids not meeting signature and addenda requirements will be rejected prior to checking of bid amounts.

Bids shall be filed at the place and before the time specified in Receipt and Opening of Bids, above.

Properly executed bid security shall be placed in a sealed envelope and shall be attached to the outside of the envelope containing the bid.

Bid signatures will be checked.

All addenda will be sent certified mail, with return receipt requested, and/or facsimile or e-mail to all prospective bidders. All bidders shall include with their bids the written acknowledgment form provided in Section 00 41 00, Bid Form.

The total dollar amount of each bid will be read, and the three apparent lowest bids will be selected for further consideration. These three apparent low bids will be read aloud for the benefit of the other bidders and the bid opening procedure will be closed. All those present at the bid opening may examine all bids after the bid opening and after the reading of the three apparent low bids.

5. Modification

Any bidder may modify his bid by written communication at any time prior to the scheduled closing time for receipt of bids. Any telegraphic communication must be received by the Owner prior to the closing time, and, provided further, the Owner must be satisfied that a written confirmation of the telegraphic modification over the signature of the bidder was mailed prior to the closing time. If written confirmation is not received within two days from the closing time, no consideration will be given to a telegraphic communication.

The communication shall not reveal the bid price but shall provide the addition or subtraction or other modification so that the final prices or terms will not be known by the Owner until the sealed bid is opened.

6. Ability and Experience of Bidder

No award will be made to any bidder who cannot satisfy the Owner that he has sufficient ability and experience in this class of work and sufficient capital and plant to enable him to prosecute and complete the work successfully within the time named. The Owner's decision or judgment on these matters will be final, conclusive, and binding.

The Owner may make such investigations as it deems necessary, and the bidder shall furnish to the Owner, under oath if so required, all such information and data for this purpose as the Owner may request.

7. Conditions of Work

Each bidder must familiarize himself fully with the conditions relating to the construction of the project and the employment of labor thereon. Failure to do so will not relieve a successful bidder of his obligation to furnish all material and labor necessary to carry out the provisions of his contract. Insofar as possible the Contractor, in carrying out his work, must employ such methods or means as will not cause any interruption of or interference with the work of any other Contractor.

8. Addenda and Interpretations

No interpretation of the meaning of the plans, specifications or other prebid documents will be made to any bidder orally. All information given to bidders other than by means of the plans, specifications, or by addenda, as described below, is given informally and shall not be used as the basis of a claim against the Owner.

Every request for such interpretation should be in writing addressed to Department of Public Works at 450 Main Street, Oxford, MA 01540, and to be given consideration must be received at least seven (7) days prior to the date fixed for the opening of bids. Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the specifications which, when issued, will be mailed by certified mail with return receipt requested to all prospective bidders (at the respective address furnished by them for such purposes), or sent via facsimile or email if time requires. Failure of any bidder to receive any such addendum or interpretation shall not relieve such bidder from any obligation under his bid as submitted. All addenda so issued shall become part of the Contract Documents.

9. Security for Faithful Performance

Simultaneously with his delivery of the executed Contract, the Contractor shall furnish a surety bond or bonds as security for faithful performance of this contract and for the payment of all persons performing labor and materials under this contract. The surety on such bond or bonds shall be a surety company qualified to do business under the laws of the Commonwealth and satisfactory to the Owner. The bonds shall remain in force for one year after final acceptance of the work by the Owner, unless the Owner, in writing, releases the Contractor from the obligation sooner.

10. Power of Attorney

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

11. Laws and Regulations

The bidder's attention is directed to the fact that all applicable State laws, municipal ordinances or bylaws, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the contract throughout, and they will be deemed to be included in the Contract the same as though written out in full.

12. Liquidated Damages for Failure to Enter into Contract

The successful bidder, upon his failure or refusal to execute and deliver the Contract and bonds required within 10 days after presentation thereof by the Owner, shall forfeit to the Owner, as liquidated damages for such failure or refusal, the security deposited with his/her bid, but the amount forfeited shall not exceed the difference between his/her bid price and the bid price of the next lowest responsible and eligible bidder. In case of death, disability, bona fide clerical or mechanical error of a substantial nature, or other similar unforeseen circumstances affecting the bidder, his/her bid deposit will be returned.

13. Obligation of Bidder

At the time of the opening of bids, each bidder will be presumed to have inspected the site and to have read and to be thoroughly familiar with the Contract Documents (including all addenda). The failure or omission of any bidder to examine any form, instrument, or document shall in no way relieve any bidder from any obligation in respect of his bid.

14. Information Not Guaranteed

All information given in the Contract Documents relating to subsurface and other conditions, natural phenomena, existing pipes, and other structures is from the

best sources at present available to the Owner. All such information is furnished only for the information and convenience of bidders and is not guaranteed.

It is agreed and understood that the Owner does not warrant or guarantee that the subsurface or other conditions, natural phenomena, existing pipes, or other structures encountered during construction will be the same as those indicated in the Contract Documents. It is further agreed and understood that no bidder or Contractor shall use or be entitled to use any of the information made available to him or obtained in any examination made by him in any manner as a basis of or ground for any claim or demand against the Owner or the Architect/Engineer, arising from or by reason of any variance which may exist between the information made available and the actual subsurface or other structures actually encountered during the construction work, except as may otherwise be expressly provided for in the Contract Documents.

15. Bid Security

Each bid and sub-bid must be accompanied by bid security in the form of a certified check, a bid bond, cash, or a treasurer's or cashier's check, payable to the Owner, in the amount of five (5) percent of the value of the bid. Such security of general bidders will be returned to all except the three lowest responsible and eligible bidders within five days, Saturdays, Sundays, and legal holidays excluded, after the opening of bids, and the remaining securities will be returned promptly after the Owner and the accepted bidder have executed the Contract, or if no notice of intent to award has been presented to the selected contractor within 30 days, Saturdays, Sundays and holidays excluded, after the date of the opening of bids, upon demand of the bidder at any time thereafter.

16. Right to Reject Bid

The Owner reserves the right to waive any informalities in bids and to reject any and all bids, should the Owner deem it to be in the public interest to do so.

The Owner may also reject bids which in its sole judgment are either incomplete, conditional, obscure or not responsive or which contain additions not called for, erasures not properly initialed, alterations, or similar irregularities.

17. Time for Completion

The successful general bidder must agree to commence work within ten (10) days of the date of the Notice to Proceed and to fully complete the project within the time limit stated in Section 00 41 00, Bid Form.

18. Comparison of Bids

Bids will be compared on the basis of prices set forth in the bid forms.

In the event that there is a discrepancy between the lump sum or unit prices written in words and figures, the prices written in words will govern.

19. Award of Contract

The Contract will be awarded to "the lowest responsible and eligible bidder" pursuant to General Laws Chapter 30, Section 39M, as amended. Such a bidder shall possess the skill, ability and integrity necessary for the faithful performance of the work, shall be able to furnish labor that can work in harmony with all other elements of labor employed, or to be employed, in the work, and shall otherwise comply with all applicable provisions of law. Contract award shall be subject to availability of an appropriation for funding.

20. Statutes Regulating Competitive Bidding

Any bid which does not comply with the provisions of Massachusetts General Laws Chapter 30, Section 39M, as amended, need not be accepted and the Owner may reject every such bid.

21. Wage Rates

Prevailing Wage Rates as determined by the Commissioner of Department of Labor and Workforce Development under the provision of the Massachusetts General Laws, Chapter 149, Section 26 to 27G, as amended, apply to this project. It is the responsibility of the bidder, before bid opening, to request any additional information on Prevailing Wage Rates for those tradespeople who may be employed for the proposed work under
this contract.

22. Contractor Records

The Contractor shall comply with the provisions of Massachusetts General Laws, Chapter 30, Section 39R concerning Contractor records.

23. INSURANCE

The Contractor shall carry and continuously maintain until completion of the Contract, insurance as specified in Agreement and in such form as shall protect him performing work covered by this Contract, and the Town of Oxford, and its employees, agents and officials, from all claims an liability for damages for bodily injury, including accidental death, and for property damage, which may arise from operations under this Contract. The Town shall be named as an additional insured. The Contractor covenants and agrees to hold the Town and its employees, agents and officials harmless from loss or damage due to claims for bodily injury or death and/or property damage arising from, or in connection with, operations under this Contract.

25. PROJECT MANAGER

The Owner may utilize the services of a project manager, whose duties shall be as set forth in an Agreement for Project Manager Services.

END OF SECTION

SECTION 00 41 00

BID FORM

CONTRACT IDENTIFICATION: MCKINSTRY POND DAM REPAIRS
OXFORD, MASSACHUSETTS

ARTICLE 1 – BID RECIPIENT

1.1 This Bid shall be submitted to:

Town of Oxford
c/o Town Manager
Attn: McKinstry Pond Dam Repair Bid
450 Main Street
Oxford, MA 01540

1.2 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with the Town of Oxford in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2 – BASIS OF BID

2.1 Bidder will complete the Work in accordance with the Contract Documents for the following prices as selected by the Owner:

A. The Total Contract Base Bid Price shall include the following bid item prices associated with the proposed dam repairs:

B. Bidder acknowledges receipt of, and this bid includes the following addenda:

No. _____ Dated: _____

No. _____ Dated: _____

No. _____ Dated: _____

No. _____ Dated: _____

OXFORD, MA
MCKINSTRY POND DAM REPAIRS
TOWN BID NO. H-25-02

Bid Form

Item No.	Estimated Quantity	Item Description	Unit Price In Figures	Amount In Figures
1	L.S.	TEMPORARY EROSION AND SEDIMENTATION CONTROL		
		Lump Sum	$	$
2	L.S.	MISCELLANEOUS DEMOLITION AND SITE PREPARATION		
		Lump Sum	$	$
3	L.S	CONTROL OF WATER		
		Lump Sum	$	$
4	L.S.	UPSTREAM SPILLWAY STRUCTURE		
		Lump Sum	$	$
5	L.S.	SPILLWAY STRUCTURE COMPONENTS		
		Lump Sum	$	$

Subtotal Page $

OXFORD, MA
MCKINSTRY POND DAM REPAIRS
TOWN BID NO. H-25-02

Bid Form

Item No.	Estimated Quantity	Item Description	Unit Price In Figures	Amount In Figures
6	L.S.	DOWNSTREAM CONCRETE HEADWALL Lump Sum	$	$
7	36	CULVERT CONCRETE CRADLE Cu. Yd.	$	$
8A	1	STORMWATER QUALITY UNIT OGS-1 (1,500 GAL) Each	$	$
8B	1	STORMWATER QUALITY UNIT OGS-2 (4,500 GAL) Each	$	$
9A	4	4-ft DIA. SINGLE CATCH BASIN Each	$	$

Subtotal Page $

OXFORD, MA
MCKINSTRY POND DAM REPAIRS
TOWN BID NO. H-25-02

Bid Form

Item No.	Estimated Quantity	Item Description	Unit Price In Figures	Amount In Figures
9B	1	5-FT DIA. DOUBLE CATCH BASIN		
		_____ Each	$ _____	$ _____
10A	2	4-FT DIA. DRAIN MANHOLE		
		_____ Each	$ _____	$ _____
10B	1	6-FT DIA. DRAIN MANHOLE		
		_____ Each	$ _____	$ _____
11A	115	12-IN DIA. HDPE DRAIN		
		_____ Lin. Ft.	$ _____	$ _____
11B	35	18-IN DIA. HDPE DRAIN		
		_____ Lin. Ft.	$ _____	$ _____
11C	100	24-IN DIA. HDPE CULVERT		
		_____	$ _____	$ _____

Subtotal Page $ _____

OXFORD, MA
MCKINSTRY POND DAM REPAIRS
TOWN BID NO. H-25-02

Bid Form

Item No.	Estimated Quantity	Item Description	Unit Price In Figures	Amount In Figures
12A	160	8-INCH CLDI WATER MAIN & FITTINGS		
		_____ Lin. Ft.	$ _____	$ _____
12B	24	8-INCH HDPE WATER MAIN & FITTINGS		
		_____ Lin. Ft.	$ _____	$ _____
13A	1	8-INCH RESILIENT SEATED GATE VALVE		
		_____ Lump Sum	$ _____	$ _____
13B	1	6-INCH INSERTION VALVE		
		_____ Lump Sum	$ _____	$ _____
14	18	15-INCH DIA.,1/4-INCH THICK STEEL CASING SLEEVE		
		_____ Lin. Ft.	$ _____	$ _____

Subtotal Page $ _____

OXFORD, MA
MCKINSTRY POND DAM REPAIRS
TOWN BID NO. H-25-02

Bid Form

Item No.	Estimated Quantity	Item Description	Unit Price In Figures	Amount In Figures
15	70	¾-INCH TYPE K COPPER SERVICE TUBING		
		Lin. Ft.	$	$
16	2	¾-INCH CORPORATION AND CURB STOP WITH BOX		
		Each Pair	$	$
17	L.S.	TEMPORARY WATER		
		Lump Sum	$	$
18	L.S.	CHAIN LINK FENCE AND METAL GUARDRAIL		
		Lump Sum	$	$
19	21	GRAVEL ACCESS DRIVE		
		Cu. Yd.	$	$

Subtotal Page $

OXFORD, MA
MCKINSTRY POND DAM REPAIRS
TOWN BID NO. H-25-02

Bid Form

Item No.	Estimated Quantity	Item Description	Unit Price In Figures	Amount In Figures
20	450	EMBANKMENT RECONSTRUCTION AND REGRADING		
		Sq. Yd.	$	$
21	75	FILTER SAND		
		Cu. Yd.	$	$
22	75	LOW PERMEABILITY FILL		
		Cu. Yd.	$	$
23	65	NATURAL STONE ARMOR		
		Cu. Yd.	$	$
24	475	FULL DEPTH PAVING, BERM, AND APRONS		
		Sq. Yd.	$	$

Subtotal Page $

OXFORD, MA
MCKINSTRY POND DAM REPAIRS
TOWN BID NO. H-25-02

Bid Form

Item No.	Estimated Quantity	Item Description	Unit Price In Figures	Amount In Figures
25	L.S.	WETLAND REPLICATION AREA		
		Lump Sum	$	$
26	L.S.	SITE RESTORATION		
		Lump Sum	$	$
27	L.S.	SITE SURVEY AND RECORD DRAWINGS		
		Lump Sum	$	$
28	L.S.	MISCELLANEOUS WORK AND CLEANUP		
		Lump Sum	$	$

Subtotal Page $

Subtotal Page 00 41 00-2 $_____
Subtotal Page 00 41 00-3 $_____
Subtotal Page 00 41 00-4 $_____
Subtotal Page 00 41 00-5 $_____
Subtotal Page 00 41 00-6 $_____
Subtotal Page 00 41 00-7 $_____
Subtotal Page 00 41 00-8 $_____

SUBTOTAL BASE BID PRICE $_____

29	L.S.	MOBILIZATION AND DEMOBILIZATION (not to exceed 5% of total bid).		
		_____ Lump sum	$_____	$_____

Total contract bid price for Items 1 through 29:

$_____(Amount in Figures)

_____(Amount in Words)

ARTICLE 3 – TIME OF COMPLETION

3.1 Bidder agrees that the Work will be substantially complete within 350 calendar days after the date when the Contract Times commence to run as provided in Article 3 of the General Conditions.

3.2 Bidder agrees that work will be completed and ready for final payment of the contract price in accordance with Article 5 of the General Conditions within 350 calendar days after the date when the Contract Times commence to run.

ARTICLE 4 – BID SUBMITTAL

4.1 This Bid submitted by:

If Bidder is:

AN INDIVIDUAL

Name (typed or printed): _____

By: _____
(SEAL)
(Individual's signature)

Doing business as: _____

Business address: _____

_____

Phone No.: _____ FAX No.: _____

A PARTNERSHIP

Partnership Name: _____
(SEAL)

By: _____
(Signature of general partner -- attach evidence of authority to sign)

Name (typed or printed): _____

Business address: _____

_____

Phone No.: _____ FAX No.: _____

A CORPORATION

Corporation Name: _____
(SEAL)

State of Incorporation: _____

Type (General Business, Professional, Service, Limited Liability):_____

By: _____
(Signature -- attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

(CORPORATE SEAL)

Attest _____
(Signature of Corporate Secretary)

Business address: _____

_____

Phone No.: _____ FAX No.: _____

Date of Qualification to do business is _____.

A JOINT VENTURE

Joint Venturer Name: _____

(SEAL)

By: _____
(Signature of joint venture partner -- attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Business address: _____

_____

Phone No.: _____ FAX No.: _____

Joint Venturer Name: _____
(SEAL)

By: _____
(Signature -- attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Business address: _____

_____

Phone No.: _____ FAX No.: _____

Phone and FAX Number, and Address for receipt of official communications:

_____

_____

(Each joint venturer must sign. The manner of signing for each individual, partnership, and corporation that is a party to the joint venture should be in the manner indicated above.)

SUBMITTED on _____, 2025.
State Contractor License No. _____

SECTION 00 45 13

QUALIFICATIONS OF BIDDER

Bidder's Name: _____

Each Bidder is required to submit information that exemplifies their qualifications, and their listed subcontractor's qualifications, to successfully implement the scope of work required by the Contract Documents. At a minimum, the information submitted shall include information requested on the forms below. Attach additional sheets if necessary.

Previous Experience Similar to this Bid

Provide written descriptions of at least three (3) and no more than five (5) previous projects involving dam repair/reconstruction entailing control of water, and five (5) projects (including the three dam repair projects) having construction values of at least $250,000.

1. Project Name: _____

   Project Location: _____

   Brief Scope of Work: _____

   _____

   _____

   Date Completed: _____

   Approximate Dollar Value: _____

   Owner's Representative: _____

   Owner's Telephone: _____

2. Project Name: _____

   Project Location: _____

   Brief Scope of Work: _____

   _____

   _____

   Date Completed: _____

   Approximate Dollar Value: _____

   Owner's Representative: _____

   Owner's Telephone: _____

3. Project Name: _____

   Project Location: _____

   Brief Scope of Work: _____

   _____

   _____

   Date Completed: _____

   Approximate Dollar Value: _____

   Owner's Representative: _____

   Owner's Telephone: _____

4. Project Name: _____

   Project Location: _____

   Brief Scope of Work: _____

   _____

   _____

   Date Completed: _____

   Approximate Dollar Value: _____

   Owner's Representative: _____

   Owner's Telephone: _____

5. Project Name: _____

   Project Location: _____

   Brief Scope of Work: _____

   _____

   _____

   Date Completed: _____

   Approximate Dollar Value: _____

   Owner's Representative: _____

   Owner's Telephone: _____

List of Subcontractors (if applicable)

1. Name: _____

   Address: _____

   Contact Person: _____ Phone: _____

   Work Efforts by Subcontractor for this Bid: _____

   _____

   _____

   _____

   _____

2. Name: _____

   Address: _____

   Contact Person: _____ Phone: _____

   Work Efforts by Subcontractor for this Bid: _____

   _____

   _____

   _____

   _____

Bank Reference:

Name: _____

Address: _____

_____

Contact: _____

Phone: _____

END OF SECTION

SECTION 00 50 00

AGREEMENT

THIS AGREEMENT, made this _____ day of _____, 2025, by and between the party of the first part, the Town of Oxford, hereinafter called "OWNER," acting herein through its _____, and the party of the second part, _____ doing business as (check one):

___ an individual
___ a partnership
___ a joint venture
___ a corporation

located in the *(City) (Town) of _____, County of _____, and State of _____, hereinafter called "CONTRACTOR."

WITNESSETH: That for and in consideration of the payments and agreements hereinafter mentioned, to be made and performed by the OWNER, the CONTRACTOR hereby agrees with the OWNER to commence and complete the project described as follows: **McKinstry Pond Dam Repairs** dated April 2025, hereinafter called the "PROJECT",

for the sum of_____ Dollars ($_____)

and all extra work in connection therewith, under the terms as stated in the Contract Documents; and at his (its or their) own proper cost and expense to furnish all the materials, supplies, machinery equipment, tools, superintendence, labor, insurance, and other accessories and services necessary to complete the said project in accordance with the conditions and prices stated in Section 00 41 00 BID FORM, Section 00 70 00 GENERAL CONDITIONS, Section 00 80 00 SUPPLEMENTARY CONDITIONS and Section 00 81 0 SUPPLEMENTAL GENERAL CONDITIONS AMENDMENTS, the plans, which include all maps, plates, blue prints, and the specifications and Contract Documents as prepared by the Owner.

The CONTRACTOR hereby agrees to commence work under this Contract on or before a date to be specified in written "Notice to Proceed" of the OWNER.

The CONTRACTOR further agrees to fully complete the project within 350 consecutive calendar days of the date of the notice to proceed.

The CONTRACTOR further agrees to pay as liquidated damages the sum of $1,500 for each consecutive calendar day thereafter as provided in the Liquidated Damages Paragraph of Section 00 70 00 GENERAL CONDITIONS.

The CONTRACTOR agrees not to discriminate against or exclude any person from participation herein on grounds of race, religion, color, sex, age or national origin; and that it shall take affirmative actions to insure that applicants are employed, and that employees are treated during their employment, without regard to race, religion, color, sex, age, handicapped status, or national origin.

The CONTRACTOR agrees not to participate in or cooperate with an international boycott, as defined in Section 999 (b)(3) and (4) of the Internal Revenue Code of 1954, as amended, or engage in conduct declared to be unlawful by Section 2 of Chapter 151E of the Massachusetts General Laws.

The OWNER agrees to pay the CONTRACTOR in current funds for the performance of the contract, subject to additions and deductions, as provided in Section 00 70 00 GENERAL CONDITIONS as amended by the supplementary general conditions, and to make payments on account thereof as provided in Section 00 70 00 GENERAL CONDITIONS.

IN WITNESS WHEREOF, the parties to these presents have executed this contract in counterparts, each of which shall be deemed an original, in the year and day first above mentioned.

See following pages for Signatures:

AGREED:

Town of _____, Massachusetts
(Owner)

By_____

_____
(Name)

_____
(Title)

_____
(Contractor)

By_____

_____
(Name)

_____
(Title)

_____
(Address)

_____
(City and State)

Approved as to Form:

By_____
(Owner's Counsel)

_____
(Name)

In accordance with M.G.L. C.44, Section 31C, this is to certify that an appropriation in the amount of this contract is available therefor and that the _____ has been authorized to execute the contract and approve all requisitions and change orders.

By_____
(Owner's Accountant)

_____
(Name)

CERTIFICATE OF VOTE
(to be filed if Contractor is a Corporation)

I, _____, hereby certify that I am the duly qualified
(Secretary of the Corporation)

and acting Secretary of _____ and I further certify that a meeting of the
(Name of Corporation)

Directors of said Company, duly called and held on _____, at which
(Date of Meeting)

all Directors were present and voting, the following vote was unanimously passed:

VOTED: To authorize and empower

_____

_____

_____

_____

_____

Anyone acting singly, to execute Forms of General Bid, Contracts or Bonds on behalf of the Corporation.

I further certify that the above vote is still in effect and has not been changed or modified in any respect.

By:_____
(Secretary of Corporation)

A True Copy:

Attest:_____
(Notary Public)

My Commission Expires:_____
(Date)

CERTIFICATIONS REQUIRED BY LAW
FOR PUBLIC CONSTRUCTION CONTRACTS

You must COMPLETE and SIGN the following certifications. You must also print, at the bottom of this page, the name of the contractor for whom these certifications are submitted.

TAX COMPLIANCE

Pursuant to Chapter 62C of the Massachusetts General Laws, Section 49A(b), I, the undersigned, authorized signatory for the below named contractor, do hereby certify under the pains and penalties of perjury that said contractor has complied with all laws of the Commonwealth of Massachusetts relating to taxes, reporting of employees and contractors, and withholding and remitting child support.

NON-COLLUSION

The undersigned certifies under the 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 subsection the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity.

PUBLIC CONTRACTOR DEBARMENT

The undersigned certifies under penalty of perjury that the below named contractor 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.

OSHA TRAINING

Pursuant to G.L. c. 30, §39S, the Contractor hereby certifies under penalties of perjury as follows:

(1) Contractor is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the work;
(2) 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 they shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and
(3) All employees to be employed in the work subject to this contract 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.

COMPLETE AND SIGN BELOW:

_____ _____
Authorized Person's Signature Date

_____
Print Name & Title of Signatory

_____
Name of Contractor

NOTICE OF AWARD

Date:			
Owner:	Town of Oxford	Owner's Project No.:	H-25-02
Engineer:	Fuss & O'Neill, Inc.	Engineer's Project:	20080026.A53
Project:	McKinstry Pond Dam Repairs		
Bidder:			
Bidder's			

You are notified that Owner has accepted your Bid dated _____for the above Contract, and that you are the Successful Bidder and are awarded a Contract for the above-mentioned contract.

The Contract Price of the awarded Contract is $_____. Contract Price is subject to adjustment based on the provisions of the Contract, including but not limited to those governing changes, Unit Price Work, and Work performed on a cost-plus-fee basis, as applicable.

Two unexecuted counterparts of the Agreement accompany this Notice of Award, and one copy of the Contract Documents accompanies this Notice of Award or has been transmitted or made available to Bidder electronically.

You must comply with the following conditions precedent within 15 days of the date of receipt of this Notice of Award:

1. Deliver to Owner Two counterparts of the Agreement, signed by Bidder (as Contractor).
2. Deliver with the signed Agreement(s) the Contract security (such as required performance and payment bonds) and insurance documentation, as specified in the Instructions to Bidders and in the General Conditions, Articles 2 and 6.
3. Other conditions precedent (if any): none.

Failure to comply with these conditions within the time specified will entitle Owner to consider you in default, annul this Notice of Award, and declare your Bid security forfeited.

Within 10 days after you comply with the above conditions, Owner will return to you one fully signed counterpart of the Agreement, together with any additional copies of the Contract Documents as indicated in Paragraph 2.02 of the General Conditions.

Owner: **Town of Oxford**

By *(signature)*: _____

Name *(printed)*: _____

Title: _____

Copy: Fuss & O'Neill

NOTICE TO PROCEED

Owner:	Town of Oxford	Owner's Project No.:	H-25-02
Engineer:	Fuss & O'Neill, Inc.	Engineer's Project No.:	20080026.A53
Contractor:		Contractor's Project No.:	
Project:	McKinstry Pond Dam Repairs		
Effective Date:			

Owner hereby notifies Contractor that the Contract Times under the above Contract will commence to run on _____ pursuant to Paragraph 4.01 of the General Conditions.

On that date, Contractor shall start performing its obligations under the Contract Documents. No Work will be done at the Site prior to such date.

In accordance with the Agreement:

The number of days to achieve Substantial Completion is 350 days from the date stated above for the commencement of the Contract Times, resulting in a date for Substantial Completion of _____; and the number of days to achieve readiness for final payment is _____ from the commencement date of the Contract Times, resulting in a date for readiness for final payment of _____.

Before starting any Work at the Site, Contractor must comply with the following:

- Submittals shall be furnished to the engineer and approved prior to mobilization.

Owner: Town of Oxford

By *(signature)*: _____

Name *(printed)*: _____

Title: _____

Date Issued: _____

Copy: Fuss & O'Neill

CERTIFICATE OF SUBSTANTIAL COMPLETION

Owner:	Town of Oxford	Owner's Project No.:	H-25-02
Engineer:	Fuss & O'Neill	Engineer's Project No.:	20080026.A53
Contractor:		Contractor's Project No.:	
Project:	McKinstry Pond Dam Repairs		

This ☐ Preliminary ☐ Final Certificate of Substantial Completion applies to:

☐ All Work ☐ The following specified portions of the Work:

Date of Substantial Completion:

The Work to which this Certificate applies has been inspected by authorized representatives of Owner, Contractor, and Engineer, and found to be substantially complete. The Date of Substantial Completion of the Work or portion thereof designated above is hereby established, subject to the provisions of the Contract pertaining to Substantial Completion. The date of Substantial Completion in the final Certificate of Substantial Completion marks the commencement of the contractual correction period and applicable warranties required by the Contract.

A punch list of items to be completed or corrected is attached to this Certificate. This list may not be all-inclusive, and the failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

Amendments of contractual responsibilities recorded in this Certificate should be the product of mutual agreement of Owner and Contractor; see Paragraph 15.03.D of the General Conditions.

The responsibilities between Owner and Contractor for security, operation, safety, maintenance, heat, utilities, insurance, and warranties upon Owner's use or occupancy of the Work must be as provided in the Contract, except as amended as follows:

Amendments to Owner's Responsibilities: ☐ None ☐ As follows:

Amendments to Contractor's Responsibilities: ☐ None ☐ As follows:

The following documents are attached to and made a part of this Certificate:

This Certificate does not constitute an acceptance of Work not in accordance with the Contract Documents, nor is it a release of Contractor's obligation to complete the Work in accordance with the Contract Documents.

Engineer

By *(signature)*: _____

Name *(printed)*: _____

Title: _____

SECTION 00 61 13

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: That we _____
(Name of Contractor)

a _____ hereinafter called “Principal” and
(Corporation, Partnership, Joint Venture or Individual)

_____of _____, State of _____
(Surety) (City & State)

_____ hereinafter called the "Surety" and licensed by the State Division of Insurance to do business under the laws of the Commonwealth of Massachusetts, are held and firmly bound to the City/Town of _____, Massachusetts, hereinafter called "Owner", in the penal sum of
_____ Dollars
($_____) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that Whereas, the Principal entered into a certain contract with the Owner, dated the _____ day of _____, 20___ (the “Construction Contract”), for the construction described as follows: _____
_____.

NOW, THEREFORE, if the Principal shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions, and agreements of the Construction Contract during the original term thereof, and any extensions thereof which may be granted by the Owner, with or without notice to the Surety, and if he shall satisfy all claims and demands incurred under the Construction Contract, and shall fully indemnify and save harmless the Owner from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the Owner all outlay and expense which the Owner may incur in making good any default, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the Surety’s obligation under this Bond shall arise after (1) the Owner has declared the Principal in default of the Construction Contract or any provision thereof or (2) has declared that the Principal has failed, or is otherwise unable or unwilling, to execute the work consistent with, and in conformance to, the Construction Contract (collectively referred to as a “Contractor Default”). The determination of a Contractor Default shall be made solely by the Owner. The Owner need not terminate the Construction Contract to declare a Contractor Default or to invoke its rights under this Bond.

When the Surety's obligation under this Bond arises, the Surety, at its sole expense and at the consent and election of the Owner, shall promptly take one of the following steps: (1) arrange for the Principal to perform and complete the work of the Construction Contract: (2) arrange for a contractor other than the Principal to perform and complete the work of the Construction Contract; (3) reimburse the Owner, in a manner and at such time as the Owner shall decide, for all costs and expenses incurred by the Owner in performing and completing the work of the Construction Contract. Surety will keep Owner reasonably informed of the progress, status and results of any investigation of any claim of the Owner.

If the Surety does not proceed as provided in this Bond with due diligence and all deliberate speed, the Surety shall be deemed to be in default of this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner.

After the Surety's obligation under this Bond arises, the Surety is obligated, to the limit of the amounts of this Bond, for (1) the correction of defective work and completion of the Construction Contract; (2) additional design, professional services, and legal costs, including attorneys' fees, resulting from the Contractor Default or from the default of the Surety under this Bond; (3) any additional work beyond the Construction Contract made necessary by the Contractor Default or default of the Surety under this Bond; (4) indemnification obligation of the Principal, if any, as provided in the Construction Contract; and (5) liquidated damages as provided in the Construction Contract, or if none are so specified, actual and foreseeable consequential damages resulting from the Contractor Default or default of the Surety under this Bond.

Any proceeding, legal or equitable, under this Bond shall be instituted in any court of competent jurisdiction in the Commonwealth of Massachusetts.

The Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Construction Contract or to the work to be performed thereunder or the specifications accompanying the same shall in any way affect its obligation on this Bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Construction Contract or to the work or to the specifications.

IN WITNESS WHEREOF, this instrument is executed in _____ ( ) counterparts, each one of which shall be deemed an original, this the _____ day of _____, 20___.

ATTEST:

_____
Principal

_____ By _____
(Principal Secretary)

_____

_____

_____
(Address-Zip Code)

_____ (SEAL)
Witness as to Principal

_____

_____
(Address-Zip Code)

ATTEST:

_____
Surety

_____ By _____
(Attorney-in-Fact)

_____

_____
(Address-Zip Code)

_____ (SEAL)
Witness as to Surety

_____

_____
(Address-Zip Code)

NOTE: Date of Bond must not be prior to date of Contract. If Contractor is a Partnership, all partners should execute Bond.

SECTION 00 61 14

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS: That we _____

_____ a_____

_____

(Name of Contractor) (Corporation, Partnership, Joint Venture or Individual)

hereinafter called "Principal" and _____ of _____,

(Surety)

State of _____ hereinafter called the “Surety” and licensed by the State

(City and State)

Division of Insurance to do business under the laws of the Commonwealth of Massachusetts, are held and firmly bound to the City/Town of _____, Massachusetts, hereinafter called "Owner", in the penal sum of _____ Dollars ($_____) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that Whereas, the Principal entered into a certain contract with the Owner, dated the _____ day of _____, 20___, for the construction described as follows:

NOW, THEREFORE, if the Principal shall promptly make payment to all persons, firms, subcontractors, and corporations furnishing materials for or performing labor in the prosecution of the work provided for in such contract, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such work, and all insurance premiums on said work, and for all labor, performed in such work whether by subcontractor or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the work to be performed thereunder or the specifications accompanying the same shall in any way affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of this contract or to the work or to the specifications.

PROVIDED, FURTHER, that no final settlement between the Owner and the Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in ____ ( ) counterparts, each one of which shall be deemed an original, this the _____ day of _____, 20__.

ATTEST:

_____
Surety

_____ By _____
(Attorney-in-Fact)

_____

_____
(Address-Zip Code)

_____ (SEAL)
Witness as to Surety

_____

_____
(Address-Zip Code)

NOTE: Date of Bond must not be prior to date of Contract. If Contractor is a Partnership, all partners should execute Bond.

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

ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

and

Issued and Published Jointly by

ACEC
American Council of Engineering Companies

The Associated General Contractors of America — Skill Responsibility Integrity

ASCE American Society of Civil Engineers

National Society of Professional Engineers
Professional Engineers in Private Practice

AMERICAN COUNCIL OF ENGINEERING COMPANIES

ASSOCIATED GENERAL CONTRACTORS OF AMERICA

AMERICAN SOCIETY OF CIVIL ENGINEERS

PROFESSIONAL ENGINEERS IN PRIVATE PRACTICE
A Practice Division of the
NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

Endorsed by

CSI

CONSTRUCTION SPECIFICATIONS INSTITUTE

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).

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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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, expediters, 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.

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.

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SECTION 00 80 00

SUPPLEMENTAL CONDITIONS

Page

AMENDING THE STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT PREPARED BY ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE (EJCDC NO. C-700, 2007 EDITION)

(Sub) Paragraph No.	
2.01B	Delete this paragraph and substitute the following: Before any Work at the Site is started, CONTRACTOR shall deliver to OWNER, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which OWNER or any additional insured may reasonably request) which CONTRACTOR is required to purchase and maintain in accordance with Article 5.
2.03	Delete the last sentence.
3.02A.1	Delete the phrase starting “shall mean” through the end of this sentence and substitute the following: shall mean the standard, specification, manual, code, or Laws or Regulations in effect and applicable at the time in question, except as may be otherwise specifically stated in the Contract Documents.
3.03A.3	Delete this paragraph and replace with the following: CONTRACTOR shall be liable to OWNER or ENGINEER for failure to report any such conflict, error, ambiguity or discrepancy if CONTRACTOR knew or reasonably should have known thereof.
4.01A	Delete the last sentence.
4.01B	Delete this subparagraph in its entirety.
4.03C.3	Delete this subparagraph in its entirety.
4.04B.2	Delete the phrase “or not shown or indicated with reasonable accuracy” following the word “indicated.” Delete the last sentence.
4.06C	Add the following to the first sentence: “unless CONTRACTOR caused or contributed to such Hazardous Environmental Condition.”
4.06D	Delete the last sentence.
4.06E	Delete the last sentence.
4.06F	Delete the second sentence.

4.06G Delete this subparagraph in its entirety.

4.06H Delete the last sentence.

5.03B Delete this subparagraph in its entirety.

5.04B.7 Insert the following new subparagraph:

7. “all coverage shall be written on an occurrence basis.

5.06A Delete this subparagraph in its entirety and substitute the following:

Owner may, in its discretion, purchase and maintain property insurance upon the Work at the Site.

5.06B Delete this subparagraph in its entirety.

5.06D Delete this subparagraph in its entirety and substitute the following:

The risk of loss within any 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.

5.07A Delete all text after the first sentence.

5.07B Delete this subparagraph in its entirety.

5.07C Delete this subparagraph in its entirety.

5.08 Delete this paragraph in its entirety.

5.09 Delete this paragraph in its entirety.

5.10 Delete this paragraph in its entirety and substitute the following:

OWNER may occupy or use a portion of the Work prior to Substantial Completion.

6.05A Add the following to the second sentence “, and in accordance with G.L. c.30, §39M.”

6.06F Insert the following at the beginning of this subparagraph:

“Except as required by and indicated in the specifications and contract documents pursuant to G.L. c.149, §44F,”

6.07A Delete the second sentence.

6.09C Delete the last sentence.

6.13E	Delete the text in parentheses at the end of the first sentence.
6.20A	Delete the parenthetical phrase “(other than the Work itself).”
6.20.A	Change the phrase “negligent act or omission” to “negligent or wrongful act or omission.”
7.01.A.2	Delete this subparagraph in its entirety.
7.01.B	Delete the last sentence.
7.02	Delete this paragraph in its entirety.
8.02	Delete the phrase “to whom CONTRACTOR makes no reasonable objection.”
8.07	Delete this paragraph in its entirety.
8.09	Insert the following after the first sentence: “However, the OWNER shall have the right to direct the CONTRACTOR to perform the Work according to any sequence schedule set forth in the Contract Documents or established pursuant thereto.”
9.02B	Insert the following at the end of this subparagraph: “However, the ENGINEER shall have the right to direct the CONTRACTOR to perform the Work according to any sequence schedule set forth in the Contract Documents or established pursuant thereto.”
9.03	Delete the last sentence.
9.04	Delete the last sentence.
9.08C	Delete the final phrase “subject to the provisions of paragraph 10.05.”
9.09B	Insert the following after the first sentence: “However, the ENGINEER shall have the right to direct the CONTRACTOR to perform the Work according to any sequence schedule set forth in the Contract Documents or established pursuant thereto.”
10.03A.3	Delete this subparagraph in its entirety.
11.01A.5	Delete subparagraphs a, b, d, e, f, g, and h.
11.02	Delete this paragraph in its entirety.
12.01B.3	Delete the last phrase “(determined as provided in paragraph 12.01.C).”
12.01C.2	Delete this subparagraph in its entirety.
12.03B	Delete this subparagraph in its entirety.

12.03F Insert the following new subparagraph:

3. Delays caused by or within the control of the OWNER. In such event, the CONTRACTOR'S sole remedy shall be an extension of the Contract Time. Notwithstanding anything to the contrary in the Contract Documents, Contractor shall not be eligible for any increase in the Contract Price/Sum on account of any delay in the work, no matter by whom such delay is caused, and Contractor shall make no claim for such an increase, whether such claim is styled as a claim for delay damages, acceleration of work, loss of production, or otherwise.

13.01 Delete the word "Prompt" at the beginning of the subparagraph.

13.03F Delete the balance of this subparagraph after the words "CONTRACTOR's expense."

13.04D Delete this subparagraph in its entirety.

13.08 Delete the fourth sentence.

13.09C Delete the second sentence.

14.02A.1 Delete the first phrase prior to the words, "Contractor shall" and substitute in place thereof the following: "On a monthly basis and in accordance with G.L. c.30, §39G,".

14.02A.3 Delete this subparagraph and substitute the following: "Retainage shall be in accordance with G.L. c.30, §39G.

14.02C Delete this subparagraph and substitute the following:

Payment shall be made in accordance with G.L. c.30, §39G.

14.02D.2 Delete the words "immediate" and "promptly".

14.02D.3 Delete this subparagraph in its entirety.

14.04C Delete the third sentence and substitute the following:

"OWNER shall review the tentative certificate and make written objection to ENGINEER as to any provisions of the certificate or attached list."

Delete the phrase "within 14 days after submission of the tentative certificate to OWNER" in the fourth sentence. Delete the phrase "within said 14 days" in the fifth sentence.

14.05 Delete the phrase "subject to the following conditions" at the end of the first sentence and delete subparagraphs 1 and 2 in their entirety.

14.07B.1 Delete the phrase “within ten days after receipt of the final Application for Payment,” in the first sentence.

14.07C Delete this subparagraph in its entirety and substitute the following:

Final payment shall be made in accordance with G.L. c.30, §39G.

14.09A.1 Delete this subparagraph in its entirety.

15.01 Delete this subparagraph in its entirety and substitute the following:

OWNER may suspend the work or any portion thereof in accordance with G.L. c.30, §39O.

15.03A Delete from subparagraph 1 the phrase “including fair and reasonable sums for overhead and profit on such Work;” and from subparagraph 2 the phrase “plus fair and reasonable sums for overhead and profit on such expenses”; and delete subparagraphs 3 and 4 in their entirety.

15.04B Delete the last sentence.

§ SC 1.1 INTRODUCTION

The following provisions modify, change, delete from or add to Section 00500 Agreement. Where any Subsection of the Agreement is modified or any Article Paragraph, Subparagraph or Clause thereof is modified or deleted by these Supplemental Conditions, the unaltered provisions of that Article, Paragraph, Subparagraph or Clause shall remain in effect.

§ SC 2.1 PREVAILING WAGE

In accordance with General Laws Chapter 149, Section 26 through 27D, the Contractor is obligated to comply with the prevailing wage rates established by the Commissioner of the Department of Labor and Workforce Development for mechanics, apprentices, chauffeurs, teamsters and laborers employed on the Project. The schedule of applicable prevailing wage rates for the Project, together with a Certificate of Compliance therewith, are set forth in Attachment A herein.

§ SC 3.1 CONTRACTOR'S LIABILITY INSURANCE

In no case shall the limits of liability be less than the following:

1. Contractor's Liability Insurance

a. Workers' Compensation:

1. State: Statutory

2. Employer Liability:

$1,000,000 Bodily Injury by Accident
$1,000,000 Bodily Injury by Disease - policy limit

3. $1,000,000 Bodily Injury by Disease - each
$1,000,000 Umbrella Liability - all limits

b. Comprehensive General Liability (including Premises-Operations; Independent Contractor's Protective; Products and Completed Operations; Broad Form Property Damage):

1. Bodily Injury:
$1,000,000 Each Occurrence
$3,000,000 Aggregate

2. Products and Completed Operations
$1,000,000 Each Occurrence (bodily injury and property damage)
$3,000,000 Aggregate

3. Property Damage Liability (including coverage for XCU hazards).
$1,000,000 Each Occurrence
$3,000,000 Aggregate

4. Products and Completed Operations insurance shall be maintained for a minimum period of 2 years after final payment and Contractor shall continue to provide evidence of such coverage to Owner on an annual basis during the aforementioned.

5. Contractual Liability (Hold Harmless Coverage):

$1,000,000 Bodily Injury Each Occurrence
$1,000,000 Property Damage Each Occurrence
$3,000,000 Property Damage Aggregate

6. Personal Injury, with Employment Exclusion deleted:
$1,000,000 All Limits

c. Comprehensive Automobile Liability (owned, non-owned, hired):

1. Bodily Injury
$1,000,000 Each Person
$1,000,000 Each Accident

2. Property Damage
$1,000,000 Each Accident

d. Property Insurance / Builders Risk: the full Contact sum

e. Pollution Liability:
$1,000,000 Each Occurrence
$2,000,000 Aggregate

f. Umbrella Liability Coverage
$2,000,000 All Limits

SECTION 00 85 00

Incorporation of Applicable Provisions of the
Massachusetts General Laws

Certain provisions of the Massachusetts General Laws are applicable to Construction contracts including, but not limited to, those contained in Chapter 30 and Chapter 149. All applicable provisions of the Massachusetts General Laws are incorporated into the Contract as if fully set forth herein, and shall prevail over any conflicting provisions of the General or Supplemental Conditions.

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

MAURA HEALEY
Governor

KIM DRISCOLL
Lt. Governor

LAUREN JONES
Secretary

MICHAEL FLANAGAN
Director

Awarding Authority: Town of Oxford

Contract Number:

City/Town: OXFORD

Description of Work: replacement of existing culvert w/ twin HDPE pipes in conc cradle & cast-in-place weir board structure & headwall; bank stabilization; drainage & water main improvements; wetlands replication; paving

Job Location: 2 Waite Street, Oxford 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 form 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 within90 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.

Issue Date: 04/07/2025 **Wage Request Number:** 20250404-047

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Construction						
(2 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	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 *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	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 *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	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 *PILE DRIVER LOCAL 56 (ZONE 2)*	08/01/2024	$117.16	$10.08	$24.29	$0.00	$151.53
For apprentice rates see "Apprentice- PILE DRIVER"						
AIR TRACK OPERATOR *LABORERS - ZONE 2*	12/01/2024	$39.70	$9.90	$18.36	$0.00	$67.96
	06/01/2025	$41.09	$9.90	$18.36	$0.00	$69.35
	12/01/2025	$42.47	$9.90	$18.36	$0.00	$70.73
	06/01/2026	$43.91	$9.90	$18.36	$0.00	$72.17
	12/01/2026	$45.35	$9.90	$18.36	$0.00	$73.61
	06/01/2027	$46.80	$9.90	$18.36	$0.00	$75.06
	12/01/2027	$48.25	$9.90	$18.36	$0.00	$76.51
	06/01/2028	$49.75	$9.90	$18.36	$0.00	$78.01
	12/01/2028	$51.25	$9.90	$18.36	$0.00	$79.51
For apprentice rates see "Apprentice- LABORER"						
AIR TRACK OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$39.70	$9.90	$18.46	$0.00	$68.06
	06/01/2025	$41.09	$9.90	$18.46	$0.00	$69.45
	12/01/2025	$42.47	$9.90	$18.46	$0.00	$70.83
	06/01/2026	$43.91	$9.90	$18.46	$0.00	$72.27
	12/01/2026	$45.35	$9.90	$18.46	$0.00	$73.71
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
ASBESTOS WORKER (PIPES & TANKS) *HEAT & FROST INSULATORS LOCAL 6 (WORCESTER)*	12/01/2024	$42.80	$14.50	$11.05	$0.00	$68.35
	06/01/2025	$43.80	$14.50	$11.05	$0.00	$69.35
	12/01/2025	$44.80	$14.50	$11.05	$0.00	$70.35

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
ASPHALT RAKER *LABORERS - ZONE 2*	12/01/2024	$39.20	$9.90	$18.36	$0.00	$67.46
	06/01/2025	$40.59	$9.90	$18.36	$0.00	$68.85
	12/01/2025	$41.97	$9.90	$18.36	$0.00	$70.23
	06/01/2026	$43.41	$9.90	$18.36	$0.00	$71.67
	12/01/2026	$44.85	$9.90	$18.36	$0.00	$73.11
	06/01/2027	$46.30	$9.90	$18.36	$0.00	$74.56
	12/01/2027	$47.75	$9.90	$18.36	$0.00	$76.01
	06/01/2028	$49.25	$9.90	$18.36	$0.00	$77.51
	12/01/2028	$50.75	$9.90	$18.36	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"						
ASPHALT RAKER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$39.20	$9.90	$18.46	$0.00	$67.56
	06/01/2025	$40.59	$9.90	$18.46	$0.00	$68.95
	12/01/2025	$41.97	$9.90	$18.46	$0.00	$70.33
	06/01/2026	$43.41	$9.90	$18.46	$0.00	$71.77
	12/01/2026	$44.85	$9.90	$18.46	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
ASPHALT/CONCRETE/CRUSHER PLANT-ON SITE *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$57.03	$15.55	$16.50	$0.00	$89.08
	06/01/2025	$58.33	$15.55	$16.50	$0.00	$90.38
	12/01/2025	$59.78	$15.55	$16.50	$0.00	$91.83
	06/01/2026	$61.08	$15.55	$16.50	$0.00	$93.13
	12/01/2026	$62.53	$15.55	$16.50	$0.00	$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BACKHOE/FRONT-END LOADER *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$57.03	$15.55	$16.50	$0.00	$89.08
	06/01/2025	$58.33	$15.55	$16.50	$0.00	$90.38
	12/01/2025	$59.78	$15.55	$16.50	$0.00	$91.83
	06/01/2026	$61.08	$15.55	$16.50	$0.00	$93.13
	12/01/2026	$62.53	$15.55	$16.50	$0.00	$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BARCO-TYPE JUMPING TAMPER *LABORERS - ZONE 2*	12/01/2024	$39.20	$9.90	$18.36	$0.00	$67.46
	06/01/2025	$40.59	$9.90	$18.36	$0.00	$68.85
	12/01/2025	$41.97	$9.90	$18.36	$0.00	$70.23
	06/01/2026	$43.41	$9.90	$18.36	$0.00	$71.67
	12/01/2026	$44.85	$9.90	$18.36	$0.00	$73.11
	06/01/2027	$46.30	$9.90	$18.36	$0.00	$74.56
	12/01/2027	$47.75	$9.90	$18.36	$0.00	$76.01
	06/01/2028	$49.25	$9.90	$18.36	$0.00	$77.51
	12/01/2028	$50.75	$9.90	$18.36	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
BLOCK PAVER, RAMMER / CURB SETTER *LABORERS - ZONE 2*	12/01/2024	$39.70	$9.90	$18.36	$0.00	$67.96
	06/01/2025	$41.09	$9.90	$18.36	$0.00	$69.35
	12/01/2025	$42.47	$9.90	$18.36	$0.00	$70.73
	06/01/2026	$43.91	$9.90	$18.36	$0.00	$72.17
	12/01/2026	$45.35	$9.90	$18.36	$0.00	$73.61
	06/01/2027	$46.80	$9.90	$18.36	$0.00	$75.06
	12/01/2027	$48.25	$9.90	$18.36	$0.00	$76.51
	06/01/2028	$49.75	$9.90	$18.36	$0.00	$78.01
	12/01/2028	$51.25	$9.90	$18.36	$0.00	$79.51
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$39.70	$9.90	$18.46	$0.00	$68.06
	06/01/2025	$41.09	$9.90	$18.46	$0.00	$69.45
	12/01/2025	$42.47	$9.90	$18.46	$0.00	$70.83
	06/01/2026	$43.91	$9.90	$18.46	$0.00	$72.27
	12/01/2026	$45.35	$9.90	$18.46	$0.00	$73.71
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
BOILER MAKER *BOILERMAKERS LOCAL 29*	01/01/2024	$48.12	$7.07	$20.60	$0.00	$75.79

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) *BRICKLAYERS LOCAL 3 (WORCESTER)*	02/01/2025	$63.66	$11.49	$22.90	$0.00	$98.05
	08/01/2025	$65.81	$11.49	$22.90	$0.00	$100.20
	02/01/2026	$67.16	$11.49	$22.90	$0.00	$101.55
	08/01/2026	$69.36	$11.49	$22.90	$0.00	$103.75
	02/01/2027	$70.76	$11.49	$22.90	$0.00	$105.15

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *BRICK/PLASTER/CEMENT MASON - Local 3 Worcester*

Effective Date - 02/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$31.83	$11.49	$22.90	$0.00	$66.22
2	60	$38.20	$11.49	$22.90	$0.00	$72.59
3	70	$44.56	$11.49	$22.90	$0.00	$78.95
4	80	$50.93	$11.49	$22.90	$0.00	$85.32
5	90	$57.29	$11.49	$22.90	$0.00	$91.68

Effective Date - 08/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$32.91	$11.49	$22.90	$0.00	$67.30
2	60	$39.49	$11.49	$22.90	$0.00	$73.88
3	70	$46.07	$11.49	$22.90	$0.00	$80.46
4	80	$52.65	$11.49	$22.90	$0.00	$87.04
5	90	$59.23	$11.49	$22.90	$0.00	$93.62

Notes:

Apprentice to Journeyworker Ratio:1:5

BULLDOZER/GRADER/SCRAPER *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
CAISSON & UNDERPINNING BOTTOM MAN *LABORERS - FOUNDATION AND MARINE*	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"						
CAISSON & UNDERPINNING LABORER *LABORERS - FOUNDATION AND MARINE*	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"						
CAISSON & UNDERPINNING TOP MAN *LABORERS - FOUNDATION AND MARINE*	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"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CARBIDE CORE DRILL OPERATOR *LABORERS - ZONE 2*	12/01/2024	$39.20	$9.90	$18.36	$0.00	$67.46
	06/01/2025	$40.59	$9.90	$18.36	$0.00	$68.85
	12/01/2025	$41.97	$9.90	$18.36	$0.00	$70.23
	06/01/2026	$43.41	$9.90	$18.36	$0.00	$71.67
	12/01/2026	$44.85	$9.90	$18.36	$0.00	$73.11
	06/01/2027	$46.30	$9.90	$18.36	$0.00	$74.56
	12/01/2027	$47.75	$9.90	$18.36	$0.00	$76.01
	06/01/2028	$49.25	$9.90	$18.36	$0.00	$77.51
	12/01/2028	$50.75	$9.90	$18.36	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"						
CARPENTER *CARPENTERS -ZONE 2 (Eastern Massachusetts)*	03/01/2025	$49.62	$9.83	$19.97	$0.00	$79.42
	09/01/2025	$50.87	$9.83	$19.97	$0.00	$80.67
	03/01/2026	$52.12	$9.83	$19.97	$0.00	$81.92
	09/01/2026	$53.37	$9.83	$19.97	$0.00	$83.17
	03/01/2027	$54.62	$9.83	$19.97	$0.00	$84.42

Apprentice - *CARPENTER - Zone 2 Eastern MA*

Effective Date - 03/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	$22.33	$9.83	$1.73	$0.00	$33.89
2	45	$22.33	$9.83	$1.73	$0.00	$33.89
3	55	$27.29	$9.83	$3.40	$0.00	$40.52
4	55	$27.29	$9.83	$3.40	$0.00	$40.52
5	70	$34.73	$9.83	$16.51	$0.00	$61.07
6	70	$34.73	$9.83	$16.51	$0.00	$61.07
7	80	$39.70	$9.83	$18.24	$0.00	$67.77
8	80	$39.70	$9.83	$18.24	$0.00	$67.77

Effective Date - 09/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	$22.89	$9.83	$1.73	$0.00	$34.45
2	45	$22.89	$9.83	$1.73	$0.00	$34.45
3	55	$27.98	$9.83	$3.40	$0.00	$41.21
4	55	$27.98	$9.83	$3.40	$0.00	$41.21
5	70	$35.61	$9.83	$16.51	$0.00	$61.95
6	70	$35.61	$9.83	$16.51	$0.00	$61.95
7	80	$40.70	$9.83	$18.24	$0.00	$68.77
8	80	$40.70	$9.83	$18.24	$0.00	$68.77

Notes:

Apprentice to Journeyworker Ratio:1:5

CARPENTER WOOD FRAME *CARPENTERS-ZONE 3 (Wood Frame)*	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

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
All Aspects of New Wood Frame Work						

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 (WORCESTER)*	07/01/2024	$49.19	$13.35	$24.21	$1.80	$88.55

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *CEMENT MASONRY/PLASTERING - Worcester*

Effective Date - 07/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$24.60	$13.35	$16.43	$0.00	$54.38
2	60	$29.51	$13.35	$19.21	$1.80	$63.87
3	65	$31.97	$13.35	$20.21	$1.80	$67.33
4	70	$34.43	$13.35	$21.21	$1.80	$70.79
5	75	$36.89	$13.35	$22.21	$1.80	$74.25
6	80	$39.35	$13.35	$23.21	$1.80	$77.71
7	90	$44.27	$13.35	$24.21	$1.80	$83.63

Notes:

Steps 3,4 are 500 hrs. All other steps are 1,000 hrs.

Apprentice to Journeyworker Ratio:1:3

CHAIN SAW OPERATOR *LABORERS - ZONE 2*	12/01/2024	$39.20	$9.90	$18.36	$0.00	$67.46
	06/01/2025	$40.59	$9.90	$18.36	$0.00	$68.85
	12/01/2025	$41.97	$9.90	$18.36	$0.00	$70.23
	06/01/2026	$43.41	$9.90	$18.36	$0.00	$71.67
	12/01/2026	$44.85	$9.90	$18.36	$0.00	$73.11
	06/01/2027	$46.30	$9.90	$18.36	$0.00	$74.56
	12/01/2027	$47.75	$9.90	$18.36	$0.00	$76.01
	06/01/2028	$49.25	$9.90	$18.36	$0.00	$77.51
	12/01/2028	$50.75	$9.90	$18.36	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"						
CLAM SHELLS/SLURRY BUCKETS/HEADING MACHINES *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$58.18	$15.55	$16.50	$0.00	$90.23
	06/01/2025	$59.51	$15.55	$16.50	$0.00	$91.56
	12/01/2025	$60.98	$15.55	$16.50	$0.00	$93.03
	06/01/2026	$62.31	$15.55	$16.50	$0.00	$94.36
	12/01/2026	$63.79	$15.55	$16.50	$0.00	$95.84
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
COMPRESSOR OPERATOR *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$36.67	$15.55	$16.50	$0.00	$68.72
	06/01/2025	$37.52	$15.55	$16.50	$0.00	$69.57
	12/01/2025	$38.47	$15.55	$16.50	$0.00	$70.52
	06/01/2026	$39.33	$15.55	$16.50	$0.00	$71.38
	12/01/2026	$40.28	$15.55	$16.50	$0.00	$72.33
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DELEADER (BRIDGE) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2025	$58.46	$9.95	$23.95	$0.00	$92.36

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

DEMO: ADZEMAN *LABORERS - ZONE 2*	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"						
DEMO: BACKHOE/LOADER/HAMMER OPERATOR *LABORERS - ZONE 2*	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: BURNERS *LABORERS - ZONE 2*	12/02/2024	$47.00	$9.90	$18.90	$0.00	$75.80
	06/02/2025	$48.50	$9.90	$18.90	$0.00	$77.30
	12/01/2025	$50.00	$9.90	$18.90	$0.00	$78.80
	06/01/2026	$51.55	$9.90	$18.90	$0.00	$80.35
	12/07/2026	$53.05	$9.90	$18.90	$0.00	$81.85
	06/07/2027	$54.65	$9.90	$18.90	$0.00	$83.45
	12/06/2027	$56.25	$9.90	$18.90	$0.00	$85.05
	06/05/2028	$57.93	$9.90	$18.90	$0.00	$86.73
	12/04/2028	$59.60	$9.90	$18.90	$0.00	$88.40

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER"						
DEMO: CONCRETE CUTTER/SAWYER *LABORERS - ZONE 2*	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 2*	12/02/2024	$47.00	$9.90	$18.90	$0.00	$75.80
	06/02/2025	$48.50	$9.90	$18.90	$0.00	$77.30
	12/01/2025	$50.00	$9.90	$18.90	$0.00	$78.80
	06/01/2026	$51.55	$9.90	$18.90	$0.00	$80.35
	12/07/2026	$53.05	$9.90	$18.90	$0.00	$81.85
	06/07/2027	$54.65	$9.90	$18.90	$0.00	$83.45
	12/06/2027	$56.25	$9.90	$18.90	$0.00	$85.05
	06/05/2028	$57.93	$9.90	$18.90	$0.00	$86.73
	12/04/2028	$59.60	$9.90	$18.90	$0.00	$88.40
For apprentice rates see "Apprentice- LABORER"						
DEMO: WRECKING LABORER *LABORERS - ZONE 2*	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"						
DIRECTIONAL DRILL MACHINE OPERATOR *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DIVER *PILE DRIVER LOCAL 56 (ZONE 2)*	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 2)*	08/01/2024	$51.97	$10.08	$24.29	$0.00	$86.34
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 2)*	08/01/2024	$83.69	$10.08	$24.29	$0.00	$118.06
For apprentice rates see "Apprentice- PILE DRIVER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
DIVER/SLURRY (EFFLUENT) *PILE DRIVER LOCAL 56 (ZONE 2)* For apprentice rates see "Apprentice- PILE DRIVER"	08/01/2024	$117.16	$10.08	$24.29	$0.00	$151.53
DRAWBRIDGE OPERATOR (Construction) *DRAWBRIDGE - SEIU LOCAL 888*	07/01/2020	$26.77	$6.67	$3.93	$0.16	$37.53
ELECTRICIAN *ELECTRICIANS LOCAL 96*	09/01/2024	$47.05	$13.99	$19.22	$0.00	$80.26
	09/07/2025	$48.16	$14.98	$19.60	$0.00	$82.74
	09/06/2026	$49.38	$15.96	$20.00	$0.00	$85.34

Apprentice - *ELECTRICIAN - Local 96*

Effective Date - 09/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$18.82	$13.99	$0.56	$0.00	$33.37
2	45	$21.17	$13.99	$0.64	$0.00	$35.80
3	48	$22.58	$13.99	$15.79	$0.00	$52.36
4	55	$25.88	$13.99	$16.26	$0.00	$56.13
5	65	$30.58	$13.99	$16.91	$0.00	$61.48
6	80	$37.64	$13.99	$17.90	$0.00	$69.53

Effective Date - 09/07/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$19.26	$14.98	$0.58	$0.00	$34.82
2	45	$21.67	$14.98	$0.65	$0.00	$37.30
3	48	$23.12	$14.98	$16.09	$0.00	$54.19
4	55	$26.49	$14.98	$16.57	$0.00	$58.04
5	65	$31.30	$14.98	$17.25	$0.00	$63.53
6	80	$38.53	$14.98	$18.26	$0.00	$71.77

Notes:

Steps 1-2 are 1000 hrs; Steps 3-6 are 1500 hrs.

Apprentice to Journeyworker Ratio:2:3***

ELEVATOR CONSTRUCTOR *ELEVATOR CONSTRUCTORS LOCAL 41*	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 *ELEVATOR CONSTRUCTORS LOCAL 41*	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) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$39.20	$9.90	$18.46	$0.00	$67.56
	06/01/2025	$40.59	$9.90	$18.46	$0.00	$68.95
	12/01/2025	$41.97	$9.90	$18.46	$0.00	$70.33
	06/01/2026	$43.41	$9.90	$18.46	$0.00	$71.77
	12/01/2026	$44.85	$9.90	$18.46	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
FIELD ENG.INST.PERSON-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 4*	11/01/2024	$51.78	$15.30	$16.40	$0.00	$83.48
	05/01/2025	$53.22	$15.30	$16.40	$0.00	$84.92
	11/01/2025	$54.51	$15.30	$16.40	$0.00	$86.21
	05/01/2026	$55.95	$15.30	$16.40	$0.00	$87.65
	11/01/2026	$57.24	$15.30	$16.40	$0.00	$88.94
	05/01/2027	$58.67	$15.30	$16.40	$0.00	$90.37
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIELD ENG.PARTY CHIEF-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 4*	11/01/2024	$53.37	$15.30	$16.40	$0.00	$85.07
	05/01/2025	$54.82	$15.30	$16.40	$0.00	$86.52
	11/01/2025	$56.12	$15.30	$16.40	$0.00	$87.82
	05/01/2026	$57.57	$15.30	$16.40	$0.00	$89.27
	11/01/2026	$58.87	$15.30	$16.40	$0.00	$90.57
	05/01/2027	$60.32	$15.30	$16.40	$0.00	$92.02
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FIELD ENG.ROD PERSON-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 4*	11/01/2024	$25.37	$15.30	$16.40	$0.00	$57.07
	05/01/2025	$26.22	$15.30	$16.40	$0.00	$57.92
	11/01/2025	$26.98	$15.30	$16.40	$0.00	$58.68
	05/01/2026	$27.83	$15.30	$16.40	$0.00	$59.53
	11/01/2026	$28.59	$15.30	$16.40	$0.00	$60.29
	05/01/2027	$29.44	$15.30	$16.40	$0.00	$61.14
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIRE ALARM INSTALLER *ELECTRICIANS LOCAL 96*	09/01/2024	$47.05	$13.99	$19.22	$0.00	$80.26
	09/07/2025	$48.16	$14.98	$19.60	$0.00	$82.74
	09/06/2026	$49.38	$15.96	$20.00	$0.00	$85.34
For apprentice rates see "Apprentice- ELECTRICIAN"						
FIRE ALARM REPAIR / MAINT/COMMISSIONING *ELECTRICIANS LOCAL 96*	09/01/2024	$47.05	$13.99	$19.22	$0.00	$80.26
	09/07/2025	$48.16	$14.98	$19.60	$0.00	$82.74
	09/06/2026	$49.38	$15.96	$20.00	$0.00	$85.34
For apprentice rates see "Apprentice- ELECTRICIAN"						
FIREMAN (ASST. ENGINEER) *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$45.96	$15.55	$16.50	$0.00	$78.01
	06/01/2025	$47.02	$15.55	$16.50	$0.00	$79.07
	12/01/2025	$48.19	$15.55	$16.50	$0.00	$80.24
	06/01/2026	$49.25	$15.55	$16.50	$0.00	$81.30
	12/01/2026	$50.43	$15.55	$16.50	$0.00	$82.48
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FLAGGER & SIGNALER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$27.01	$9.90	$18.46	$0.00	$55.37
	06/01/2025	$28.09	$9.90	$18.46	$0.00	$56.45
	12/01/2025	$28.09	$9.90	$18.46	$0.00	$56.45
	06/01/2026	$29.21	$9.90	$18.46	$0.00	$57.57
	12/01/2026	$29.21	$9.90	$18.46	$0.00	$57.57
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
FLOORCOVERER *FLOORCOVERERS LOCAL 2168 ZONE II*	03/01/2024	$49.47	$8.83	$20.27	$0.00	$78.57

Apprentice - *FLOORCOVERER - Local 2168 Zone II*

Effective Date - 03/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$24.74	$8.83	$1.76	$0.00	$35.33
2	55	$27.21	$8.83	$1.76	$0.00	$37.80
3	60	$29.68	$8.83	$3.52	$0.00	$42.03
4	65	$32.16	$8.83	$3.52	$0.00	$44.51
5	70	$34.63	$8.83	$16.75	$0.00	$60.21
6	75	$37.10	$8.83	$16.75	$0.00	$62.68
7	80	$39.58	$8.83	$18.51	$0.00	$66.92
8	85	$42.05	$8.83	$18.51	$0.00	$69.39

Notes: Steps are 750 hrs.
% After 10/1/17; 45/45/55/55/70/70/80/80 (1500hr Steps)
Step 1&2 $32.63/ 3&4 $39.28/ 5&6 $59.86/ 7&8 $66.52

Apprentice to Journeyworker Ratio:1:1

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FORK LIFT/CHERRY PICKER *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$57.03	$15.55	$16.50	$0.00	$89.08
	06/01/2025	$58.33	$15.55	$16.50	$0.00	$90.38
	12/01/2025	$59.78	$15.55	$16.50	$0.00	$91.83
	06/01/2026	$61.08	$15.55	$16.50	$0.00	$93.13
	12/01/2026	$62.53	$15.55	$16.50	$0.00	$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GENERATOR/LIGHTING PLANT/HEATERS *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$36.67	$15.55	$16.50	$0.00	$68.72
	06/01/2025	$37.52	$15.55	$16.50	$0.00	$69.57
	12/01/2025	$38.47	$15.55	$16.50	$0.00	$70.52
	06/01/2026	$39.33	$15.55	$16.50	$0.00	$71.38
	12/01/2026	$40.28	$15.55	$16.50	$0.00	$72.33
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS) *GLAZIERS LOCAL 35 (ZONE 2)*	01/01/2025	$47.96	$9.95	$23.95	$0.00	$81.86

Apprentice - *GLAZIER - Local 35 Zone 2*

Effective Date - 01/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$23.98	$9.95	$0.00	$0.00	$33.93
2	55	$26.38	$9.95	$6.66	$0.00	$42.99
3	60	$28.78	$9.95	$7.26	$0.00	$45.99
4	65	$31.17	$9.95	$7.87	$0.00	$48.99
5	70	$33.57	$9.95	$20.32	$0.00	$63.84
6	75	$35.97	$9.95	$20.93	$0.00	$66.85
7	80	$38.37	$9.95	$21.53	$0.00	$69.85
8	90	$43.16	$9.95	$22.74	$0.00	$75.85

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

HOISTING ENGINEER/CRANES/GRADALLS *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$57.03	$15.55	$16.50	$0.00	$89.08
	06/01/2025	$58.33	$15.55	$16.50	$0.00	$90.38
	12/01/2025	$59.78	$15.55	$16.50	$0.00	$91.83
	06/01/2026	$61.08	$15.55	$16.50	$0.00	$93.13
	12/01/2026	$62.53	$15.55	$16.50	$0.00	$94.58

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *OPERATING ENGINEERS - Local 4*

Effective Date - 12/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$31.37	$0.00	$0.00	$0.00	$31.37
2	60	$34.22	$15.55	$16.50	$0.00	$66.27
3	65	$37.07	$15.55	$16.50	$0.00	$69.12
4	70	$39.92	$15.55	$16.50	$0.00	$71.97
5	75	$42.77	$15.55	$16.50	$0.00	$74.82
6	80	$45.62	$15.55	$16.50	$0.00	$77.67
7	85	$48.48	$15.55	$16.50	$0.00	$80.53
8	90	$51.33	$15.55	$16.50	$0.00	$83.38

Effective Date - 06/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$32.08	$0.00	$0.00	$0.00	$32.08
2	60	$35.00	$15.55	$16.50	$0.00	$67.05
3	65	$37.91	$15.55	$16.50	$0.00	$69.96
4	70	$40.83	$15.55	$16.50	$0.00	$72.88
5	75	$43.75	$15.55	$16.50	$0.00	$75.80
6	80	$46.66	$15.55	$16.50	$0.00	$78.71
7	85	$49.58	$15.55	$16.50	$0.00	$81.63
8	90	$52.50	$15.55	$16.50	$0.00	$84.55

Notes:

Apprentice to Journeyworker Ratio:1:6

HVAC (DUCTWORK) *SHEETMETAL WORKERS LOCAL 63*	01/01/2025	$42.23	$12.20	$18.74	$2.13	$75.30
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (ELECTRICAL CONTROLS) *ELECTRICIANS LOCAL 96*	09/01/2024	$47.05	$13.99	$19.22	$0.00	$80.26
	09/07/2025	$48.16	$14.98	$19.60	$0.00	$82.74
	09/06/2026	$49.38	$15.96	$20.00	$0.00	$85.34
For apprentice rates see "Apprentice- ELECTRICIAN"						
HVAC (TESTING AND BALANCING - AIR) *SHEETMETAL WORKERS LOCAL 63*	01/01/2025	$42.23	$12.20	$18.74	$2.13	$75.30
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (TESTING AND BALANCING -WATER) *PLUMBERS LOCAL 4*	03/01/2025	$55.00	$11.30	$17.77	$0.00	$84.07
	09/01/2025	$56.40	$11.30	$17.77	$0.00	$85.47
	03/01/2026	$57.80	$11.30	$17.77	$0.00	$86.87
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HVAC MECHANIC *PLUMBERS LOCAL 4*	03/01/2025	$55.00	$11.30	$17.77	$0.00	$84.07
	09/01/2025	$56.40	$11.30	$17.77	$0.00	$85.47
	03/01/2026	$57.80	$11.30	$17.77	$0.00	$86.87
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
HYDRAULIC DRILLS *LABORERS - ZONE 2*	12/01/2024	$39.70	$9.90	$18.36	$0.00	$67.96
	06/01/2025	$41.09	$9.90	$18.36	$0.00	$69.35
	12/01/2025	$42.47	$9.90	$18.36	$0.00	$70.73
	06/01/2026	$43.91	$9.90	$18.36	$0.00	$72.17
	12/01/2026	$45.35	$9.90	$18.36	$0.00	$73.61
	06/01/2027	$46.80	$9.90	$18.36	$0.00	$75.06
	12/01/2027	$48.25	$9.90	$18.36	$0.00	$76.51
	06/01/2028	$49.75	$9.90	$18.36	$0.00	$78.01
	12/01/2028	$51.25	$9.90	$18.36	$0.00	$79.51
For apprentice rates see "Apprentice- LABORER"						
HYDRAULIC DRILLS (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$39.70	$9.90	$18.46	$0.00	$68.06
	06/01/2025	$41.09	$9.90	$18.46	$0.00	$69.45
	12/01/2025	$42.47	$9.90	$18.46	$0.00	$70.83
	06/01/2026	$43.91	$9.90	$18.46	$0.00	$72.27
	12/01/2026	$45.35	$9.90	$18.46	$0.00	$73.71
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
INSULATOR (PIPES & TANKS) *HEAT & FROST INSULATORS LOCAL 6 (WORCESTER)*	09/01/2024	$51.23	$14.75	$19.61	$0.00	$85.59
	09/01/2025	$54.31	$14.75	$19.61	$0.00	$88.67
	09/01/2026	$57.38	$14.75	$19.61	$0.00	$91.74

Apprentice - *ASBESTOS INSULATOR (Pipes & Tanks) - Local 6 Worcester*

Effective Date - 09/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$25.62	$14.75	$14.32	$0.00	$54.69
2	60	$30.74	$14.75	$15.37	$0.00	$60.86
3	70	$35.86	$14.75	$16.43	$0.00	$67.04
4	80	$40.98	$14.75	$17.49	$0.00	$73.22

Effective Date - 09/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$27.16	$14.75	$14.32	$0.00	$56.23
2	60	$32.59	$14.75	$15.37	$0.00	$62.71
3	70	$38.02	$14.75	$16.43	$0.00	$69.20
4	80	$43.45	$14.75	$17.49	$0.00	$75.69

Notes:
Steps are 1 year

Apprentice to Journeyworker Ratio:1:4

IRONWORKER/WELDER *IRONWORKERS LOCAL 7 (WORCESTER AREA)*	03/16/2024	$53.67	$8.35	$26.70	$0.00	$88.72

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *IRONWORKER - Local 7 Worcester*

Effective Date - 03/16/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$32.20	$8.35	$26.70	$0.00	$67.25
2	70	$37.57	$8.35	$26.70	$0.00	$72.62
3	75	$40.25	$8.35	$26.70	$0.00	$75.30
4	80	$42.94	$8.35	$26.70	$0.00	$77.99
5	85	$45.62	$8.35	$26.70	$0.00	$80.67
6	90	$48.30	$8.35	$26.70	$0.00	$83.35

Notes:

Apprentice to Journeyworker Ratio:1:4

JACKHAMMER & PAVING BREAKER OPERATOR *LABORERS - ZONE 2*	12/01/2024	$39.20	$9.90	$18.36	$0.00	$67.46
	06/01/2025	$40.59	$9.90	$18.36	$0.00	$68.85
	12/01/2025	$41.97	$9.90	$18.36	$0.00	$70.23
	06/01/2026	$43.41	$9.90	$18.36	$0.00	$71.67
	12/01/2026	$44.85	$9.90	$18.36	$0.00	$73.11
	06/01/2027	$46.30	$9.90	$18.36	$0.00	$74.56
	12/01/2027	$47.75	$9.90	$18.36	$0.00	$76.01
	06/01/2028	$49.25	$9.90	$18.36	$0.00	$77.51
	12/01/2028	$50.75	$9.90	$18.36	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"						
LABORER *LABORERS - ZONE 2*	12/01/2024	$38.95	$9.90	$18.36	$0.00	$67.21
	06/01/2025	$40.34	$9.90	$18.36	$0.00	$68.60
	12/01/2025	$41.72	$9.90	$18.36	$0.00	$69.98
	06/01/2026	$43.16	$9.90	$18.36	$0.00	$71.42
	12/01/2026	$44.60	$9.90	$18.36	$0.00	$72.86
	06/01/2027	$46.05	$9.90	$18.36	$0.00	$74.31
	12/01/2027	$47.50	$9.90	$18.36	$0.00	$75.76
	06/01/2028	$49.00	$9.90	$18.36	$0.00	$77.26
	12/01/2028	$50.50	$9.90	$18.36	$0.00	$78.76

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *LABORER - Zone 2*

Effective Date - 12/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$23.37	$9.90	$18.36	$0.00	$51.63
2	70	$27.27	$9.90	$18.36	$0.00	$55.53
3	80	$31.16	$9.90	$18.36	$0.00	$59.42
4	90	$35.06	$9.90	$18.36	$0.00	$63.32

Effective Date - 06/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$24.20	$9.90	$18.36	$0.00	$52.46
2	70	$28.24	$9.90	$18.36	$0.00	$56.50
3	80	$32.27	$9.90	$18.36	$0.00	$60.53
4	90	$36.31	$9.90	$18.36	$0.00	$64.57

Notes:

Apprentice to Journeyworker Ratio:1:5

LABORER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$38.95	$9.90	$18.46	$0.00	$67.31
	06/01/2025	$40.34	$9.90	$18.46	$0.00	$68.70
	12/01/2025	$41.72	$9.90	$18.46	$0.00	$70.08
	06/01/2026	$43.16	$9.90	$18.46	$0.00	$71.52
	12/01/2026	$44.60	$9.90	$18.46	$0.00	$72.96

Apprentice - *LABORER (Heavy & Highway) - Zone 2*

Effective Date - 12/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$23.37	$9.90	$18.46	$0.00	$51.73
2	70	$27.27	$9.90	$18.46	$0.00	$55.63
3	80	$31.16	$9.90	$18.46	$0.00	$59.52
4	90	$35.06	$9.90	$18.46	$0.00	$63.42

Effective Date - 06/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$24.20	$9.90	$18.46	$0.00	$52.56
2	70	$28.24	$9.90	$18.46	$0.00	$56.60
3	80	$32.27	$9.90	$18.46	$0.00	$60.63
4	90	$36.31	$9.90	$18.46	$0.00	$64.67

Notes:

Apprentice to Journeyworker Ratio:1:5

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LABORER: CARPENTER TENDER *LABORERS - ZONE 2*	12/01/2024	$38.95	$9.90	$18.36	$0.00	$67.21
	06/01/2025	$40.34	$9.90	$18.36	$0.00	$68.60
	12/01/2025	$41.72	$9.90	$18.36	$0.00	$69.98
	06/01/2026	$43.16	$9.90	$18.36	$0.00	$71.42
	12/01/2026	$44.60	$9.90	$18.36	$0.00	$72.86
	06/01/2027	$46.05	$9.90	$18.36	$0.00	$74.31
	12/01/2027	$47.50	$9.90	$18.36	$0.00	$75.76
	06/01/2028	$49.00	$9.90	$18.36	$0.00	$77.26
	12/01/2028	$50.50	$9.90	$18.36	$0.00	$78.76
For apprentice rates see "Apprentice- LABORER"						
LABORER: CEMENT FINISHER TENDER *LABORERS - ZONE 2*	12/01/2024	$38.95	$9.90	$18.36	$0.00	$67.21
	06/01/2025	$40.34	$9.90	$18.36	$0.00	$68.60
	12/01/2025	$41.72	$9.90	$18.36	$0.00	$69.98
	06/01/2026	$43.16	$9.90	$18.36	$0.00	$71.42
	12/01/2026	$44.60	$9.90	$18.36	$0.00	$72.86
	06/01/2027	$46.05	$9.90	$18.36	$0.00	$74.31
	12/01/2027	$47.50	$9.90	$18.36	$0.00	$75.76
	06/01/2028	$49.00	$9.90	$18.36	$0.00	$77.26
	12/01/2028	$50.50	$9.90	$18.36	$0.00	$78.76
For apprentice rates see "Apprentice- LABORER"						
LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER *LABORERS - ZONE 2*	12/02/2024	$39.04	$9.90	$18.42	$0.00	$67.36
	06/02/2025	$40.43	$9.90	$18.42	$0.00	$68.75
	12/01/2025	$41.81	$9.90	$18.42	$0.00	$70.13
	06/01/2026	$43.25	$9.90	$18.42	$0.00	$71.57
	12/07/2026	$44.69	$9.90	$18.42	$0.00	$73.01
	06/07/2027	$46.14	$9.90	$18.42	$0.00	$74.46
	12/06/2027	$47.59	$9.90	$18.42	$0.00	$75.91
	06/05/2028	$49.09	$9.90	$18.42	$0.00	$77.41
	12/04/2028	$50.59	$9.90	$18.42	$0.00	$78.91
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER *LABORERS - ZONE 2*	12/01/2024	$39.20	$9.90	$18.36	$0.00	$67.46
	06/01/2025	$40.59	$9.90	$18.36	$0.00	$68.85
	12/01/2025	$41.97	$9.90	$18.36	$0.00	$70.23
	06/01/2026	$43.41	$9.90	$18.36	$0.00	$71.67
	12/01/2026	$44.85	$9.90	$18.36	$0.00	$73.11
	06/01/2027	$46.30	$9.90	$18.36	$0.00	$74.56
	12/01/2027	$47.75	$9.90	$18.36	$0.00	$76.01
	06/01/2028	$49.25	$9.90	$18.36	$0.00	$77.51
	12/01/2028	$50.75	$9.90	$18.36	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$39.20	$9.90	$18.46	$0.00	$67.56
	06/01/2025	$40.59	$9.90	$18.46	$0.00	$68.95
	12/01/2025	$41.97	$9.90	$18.46	$0.00	$70.33
	06/01/2026	$43.41	$9.90	$18.46	$0.00	$71.77
	12/01/2026	$44.85	$9.90	$18.46	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LABORER: MULTI-TRADE TENDER *LABORERS - ZONE 2*	12/01/2024	$38.95	$9.90	$18.36	$0.00	$67.21
	06/01/2025	$40.34	$9.90	$18.36	$0.00	$68.60
	12/01/2025	$41.72	$9.90	$18.36	$0.00	$69.98
	06/01/2026	$43.16	$9.90	$18.36	$0.00	$71.42
	12/01/2026	$44.60	$9.90	$18.36	$0.00	$72.86
	06/01/2027	$46.05	$9.90	$18.36	$0.00	$74.31
	12/01/2027	$47.50	$9.90	$18.36	$0.00	$75.76
	06/01/2028	$49.00	$9.90	$18.36	$0.00	$77.26
	12/01/2028	$50.50	$9.90	$18.36	$0.00	$78.76
For apprentice rates see "Apprentice- LABORER"						
LABORER: TREE REMOVER *LABORERS - ZONE 2*	12/01/2024	$38.95	$9.90	$18.36	$0.00	$67.21
	06/01/2025	$40.34	$9.90	$18.36	$0.00	$68.60
	12/01/2025	$41.72	$9.90	$18.36	$0.00	$69.98
	06/01/2026	$43.16	$9.90	$18.36	$0.00	$71.42
	12/01/2026	$44.60	$9.90	$18.36	$0.00	$72.86
	06/01/2027	$46.05	$9.90	$18.36	$0.00	$74.31
	12/01/2027	$47.50	$9.90	$18.36	$0.00	$75.76
	06/01/2028	$49.00	$9.90	$18.36	$0.00	$77.26
	12/01/2028	$50.50	$9.90	$18.36	$0.00	$78.76
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"						
LASER BEAM OPERATOR *LABORERS - ZONE 2*	12/01/2024	$39.20	$9.90	$18.36	$0.00	$67.46
	06/01/2025	$40.59	$9.90	$18.36	$0.00	$68.85
	12/01/2025	$41.97	$9.90	$18.36	$0.00	$70.23
	06/01/2026	$43.41	$9.90	$18.36	$0.00	$71.67
	12/01/2026	$44.85	$9.90	$18.36	$0.00	$73.11
	06/01/2027	$46.30	$9.90	$18.36	$0.00	$74.56
	12/01/2027	$47.75	$9.90	$18.36	$0.00	$76.01
	06/01/2028	$49.25	$9.90	$18.36	$0.00	$77.51
	12/01/2028	$50.75	$9.90	$18.36	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$39.20	$9.90	$18.46	$0.00	$67.56
	06/01/2025	$40.59	$9.90	$18.46	$0.00	$68.95
	12/01/2025	$41.97	$9.90	$18.46	$0.00	$70.33
	06/01/2026	$43.41	$9.90	$18.46	$0.00	$71.77
	12/01/2026	$44.85	$9.90	$18.46	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
MARBLE & TILE FINISHERS *BRICKLAYERS LOCAL 3 - MARBLE & TILE*	02/01/2025	$50.36	$11.49	$21.62	$0.00	$83.47
	08/01/2025	$52.08	$11.49	$21.62	$0.00	$85.19
	02/01/2026	$53.16	$11.49	$21.62	$0.00	$86.27
	08/01/2026	$54.92	$11.49	$21.62	$0.00	$88.03
	02/01/2027	$56.04	$11.49	$21.62	$0.00	$89.15

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *MARBLE & TILE FINISHER - Local 3 Marble & Tile*

Effective Date - 02/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$25.18	$11.49	$21.62	$0.00	$58.29
2	60	$30.22	$11.49	$21.62	$0.00	$63.33
3	70	$35.25	$11.49	$21.62	$0.00	$68.36
4	80	$40.29	$11.49	$21.62	$0.00	$73.40
5	90	$45.32	$11.49	$21.62	$0.00	$78.43

Effective Date - 08/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$26.04	$11.49	$21.62	$0.00	$59.15
2	60	$31.25	$11.49	$21.62	$0.00	$64.36
3	70	$36.46	$11.49	$21.62	$0.00	$69.57
4	80	$41.66	$11.49	$21.62	$0.00	$74.77
5	90	$46.87	$11.49	$21.62	$0.00	$79.98

Notes:

Apprentice to Journeyworker Ratio:1:3

MARBLE MASONS,TILELAYERS & TERRAZZO MECH *BRICKLAYERS LOCAL 3 - MARBLE & TILE*	02/01/2025	$65.82	$11.49	$23.56	$0.00	$100.87
	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

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *MARBLE-TILE-TERRAZZO MECHANIC - Local 3 Marble & Tile*

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

MECH. SWEEPER OPERATOR (ON CONST. SITES) *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MECHANICS MAINTENANCE *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MILLWRIGHT (Zone 3) *MILLWRIGHTS LOCAL 1121 - Zone 3*	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

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

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 *LABORERS - ZONE 2*	12/01/2024	$39.20	$9.90	$18.36	$0.00	$67.46
	06/01/2025	$40.59	$9.90	$18.36	$0.00	$68.85
	12/01/2025	$41.97	$9.90	$18.36	$0.00	$70.23
	06/01/2026	$43.41	$9.90	$18.36	$0.00	$71.67
	12/01/2026	$44.85	$9.90	$18.36	$0.00	$73.11
	06/01/2027	$46.30	$9.90	$18.36	$0.00	$74.56
	12/01/2027	$47.75	$9.90	$18.36	$0.00	$76.01
	06/01/2028	$49.25	$9.90	$18.36	$0.00	$77.51
	12/01/2028	$50.75	$9.90	$18.36	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"						
OILER (OTHER THAN TRUCK CRANES,GRADALLS) *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$25.37	$15.30	$16.40	$0.00	$57.07
	06/01/2025	$25.97	$15.30	$16.40	$0.00	$57.67
	12/01/2025	$26.63	$15.30	$16.40	$0.00	$58.33
	06/01/2026	$27.22	$15.30	$16.40	$0.00	$58.92
	12/01/2026	$27.89	$15.30	$16.40	$0.00	$59.59
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
OILER (TRUCK CRANES, GRADALLS) *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$31.08	$15.30	$16.40	$0.00	$62.78
	06/01/2025	$31.80	$15.30	$16.40	$0.00	$63.50
	12/01/2025	$32.60	$15.30	$16.40	$0.00	$64.30
	06/01/2026	$33.32	$15.30	$16.40	$0.00	$65.02
	12/01/2026	$34.12	$15.30	$16.40	$0.00	$65.82
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
OTHER POWER DRIVEN EQUIPMENT - CLASS II *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PAINTER (BRIDGES/TANKS) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2025	$58.46	$9.95	$23.95	$0.00	$92.36

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

PAINTER (SPRAY OR SANDBLAST, NEW) * * If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used.*PAINTERS LOCAL 35 - ZONE 2*	01/01/2025	$49.36	$9.95	$23.95	$0.00	$83.26

Apprentice - *PAINTER Local 35 Zone 2 - Spray/Sandblast - New*

Effective Date - 01/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$24.68	$9.95	$0.00	$0.00	$34.63
2	55	$27.15	$9.95	$6.66	$0.00	$43.76
3	60	$29.62	$9.95	$7.26	$0.00	$46.83
4	65	$32.08	$9.95	$7.87	$0.00	$49.90
5	70	$34.55	$9.95	$20.32	$0.00	$64.82
6	75	$37.02	$9.95	$20.93	$0.00	$67.90
7	80	$39.49	$9.95	$21.53	$0.00	$70.97
8	90	$44.42	$9.95	$22.74	$0.00	$77.11

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PAINTER (SPRAY OR SANDBLAST, REPAINT) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2025	$47.42	$9.95	$23.95	$0.00	$81.32

Apprentice - *PAINTER Local 35 Zone 2 - Spray/Sandblast - Repaint*

Effective Date - 01/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$23.71	$9.95	$0.00	$0.00	$33.66
2	55	$26.08	$9.95	$6.66	$0.00	$42.69
3	60	$28.45	$9.95	$7.26	$0.00	$45.66
4	65	$30.82	$9.95	$7.87	$0.00	$48.64
5	70	$33.19	$9.95	$20.32	$0.00	$63.46
6	75	$35.57	$9.95	$20.93	$0.00	$66.45
7	80	$37.94	$9.95	$21.53	$0.00	$69.42
8	90	$42.68	$9.95	$22.74	$0.00	$75.37

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER / TAPER (BRUSH, NEW) * * If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used.*PAINTERS LOCAL 35 - ZONE 2*	01/01/2025	$47.96	$9.95	$23.95	$0.00	$81.86

Apprentice - *PAINTER - Local 35 Zone 2 - BRUSH NEW*

Effective Date - 01/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$23.98	$9.95	$0.00	$0.00	$33.93
2	55	$26.38	$9.95	$6.66	$0.00	$42.99
3	60	$28.78	$9.95	$7.26	$0.00	$45.99
4	65	$31.17	$9.95	$7.87	$0.00	$48.99
5	70	$33.57	$9.95	$20.32	$0.00	$63.84
6	75	$35.97	$9.95	$20.93	$0.00	$66.85
7	80	$38.37	$9.95	$21.53	$0.00	$69.85
8	90	$43.16	$9.95	$22.74	$0.00	$75.85

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER / TAPER (BRUSH, REPAINT) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2025	$46.02	$9.95	$23.95	$0.00	$79.92

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PAINTER Local 35 Zone 2 - BRUSH REPAINT*

Effective Date - 01/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$23.01	$9.95	$0.00	$0.00	$32.96
2	55	$25.31	$9.95	$6.66	$0.00	$41.92
3	60	$27.61	$9.95	$7.26	$0.00	$44.82
4	65	$29.91	$9.95	$7.87	$0.00	$47.73
5	70	$32.21	$9.95	$20.32	$0.00	$62.48
6	75	$34.52	$9.95	$20.93	$0.00	$65.40
7	80	$36.82	$9.95	$21.53	$0.00	$68.30
8	90	$41.42	$9.95	$22.74	$0.00	$74.11

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER TRAFFIC MARKINGS (HEAVY/HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$38.95	$9.90	$18.46	$0.00	$67.31
	06/01/2025	$40.34	$9.90	$18.46	$0.00	$68.70
	12/01/2025	$41.72	$9.90	$18.46	$0.00	$70.08
	06/01/2026	$43.16	$9.90	$18.46	$0.00	$71.52
	12/01/2026	$44.60	$9.90	$18.46	$0.00	$72.96
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
PANEL & PICKUP TRUCKS DRIVER *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	01/01/2025	$39.78	$15.57	$20.17	$0.00	$75.52
	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
PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK) *PILE DRIVER LOCAL 56 (ZONE 2)*	08/01/2024	$51.97	$10.08	$24.29	$0.00	$86.34
For apprentice rates see "Apprentice- PILE DRIVER"						
PILE DRIVER *PILE DRIVER LOCAL 56 (ZONE 2)*	08/01/2024	$51.97	$10.08	$24.29	$0.00	$86.34

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PILE DRIVER - Local 56 Zone 2*

Effective Date - 08/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	$23.39	$10.08	$2.53	$0.00	$36.00
2	55	$28.58	$10.08	$5.07	$0.00	$43.73
3	70	$36.38	$10.08	$19.22	$0.00	$65.68
4	80	$41.58	$10.08	$21.76	$0.00	$73.42

Notes:

% Indentured BEFORE 8/1/2020, 50/60/70/75/80/80/90/90
Step 1 $60.36/2 $65.75/3 $70.75/4 $73.35/5&6 $75.95/7&8 81.14

Apprentice to Journeyworker Ratio:1:5

PIPELAYER *LABORERS - ZONE 2*	12/01/2024	$39.20	$9.90	$18.36	$0.00	$67.46
	06/01/2025	$40.59	$9.90	$18.36	$0.00	$68.85
	12/01/2025	$41.97	$9.90	$18.36	$0.00	$70.23
	06/01/2026	$43.41	$9.90	$18.36	$0.00	$71.67
	12/01/2026	$44.85	$9.90	$18.36	$0.00	$73.11
	06/01/2027	$46.30	$9.90	$18.36	$0.00	$74.56
	12/01/2027	$47.75	$9.90	$18.36	$0.00	$76.01
	06/01/2028	$49.25	$9.90	$18.36	$0.00	$77.51
	12/01/2028	$50.75	$9.90	$18.36	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"						
PIPELAYER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$39.20	$9.90	$18.46	$0.00	$67.56
	06/01/2025	$40.59	$9.90	$18.46	$0.00	$68.95
	12/01/2025	$41.97	$9.90	$18.46	$0.00	$70.33
	06/01/2026	$43.41	$9.90	$18.46	$0.00	$71.77
	12/01/2026	$44.85	$9.90	$18.46	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
PLUMBER & PIPEFITTER *PLUMBERS LOCAL 4*	03/01/2025	$55.00	$11.30	$17.77	$0.00	$84.07
	09/01/2025	$56.40	$11.30	$17.77	$0.00	$85.47
	03/01/2026	$57.80	$11.30	$17.77	$0.00	$86.87

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PLUMBER/PIPEFITTER - Local 4*

Effective Date - 03/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$22.00	$11.30	$0.00	$0.00	$33.30
2	50	$27.50	$11.30	$0.00	$0.00	$38.80
3	60	$33.00	$11.30	$0.00	$0.00	$44.30
4	70	$38.50	$11.30	$8.06	$0.00	$57.86
5	80	$44.00	$11.30	$8.06	$0.00	$63.36

Effective Date - 09/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$22.56	$11.30	$0.00	$0.00	$33.86
2	50	$28.20	$11.30	$0.00	$0.00	$39.50
3	60	$33.84	$11.30	$0.00	$0.00	$45.14
4	70	$39.48	$11.30	$8.06	$0.00	$58.84
5	80	$45.12	$11.30	$8.06	$0.00	$64.48

Notes:

Steps - 2000 hrs; Step 4 w/lic 75%, Step 5 w/lic 85%
Step 4 w/lic $52.59, Step 5 w/lic $57.44

Apprentice to Journeyworker Ratio:1:3

PNEUMATIC CONTROLS (TEMP.) *PLUMBERS LOCAL 4*	03/01/2025	$55.00	$11.30	$17.77	$0.00	$84.07
	09/01/2025	$56.40	$11.30	$17.77	$0.00	$85.47
	03/01/2026	$57.80	$11.30	$17.77	$0.00	$86.87
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
PNEUMATIC DRILL/TOOL OPERATOR *LABORERS - ZONE 2*	12/01/2024	$39.70	$9.90	$17.54	$0.00	$67.14
	06/01/2025	$41.09	$9.90	$17.54	$0.00	$68.53
	12/01/2025	$42.47	$9.90	$17.54	$0.00	$69.91
	06/01/2026	$43.91	$9.90	$17.54	$0.00	$71.35
	12/01/2026	$45.35	$9.90	$17.54	$0.00	$72.79
	06/01/2027	$46.80	$9.90	$17.54	$0.00	$74.24
	12/01/2027	$48.25	$9.90	$17.54	$0.00	$75.69
	06/01/2028	$49.75	$9.90	$17.54	$0.00	$77.19
	12/01/2028	$51.25	$9.90	$17.54	$0.00	$78.69
For apprentice rates see "Apprentice- LABORER"						
PNEUMATIC DRILL/TOOL OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$39.20	$9.90	$18.46	$0.00	$67.56
	06/01/2025	$40.59	$9.90	$18.46	$0.00	$68.95
	12/01/2025	$41.97	$9.90	$18.46	$0.00	$70.33
	06/01/2026	$43.41	$9.90	$18.46	$0.00	$71.77
	12/01/2026	$44.85	$9.90	$18.46	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
POWDERMAN & BLASTER *LABORERS - ZONE 2*	12/01/2024	$39.95	$9.90	$18.36	$0.00	$68.21
	06/01/2025	$41.34	$9.90	$18.36	$0.00	$69.60
	12/01/2025	$42.72	$9.90	$18.36	$0.00	$70.98
	06/01/2026	$44.16	$9.90	$18.36	$0.00	$72.42
	12/01/2026	$45.60	$9.90	$18.36	$0.00	$73.86
	06/01/2027	$47.05	$9.90	$18.36	$0.00	$75.31
	12/01/2027	$48.50	$9.90	$18.36	$0.00	$76.76
	06/01/2028	$50.00	$9.90	$18.36	$0.00	$78.26
	12/01/2028	$51.50	$9.90	$18.36	$0.00	$79.76
For apprentice rates see "Apprentice- LABORER"						
POWDERMAN & BLASTER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$39.95	$9.65	$18.46	$0.00	$68.06
	06/01/2025	$41.34	$9.65	$18.46	$0.00	$69.45
	12/01/2025	$42.72	$9.65	$18.46	$0.00	$70.83
	06/01/2026	$44.16	$9.65	$18.46	$0.00	$72.27
	12/01/2026	$45.60	$9.65	$18.46	$0.00	$73.71
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
POWER SHOVEL/DERRICK/TRENCHING MACHINE *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$57.03	$15.55	$16.50	$0.00	$89.08
	06/01/2025	$58.33	$15.55	$16.50	$0.00	$90.38
	12/01/2025	$59.78	$15.55	$16.50	$0.00	$91.83
	06/01/2026	$61.08	$15.55	$16.50	$0.00	$93.13
	12/01/2026	$62.53	$15.55	$16.50	$0.00	$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (CONCRETE) *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (DEWATERING, OTHER) *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$36.67	$15.55	$16.50	$0.00	$68.72
	06/01/2025	$37.52	$15.55	$16.50	$0.00	$69.57
	12/01/2025	$38.47	$15.55	$16.50	$0.00	$70.52
	06/01/2026	$39.33	$15.55	$16.50	$0.00	$71.38
	12/01/2026	$40.28	$15.55	$16.50	$0.00	$72.33
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
READY-MIX CONCRETE DRIVER *TEAMSTERS 170 - Dauphinais (Bellingham)*	01/01/2025	$27.60	$11.26	$6.15	$0.00	$45.01
RECLAIMERS *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
RIDE-ON MOTORIZED BUGGY OPERATOR *LABORERS - ZONE 2*	12/01/2024	$39.20	$9.90	$18.36	$0.00	$67.46
	06/01/2025	$40.59	$9.90	$18.36	$0.00	$68.85
	12/01/2025	$41.97	$9.90	$18.36	$0.00	$70.23
	06/01/2026	$43.41	$9.90	$18.36	$0.00	$71.67
	12/01/2026	$44.85	$9.90	$18.36	$0.00	$73.11
	06/01/2027	$46.30	$9.90	$18.36	$0.00	$74.56
	12/01/2027	$47.75	$9.90	$18.36	$0.00	$76.01
	06/01/2028	$49.25	$9.90	$18.36	$0.00	$77.51
	12/01/2028	$50.75	$9.90	$18.36	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"						
ROLLER/SPREADER/MULCHING MACHINE *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
ROOFER (Inc.Roofer Waterproofng &Roofer Damproofg) *ROOFERS LOCAL 33*	02/01/2025	$52.03	$13.28	$21.70	$0.00	$87.01
	08/01/2025	$53.53	$13.28	$21.70	$0.00	$88.51
	02/01/2026	$54.78	$13.28	$21.70	$0.00	$89.76

Apprentice - *ROOFER - Local 33*

Effective Date - 02/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$26.02	$13.28	$15.55	$0.00	$54.85
2	60	$31.22	$13.28	$21.70	$0.00	$66.20
3	65	$33.82	$13.28	$21.70	$0.00	$68.80
4	75	$39.02	$13.28	$21.70	$0.00	$74.00
5	85	$44.23	$13.28	$21.70	$0.00	$79.21

Effective Date - 08/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$26.77	$13.28	$15.55	$0.00	$55.60
2	60	$32.12	$13.28	$21.70	$0.00	$67.10
3	65	$34.79	$13.28	$21.70	$0.00	$69.77
4	75	$40.15	$13.28	$21.70	$0.00	$75.13
5	85	$45.50	$13.28	$21.70	$0.00	$80.48

Notes: ** 1:5, 2:6-10, the 1:10; Reroofing: 1:4, then 1:1
Step 1 is 2000 hrs.; Steps 2-5 are 1000 hrs.
(Hot Pitch Mechanics' receive $1.00 hr. above ROOFER)

Apprentice to Journeyworker Ratio:**

ROOFER SLATE / TILE / PRECAST CONCRETE *ROOFERS LOCAL 33*	02/01/2025	$52.28	$13.28	$21.70	$0.00	$87.26
	08/01/2025	$53.78	$13.28	$21.70	$0.00	$88.76
	02/01/2026	$55.03	$13.28	$21.70	$0.00	$90.01
For apprentice rates see "Apprentice- ROOFER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
SHEETMETAL WORKER *SHEETMETAL WORKERS LOCAL 63*	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 *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	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
SPECIALIZED EARTH MOVING EQUIP > 35 TONS *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	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 *SPRINKLER FITTERS LOCAL 669*	04/01/2023	$47.43	$11.45	$16.61	$0.00	$75.49

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

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

STEAM BOILER OPERATOR *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TAMPERS, SELF-PROPELLED OR TRACTOR DRAWN *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TERRAZZO FINISHERS *BRICKLAYERS LOCAL 3 - MARBLE & TILE*	02/01/2025	$64.74	$11.49	$23.59	$0.00	$99.82
	08/01/2025	$66.89	$11.49	$23.59	$0.00	$101.97
	02/01/2026	$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

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *TERRAZZO FINISHER - Local 3 Marble & Tile*

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:

Apprentice to Journeyworker Ratio:1:3

TEST BORING DRILLER *LABORERS - FOUNDATION AND MARINE*	12/01/2024	$50.20	$9.90	$19.05	$0.00	$79.15
	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"						
TEST BORING DRILLER HELPER *LABORERS - FOUNDATION AND MARINE*	12/01/2024	$46.32	$9.90	$19.05	$0.00	$75.27
	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"						
TEST BORING LABORER *LABORERS - FOUNDATION AND MARINE*	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"						
TRACTORS/PORTABLE STEAM GENERATORS *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TRAILERS FOR EARTH MOVING EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	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 *LABORERS (COMPRESSED AIR)*	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) *LABORERS (COMPRESSED AIR)*	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 *LABORERS (FREE AIR TUNNEL)*	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) *LABORERS (FREE AIR TUNNEL)*	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 *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	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
VOICE-DATA-VIDEO TECHNICIAN *ELECTRICIANS LOCAL 96*	09/01/2024	$35.29	$13.99	$17.57	$0.00	$66.85
	09/07/2025	$36.12	$14.98	$17.91	$0.00	$69.01
	09/06/2026	$37.04	$15.96	$18.27	$0.00	$71.27

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *VOICE-DATA-VIDEO TECHNICIAN - Local 96*

Effective Date - 09/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$17.65	$13.99	$4.41	$0.00	$36.05
2	55	$19.41	$13.99	$4.46	$0.00	$37.86
3	60	$21.17	$13.99	$17.15	$0.00	$52.31
4	65	$22.94	$13.99	$17.20	$0.00	$54.13
5	70	$24.70	$13.99	$17.25	$0.00	$55.94
6	75	$26.47	$13.99	$17.30	$0.00	$57.76
7	80	$28.23	$13.99	$17.36	$0.00	$59.58
8	85	$30.00	$13.99	$17.41	$0.00	$61.40

Effective Date - 09/07/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$18.06	$14.98	$4.51	$0.00	$37.55
2	55	$19.87	$14.98	$4.57	$0.00	$39.42
3	60	$21.67	$14.98	$17.48	$0.00	$54.13
4	65	$23.48	$14.98	$17.53	$0.00	$55.99
5	70	$25.28	$14.98	$17.59	$0.00	$57.85
6	75	$27.09	$14.98	$17.64	$0.00	$59.71
7	80	$28.90	$14.98	$17.70	$0.00	$61.58
8	85	$30.70	$14.98	$17.75	$0.00	$63.43

Notes:

Apprentice to Journeyworker Ratio:1:1

WAGON DRILL OPERATOR *LABORERS - ZONE 2*	12/01/2024	$40.61	$9.65	$17.70	$0.00	$67.96
	06/01/2025	$42.00	$9.65	$17.70	$0.00	$69.35
	12/01/2025	$43.38	$9.65	$17.70	$0.00	$70.73
	06/01/2026	$44.82	$9.65	$17.70	$0.00	$72.17
	12/01/2026	$46.26	$9.65	$17.70	$0.00	$73.61
	06/01/2027	$47.71	$9.65	$17.70	$0.00	$75.06
	12/01/2027	$49.16	$9.65	$17.70	$0.00	$76.51
	06/01/2028	$50.66	$9.65	$17.70	$0.00	$78.01
	12/01/2028	$52.16	$9.65	$17.70	$0.00	$79.51

For apprentice rates see "Apprentice- LABORER"

WAGON DRILL OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$39.20	$9.90	$18.46	$0.00	$67.56
	06/01/2025	$40.59	$9.90	$18.46	$0.00	$68.95
	12/01/2025	$41.97	$9.90	$18.46	$0.00	$70.33
	06/01/2026	$43.41	$9.90	$18.46	$0.00	$71.77
	12/01/2026	$44.85	$9.90	$18.46	$0.00	$73.21

For apprentice rates see "Apprentice- LABORER (Heavy and Highway)

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
WASTE WATER PUMP OPERATOR *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$57.03	$15.55	$16.50	$0.00	$89.08
	06/01/2025	$58.33	$15.55	$16.50	$0.00	$90.38
	12/01/2025	$59.78	$15.55	$16.50	$0.00	$91.83
	06/01/2026	$61.08	$15.55	$16.50	$0.00	$93.13
	12/01/2026	$62.53	$15.55	$16.50	$0.00	$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
WATER METER INSTALLER *PLUMBERS LOCAL 4*	03/01/2025	$55.00	$11.30	$17.77	$0.00	$84.07
	09/01/2025	$56.40	$11.30	$17.77	$0.00	$85.47
	03/01/2026	$57.80	$11.30	$17.77	$0.00	$86.87
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER"						

Additional Apprentice 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. Apprentice 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.

SECTION 01 11 00

SUMMARY OF WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 PROJECT INFORMATION

A. Project Identification: McKinstry Pond Dam Repairs, April 2025.

1. Project Location: 2 Waite Street - McKinstry Pond Dam, MA Dam No. MA01953, Restoration Area: Forest Street (across pond) both residing in Oxford, MA.

2. Owner: Town of Oxford

B. Engineer Identification: the Contract Documents, dated April 2025, were prepared for the Project by Fuss & O'Neill, Inc., 108 Myrtle St, Suite 502, Quincy, MA 02171.

C. Scope of Work includes, but is not necessarily limited to, the following:

1. Removal and disposal of the existing spillway structure and its headwalls, its associated culvert beneath Waite Street; removal of existing drainage system within the project limits, removal of granite block walls on the upstream face, removal of headwall in the downstream channel, full width pavement removal,

2. Construction of a cast-in-place concrete weir board structure with debris rack; weir boards, grating; HDPE discharge pipes, construction of a concrete cradle for the HDPE discharge pipes, construction a cast-in-place concrete headwall within the downstream channel, placement of special backfill as noted,

3. Installation a new storm drainage system with oil-grit separation system, HDPE pipe, precast concrete catch basins and manholes within the project area,

4. Replacement and vertical relocation of the water main in Waite Street under the proposed culvert, including 8" HDPE pipe and steel casing sleeve under the culvert, 8" DI pipe and fittings, valves (2), temporary and permanent services (2 each), chlorination and testing. The water main is owned by Aquarion Water Company and its specifications are attached. Coordination with the Water Company is required.

5. Reconstruction of a wetland through removal of existing drainage structures, furnishing of topsoil and imported loam borrow with necessary soil amendments, planting of shrubs, live stakes, and seeding with permanent seed blend, grading and restoration,

6. Improvements to Waite Street inclusive of curbing, drive aprons, and full depth paving within project limits

7. Grading of the dam embankment and slopes, installation of natural stone armor, soil filled and vegetated, installation of chain link fencing, constructing gravel drive, installation of guardrail, and restoring the site as shown on the Drawings.

8. All dewatering, coffer dam construction, temporary flow bypass, erosion and sedimentation controls, and traffic management & work zone controls required to perform the work.

1.3 CONTRACT

A. Project will be constructed under a general construction contract.

1.4 WORK SEQUENCE

A. The Work shall be conducted in planned phases established under the Contractor's accepted construction schedule, limiting disturbance to respective portions of the embankment where work is actively being completed and restoring completed areas (whether interim or final) with vegetation to minimize impacts to impoundment and environmental resources.

1.5 USE OF PREMISES

A. General: Contractor shall have right of access to premises for construction operations, including use of Project site, during construction period.

B. Staging areas for materials and equipment have been identified on the Drawings.

C. Contractor shall have the right to close the immediate work zone to all traffic (road closure) for the stipulated Contract Time.

1.6 SPECIFICATION FORMATS AND CONVENTIONS

A. Specification Format: The Specifications are organized into Divisions and Sections using the CSI "Master Format" numbering system.

1. Section Identification: The Specifications use section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of sections in the Contract Documents.

B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

1.7 DIG SAFE

A. Contact Dig Safe at 1-888-344-7233 at least 72 hours prior to the start of construction (excluding weekends and holidays), to mark out the utility locations.

1.8 ACCESS TO SITE

A. Site Access shall be from Prince to Bollard to Waite Street.

B. Preserve access to driveways for #2 and #6 Waite Street. Note that the driveway for #2 Waite Street is within the work zone. Special considerations shall be made to accommodate access to/from the driveway by the homeowner.

C. A portion of the Work is located on private property (2 & 6 Waite Street). The Town shall obtain Rights of Access and furnish them to the Contractor. Further, an Easement Plan for temporary construction and permanent easements is being prepared in support of the work. Contractor shall adhere to temporary construction easement extents.

D. Minimize damage to adjacent roadways and associated or otherwise adjacent existing structures. Restore damaged areas and/or items to their original condition or better.

E. Remove and restore to original condition fences, guard rails, structures, parking areas, and other improvements required to be relocated for construction of the Work.

F. Notify the Engineer, the Owner, and utilities of intended modification or disruption to their property prior to the start of construction and cooperate with them in the scheduling and performance of operations.

G. If the Contractor, by direct negotiation and bargain with any land owner, lessee or tenant, has secured for himself any right to use more space or greater privileges in the space provided by the Owner for purposes incidental to the performance of the Contract, he shall, upon request of the Engineer, furnish to the Engineer proper evidence that such additional rights have been properly secured and assurance that no damage to or claim upon the Owner or Engineer will arise there from. Neither the Owner nor the Engineer shall be liable in any way for any expense incurred by the Contractor in securing any such right to use additional property.

H. The Contractor shall be responsible for and reimburse the Owner and others for any and all losses, damage or expense which the Owner or those others may suffer, either directly or indirectly or through any claims of any person or party, for any trespass outside the spaces and rights of way provided by the Owner to the Contractor or any violation or disregard of the terms and conditions established for the use or occupancy of those rights or for negligence in the exercise of those rights. The Owner may retain or deduct from any sum or sums due or to become due to the Contractor such amount or amounts as may be proper to insure the Owner against loss or expense by reason of the failure of the Contractor to observe the limits and conditions of the rights-of-way, rights-of-access, easements, etc., provided by the Owner.

1.9 WORK HOURS

A. Work hours are Monday through Friday, 7:30 AM to 4:00 PM. Work shall exclude holidays which include New Year's Day, MLK Day, Presidents' Day, Patriots Day, Memorial Day, Juneteenth, Independence Day, Labor Day, Indigenous Peoples' Day,

Veterans Day, Thanksgiving Day and the day after, and Christmas Day. Owner may require advance preparations to the site prior to a holiday.

B. Should access to the Site at other times be necessary, make arrangements with Owner.

1.10 SITE CONDITIONS

A. The underground utilities and structures at the site have been located primarily from information furnished by others and the locations as depicted on the Drawings are considered approximate as to size and location. There may be additional underground utilities and structures that are not shown on the Drawings and it shall be the responsibility of the Contractor to locate all existing utilities and structures and to protect same from damage or harm. Restore utilities and underground structures interfered with or damaged, at the expense of the Contractor, and to the satisfaction of its Owner.

B. Ensure none of his activities impact the activities or properties of the Owner and its Departments without prior coordination and consent of these entities.

C. Immediately notify the Engineer upon encountering archaeological material, including "charcoal," "bone," "shell," "cultural objects" (e.g., fire cracked stones/stone flaking material), "middens," or any other artifacts or related items of historical significance.

1.11 RESTORATION

A. Restore all areas to the condition that existed prior to construction. Restoration will be at the Contractor's expense.

B. Existing pavement and curbing disturbed and replaced shall be of matching thickness and type that existed prior to construction.

C. Private irrigation systems disturbed by the Contractor's activities are the responsibility of the Contractor to restore

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE AND PHASING

A. Construction phasing requirements contained in the Contract Drawings and specifications must be adhered to in the Contractor's detailed construction schedule submitted to the Engineer, including installation of erosion and sedimentation controls, installation of temporary cofferdams, removal of such cofferdams and conveyances, seeding, and installation of plantings.

B. Submit a construction schedule and a schedule of values to the Engineer prior to mobilization. No Work Shall occur until these items have been stamped as accepted by the Engineer.

C. Obtain all necessary permits locally required to perform the Work. Environmental Permits which have already been obtained are appended to the Specifications.

END OF SECTION

SECTION 01 20 00

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section describes the measurement and payment for the Work to be completed under each item in the Bid Form. The descriptions may not reference all of the associated Work. Work specified but not designated as a separate Bid item is considered incidental to all Bid items. The Contractor shall review all work associated with each work item and shall have no claim for being unfamiliar with the requirements of these specifications.

1.3 DEFINITIONS

A. Payment Items: The Owner's distribution of the Contract Sum through listed work items, as outlined in this Section, reviewed, and accepted by the Engineer.

1. Each item is specified to include a defined scope of services. The payment items have been established for the Owner's convenience only and, not all materials, labor, equipment, or services of a payment item are guaranteed to be listed or specified herein.
2. Include costs associated with items of work required to complete the defined scope of services within the appropriately specified payment item.
3. Payment items include all necessary products, materials, equipment, plus costs for delivery, handling, storage, installation, all applicable fees, and taxes (where applicable), administrative oversite, tools, labor, incidentals, research, and testing, overhead, and profit.

B. Unit price is an amount incorporated in the Agreement, applicable during the duration of the Work as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Price by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

C. Lump Sum: When used as an item of payment, means complete payment for the work prescribed for that portion of the Work under the item, or all work prescribed in the Contract, as the case may be.

1. Lump sum payment items are groupings of the Work as determined by the Owner only for the Owner's convenience. Such listings of payment items shall establish the minimum level of detail for the Schedule of Values.

2. The Schedule of Values shall further include the breakdown of each lump sum bid item that appears in the Agreement and shall include the Contractor's verified quantities used in preparing its bid. If accepted by the Engineer, this breakdown will be used in approximating percentages of completion of the lump sum bid items during the processing of payment applications.

D. Payment for Work associated with individual Work Segments will not be released until such Work Segment is Substantially Complete, including site restoration and site improvements of that Work Segment and has been approved as such by the Engineer.

E. It should be understood that each Bid Item below shall have the following phrase apply: "Includes, but is not limited to: All products, materials, equipment, tools, labor, overhead and profit, and incidentals required to complete…" meaning the price and payment shall be full compensation to complete all of the described work, even if not specifically listed but obviously necessary to perform the Work.

1.4 PROCEDURES

A. To ensure payment items are balanced, Mobilization and Demobilization, shall be limited to no more than five (5) percent of the total lump sum contract price. Such limit will not prohibit the Contractor from seeking payment for documented expenditures (i.e., invoices or cancelled checks) in excess of this amount under other bid items during project startup and mobilization.

1.5 DESCRIPTION OF BID ITEMS

A. Bid Item No. 1 – Temporary Erosion and Sedimentation Control

1. Work associated with this item will be paid for at the stated price including, but not limited to, work under the following:
   a. All or portions of Division 01 specifications, as applicable, including:
   b. Section 31 00 00 Earthwork
   c. Section 31 25 00 Erosion and Sedimentation Control
   d. Section 35 01 70 Control of Water
   e. Includes installing, maintaining, inspecting, and removing & disposing all temporary erosion and sedimentation control measures and practices for the duration of work associated with the project. Such measures include, but are not limited to, construction entrance, temporary matting, straw wattles, silt fence, hydrocarbon absorption boom, pump and settling basin, silt bags, and catch basin inserts.
   f. Item also includes removing and disposing of all accumulated sediment off site and installing/maintaining controls or establishing temporary vegetation in areas to remain dormant for extended periods as indicated on the Contract Drawings.
2. Measurement: As measured by the Contractor and accepted by the Engineer, pro-rated with the Contractor's progress of work in establishing, maintaining and

restoring all temporary erosion control measures and practices required for completion of work.

3. Payment: Payment for this bid item will be made on a Lump Sum basis based on a percentage of completion as estimated from measurements made by the Contractor and accepted by the Engineer.

B. Bid Item No. 2 – Miscellaneous Demolition and Site Preparation

1. Work associated with this item will be paid for at the stated price including, but not limited to, work under the following:

   a. All or portions of Division 01 specifications, as applicable.

   b. Section 02 41 13 Dam Demolition

   c. Section 31 10 00 Site Clearing

   d. Section 31 00 00 Earthwork

   e. Section 31 25 00 Erosion and Sedimentation Control

   f. Section 35 01 40 Protection of Dam

   g. Includes demolition, handling, transport, and disposal of all items to be removed and disposed as indication on Contract Drawings;

   h. Clearing and grubbing within the project limit of disturbance; removing and disposing brush. Demolish, remove, and dispose existing concrete, stone, wood, and metal features of the existing drainage and culvert system as depicted on the Contract Drawings.

   i. Includes soil excavation, dust control, protecting existing structures and vegetation to remain within and adjacent to work areas; repairing any damage to such features resulting from the Contractor's operations, identifying, and locating below surface utilities, protecting and temporarily relocating such utilities as required by respective utility owners for the duration of work activities potentially affecting respective utilities.

   j. Includes pavement removal. Pavement to be removed will be saw cut at the extents.

   k. Stack granite curbing to be reused by Oxford and deliver to DPW yard

2. Measurement: As measured by the Contractor and accepted by the Engineer, pro-rated with the Contractor's progress of work in performing and completing respective work items associated with this bid item.

3. Payment: Payment for this bid item will be made on a Lump Sum basis based on a percentage of completion as estimated from measurements made by the Contractor and accepted by the Engineer.

C. Bid Item No. 3 – Control of Water

1. Work associated with this item will be paid for at the stated price including, but not limited to, work under the following:

   a. All or portion of Division 1 specifications, as applicable.

b. Section 31 00 00 Earthwork

c. Section 31 25 00 Erosion and Sedimentation Control

d. Section 35 01 40 Protection of Dam

e. Section 35 01 70 Control of Water

f. Includes, submit for approval, install, and maintain temporary drawdown of the pond, control of surface water via cofferdam and temporary outlet conveyance, and groundwater within excavations as work progress within the site, including:

g. Downstream / discharge controls, protection of adjacent properties from discharged/diverted waters, by means such as stone check dams and turbidity and velocity controls as necessary to protect downstream waters

h. Design, install, and remove cofferdam to isolate the work zone from the pond. Driven sheeting will not be allowed. Supersacks are preferred. Refer to permits for drawdown elevations. Provide temporary conveyance of the pond outlet thru the work zone to the discharge stream.

i. Perform all culvert, structure, utility excavation work in the dry. This item is full compensation for equipment, materials, and labor for dewatering of excavations to install proposed work in the dry.

2. Measurement: As measured by the Contractor and accepted by the Engineer, pro-rated with the Contractor's progress of work in performing and completing respective work items associated with this bid item.

3. Payment: Payment for this bid item will be made on a Lump Sum basis based on a percentage of completion as estimated from measurements made by the Contractor and accepted by the Engineer.

D. Bid Item No. 4 – Upstream Spillway Structure

1. Work associated with this item will be paid for at the stated price including, but not limited to, work under the following:

a. All or portions of Division 01 specifications, as applicable.

b. Section 03 30 00 Cast-In-Place Concrete

c. Section 05 50 00 Metal Fabrications

d. Section 31 20 00 Earthwork

e. Section 35 01 40 Protection of Dam

f. Description: Construct the concrete weir board structure, including, but not limited to, excavation with support and protection, the cast-in-place concrete structure & footing, reinforcing steel, waterstops, and appurtenances as depicted on the Contract Drawings.

g. installing compacted soil backfill behind walls. Associated quality control is included within this Bid Item.

2. Measurement: As measured by the engineer, pro-rated with the Contractor's progress of work in the construction of the spillway on a suitable subgrade

surface as required by the specifications. Additional quantities of reinforced concrete authorized under a change order shall be measured by the Contractor per cubic yard of concrete in place and accepted by the Engineer on a suitable subgrade surface.

3. Payment: Lump sum price as stated on the Bid Form. The Contractor shall provide the quantity of reinforced concrete required to construct the spillway structure. Additional reinforced concrete beyond the limits indicated on the drawings shall be paid on a unit price basis under a contract change order based on the Contractor's lump sum and quantity of reinforced concrete stated on the bid form.

E. Bid Item No. 5 – Spillway Structure Components

1. Work associated with this item will be paid for at the stated price including, but not limited to, work under the following:
   a. All or portions of Division 1 specifications, as applicable.
   b. Section 05 50 00 Metal Fabrications
   c. Section 35 20 16 Aluminum Weir boards
   d. Includes furnish and install the aluminum weir boards, galvanized grating, trash rack, and ladders as specified in the Contract Drawings.
   e. The Contractor shall facilitate the installation of the aluminum weir boards and test for leakage prior to acceptance by the owner. The Contractor shall facilitate the installation of the trash rack, grating, and ladders in conjunction with Item 4.
2. Measurement: As measured by the Contractor and accepted by the Engineer, pro-rated with the Contractor's progress of the work associated with this bid price item.
3. Payment: Lump Sum as stated on the Bid Form. Provide schedule of values for metal components in this item prior to mobilization.

F. Bid Item No. 6 – Downstream Concrete Headwall

1. Work associated with this item will be paid for at the stated price including, but not limited to, work under the following:
   a. All or portions of Division 1 specifications, as applicable.
   b. Section 02 41 13 Dam Demolition
   c. Section 03 30 00 Cast-In-Place Concrete
   d. Section 31 20 00 Earthwork
   e. Section 35 01 40 Protection of Dam
   f. Section 33 40 23 Storm Drainage
   g. Includes, but is not limited to: Construct the downstream headwall, the cast in place concrete structure, footing, and wingwalls as depicted on the Contract Drawings. Includes installation of the two stormwater outfalls

within the wingwalls, all grading and backfill. Associated quality control is included within this Bid Item.

2. Measurement: As measured by the Contractor and accepted by the Engineer, pro-rated with the Contractor's progress of the work associated with this bid price item.

3. Payment: Payment for this bid item will be made on a Lump Sum basis based on a percentage of completion as estimated from measurements made by the Contractor and accepted by the Engineer.

G. Bid Item No. 7 – Culvert Concrete Cradle

1. Work associated with this item will be paid for at the stated price including, but not limited to, work under the following:

   a. All or portions of Division 1 specifications, as applicable.

   b. Section 03 30 00 Concrete

   c. Section 31 00 00 Earthwork

   d. Section 33 40 23 Storm Drainage

   e. Section 35 01 40 Protection of Dam

   f. Section 35 01 70 Water Control Systems

   g. Includes; furnish and install the concrete cradle for the twin 24" HDPE culvert pipes as specified in the Contract Drawings.

   h. Placement of approximately 36 cubic yards of concrete cradle as shown on Drawing STR-02 and on detail sheet CD-503.

   i. Payment for the HDPE drain pipe is not included in this item.

2. Measurement: As measured by the Contractor and accepted by the Engineer, using delivery slips, concrete cradle to be measured by cubic yards of concrete actually placed. Truck measurements will not be allowed.

3. Payment: per cubic yard once complete in place.

H. Bid Item No. 8A – OGS-1

1. Work associated with this item will be paid for at the stated price including, but not limited to, work under the following:

   a. All or portions of Division 1 specifications, as applicable.

   b. Section 31 25 00 Erosion and Sedimentation Control

   c. Section 31 20 00 Earthwork

   d. Section 33 40 23 Storm Drainage

   e. Section 35 01 40 Protection of Dam

   f. Includes: furnish and install, complete in place, 1,500-gallon stormwater quality unit as specified on Drawing CD-502. Inclusive of all appurtenances of the unit, frame, cover, adjustments, inspection ports, and pipe

connections. Also includes backfill and compaction, and excavation support and protection.

2. Measurement: As measured by the Contractor and accepted by the Engineer, complete in place for respective items associated with this bid price item.

3. Payment: Payment for this bid item will be made on an Each basis based quantity actually installed by the Contractor and accepted by the Engineer.

I. Bid Item No. 8B – OGS-2

1. Work associated with this item will be paid for at the stated price including, but not limited to, work under the following:

   a. All or portions of Division 1 specifications, as applicable.

   b. Section 31 25 00 Erosion and Sedimentation Control

   c. Section 31 20 00 Earthwork

   d. Section 33 40 23 Storm Drainage

   e. Section 35 01 40 Protection of Dam

   f. Includes: furnish and install, complete in place, 4,500-gallon stormwater quality unit as specified on Drawing CD-502. Inclusive of all appurtenances of the unit, frame, cover, adjustments, inspection ports, and pipe connections. Also includes backfill and compaction, and excavation support and protection.

2. Measurement: As measured by the Contractor and accepted by the Engineer, complete in place for respective items associated with this bid price item.

3. Payment: Payment for this bid item will be made on an Each basis based on quantity actually installed by the Contractor and accepted by the Engineer.

J. Bid Item No. 9A – 4-ft Dia. Single Catch Basin

1. Work associated with this item will be paid for at the stated price including, but not limited to, work under the following:

   a. All or portions of Division 1 specifications, as applicable.

   b. Section 31 25 00 Erosion and Sedimentation Control

   c. Section 31 20 00 Earthwork

   d. Section 33 40 23 Storm Drainage

   e. Includes: furnish and install, complete in place, precast concrete 4-foot diameter single grate catch basins as shown on Drawing CS-101 and specified on Drawing CD-502.

   f. Inclusive of all appurtenances of the unit, frame, cover, adjustments, hoods, and pipe connections. Also includes backfill and compaction, and excavation support and protection.

   g. Catch basins are typically 7 to 8 feet in depth. See sheet CS-101 for depths.

h. Item requires clock drawing review prior to ordering.

2. Measurement: As measured by the Contractor and accepted by the Engineer, complete in place for respective items associated with this bid price item.

3. Payment: Payment for this bid item will be made on an Each basis based on quantity actually installed by the Contractor and accepted by the Engineer.

K. Bid Item No. 9B – 5-ft Dia. Double Catch Basin

1. Work associated with this item will be paid for at the stated price including, but not limited to, work under the following:

   a. All or portions of Division 1 specifications, as applicable.

   b. Section 31 25 00 Erosion and Sedimentation Control

   c. Section 31 20 00 Earthwork

   d. Section 33 40 23 Storm Drainage

   e. Includes: furnish and install, complete in place, precast concrete 5-foot diameter double grate catch basins as shown on Drawing CS-101 and specified on Drawing CD-502.

   f. Inclusive of all appurtenances of the unit, frame, cover, adjustments, hoods, and pipe connections. Also includes backfill and compaction, and excavation support and protection.

   g. Catch basins are typically 7 to 8 feet in depth. See sheet CS-101 for depths.

   h. Item requires clock drawing review prior to ordering.

2. Measurement: As measured by the Contractor and accepted by the Engineer, complete in place for respective items associated with this bid price item.

3. Payment: Payment for this bid item will be made on an Each basis based on quantity actually installed by the Contractor and accepted by the Engineer.

L. Bid Item No. 10A – 4-ft Dia. Drain Manhole

1. Work associated with this item will be paid for at the stated price including, but not limited to, work under the following:

   a. All or portions of Division 1 specifications, as applicable.

   b. Section 31 25 00 Erosion and Sedimentation Control

   c. Section 31 20 00 Earthwork

   d. Section 33 40 23 Storm Drainage

   e. Includes: furnish and install, complete in place, precast concrete 4-foot diameter drain manholes as shown on Drawing CS-101 and specified on Drawing CD-502.

   f. Inclusive of all appurtenances of the unit, frame, cover – marked "DRAIN", adjustments, brickwork, and pipe connections. Also includes backfill and compaction, and excavation support and protection.

g. Drain manholes are typically 4 feet in depth. See sheet CS-101 for depths.

h. Item requires clock drawing review prior to ordering.

2. Measurement: As measured by the Contractor and accepted by the Engineer, complete in place for respective items associated with this bid price item.

3. Payment: Payment for this bid item will be made on an Each basis based on quantity actually installed by the Contractor and accepted by the Engineer.

M. Bid Item No. 10B – 6-ft Dia. Drain Manhole

1. Work associated with this item will be paid for at the stated price including, but not limited to, work under the following:

a. All or portions of Division 1 specifications, as applicable.

b. Section 31 25 00 Erosion and Sedimentation Control

c. Section 31 20 00 Earthwork

d. Section 33 40 23 Storm Drainage

e. Includes: furnish and install, complete in place, precast concrete 6-foot diameter drain manholes as shown on Drawing CS-101 and specified on Drawing CD-502.

f. Inclusive of all appurtenances of the unit, frame, cover – marked "DRAIN", adjustments, brickwork, and pipe connections. Also includes backfill and compaction, and excavation support and protection.

g. Drain manholes are typically 4 feet in depth. See sheet CS-101 for depths.

h. Item requires clock drawing review prior to ordering. Confirm 5-ft diam structure will not work.

2. Measurement: As measured by the Contractor and accepted by the Engineer, complete in place for respective items associated with this bid price item.

3. Payment: Payment for this bid item will be made on an Each basis based on quantity actually installed by the Contractor and accepted by the Engineer.

N. Bid Item No. 11A – 12-Inch Dia. HDPE Drain

1. Work associated with this item will be paid for at the stated price including, but not limited to, work under the following:

a. All or portions of Division 1 specifications, as applicable.

b. Section 33 40 23 Storm Drainage

c. Includes: furnish and install, complete in place, 12-in high density polyethylene drain pipe as shown on Drawing CS-101.

d. Inclusive of all laying, jointing, connections to structures, testing, inspection Also includes backfill and compaction, and excavation support and protection.

2. Measurement: As measured by the Contractor and accepted by the Engineer, complete in place along the centerline of the pipe from the inside face of the structure to inside face of the structure to the nearest 0.5-ft.

3. Payment: Payment for this bid item will be made by the linear foot to the nearest 0.5-ft actually installed.

O. Bid Item No. 11B – 18-Inch Dia. HDPE Drain

1. Work associated with this item will be paid for at the stated price including, but not limited to, work under the following:

   a. All or portions of Division 1 specifications, as applicable.

   b. Section 33 40 23 Storm Drainage

   c. Includes: furnish and install, complete in place, 18-in high density polyethylene drain pipe as shown on Drawing CS-101.

   d. Inclusive of all laying, jointing, connections to structures, testing, inspection Also includes backfill and compaction, and excavation support and protection.

2. Measurement: As measured by the Contractor and accepted by the Engineer, complete in place along the centerline of the pipe from the inside face of the structure to inside face of the structure to the nearest 0.5-ft.

3. Payment: Payment for this bid item will be made by the linear foot to the nearest 0.5-ft actually installed.

P. Bid Item No. 11C – 24-Inch Dia. HDPE Culvert

1. Work associated with this item will be paid for at the stated price including, but not limited to, work under the following:

   a. All or portions of Division 1 specifications, as applicable.

   b. Section 33 40 23 Storm Drainage

   c. Section 35 01 40 Protection of Dam

   d. Includes: furnish and install, complete in place, 24-in high density polyethylene drain pipe as shown on Drawing CS-101, STR-01, STR-02, and CD-503.

   e. Inclusive of all excavation, bedding, laying, jointing, connections to structures, testing, inspection Also includes backfill and compaction, and excavation support and protection.

   f. Note that separate payment is made for filter sand, low permeability backfill layer, concrete cradle, water main, paving, flow handling, etc. This item is payment for the pipe installation as indicated in bullet above, and coordination or the work with other related items.

2. Measurement: As measured by the Contractor and accepted by the Engineer, complete in place along the centerline of the pipe from the inside face of the structure to inside face of the structure to the nearest 0.5-ft.

3. Payment: Payment for this bid item will be made by the linear foot to the nearest 0.5-ft actually installed.

Q. Bid Item No. 12A – 8-In Ductile Iron Water Main and Fittings

1. Work associated with this item will be paid for at the stated price including, but not limited to, work under the following:
   a. All or portions of Division 1 specifications, as applicable.
   b. Appendix F – Aquarion Water Company Technical Specifications
   c. Includes: furnish and install, complete in place, 8-inch cement-lined ductile iron water main as shown on Drawings CU-101 and STR-02 and in conformance with Aquarion Water Specifications and coordination with their system Foreman.
   d. Inclusive of all excavation, bedding, laying, jointing, restraining, connections to valves, chlorination including appurtenances required for insertion of CL2, AWWA pressure testing, AWWA bacteria testing, inspection Also includes backfill and compaction, and excavation support and protection. This includes thrust protection.
   e. This item includes fittings associated with the ductile iron main:
      1) Eight 45-degree bends (8")
      2) Two 8"x6" DI reducers
      3) Two 6" DI to CI Couplings
      4) Valves are not included. See Items 13A & B.
   f. Water main installation shall occur prior to culvert installation. Contractor shall confirm water main is laid at 5-ft of cover; then turning vertically down to pass underneath the culvert as shown on STR-02.
2. Measurement: As measured by the Contractor and accepted by the Engineer, complete in place along the centerline of the pipe from the center of the valve or fitting to the center of the next valve or fitting, with no deductions for the length of the fittings themselves, to the nearest 0.1-ft.
3. Payment: Payment for this bid item will be made by the linear foot to the nearest 0.1-ft actually installed which passes bacteria and pressure tests, as accepted by Aquarion Water Company.

R. Bid Item No. 12B – 8-In HDPE Water Main

1. Work associated with this item will be paid for at the stated price including, but not limited to, work under the following:
   a. All or portions of Division 1 specifications, as applicable.
   b. Appendix F – Aquarion Water Company Technical Specifications
   c. Includes: furnish and install, complete in place, 8-inch high density polyethene pressure pipe for water main as shown on Drawings CU-101 and STR-02 and in conformance with Aquarion Water Specifications and coordination with their system Foreman.

d. Inclusive of all excavation, bedding, laying, jointing, restraining, connections to valves, chlorination including all appurtenances required for insertion of CL2; AWWA pressure testing, AWWA bacteria testing, inspection Also includes backfill and compaction, and excavation support and protection. This includes thrust protection.

e. *This item includes fittings associated with the ductile iron main:*

1) Two 8" HDPE to DI mechanical adaptors with MJ restraint

2) Two 8" APS InnerLynx mechanical end seal with centering block

3) Pipe spacers within steel casing sleeve

f. Water main installation shall occur prior to culvert installation. Contractor shall confirm water main is laid at 5-ft of cover; then turning vertically down to pass underneath the culvert as shown on STR-02.

2. Measurement: As measured by the Contractor and accepted by the Engineer, complete in place along the centerline of the pipe from the center of the valve or fitting to the center of the next valve or fitting, with no deductions for the length of the fittings themselves, to the nearest 0.1-ft.

3. Payment: Payment for this bid item will be made by the linear foot to the nearest 0.1-ft actually installed which passes bacteria and pressure tests, as accepted by Aquarion Water Company.

S. Bid Item No. 13A – 8-In Resilient-Seated Gate Valve and Box

1. Work associated with this item will be paid for at the stated price including, but not limited to, work under the following:

a. All or portions of Division 1 specifications, as applicable.

b. Appendix F – Aquarion Water Company Technical Specifications

c. Includes: furnish and install, complete in place, 8-inch gate valve and box as shown on Drawings CU-101 and in conformance with Aquarion Water Specifications 02641-2 and detail 4 on Drawing CD-504; and coordination with their system Foreman.

d. Inclusive of all excavation, bedding, laying, jointing, restraining, connections to valves, AWWA pressure testing, AWWA bacteria testing, inspection Also includes backfill and compaction, and excavation support and protection. This includes thrust protection.

1) Open: LEFT

2) Box Stamped "Water"

e. Water main installation shall occur prior to culvert installation. Contractor shall confirm water main is laid at 5-ft of cover; then turning vertically down to pass underneath the culvert as shown on STR-02.

2. Measurement: As measured by the Contractor and accepted by the Engineer, complete in place for each actually installed and accepted after testing.

3. Payment: Payment for this bid item will be made for each installed and accepted.

T. Bid Item No. 13B – 6-In Insertion Valve and Box

1. Work associated with this item will be paid for at the stated price including, but not limited to, work under the following:
   a. All or portions of Division 1 specifications, as applicable.
   b. Appendix F – Aquarion Water Company Technical Specifications
   c. Includes: furnish and install, complete in place, 8-inch gate valve and box as shown on Drawings CU-101 and in conformance with Aquarion Water Specifications 02641-2 and detail 4 on Drawing CD-504; and coordination with their system Foreman.
   d. Inclusive of all excavation, bedding, laying, jointing, restraining, connections to valves, AWWA pressure testing, AWWA bacteria testing, inspection Also includes backfill and compaction, and excavation support and protection. This includes thrust protection.
      1) Open: LEFT
      2) Box Stamped "Water"
   e. Water main installation shall occur prior to culvert installation. Contractor shall confirm water main is laid at 5-ft of cover; then turning vertically down to pass underneath the culvert as shown on STR-02.
2. Measurement: As measured by the Contractor and accepted by the Engineer, complete in place for each actually installed and accepted after testing.
3. Payment: Payment for this bid item will be made for each installed and accepted.

U. Bid Item No. 14 – 15-Inch Casing Pipe

1. Work associated with this item will be paid for at the stated price including, but not limited to, work under the following:
   a. All or portions of Division 1 specifications, as applicable.
   b. Appendix F – Aquarion Water Company Technical Specifications
   c. Includes: furnish and install, complete in place, steel casing sleeve to carry the 8" HDPE water main on spacers under the culvert as shown on Drawings CU-101 and STR-02; and coordination with their system Foreman.
   d. Casing sleeve shall be 18-ft long, ¼-inch thick steel, confirm prior to ordering that 15" diameter is suitable to pass joints on HDPE pipe if they exist.
   e. Spacers, end seals and appurtenances are included in HDPE water main item.
   f. This item includes the installation of the main within the casing sleeve.
   g. Water main installation shall occur prior to culvert installation. Contractor shall confirm water main is laid at 5-ft of cover; then turning vertically down to pass underneath the culvert as shown on STR-02.

2. Measurement: As measured by the Contractor and accepted by the Engineer, by the linear foot, to the closest 0.5-ft actually ordered and delivered to the site.
3. Payment: Payment for this bid item will be made for the linear foot order and delivered to site, installed and accepted.

V. Bid Item No. 15 – Type K copper Tubing for Service Connections

1. Work associated with this item will be paid for at the stated price including, but not limited to, work under the following:
   a. All or portions of Division 1 specifications, as applicable.
   b. Appendix F – Aquarion Water Company Technical Specifications
   c. The location of the water services for #2 & #6 Waite Street are unknown, but very likely to be within the extents of the water work and shutdown.
   d. Item includes: furnish and install, complete in place, ¾" Type K copper tubing for service connections; coordination with their system Foreman and homeowners, signing shut-offs prior to the work.
   e. Includes excavation, backfill, compaction, restoration, chlorination, testing, and adaptors to connect to existing service pipe after the new box.
   f. Includes preparation of tie cards for each service.
2. Measurement: As measured by the Contractor and accepted by the Engineer, by the linear foot, to the closest 0.1-ft, from the corporation to the adaptor to existing service, as actually installed.
3. Payment: Payment for this bid item will be made for the linear foot installed and accepted.

W. Bid Item No. 16 – ¾-Inch Corporation and Curb Stop with Box

1. Work associated with this item will be paid for at the stated price including, but not limited to, work under the following:
   a. All or portions of Division 1 specifications, as applicable.
   b. Appendix F – Aquarion Water Company Technical Specifications
   c. The location of the water services for #2 & #6 Waite Street are unknown, but very likely to be within the extents of the water work and shutdown.
   d. Item includes: furnish and install, complete in place, ¾-in corporation including tapping the live main; ¾-in curb stop (customer shutoff) and associated service box per Aquairon Water Company Specifications; coordination with their system Foreman and homeowners, signing shut-offs prior to the work.
   e. Includes excavation, backfill, compaction, restoration, testing, and box with casting cover.
2. Measurement: As measured by the Contractor and accepted by the Engineer, by for each pair of corps and curb stops as actually installed.

3. Payment: Payment for this bid item will be made for each pair installed and accepted.

X. Bid Item No. 17 – Temporary Water

1. Work associated with this item will be paid for at the stated price including, but not limited to, work under the following:
   a. All or portions of Division 1 specifications, as applicable.
   b. Appendix F – Aquarion Water Company Technical Specifications
   c. The location of the water services for #2 & #6 Waite Street are unknown, but very likely to be within the extents of the water work and shutdown.
   d. Item includes: furnish and install, complete in place, temporary services for #2 & #6 Waite Street after the insertion valve is installed; including tapping the live side of the 6" existing main; providing temporary 1-inch service hose to each residence (~80-ft each); coordination with their system Foreman and homeowners, signing shut-offs prior to the work.
   e. Includes excavation, backfill, compaction, restoration of the tapping pits, maintenance of the services, connection to the hose bib or directly to the service pipe by means of excavation.
2. Measurement: As measured by the Contractor and accepted by the Engineer, by percent complete of install.
3. Payment: Payment for this bid item will be made on a lump sum basis.

Y. Bid Item No. 18 – Chain Link Fencing and Metal Guardrail

1. Work associated with this item will be paid for at the stated price including, but not limited to, work under the following:
   a. All or portions of Division 01 specifications, as applicable.
   b. Section 05 50 00 Metal Fabrications
   c. Section 31 20 00 Earthwork
   d. Section 32 40 00 Site Restoration
   e. Section 32 30 51 Highway Guard
   f. Description: Provide chain link fencing and metal guardrail as depicted on the Contract Drawings:
   g. Install approximately 65-ft of 5-ft tall black pvc-coated chain link fence with black painted posts (and foundations); 3-ft swing gate with black appurtenances (to gravel drive), as shown on the Drawings and detailed on Sheet CD-503
   h. Installation of MassDOT MTL-3 metal guard rail with end terminals, posts, connections, blocks, and all else to required for approximately 25-ft of guardrail installation.
2. Measurement: As measured by the engineer, pro-rated with the Contractor's progress of work in the installation of the chain-link fence and guardrail.

3. Payment: Lump Sum as stated on the Bid Form.

Z. Bid Item No. 19 – Gravel Access Drive

1. Work associated with this item will be paid for at the stated price including, but not limited to, work under the following:
   a. All portions of Division 01 specifications, as applicable.
   b. Section 31 00 00 Earthwork
   c. Section 31 25 00 Erosion and Sedimentation Control
   d. Includes furnishing the permanent gravel access drive as shown in the Contract Drawings.
   e. MassDOT M1.03.0 Type B Gravel Borrow – 3-inch largest dimension; delivered, placed, subbase graded and shaped, and material compacted. 12-ft wide minimum width; 12-inch thick depth to subbase.
2. Measurement: As measured by the Contractor and accepted by the Engineer, by the cubic yard actually placed. Truck measurement will not be allowed.
3. Payment: Unit price per cubic yard of in-place gravel.

AA. Bid Item No. 20 – Embankment Reconstruction and Regrading

1. Work associated with this item will be paid for at the stated price including, but not limited to, work under the following:
   a. All or portions of Division 1 specifications, as applicable.
   b. Section 31 20 00 Earthwork
   c. Section 31 25 00 Erosion and Sedimentation Control
   d. Section 32 40 00 Site Restoration
   e. Section 35 01 40 Protection of Dam
   f. Includes, but is not limited to, Importing, placing, and compacting impermeable and pervious fill as required to reconstruct the dam embankments to provide the grades as depicted on the Contract Drawings. Any excavated embankment soil not meeting the requirements of Section 31 20 00 of the Project Specifications shall be disposed of lawfully off-site or as directed by the Engineer.
   g. Imported material will be paid for at their respective unit items. Placing the items to meet desired grading is included in this item.
2. Measurement: As measured by the engineer, by the square yard completed for reconstructing and finish grading of the embankment.
3. Payment: By the Square yard completed and accepted by the Engineer at the unit price stated on the Bid Form.

BB. Bid Item No. 21 – Filter Sand

1. Work associated with this item will be paid for at the stated price including, but not limited to, work under the following:

a. All portions of Division 01 specifications, as applicable.

b. Section 31 20 00 Earthwork

c. Section 35 01 40 Protection of Dam

d. Includes constructing the filter sand embankment zone within the dam embankment as indicated on the Contract Drawings.

2. Measurement: As measured by the Contractor with surveyed quantities of compacted material, as accepted by the Engineer.

a. Measurement will be made by in-place volume in cubic yards of compacted filtered sand as determined by topographic survey completed on the accepted subgrade prior to installation and upon completion of the filter sand installation. The survey shall reference the site's vertical and horizontal datum.

b. All such survey measurements shall be clearly depicted on a scaled site plan and section drawings, with supporting computations provided in electronic (spreadsheet) or otherwise in hard copies and transmitted for the Engineer's review and recommendation for payment.

3. Payment: Unit price per cubic yard of in place, compacted filter sand fill and accepted by the Engineer at the unit price stated on the Bid Form.

CC. Bid Item No. 22 – Low Permeability Fill

1. Work associated with this item will be paid for at the stated price including, but not limited to, work under the following:

a. All portions of Division 01 specifications, as applicable.

b. Section 31 20 00 Earthwork

c. Section 35 01 40 Protection of Dam

d. Includes constructing the low permeability fill embankment zone within the dam embankment as indicated on the Contract Drawings.

2. Measurement: As measured by the Contractor with surveyed quantities of compacted material, as accepted by the Engineer.

a. Measurement will be made by in-place volume in cubic yards of compacted low permeability backfill as determined by topographic survey completed on the accepted subgrade prior to installation and upon completion of the low permeability backfill installation. The survey shall reference the site's vertical and horizontal datum.

b. All such survey measurements shall be clearly depicted on a scaled site plan and section drawings, with supporting computations provided in electronic (spreadsheet) or otherwise in.

3. Payment: Unit price per cubic yard of in place, compacted low permeability fill and accepted by the Engineer at the unit price stated on the Bid Form.

DD. Bid Item No. 23 – Natural Stone Armor

1. Work associated with this item will be paid for at the stated price including, but not limited to, work under the following:
   a. All portions of Division 01 specifications, as applicable.
   b. Section 31 20 00 Earthwork
   c. Section 35 01 40 Protection of Dam
   d. Includes: constructing the natural stone armor embankment zone within the dam embankment as indicated on the Contract Drawings. Includes reuse of excess stones equal to or greater than 18 inches in least diameter from upstream face. MassDOT Modified Rock Fill M2.02.4; 18" average depth.
2. Measurement: As measured by the engineer, per cubic yard by assuming uniform thickness of 18 inches.
3. Payment: Unit price per cubic yard of in place natural stone armor.

EE. Bid Item No. 24 – Full Depth Bituminous Concrete Paving and Asphalt Berm

1. Work associated with this item will be paid for at the stated price including, but not limited to, work under the following:
   a. All or portions of Division 1 specifications, as applicable.
   b. Section 32 12 16 Bituminous Concrete Paving
   c. Section 32 16 14 Curbing
   d. Includes: furnish and install gravel subbase atop the subgrade to the lines and grades shown on the Contract Drawings,
   e. install 2-inch rolled thickness binder course and 1-inch rolled thickness top course of bituminous concrete pavement
   f. hot mix asphalt curb MassDOT modified berm Type 2, in accordance with the Contract Documents and as directed by the Engineer.
   g. Driveway aprons / transitions including hand paving
2. Measurement: As measured by the Contractor in square yards for the area of disturbed pavement to be replaced: full depth pavement that is complete, in place, and accepted by the Engineer shall be full compensation for the base material, binder, top course, berm curbing and aprons inclusive. Material quantity above the target thickness shall not be considered for payment.
3. Payment: Full Depth Pavement Reconstruction will be paid for at the contract unit square yard price, complete and in place.

FF. Bid Item No. 25 – Wetland Replication Area

1. Work associated with this item will be paid for at the stated price including, but not limited to, work under the following:
   a. All portions of Division 01 specifications, as applicable.

b. Section 32 40 00 Site Restoration

c. Section 32 92 00 Wetland Mitigation Area

d. Drawing WET-02

e. Includes: construct the wetland mitigation area with planting soils and soil amendments, sampling and testing of soils, furnish permanent and temporary grasses, furnish nursery grown plants of specified sizes and grades, installation and removal of temporary drainage piping, tilling of subgrade and application of soil amendments to specified thicknesses, excavation for planting pits, maintenance of plants, turf and shrubs, repair and replace damaged trees as designated by the Engineer, and fine grading.

2. Measurement – As measured by the Engineer, pro-rated with the Contractor's progress of work on restoring the site.

3. Payment – Lump Sum price as stated on the Bid Form

GG. Bid Item No. 26 – Site Restoration

1. Work associated with this item will be paid for at the stated price including, but not limited to, work under the following:

a. All portions of Division 01 specifications, as applicable.

b. Section 31 20 00 Earthwork

c. Section 31 25 00 Erosion and Sedimentation Control

d. Section 32 40 00 Site Restoration

e. Description: Includes, but is not limited to: Fine grading, installing topsoil and seed, erosion control blanketing, restoring other site features to their original condition (or better) that were disrupted by construction activities.

f. Repeated watering to establish plantings and seed.

2. Measurement – As measured by the Engineer, pro-rated with the Contractor's progress of work on restoring the site.

3. Payment – Lump Sum price as stated on the Bid Form.

HH. Bid Item No. 27 – Construction Survey and Record Drawings

1. Work associated with this item will be paid for at the stated price including but not limited to work under the following:

a. Includes: Establish survey control at the site, verify existing site dimensions and elevations, stake out Limit of Disturbance, stake out vertical and horizontal limits of proposed features, conduct additional surveys of constructed features to confirm conformance to required lines and grades depicted on the Contract Drawings or otherwise instructed by the Engineer, survey constructed features as required for measurement and payment of completed work, **conduct final survey(s) of completed work and preparing and revising record drawings**, as accepted by the Engineer.

2. Measurement: As measured by the Engineer, pro-rated with the Contractor's progress of work in completing respective items requiring construction stakeout, this payment item, one-third (33%) of the lump sum shall be considered as payment in whole for establishing survey control and construction stakeout of proposed features, one third (33%) of the lump sum shall be considered as payment in whole for measurement of completed items, and one-third (33%) of the lump sum shall be considered as payment in whole for final surveys and productions of completed record drawing submitted to Engineer.

3. Payment: Lump Sum price as stated on the Bid Form.

II. Bid Item No. 28 – Miscellaneous Work and Cleanup

1. Work associated with this item will be paid for at the stated price including respective portions of work under all specifications necessary to initiate, sustain and conclude Contractor's activities at the project site.

   a. All or portions of the Contract Requirements and Division 01 specifications, as applicable.

   b. Includes: Contractor's general requirements to complete the work, including insurance, bonds, administrative and general requirements, meetings, schedules (including, but not limited to, construction schedules, submittal schedules, and schedule of values), temporary facilities and controls for field offices, storage sheds, securing local permits as required, and all other measures not specified elsewhere and miscellaneous costs associated with the Work including incidentals not covered by other payment items. The bid amount for this item shall not exceed 5% of the Total Contract Base Bid Price.

   c. Also includes other incidental items such as obtaining necessary remaining permits, field and laboratory testing, construction survey layout, and project record drawings/mapping.

2. Measurement: This item will not be measured for payment but will be pro-rated with the Contractor's progress of work as accepted by Engineer.

3. Payment: Lump Sum price as stated on the bid form in the following manner: Contractor will be paid 40% upon completion of mobilization, 30% upon earning 50% of the total base bid contract value, and the remaining 30% upon completion of demobilization from the site as accepted by the Engineer.

JJ. Bid Item No. 29 – Mobilization

1. Work associated with this item will be paid for at the stated price including respective portions of work under all specifications necessary to initiate, sustain and conclude Contractor's activities at the project site.

   a. All or portions of the Contract Requirements and Division 01 specifications, as applicable.

   b. Includes: complete the work associated with the mobilization and demobilization of temporary field offices and sheds, temporary utilities, materials, personnel, and equipment to and from the project site. Also includes restoring all incidental areas inside or outside the project limits

disturbed by Contractor's activities or traffic control, by placement of topsoil, seeding and establishing satisfactory vegetation to existing condition or better. Mobilization shall be considered complete when the Contractor has commenced the work on-site. Demobilization shall be considered complete when the Contractor has achieved final completion of the work and removed all equipment and materials from the site. The amount bid for this item shall not exceed 5 percent (5%) of the Total Contract Base Bid Price.

2. Measurement: This item will not be measured for payment but will be pro-rated with the Contractor's progress of work as accepted by the Engineer.

3. Payment: Lump Sum price as stated on Bid form and will be based on the following schedule Contractor will be paid 50% upon completion of mobilization, 25% upon earning 50% of the total base bid contract value, and the remaining 25% upon completion of demobilization from the site as accepted by the Engineer.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 GENERAL

A. Measurement: Notify Engineer at least 48-hours prior to the time at which necessary measurements must be taken. Notification must be in advance of obscuring pay item; do not proceed until such measurements have been taken in the presence of the Engineer.

END OF SECTION

SECTION 01 26 00

CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 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.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications.

1.3 FIELD ORDER

A. Engineer will issue written supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Price or the Contract Time on EJCDC Form C-942.

1.4 PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: Engineer will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Price or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. Proposal Requests issued by Engineer are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.

2. Within time specified in Proposal Request after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Price and the Contract Time necessary to execute the change.

a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.

b. Indicate delivery charges, equipment rental, and amounts of trade discounts.

c. Include costs of labor and supervision directly attributable to the change.

d. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change to Engineer.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Price and the Contract Time.

2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.

3. Indicate applicable delivery charges, equipment rental, and amounts of trade discounts.

4. Include costs of labor and supervision directly attributable to the change.

5. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

6. Comply with requirements in Division 1 Section "Product Requirements" if the proposed change requires substitution of one product or system for product or system specified.

C. Proposal Request Form: For Change Order proposals, use forms provided by Owner. Sample copies are included at end of this Section.

1.5 WORK CHANGE DIRECTIVE

A. Work Change Directive: Engineer may issue a Work Change Directive on EJCDC form C-940. Work Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

1. Work Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Price or the Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Work Change Directive.

1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

1.6 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Proposal Request, Engineer will issue a Change Order for signatures of Owner and Contractor on EJCDC form C-941.

PART 2 - PRODUCTS (Not Used)

PART 3 – EXECUTION

3.1 ATTACHED FORMS

1. Work Change Directive - EJCDC form C-940
2. Change Order – EJCDC form C-941
3. Field Order – EJCDC form C-942

END OF SECTION

FUSS & O'NEILL

WORK CHANGE DIRECTIVE NO.: ____

Owner:	Owner's Project No.:
Engineer:	Engineer's Project No.:
Contractor:	Contractor's Project No.:
Project:	
Contract Name:	
Date Issued:	Effective Date of Field Order:

Contractor is directed to proceed promptly with the following change(s):

Description:

Attachments:

Purpose for the Work Change Directive:

Directive to proceed promptly with the Work described herein, prior to agreeing to change in Contract Price and Contract Time, is issued due to:

☐ Non-agreement on pricing of proposed change. ☐ Necessity to proceed for schedule or other reasons.

Estimated Change in Contract Price and Contract Times (non-binding, preliminary):

Contract Price: $ _____ **[increase] [decrease] [not yet estimated]**.

Contract Time: _____ days **[increase] [decrease] [not yet estimated]**.

Basis of estimated change in Contract Price:

☐ Lump Sum ☐ Unit Price ☐ Cost of the Work ☐ Other

	Recommended by Engineer	Authorized by Owner
By:		
Title:		
Date:		

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(FOR DUPLEX PRINTING PURPOSES)

FUSS & O'NEILL

CHANGE ORDER NO.: ____

Owner:	Owner's Project No.:
Engineer:	Engineer's Project No.:
Contractor:	Contractor's Project No.:
Project:	
Contract Name:	
Date Issued:	Effective Date of Field Order:

The Contract is modified as follows upon execution of this Change Order:

Description:

Attachments:

CHANGE IN CONTRACT PRICE	**CHANGE IN CONTRACT TIMES** *[note changes in Milestones if applicable]*
Original Contract Price: $_____	Original Contract Times: Substantial Completion: _____ Ready for Final Payment: _____ days or dates
[Increase] [Decrease] from previously approved Change Orders No. ___ to No. ___: $_____	[Increase] [Decrease] from previously approved Change Orders No. ___ to No. ___: Substantial Completion: _____ Ready for Final Payment: _____ Days
Contract Price prior to this Change Order: $_____	Contract Times prior to this Change Order: Substantial Completion: _____ Ready for Final Payment: _____ days or dates
[Increase] [Decrease] of this Change Order: $_____	[Increase] [Decrease] of this Change Order: Substantial Completion: _____ Ready for Final Payment: _____ days or dates
Contract Price incorporating this Change Order: $_____	Contract Times with all approved Change Orders: Substantial Completion: _____ Ready for Final Payment: _____ days or dates

RECOMMENDED:	ACCEPTED:	ACCEPTED:
By: _____	By: _____	By: _____
Engineer (if required)	Owner (Authorized Signature)	Contractor (Authorized Signature)
Title: _____	Title: _____	Title: _____
Date: _____	Date: _____	Date: _____

Approved by Funding Agency (if applicable)

By: _____ Title: _____ Date: _____

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FUSS & O'NEILL

FIELD ORDER NO.: _____

Owner:	Owner's Project No.:
Engineer:	Engineer's Project No.:
Contractor:	Contractor's Project No.:
Project:	
Contract Name:	
Date Issued:	Effective Date of Field Order:

Contractor is hereby directed to promptly perform the Work described in this Field Order, issued in accordance with Paragraph 11.04 of the General Conditions, for minor changes in the Work without changes in Contract Price or Contract Times. If Contractor considers that a change in Contract Price or Contract Times is required, submit a Change Proposal before proceeding with this Work.

Reference:

Specification Section(s):

Drawing(s) / Details (s):

Description:

Attachments:

Issued by Engineer

By: _____

Title: _____

Date: _____

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SECTION 01 31 00

PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1. General project coordination procedures.
2. Coordination Drawings.
3. Project meetings.

1.3 SITE ADMINISTRATION

A. Maintain a daily attendance log to include the names of all project employees and guests to the site. The log sheet or sheets must clearly indicate the Project Name, and the name of the General Contractor. Each line on the log should allow for the name of each employee, the employee's job title (use terminology used by prevailing wage job title), and the name of that employee's employer.

1.4 COORDINATION

A. Coordination: Coordinate construction operations to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

B. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's Construction Schedule.
2. Preparation of the Schedule of Values.

3. Installation and removal of temporary facilities and controls.
4. Progress meetings.
5. Project closeout activities.

1.5 PROJECT MEETINGS

A. Preconstruction Conference: Engineer will schedule a preconstruction conference before start of construction, at a time convenient to Owner, Contractor, and Engineer, but no later than 15 days after Notice to Proceed. Conference will be held at Project site or another convenient location. Meeting will be conducted to review responsibilities and personnel assignments.

1. Attendees: Authorized representatives of Owner, Engineer, and their consultants; and Contractor and its superintendent; shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Discuss items of significance that could affect progress, including the following:
    a. Construction schedule.
    b. Critical work sequencing.
    c. Designation of responsible personnel and contact information.
    d. Procedures for processing field decisions and Change Orders.
    e. Procedures for processing Applications for Payment.
    f. Distribution of the Contract Documents.
    g. Submittal procedures.
    h. Preparation of Record Documents.
    i. Responsibility for temporary facilities and controls.
    j. Logistics of the Work Site.
    k. Safety.
    l. Working hours.
3. Execution of Owner-Contractor Agreement including executed bonds and insurance certificates shall be completed prior to pre-construction conference.

B. Progress Meetings: Engineer will conduct regular progress meetings at periodic intervals during construction at the site.

1. Attendees: Contractor's attendance at progress meetings will be mandatory. A meeting schedule will be established at the pre-bid conference. Meetings shall include subcontractors, trades, or suppliers when necessary for coordination purposes.
2. Agenda: Review progress since last meeting. Provide look-ahead for work to be accomplished by next meeting. Identify all construction issues. Include topics for discussion as appropriate to status of Project.

a. Schedule Updating: Revise Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

1.6 APPLICATIONS FOR PAYMENT

A. Applications for payment shall be submitted on EJCDC forms, as PDF, emailed to the Owner's Representative monthly. Owner's Representative will review the application for accuracy and verify completion of the work presented.

B. Owner's Representative will review each application within seven (7) working days of receipt. Once agreed upon the application will be endorsed and sent to the Owner for execution.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. Closeout Procedures for submitting warranties, and Project Record Documents are included in Section 01 77 00.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other miscellaneous submittals.

1.3 DEFINITIONS

A. Action Submittals: Written and graphic information that requires Engineer's responsive action.

B. Informational Submittals: Written information that does not require Engineer's approval. Submittals may be rejected for not complying with requirements.

1.4 SUBMITTAL PROCEDURES

A. **Master List Submittal**: Submit a master list of the required submittals with a proposed date for each item to be submitted. Show the date submittal was sent, days since submittal was sent, status of submittal, date submittal was received in return, and any date associated with resubmittals. The master list will be updated with each submission and response. Issue copy of master list at least monthly to the Engineer.

B. General: Electronic copies of CAD Drawings of the Contract Drawings will not be provided by Engineer for Contractor's use in preparing submittals.

C. Method of Transmitting Submittals: Electronic transmission of submittals Via email is required. Each submittal shall be its own file, PDF or word format. Single submittals shall not contain multiple files.

D. Clarity: Provide neat, clean, and legible printed materials that can be easily reproduced by normal photocopying. Illegible submittals will be returned un-reviewed.

E. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.

2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.

    a. Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

F. Processing Time: Allow enough time for submittal review, including time for re-submittals, as follows. Time for review shall commence on Engineer's receipt of submittal.

1. Initial Review: Allow 7 days for initial review of each submittal. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. Engineer will advise Contractor when a submittal being processed must be delayed for coordination.
2. If an intermediate submittal is necessary, process it in same manner as initial submittal.
3. Allow 7 days for processing each resubmittal.
4. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing.

G. Identification: Place a digital stamp or title block on each submittal for identification.

1. Indicate name of firm or entity that prepared each submittal on label or title block.
2. Provide a space approximately 4 by 5 inches on label or beside title block to record Contractor's review and approval markings and action taken by Engineer.
3. Include the following information on label for processing and recording action taken:
4. Project name.
5. Date.
6. Name and address of Engineer.
7. Name and address of Contractor.
8. Name and address of subcontractor.
9. Name and address of supplier including name and telephone number of contact.
10. Name of manufacturer including name and telephone number of contact.
11. Unique identifier, including revision number.
12. Number and title of appropriate Specification Section.
13. Drawing number and detail references, as appropriate.
14. Other necessary identification.

H. Deviations: Highlight, encircle, or otherwise identify deviations from the Contract Documents on submittals. Provide list or narrative of deviations on Submittal Transmittal form.

I. Additional Copies: Unless additional copies are required for final submittal, and unless Engineer observes noncompliance with provisions of the Contract Documents, initial submittal may serve as final submittal.

J. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. For electronic submissions, compile each submittal individually in .PDF electronic format for transmittal via email and handling. Engineer will return submittals, without review, received from sources other than Contractor.

1. Transmittal Form: Use sample form at end of Section.

K. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

L. Use for Construction: Use only final submittals with mark indicating action taken by Engineer in connection with construction.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

A. General: Prepare and submit Action Submittals required by individual Specification Sections.

1. Number of Copies: For electronic submission, submit one electronic copy of each submittal, unless otherwise indicated. Mark up and retain one returned copy as a Project Record Document.

a. Submit a preliminary single copy of each submittal where selection of options, color, pattern, texture, or similar characteristics is required. Engineer will return submittal with options selected.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.

2. Mark each copy of each submittal to show which products and options are applicable.

3. Include the following information, as applicable:

a. Manufacturer's written recommendations.

b. Manufacturer's product specifications.

c. Manufacturer's installation instructions.

d. Standard color charts.

e. Manufacturer's catalog cuts.

f. Standard product operating and maintenance manuals.

g. Compliance with recognized trade association standards.

h. Compliance with recognized testing agency standards.

i. Application of testing agency labels and seals.

j. Notation of coordination requirements.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.

1. Preparation: Include the following information, as applicable:

a. Dimensions.

b. Identification of products.

c. Fabrication and installation drawings.

d. Roughing-in and setting diagrams.

e. Templates and patterns.

f. Schedules.

g. Compliance with specified standards.

h. Notation of coordination requirements.

2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 12 by 18 inches.

D. Delegated-Design Submittal: Comply with requirements in Division 1 Section "Quality Requirements."

E. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Use CSI Form 1.5A. Include the following information in tabular form:

1. Name, address, and telephone number of entity performing subcontract or supplying products.

2. Number and title of related Specification Section(s) covered by subcontract.

3. Drawing number and detail references, as appropriate, covered by subcontract.

2.2 INFORMATIONAL SUBMITTALS

A. General: Prepare and submit Informational Submittals required by other Specification Sections.

1. Number of Copies: For electronic submission, submit one electronic copy of each submittal, unless otherwise indicated.

2. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.

B. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements and, where required, is authorized for this specific Project.

C. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements. Include evidence of manufacturing experience where required.

D. Material or Product Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements. Use attached sample Material Certificate, or provide certificate that includes the following information.

1. Project to which material is consigned.
2. Name of contractor receiving material.
3. Item number and description of material.
4. Quantity of material represented by the certificate.
5. Means of identifying consignment including label, marking, or lot number.
6. Date and method of shipment.
7. Signature of Supplier's authorized agent.
8. Notarization of certificate.

E. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.

F. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

G. Preconstruction Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements.

H. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements.

I. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements in Division 1 Section "Closeout Procedures"

J. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:

1. Preparation of substrates.
2. Required substrate tolerances.
3. Sequence of installation or erection.
4. Required installation tolerances.
5. Required adjustments.
6. Recommendations for cleaning and protection.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Review each submittal and check for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Engineer.

B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents. See attached Submittal Transmittal for sample of statement.

3.2 ENGINEER'S ACTION

A. General: Engineer will not review submittals that do not bear Contractor's approval stamp and will return them without action.

B. Action Submittals: Engineer will review each submittal, make marks to indicate corrections or modifications required, and return it. Engineer will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:

1. Furnish as Submitted: Submittal appears to conform to Contract Documents and Contractor may proceed with ordering and installation.
2. Furnish as Noted: Same as "Furnish as Submitted" except that the Contractor must comply with modifications or notes added to the submittal by the Engineer.
3. Rejected: Submittal must be revised and resubmitted.

C. Informational Submittals: Engineer will review each submittal and will not return it, or will reject and return it if it does not comply with requirements. Engineer will forward each submittal to appropriate party.

D. Submittals not required by the Contract Documents will not be reviewed and may be discarded.

END OF SECTION

To: Fuss & O'Neill, Inc.
115 Broad Street, 6th Floor
Boston, MA 02110
ATTN: Mike Nelson, P.E.

From: _____

PROJECT: _____

SUBMITTAL NO.: _____
(List Section No., Article No., Paragraph)

_____

_____
(Revision: 1st, 2nd, 3rd)

Transmitted herewith for review and comment are the following:

Copy	Dwg.	No.	Description

MANUFACTURER / SUPPLIER

Name: _____

Address: _____

Telephone No.: _____ Facsimile No.: _____

For Additional Information, Contact: _____

E-mail Address: _____

I hereby certify that I have carefully examined the enclosed submittal and have determined and verified all field measurements, construction criteria, materials, catalog numbers and similar data, coordinated the submittal with other submissions and the work of other trades and contractors, and that to the best of my knowledge and belief, the enclosed submittal is in full compliance with the Contract Documents, except for the following deviations:

BY: _____
Signature:

Date: _____

Title: _____

- - SAMPLE - - MATERIALS CERTIFICATE - - SAMPLE - -

(Submit on Manufacturer's letterhead)

Date: _____

WE HEREBY CERTIFY THAT _____
(Description, Kind of Material, Product Name, Model No.)

FURNISHED TO _____
(Name of Contractor) (Prime or Subcontractor)

FOR USE ON _____
(Project Name)

OWNER _____
(Project Owner)

IDENTIFIED BY: _____
(Label, Marking, Seal No., Consignment, or Waybill No.)

SHIPPED VIA: _____
(Method of Shipment, Car No., Truck No.)

SHIPPED ON: _____ DELIVERED ON: _____

MEETS THE REQUIREMENTS OF THE CONTRACT DOCUMENTS FOR THE SUBJECT PROJECT IN ALL RESPECTS. PROCESSING, PRODUCT TESTING AND INSPECTION CONTROL OF RAW MATERIALS ARE IN CONFORMANCE WITH APPLICABLE SPECIFICATIONS, DRAWINGS AND STANDARDS OF ARTICLES FURNISHED. ARTICLES FURNISHED COMPLY WITH THE FOLLOWING SPECIFICATIONS:

_____

_____

_____

_____

All records and documents pertinent to this certificate and not submitted herewith will be maintained available by the undersigned for a period of not less than 3 years from the date of this certificate.

_____
(Name of Manufacturer)

_____
(Authorized Representative's Signature)

_____
(Title)

- - SAMPLE - - EQUIPMENT RECORD SHEET - - SAMPLE - -

PROJECT: _____ SUBMITTAL NO.: _____
_____ (list Section No., Article No., and Paragraph)
_____ _____
(Revision: 1st, 2nd, 3rd, etc.)

EQUIPMENT MANUFACTURER

_____
_____
_____
_____

SERVICE REPRESENTATIVE

_____
_____
_____
_____

TYPE _____ Motor Mfr. _____

MODEL NO. _____ Motor Size _____

SERIAL NO. _____ Volts _____ Amps _____

CAPACITY _____ at _____ Phase _____ Cycles _____ RPS _____

SPECIAL NOTES AND REMARKS

_____
_____
_____
_____
_____
_____
_____
_____

SECTION 01 50 63

ENVIRONMENTAL PROTECTION AND EMERGENCY RESPONSE

PART 1 - GENERAL

1.1 SUMMARY

A. This section consists of procedures to be followed in preventing any release of oil and hazardous materials (OHM) which include but are not limited to petroleum fuel products containing hydrocarbons including petroleum, petroleum derivatives, hydraulic fluids and like products at or adjacent to the project site, including requirements for handling material contaminated by spillage (including leaks) from vehicles and equipment.

B. Leaks and spillage may occur when using mechanical equipment. Equipment generated or lubricated with petroleum products, are prone to leaks or spillages, therefore proper management of "spillage incidents" is essential especially when working adjacent to recreational water bodies, public drinking water supply reservoirs and sensitive wetland resources, as is to occur for work under this project.

C. Spillage or leakage of petroleum fuel products shall be immediately remediated by the Contractor using applicable and appropriate procedure(s). Whenever such spillage or leakage occurs, the Contractor shall immediately contact the Owner and implement the appropriate corrective actions as required.

D. The Contractor shall fully clean up any release or spill in full at its own expense.

E. Where Contractor is identified within this section, it shall include all its subcontractors, suppliers, representatives and agents. The requirements under this section apply to the Contractor, which shall provide for execution of all appropriate and required actions in response to a release of OHM whether a result of the Contractor's own forces or its subcontractors, suppliers, representatives or other agents. All activities occurring within the project site during the performance of work under this contract shall be the responsibility of the Contractor, who shall take all necessary, appropriate and required actions to ensure protection of the water supply, public health and quality of wetland resources throughout the period of construction.

F. The Contractor's requirements for responding to releases or spills of OHM including:

   a. The following actions, at a minimum:

      1) Immediate notification of the Owner.

      2) Immediate response to halt the continued release of OHM.

      3) Immediate response to apply absorbent and containment measures at the OHM spill or release location.

      4) Full containment of the OHM to protect public water supplies and wetland resources within no more than one-half (1/2) hour from the time of release of OHM.

5) In the event of a spill or release, the Contractor shall retain a Massachusetts Licensed Site Professional (LSP) who shall be responsible for preparing all verbal and written notifications and other relevant documentation concerning reportable releases of OHM to MassDEP, EPA and other relevant agencies within the prescribed report notification time frames, to the extent required by applicable laws, statutes, and regulations.

6) The Contractor shall be responsible for selecting, managing, and executing in full the appropriate disposal/recycling options for the OHM wastes resulting from spills or releases. The disposal/recycling option will be subject to the approval by the Owner. The Contractor shall be responsible for transporting and disposing/recycling of these OHM wastes to approved facilities in accordance with applicable state and federal laws and regulations.

G. Incidental materials and activities necessary for the completion of this work in accordance with good practice and applicable laws and regulations shall be furnished, installed and provided, whether or not specifically mentioned herein.

1.2 RESPONSIBILITY OF THE CONTRACTOR

A. The Contractor shall comply with all prevailing federal, state, and local environmental protection ordinances and codes governing and having application to any discharges, intentional or accidental, which may cause water pollution, harm public health or wetland resources, or constitute a nuisance, aesthetic or otherwise.

B. The Contractor shall be responsible for adhering to regulations, specifications and recognized standard practices related to the execution of emergency response activities. The Owner or its agents shall not be responsible at any time for the Contractor's violation of pertinent regulations or endangerment of its work, personnel, equipment, materials, public water supply and environmental resources, members of the public, private property or for any other damages resulting from a spill or release of OHM.

C. The Owner or its agents shall not be held negligent or liable for any spills or releases of OHM caused by the Contractor nor inadequacies or deficiencies in the Contractor's implementation of the emergency response activities.

1.3 REQUIRED SUBMITTALS

A. The Contractor shall submit the following no less than two (2) weeks prior to the start of construction.

1. Emergency Contact List.

2. A basic plan to address a hydraulic hose failure, refueling spill, or machinery leak within the work zone or staging areas. Plan at a minimum shall include what absorption and containment materials shall be stored on site, the amount, and how they will deployed.

1.4 EMERGENCY RESPONSE NOTIFICATION

A. In the event of a release or spill regardless of quantity, the Contractor is required to immediately contact the Owner.

1. If the spill is too large to be cleaned up by Contractor personnel, the Contractor shall immediately contact an Emergency Response Contractor for cleanup at the Contractor's expense.

2. If the spill is fuel or oil and the quantity is five (5) gallons or more or if the spill enters a watercourse regardless of quantity, the Contractor is required to contact the MassDEP's Office of Emergency Response immediately at 401-222-3070 (24 hour/7 days per week).

a. When MassDEP is called, the Contractor shall provide the following information

1) Date and Time of Spill

2) Project name

3) The precise location of the spill

4) Contact person, telephone number and mailing address

5) Description of the spill (estimated quantity; type of material released)

6) Name of Emergency Response Contractor

7) Response Actions taken (has containment been done, has cleanup been initiated)

8) The names of other entities/agencies notified (i.e., Owner, Fire Department, etc.)

PART 2 - PRODUCTS

2.1 ABSORBENT AND CONTAINMENT MATERIALS

A. Contractor shall equip crews and/or provide machinery with the most efficient type of petroleum absorbent materials. These materials are available at petroleum equipment suppliers and must be readily accessible so that spillages can be quickly contained and prevented from becoming greater incidents.

B. Absorbent "pigs", pillows, pads, and/or other fiber materials, as well as sand or absorbent granular material (e.g., cat litter) may be used as an absorbent material. Oil-Dri, Speedy-Dri and like products are accepted and shall be stocked on site.

C. Floating containment booms shall be stocked on site capable of extending to encompass an area no less than 50-feet along the impoundment shoreline, or otherwise along or across the moat channel.

D. Sufficient quantity of absorbent and containment materials capable of absorbing at least 50 gallons of OHM shall be stocked at the job site at all times in order to implement an initial response to mitigate and contain a spill or release:

1. Contractor staging area shown on contract drawings

2. Other locations if accepted by the Engineer prior to construction.

PART 3 - EXECUTION

3.1 GENERAL

A. Stockpiling of floating booms and absorption material on-site in sufficient quantity is required due to the sensitive nature of the work zone. Payment for these items is included in miscellaneous work and cleanup.

B. The Contractor shall provide all necessary Emergency Response training to its own personnel at all levels to ensure the proper implementation of Emergency Response.

C. It is the Contractor's responsibility to provide off-site transport and disposal of all remediation waste associated with any OHM release incident.

D. Contaminated waste materials generated during emergency response activities shall be temporarily stored by the Contractor in a designated area approved by the Engineer until an off-site receiving facility has accepted the shipment.

E. The Contractor shall identify a legal receiving facility for the disposal of the cleanup wastes. The receiving facility must be approved by the Owner prior to offsite transport and disposal of the material by the Contractor. A copy of the chain of custody and disposal documents shall be provided to the Owner after the waste is disposed.

F. The Contractor's LSP shall prepare all written documents that are required in relation to any and all releases, to the extent required by applicable laws and regulations. Copies of all documents must be submitted to the Owner at the time the documents are transmitted to the relevant agencies.

3.2 PROCEDURES

A. Perform work as specified herein and in accordance with the applicable provisions of MassDEP and Massachusetts Dept. of Transportation (MassDOT) procedures, and any Owner spill prevention countermeasures and control requirements.

B. No payment will be made to the Contractor for the cost of any response or handling and disposing of leaks, spillages and materials contaminated by such leaks or spillages.

C. The steps outlined below are minimum requirements and are only presented as guidelines for a spill or release of ANY quantity of OHM. They do not constitute a complete compliance or notification procedure:

1. STEP 1

a. If a spill or release is discovered, determine the origin of that leak or spillage. Stop the spillage or leak and positively contain it, and then use absorbents to collect discharged liquid.

Immediately notify the Owner and the Engineer.

2. STEP 2

   a. Deploy containment booms and other absorbent materials to prevent migration of spillage and/or seepage below ground.

      Once containment and absorption of spilled fuels is complete, the impacted (Contaminated) absorbent materials shall be stored in 55-gallon steel drums (100-150 lbs.). If leaked or spilled fuel has been absorbed into the soils, excavate and containerize the impacted (contaminated) soils. Soils may be stored in sealed 55- gallon steel drums.

3. STEP 3

   a. The contaminated materials must be collected, containerized and otherwise properly stored and labeled prior to transport to a pre-approved storage, disposal or treatment facility.

      All drums used to store impacted (contaminated) absorbent material and/or contaminated soils shall be properly sealed and labeled with the following information.

      Name of Company (Contractor)
      Contract or Project No.:
      Location of origin:
      Type of contents:
      Type of containment:
      Quantity: (e.g. 1 of 1)
      Date:
      Containerized by:
      Labeled by:

END OF SECTION

SECTION 01 70 00
EXECUTION REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:

1. Examination
2. Preparation
3. Construction layout
4. Field engineering and surveying
5. General installation of products
6. Progress cleaning
7. Adjusting
8. Protection of installed construction
9. Correction of the Work

1.3 SUBMITTALS

A. Certificates: Submit certificate signed by land surveyor or professional engineer certifying that location and elevation of improvements comply with requirements.

1.4 QUALITY ASSURANCE

A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

B. All survey work for the project shall be performed to meet Class II accuracy standards, as established in the Land Surveying Procedures and Standards in the State of Massachusetts, effective April 1, 1994 and applicable revisions.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of site improvements and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical, plumbing and electrical systems and other construction affecting the Work.

B. Existing Utilities: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning site work, investigate and verify the existence and location of underground utilities and other construction affecting the Work.

C. Acceptance of Conditions: Examine substrates, areas, and conditions, with Engineer present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations and report to Engineer conditions pertaining to suitability for connecting to proposed structure.

1. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:

a. Description of the Work.

b. List of detrimental conditions, including substrates.

c. List of unacceptable installation tolerances.

d. Recommended corrections.

2. Verify compatibility with and suitability of substrates, including compatibility with proposed dowels and concrete structures.

3. Proceed with installation only after unsatisfactory conditions have been adequately addressed by inspection and measurements determined by Engineer.

3.2 PREPARATION

A. Existing Utility Information: Furnish information to Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Engineer and Owner not less than seven days in advance of proposed utility interruptions.

2. Do not proceed with utility interruptions without Engineer's or Owner's written permission.

C. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

D. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

E. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Engineer. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents.

3.3 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings. If discrepancies are discovered, notify Engineer prior to proceeding with the Work.

B. General: Engage a land surveyor or professional engineer to lay out the Work using accepted surveying practices.

1. Establish benchmarks and control points to set lines, grades, and levels as needed to locate each element of Project.
2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
3. Check the location, level and plumb, of every major element as the Work progresses.
4. Notify Engineer when deviations from required grades, lines, and levels exceed allowable tolerances.

C. Site Improvements: Locate and lay out site improvements, including grading, and invert elevations.

D. Lines and Levels: Locate and lay out control lines and levels for structures.

3.4 FIELD ENGINEERING

A. Reference Points: Locate or establish benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.

1. Do not change or relocate existing benchmarks or control points without prior

written approval of Owner. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Engineer before proceeding.

2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

B. Certified Survey: On completion of work, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and site work.

3.5 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb and make horizontal work level.

2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.

F. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

G. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.6 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness

necessary for proper execution of the Work.

1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Cutting and Patching: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

1. Thoroughly clean surfaces before applying paint or other finishing materials.

H. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.

I. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

J. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

K. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.7 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.8 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes

1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

B. Restore permanent facilities used during construction to their specified condition.

C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION

SECTION 01 77 00

CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Inspection procedures
2. Project Record Documents (As-Built Drawings)
3. Final cleaning

1.3 QUALITY ASSURANCE

A. Where "MassDOT Standard Specifications" is used, it shall mean "Commonwealth of Massachusetts Department of Transportation Standard Specifications for Highways and Bridges, 2023 Edition" and issued supplements

1.4 SUBMITTALS

A. Record Drawings: Submit Project Record Documents

1. One set of 24" x 36" record drawings are required. See Section 1.9 below.

B. Submit a written request for substantial completion.

C. Prior to final inspection submit a list certifying completion of the punch list.

D. Product Data and Warranty: Submit one copy of each Product Data and warranty package provided by manufacturer including maintenance procedures.

1.5 SUBSTANTIAL COMPLETION

A. When Contractor considers the Work is substantially complete, he shall submit to the Engineer:

1. A list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
2. Advise Owner of pending insurance changeover requirements.
3. Engineer will review the Contractor's certification and examine the Work for conformance to the Substantial Completion Certification and the Contract Documents.
4. Submit specific warranties, workmanship bonds, maintenance service agreements (if applicable), final certifications, and similar documents.
5. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities.
6. Contractor shall remedy the deficiencies in the Work within seventy-two (72) hours, and send a second written notice of substantial completion to the Engineer.
7. Prepare and submit Project Record Documents, operation and maintenance manuals, and similar final record information.
8. Engineer will re-examine the Work.

B. When Engineer finds that the Work is substantially complete, the Engineer will:

1. Prepare a Certificate of Substantial Completion, accompanied by Contractor's list of items to be completed or corrected, as verified and amended.
2. Distribute to Contractor, Engineer, and Owner for their written acceptance of the responsibilities assigned to them in the Certificate.

C. After Work is substantially complete, Contractor shall:

1. Complete Work listed for completion or correction within designated form.
2. Perform all cleaning in accordance execution requirements noted below.

1.6 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Submit a punch list of incomplete items. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Include the following information at the top of each page:
   a. Project name
   b. Date
   c. Name of Engineer
   d. Name of Contractor
   e. Page number

1.7 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:

1. Submit a final Application for Payment.

2. Submit certified copy of Engineer's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Engineer. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.

3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will notify Contractor of construction that must be completed or corrected before final payment will be issued.

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.8 PRODUCT WARRANTIES AND PRODUCT BONDS

A. Obtain warranties and bonds executed in duplicate by the responsible subcontractors, suppliers, and manufacturers, within 10 days after the completion of the applicable item of work.

B. Execute and assemble the transferable warranty documents and bonds from the subcontractors, suppliers, and manufacturers.

C. Verify that the documents are in the proper form, contain full information, and are notarized.

D. Co-execute the submittals when required.

E. Include a Table of Contents and assemble in a three D side ring binder with a durable plastic cover.

F. Submit prior to the final Application for Payment.

G. Time of Submittals:

1. For equipment or component parts of equipment put into service during construction with the Owner's permission, submit the documents within 10 days after acceptance.

2. Make other submittals within 10 days after the Date of Substantial Completion, prior to the final Application for Payment.

3. For items of Work for which acceptance is delayed beyond the Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty or bond period.

1.9 PROJECT RECORD DOCUMENTS

A. General: Do not use Project Record Documents for construction purposes. Protect Project Record Documents from deterioration and loss. Provide access to Project Record Documents for Engineer's reference during normal working hours.

a. Meet with Engineer monthly to review Red Line Markups on Construction Plans.

b. Where installation varied from that originally shown, provide information sufficient to locate the changes e.g. elevations, dimensions, and swing ties.

c. Record data as soon as possible after obtaining it. Record information prior to backfill.

d. Create tie cards for water services including swing ties, install date, materials and sizes used, installer and inspector info.

e. Take swing ties to all valves and fittings on water mains. Ties shall be to permanent structures.

2. Final As-Built Drawings shall be submitted to the Engineer prior to retainage release. Translate all red-line markups onto a clean plan set either digitally or one hard copy and submit to the Engineer for review and approval.

B. Miscellaneous Record Submittals: Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

PART 2 - PRODUCTS

2.1 Not Used

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning:

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:

   a. Clean areas disturbed by construction activities, of rubbish, surplus soil, waste material, litter, and other foreign substances.

   b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.

   c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.

   d. Remove tools, construction equipment, machinery, and surplus material from Project site.

   e. Remove debris from limited access spaces, including trenches, equipment vaults, manholes, and similar spaces.

   f. Leave Project clean and ready for occupancy.

C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury stumps, debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials unlawfully. Remove waste materials from Project site and dispose of lawfully.

D. If the Contractor fails to clean up, the Owner may do so and the cost thereof will be charged to the Contractor.

END OF SECTION

SECTION 02 41 13

DAM DEMOLITON

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Special Conditions apply to this section.

1.2 SUMMARY

A. This section includes the following:

1. Full depth sawcut roadway at limit of work.
2. Remove and legally dispose of existing pavement.
3. Demolition and removal of the existing spillway, guardrail, stone culvert, upstream granite block walls, wooden platform, and earthen embankment
4. Removal and disposal of existing corroded storm water drainage system through the dam embankment.

1.3 DEFINITIONS

A. Dam: Spillway, training walls, weir structure and earthen embankments.

B. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged.

1.4 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of the Contractor.

1.5 INFORMATIONAL SUBMITTALS

A. Schedule of Dam Demolition Activities: Indicate the following:

1. Detailed sequence of demolition work and water control, with starting and ending dates for each activity.

B. Pre-demolition Photographs Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by demolition operations. Submit before the Work begins.

1.6 QUALITY ASSURANCE

A. Preconstruction Meeting: Conduct meeting with Engineer and on-site supervisor to review the following:

1. Inspect and discuss the condition of the materials to be demolished.

2. Review and finalize protection requirements.

3. Review procedures for noise control and dust control.

1.7 PROJECT CONDITIONS

A. Traffic: minimize interference with adjoining roads, homes, and other adjacent facilities during demolition. The road is permitted to be closed in the immediate area of the work zone for the stated contract time.

B. Utility Locator Service: Notify Dig Safe for the area where the project is located before demolition commences. Aquarion Water Company must be notified prior to demolition. There is a 6" 1977 ductile iron water main crossing the culvert. Locate water main prior to demolition.

C. Do not commence any demolition operations until temporary erosion and sedimentation control measures are in place.

D. Restore items and surfaces damaged by construction operations to existing condition or better.

E. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

1. If materials suspected of containing hazardous materials are encountered, do not disturb and immediately notify the Engineer and Owner.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. Satisfactory Soils: Comply with requirements in Section 31 20 00 – Earthwork. Satisfactory Soils may be considered for re-use on site. The Contractor shall be responsible for stockpiling and segregating Satisfactory Soils.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Review available project record documents and existing conditions ahead of demolition. The owner does not guarantee that existing conditions are the same as indicated on the available project documents.

3.2 PROTECTION

A. Existing Facilities: Protect adjacent roadway, embankments, and utilities during demolition operations.

B. Temporary Protection: Erect temporary protection, such as fences and railings, where required by authorities having jurisdiction and as indicated.

1. Protect adjacent facilities from damage due to demolition activities.
2. Protect existing site improvements, appurtenances of the dam not marked for demolition and landscaping to remain.
3. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.
4. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

3.3 DEMOLITION, GENERAL

A. General: Demolish indicated portions of the dam completely. Used methods required to complete the work within limitations of governing regulations.

B. Site Access and Temporary Controls: Conduct dam demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.

C. Use of explosives is not permitted.

D. Below-Grade Construction

1. Fully remove foundations, walls, and other below-grade construction. Cut below-grade construction.

E. Deploy dewatering and temporary flow controls to perform the work "in-the-dry". This includes trench groundwater, pond outlet flow conveyance if necessary, coffer dams, and environmental controls at the discharge of pumps.

F. GRANITE BLOCK WALL

1. The existing bank is protected by granite block wall in good condition, as does portions of the downstream headwall. Remove and stack reuseable pieces of granite block wall within the disturbance area and deliver to the DPW yard at 34 Charlton Street, Oxford MA 01540.

3.4 SITE RESORATION

A. Below-Grade Areas:

1. Rough grade below-grade areas ready for further excavation or new construction.

B. Site Grading: Uniformly rough grade area of demolished construction to as smooth surface, free from irregular surface changes, Provide a smooth transition between adjacent existing grades and new grades.

3.5 DISPOSAL OF DEMOLISHED MATERIALS

A. Remove demolition materials from the project site and legally dispose off the Owner's property.

1. Do not allow demolished materials to accumulate on-site. Remove expeditiously.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

END OF SECTION

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions, apply to this Section.

1.2 SUMMARY

A. This Section specifies cast-in place concrete, formwork, reinforcement, concrete materials, mix design, placement procedures, and finishes.

1.3 SUBMITTALS

A. Product Data: For each type of manufactured material and product indicated.

B. Design Mixes: For each concrete mix. Include alternate mix designs when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.

1. Indicate amounts of mix water to be withheld for later addition at Project site.

C. Steel Reinforcement Shop Drawings: Details of fabrication, bending, and placement, prepared according to ACI 315, "Details and Detailing of Concrete Reinforcement." 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.

D. Material Certificates: Signed by manufacturers certifying that each of the following items complies with requirements:

1. Cementitious materials and aggregates
2. Form materials and form-release agents
3. Steel reinforcement and reinforcement accessories
4. Admixtures
5. Waterstops
6. Curing materials
7. Bonding agents
8. Adhesives
9. Epoxy joint filler

10. Joint-filler strips

1.4 QUALITY ASSURANCE

A. 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.

B. 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.

C. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 to conduct the testing indicated, as documented according to ASTM E 548.

D. 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.

E. 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."

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle steel reinforcement to prevent bending and damage.

1. Avoid damaging coatings on steel reinforcement.
2. Repair damaged epoxy coatings on steel reinforcement according to ASTM D 3963/D 3963M.

PART 2 - PRODUCTS

2.1 CONCRETE MATERIALS

A. Portland Cement: ASTM C 150, Type I/II

B. Silica Fume: ASTM C 1240, amorphous silica

C. Normal-Weight Aggregate: 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

2.2 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. High-Range, Water-Reducing Admixture: ASTM C 494, Type F

E. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E

F. Water-Reducing and Retarding Admixture: ASTM C 494, Type D

2.3 CONCRETE MIXES

A. Prepare design mixes for each type and strength of concrete determined by either laboratory trial mix or field test data bases, as follows:

1. Proportion normal-weight concrete according to ACI 211.1 and ACI 301.

B. Use a qualified independent testing agency for preparing and reporting proposed mix designs for the laboratory trial mix basis.

C. All Concrete: Proportion normal-weight concrete mix as follows:

1. Compressive Strength (28 Days): 4000 psi
2. Maximum Slump: 4 inches
3. Minimum Cementitious Materials Content: 560 lb/cu yd

D. Cementitious Materials: For concrete exposed to deicers, limit percentage, by weight, of cementitious materials other than Portland cement according to ACI 301 requirements.

E. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than Portland cement in concrete as follows:

1. Silica Fume: 10 percent

F. Maximum Water-Cementitious Materials Ratio: 0.45 for concrete exposed to deicers or subject to freezing and thawing while moist.

G. Air Content: Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content as follows within a tolerance of plus 1 or minus 1.5 percent, unless otherwise indicated:

1. Air Content: 6 percent for 3/4-inch-nominal maximum aggregate size.

H. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.

I. Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing admixture or high-range water-reducing admixture (superplasticizer) in concrete, as required, for placement and workability.

2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

2.4 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94, and furnish batch ticket information.

2.5 STEEL REINFORCEMENT

A. Plain Steel Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed

B. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.6 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 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.

B. Joint Dowel Bars: Plain-steel bars, ASTM A 615/A 615M, Grade 60 (Grade 420). Cut bars true to length with ends square and free of burrs.

2.7 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. Plywood, metal, or other approved panel materials.

2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:

a. High-density overlay, Class 1, or better.

b. Medium-density overlay, Class 1, or better, mill-release agent treated and edge sealed.

c. Structural 1, B-B, or better, mill oiled and edge sealed.

d. B-B (Concrete Form), Class 1, or better, mill oiled 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. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch, minimum.

D. 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.

E. 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 inch to the plane of the exposed concrete surface.

2. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

2.8 WATERSTOPS

A. Flexible PVC Waterstops: CE CRD-C 572, for embedding in concrete to prevent passage of fluids through joints. Factories fabricate corners, intersections, and directional changes.

1. Profile: Ribbed with center bulb

B. Self-Expanding Strip Waterstops: Manufactured rectangular or trapezoidal strip, sodium bentonite or other hydrophylic material for adhesive bonding to concrete.

2.9 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete

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. Clear, Solvent-Borne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B

2.10 RELATED MATERIALS

A. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber, or ASTM D 1752, cork or self-expanding cork.

B. Epoxy Joint Filler: Two-component, semi-rigid, 100 percent solids, epoxy resin with a Shore A hardness of 80 per ASTM D 2240.

C. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

D. 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. Type II, non-load bearing, for bonding freshly mixed concrete to hardened concrete.
2. Types I and II, non-load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
3. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

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.

C. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:

1. Class A, 1/8 inch.

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. Chamfer exterior corners and edges of permanently exposed concrete.

H. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

I. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

J. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

K. 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 deg. F for 24 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.

B. Leave formwork, for beam soffits, joists, slabs, and other structural elements, that supports the weight of concrete in place until concrete has achieved the following:

1. At least 70 percent of 28-day design compressive strength.

2. 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 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.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

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.

3.5 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.

3.6 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.

C. Dowel Joints: Install dowel sleeves and dowels or dowel bar and support assemblies at joints where indicated.

1. Use dowel sleeves or lubricate or asphalt-coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.7 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. Concrete shall not be placed before the reinforcing has been inspected and approved to be in accordance with the plans by the Engineer, the Engineer's representative or the Owner's representative.

C. Before placing concrete, water may be added at Project site, subject to limitations of ACI 301.

1. Do not add water to concrete after adding high-range water-reducing admixtures to mix.

D. 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.

E. 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. Consolidate placed concrete with mechanical vibrating equipment. Use equipment and procedures for consolidating concrete recommended by ACI 309R.

2. 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.

F. 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.

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 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg 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 deg 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.

3.8 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defective areas repaired and patched, and fins and other projections exceeding 1/4 inch in height rubbed down or chipped off.

1. Apply to concrete surfaces not exposed to public view

B. 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. Completely remove fins and other projections.

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.

2. Apply the following rubbed finish, defined in ACI 301, to smooth-formed finished concrete:

a. Smooth-rubbed finish

C. 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.

3.9 FINISHING UNFORMED SURFACES

A. General: Comply with ACI 302.1R for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Screed surfaces with a straightedge and strike off. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane before excess moisture or bleedwater appears on the surface.

1. Do not further disturb surfaces before starting finishing operations.

C. Float Finish: Apply float finish to surfaces indicated, to surfaces to receive trowel finish.

D. Trowel Finish: Apply a hard trowel finish to non-formed surfaces exposed to view.

3.10 TOLERANCES

A. Comply with ACI 117, "Specifications for Tolerances for Concrete Construction and Materials".

3.11 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.

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.

3.12 FIELD QUALITY CONTROL

A. Testing Agency: Engage a 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 Agency: The Contractor will engage a qualified independent testing and inspecting agency to sample materials, perform tests, and submit test reports during concrete placement. Sampling and testing for quality control may include those specified in this Article.

C. Concrete 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 mix exceeding 5 cu. yd., but less than 25 cu. yd., 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 deg. F and below and when 80 deg. 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.

6. Compressive-Strength Tests: ASTM C 39; test two laboratory-cured specimens at 7 days and two at 28 days.

a. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at age indicated.

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 to Engineer, 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. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Engineer but will not be used as sole basis for approval or rejection of concrete.

G. 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 may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42 or by other methods as directed by Engineer.

END OF SECTION

SECTION 05 50 00

METAL FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Miscellaneous Metals.

B. Elements under this Section include, but are not limited to, the following:

1. Grating
2. Ladders at the spillway
3. Trash racks

1.3 SUBMITTALS

A. Shop Drawings: Show fabrication and installation details for metal fabrications.

1. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.

B. Qualification Data: For qualified professional engineer.

C. Mill Certificates: Signed by manufacturers of stainless-steel certifying that products furnished comply with requirements.

D. Welding certificates.

1.4 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

B. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
2. AWS D1.6, "Structural Welding Code - Stainless Steel."

1.5 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

1.6 COORDINATION

A. Deliver items to Project site in time for installation.

PART 2 - PRODUCTS

2.1 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

2.2 FERROUS METALS

A. Beam: Hot rolled carbon steel, ASTM A36

2.3 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

2.4 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm) unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

D. Form exposed work with accurate angles and surfaces and straight edges.

E. Weld corners and seams continuously to comply with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.

4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing.

F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.

G. Fabricate seams and other connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

2.5 FINISHES, GENERAL

A. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

C. Field Welding: Comply with the following requirements:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.

2. Obtain fusion without undercut or overlap.

3. Remove welding flux immediately.

4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

D. Welded Shear Studs

1. The surface on which the shear connectors are to be welded shall be thoroughly cleaned of mill scale, rust, dirt, paint, grease or other materials which would

reduce the quality of the weld. The stud shear connectors shall be free from rust scale, rust pits and oil at the time of welding.

2. Stud shear connectors shall be end welded with automatically timed stud welding equipment connected to a recommended power source.

3. Welding will not be permitted when the air temperature is below 35°F, except with the special permission of the Engineer, and in no case will welding be permitted when air temperature is below 25°F, or when surfaces to be welded are wet from condensation, rain, snow or ice, when rain or snow is falling on the surfaces to be welded, or during periods of high wind, unless the welding operation and the work are properly protected.

4. While in operation, the welding gun shall be held in position without movement until the weld metal has solidified. After cooling, the ferrules shall be removed from each stud.

E. Proposed and constructed final finish color and gloss of fabricated structures installed at the site shall meet the approval of the Owner. Damaged or defective areas shall be corrected by the Contractor as required by the Owner.

END OF SECTION

SECTION 31 00 00

EARTHWORK

PART 1 - GENERAL

1.1 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.

1.2 SUMMARY

A. Furnish all labor, materials, equipment, and incidentals necessary to perform all earthwork, to include but not limited to excavation, fill placement, grading, and compaction required to complete the work in accordance with the Contract Drawings and Specifications.

1.3 QUALITY ASSURANCE

A. Materials shall be tested using the following standards:

1. ASTM D 6913: Grain Size Analysis
2. ASTM D 1557: Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort.
3. ASTM D 2922/3017: Field Moisture/Density Tests

B. Standard Specifications: "Commonwealth of Massachusetts Department of Transportation Standard Specifications for Highways and Bridges"

1.4 SUBMITTALS

A. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated.

1. All Fill Materials
    a. Gradation analysis according to ASTM D 6913, prior to delivery to the site and one per 1,000 CY delivered.
    b. Laboratory compaction test results according to ASTM D 1557, prior to delivery to the site and one per 1,000 CY delivered.
    c. Field Compaction Test results according to ASTM D 6938, one per 1,000 square feet of lift, or one per lift if lift is less than 1,000 square feet.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Low Permeability Fill: to be used for backfill around structures where called out on the Drawings shall be free from ice, snow, roots, sod, rubbish, and other deleterious or organic matter, and shall be graded within the following limits:

U.S. Standard Sieve Size	Percent Passing by Weight
3-inch	100
No. 10	30 – 90
No. 40	10 – 70
No. 200	10 – 40

B. Satisfactory Soils: Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D 2487 or a combination of these groups; free of rock or gravel larger than 4 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

C. Unsatisfactory Soils: Soil Classification Groups OL, OH, and PT according to ASTM D 2487 or a combination of these groups. Any Soil that does not meet the specifications for any soils proposed to be used on the dam.

   a. Soils not maintained within 2 percent of optimum moisture content at time of compaction.

   b. Reclaimed onsite soil containing greater than 2 percent fractured construction debris. Soil containing bulk waste that exceeds 3 inches in diameter or volatile solids, organic material. Filter sand that has become contaminated with foreign soil material containing more than 3 percent fines (percent passing the No. 200 sieve). This material shall be removed and disposed from the site.

D. Stone Armor: Shall consist of Modified Rockfill as specified in the Commonwealth of Massachusetts Department of Transportation Standard Specifications for Highways and Bridges

E. Bedding/Crushed Stone: Bedding stone shall consist of material conforming to the Commonwealth of Massachusetts Department of Transportation Standard Specifications for Highways and Bridges

   a. Section M2.01.0. Crushed stone and meeting the gradation of M2.01.1 or M2.01.2.

F. Filter Sand: Shall consist of washed fine aggregate conforming to ASTM-C33 Sand or meet the following gradation:

U.S. Standard Sieve Size	Percent Passing by Weight
3/8"	100
No. 4	95-100
No. 10	80-100
No. 40	50-85
No. 50	5-30
No. 100	0-10
No. 200	0-2

A. Gravel Borrow: To be used for construction of gravel access roads, roadway subbase, and general backfill shall meet the of Type B Gravel Borrow as as specified in the Commonwealth of Massachusetts Department of Transportation Standard Specifications for Highways and Bridges.

2.2 AUXILIARY MATERIAL

A. Filter Fabric: Nonwoven geotextile, specifically manufactured as a drainage geotextile; made from polyolefins, polyesters, or polyamides; and with the following minimum properties determined according to ASTM D 4759 and referenced standard test methods":

a. Grab Tensile Strength: 120 lbf; ASTM D 4632.

b. Tear Strength: 50 lbf; ASTM D 4533.

c. Puncture Resistance: 310 lbf; ASTM D 4833.

d. Water Flow Rate: 135 gpm per sq. ft.; ASTM D 4491.

e. Apparent Opening Size: No. 70; ASTM D 4751.

f. Available Product and Manufacturer:
   i. Mirafi 140N by Tencate.
   ii. Or an approved equal.

PART 3 - EXECUTION

3.1 JOB CONDITIONS

Locate and acknowledge existing underground and above-ground utilities and structures in areas of work. If structures and utilities are to remain in place, provide adequate means of support and protection during earthwork operations. Should uncharted structures, piping or utilities be encountered during excavation, consult utility owner immediately for directions. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.

A. Protection of Persons and Property:

1. Protect all construction areas in an approved manner with items not limited to warning lights, barricades or signs.

2. Protect all structures, including the dam and associated appurtenances, utilities, pavements, and other facilities from damage caused by settlement, undermining, lateral movement, washout and/or other hazards created by earthwork operations.

3. The contractor shall not enter upon private property without first obtaining permission and shall be responsible for the preservation of all public and private property, outside the limits of construction indicated on the plans. If any damage is done to public or private property by or on account of any act, omission, neglect or misconduct in the execution of work, Contractor shall restore at its own expense such property to a condition similar or equal to the condition which existed before the damage was done.

4. Temporary construction and permanent easements have been laid out for work on private property as part of this construction package.

3.2 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.

3.3 UNAUTHORIZED EXCAVATION

A. If unauthorized excavation is performed beyond the limits shown on the Plans or the limits directed by the Engineer, it shall be backfilled at the Contractor's expense with material satisfactory to the Engineer and compacted in accordance with provisions in this section.

3.4 SUBGRADE PREPARATION

A. Prior to fill placement, the subgrade should be compact, dry, and free from debris, ice, and snow. Fill placement will not be allowed over frozen subgrade. The temporary construction access ramp shall be performed to the original lines, grades, and contours at the site or as indicated on the Construction Drawings.

B. Subgrade preparation should be followed immediately by fill placement, or the intended construction. Deterioration of the subgrade between excavation and initial fill placement shall be the responsibility of the Contractor and shall be repaired at the Contractor's expense.

C. All subgrades must be inspected by the Engineer prior to fill placement. Sufficient time must be given to the Engineer to inspect and perform any necessary tests on the subgrade.

D. If in the opinion of the Engineer, the subgrade becomes disturbed, the material shall be recompacted if conditions permit, or excavated and replaced with compacted suitable material as ordered by the Engineer.

E. Excavation in preparation for the new spillway structure shall be graded back to 3H:1V slopes to allow good contact with compacted low permeability backfill.

3.5 STOCKPILES

A. Space is limited on the site is limited. Laydown areas for equipment and materials have been identified on the drawings.

B. Imported material should be delivered in a continuous manner and not stockpiled on site for more than three days.

C. All stockpiled materials must be contained with appropriate sedimentation controls.

3.6 FILL PLACEMENT AND COMPACTION REQUIREMENTS

A. Fill shall be placed in a continuous manner. Deterioration of fill surfaces due to freezing and thawing, precipitation, excessive drying, etc. shall be repaired by and at the expense of the Contractor to the satisfaction of the Engineer prior to placement of additional fill materials.

B. Maximum loose lift thickness of fill during placement is not to exceed 12 inches, unless otherwise noted.

C. All fill shall be placed "in the dry." The fill areas shall be graded to drain and provide a smooth surface which will readily shed water.

D. Fill placement shall not be allowed on top of frozen ground or during weather conditions which do not allow for proper moisture and density controls.

E. The Degree of compaction shall be based on a maximum dry density as determined by ASTM Specification D 1557. The degree of compaction required, unless otherwise noted on the Plans or directed and approved by the Engineer, shall be as follows:

1. Gravel Borrow – Minimum 95% of the maximum dry density.
2. Low Permeability Fill – Minimum of 95% of the maximum dry density.
3. Filter Sand – Place in maximum 8 inch thick loose lifts and compact each lift with three passes of a vibratory plate compactor.
4. Gravel Borrow for Drainage Structures – Place in maximum 8 inch thick loose lifts and compact each lift with three passes of a vibratory plate compactor.

F. Compaction testing is required at the following frequencies:

1. At each compacted fill layer, at least one test for every 1,000 square feet or less.
2. At least one per compacted fill layer.

3.7 WORK IN FREEZING WEATHER

A. Protect excavation bottoms against freezing when atmospheric temperature is lass than 35 degrees Fahrenheit.

B. Do not place foundations or fill material on frozen ground. Removal of these unsatisfactory materials will be required as directed by the Engineer.

C. When freezing temperatures may be expected, do not excavate to the full depth indicated, unless foundations or fille material can be placed immediately after the excavation has been completed and inspected.

D. The Contract shall keep the operations under this Contract clear and free of accumulation of snow within the limits of the Contract Lines as required to carry out the work.

3.8 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from freezing and erosion. Keep free of trash and debris.

1. Provide mulching on all slide slopes of the temporary construction access ramp.

2. Provide timber crane matting as indicated on the contract drawings for additional stabilization within the footprint of the temporary construction access ramps and between the delineated wetland on the side slopes.

B. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.

DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

END OF SECTION

SECTION 31 10 00

SITE CLEARING

GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Special Conditions apply to this Section.

1.2 SUMMARY

A. This section includes the following:

1. Protecting existing trees and vegetation to remain.

2. Stripping and stockpiling topsoil.

B. Limits of Work: Perform only as much clearing as required to complete the Work.

1.3 DEFINITIONS

A. Existing Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt and clay particles; friable, pervious and black or darker shade of brown that underlying subsoil; reasonably free of subsoil, clay lumps, gravel and other objects more than 2 inches in diameter; and free of subsoil and weeds, roots, toxic materials or other non-soil materials.

1.4 MATERIALS OWNERSHIP

A. Except for stripped topsoil or other materials indicated to remain on Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.5 SUBMITTALS

A. Photographs, sufficiently detailed, of existing conditions of trees and plantings, adjoining construction, and site improvements that might be misconstrued as damage caused by site clearing.

1.6 QUALITY ASSURANCE

A. Preconstruction Meeting: Conduct meeting with Engineer and on-site supervisor and review the following:

1. Clearing limits.

2. Trees to be protected and Location of tree protection zones.

3. Location of tree protections zones.

4. Tree removal marking system and requirements.

1.7 PROJECT CONDITIONS

A. Traffic: minimize interference with adjoining roads, homes, and other adjacent facilities during site clearing operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from the Owner and authorities having jurisdiction.

B. Protect-In-Place Existing Site Improvements: Support and protect in place existing site improvements. Items include poles, wires, mailboxes, fences, curbing, property line markers, and other structures. Restore items promptly; do not leave until the end of construction.

C. Remove and Reset Existing Site Improvements: Remove and protect items to be reset upon completion of construction.

D. Utility Locator Service: Notify Dig Safe for the area where the project is located before site clearing commences.

E. Do not commence site clearing operations until temporary erosion and sedimentation control measures are in place.

F. Restore items and surfaces damaged by construction operations to existing condition or better.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction.

B. Locate and clearly flag trees and vegetation to remain.

C. Protect existing site improvements to remain from damage during construction.

D. Restore damaged improvements to their original condition, as acceptable to Owner.

3.2 TOPSOIL STRIPPING

A. Remove sod and grass before stripping topsoil.

B. Strip topsoil to whatever depths are encountered in a manner to prevent intermingling with underlying subsoil or other waste materials.

1. Screen existing topsoil material with a 1-inch screen. Remove subsoil and non-soil materials from topsoil, including trash, debris, weeds, roots, and other waste materials.

C. Stockpile topsoil materials away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Limit height of topsoil stockpiles to 72 inches.
2. Do not stockpile topsoil within tree protection zones.
3. Stockpile surplus topsoil to allow for respreading deeper topsoil.

3.3 SITE IMPROVMENTS

A. Existing Facilities: Protect adjacent roadway, embankments, and utilities during clearing operations.

B. Temporary Protection: Erect temporary protection, such as fences and railings, where required by authorities having jurisdiction and as indicated.

1. Protect adjacent facilities from damage due to clearing activities.
2. Protect existing site improvements, appurtenances of the dam not marked for clearing and landscaping to remain.

3.4 CLEARING, GENERAL

A. General: Clear indicated portions of the brush to establish access to the downstream channel and gatehouse.

B. Use water mist and other suitable methods to limit the spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.

C. For trees marked for removal, grind down stumps and remove roots, obstructions and debris to a depth of 24 inches below existing grade.

3.5 RESTORATION

A. Restore areas disturbed by clearing procedures according to the requirements in Section 32 40 00 "Site Restoration"

3.6 DISPOSAL OF CLEARED MATERIALS

A. Remove cleared materials from the project site and legally dispose of them in an EPA approved landfill.

1. Do not allow cleared materials to accumulate on-site.

2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

END OF SECTION

SECTION 31 25 00

EROSION AND SEDIMENTATION CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Special Requirements, apply to this Section.

1.2 SUMMARY

A. This Section includes furnishing, placing, and maintaining sedimentation control measures as shown on the Drawings, as directed by the Engineer, and where necessary to reduce sediment content of runoff. Measures include the following:

1. Silt fence
2. Straw bales
3. Turbidity barrier
4. Erosion control blanket
5. Dewatering basin
6. Construction entrance
7. Dust control.

1.3 SUBMITTALS

A. Product Data

1. Silt fence
2. Geotextile fabric
3. Erosion control blanket
4. Turbidity curtain

B. Certificates of Compliance

1. Filter fabric and geotextiles
2. Erosion control blank et
3. Silt fence
4. Dewatering Basin

1.4 QUALITY ASSURANCE

A. Commonwealth of Massachusetts Department of Transportation Standard Specifications for Highways and Bridges

B. Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas, 2003.

PART 2 - PRODUCTS

2.1 STRAW BALE

A. Filling: Compostable material, 67 pounds/linear foot.

B. Diameter: 18 inches.

C. Stakes: Wood, 2-inch by 2-inch by 48-inch minimum.

2.2 TURBIDITY BARRIER

A. Shall be a sediment containment barrier meeting the following requirements:

1. Comprised of a filter fabric composed of woven polypropylene allowing the passage of water but retaining soil particles.
2. Fabric comprised of vinyl coated nylon or polyester, having a weight of 22 oz/square yard.
3. Ballast provided by galvanized chain having a weight of 1.1 lb/foot.
4. 7,600 lb break strength on load carrying components.
5. 6" min. diameter cylindrical flotation boom.

2.3 EROSION CONTROL BLANKET

A. Shall be three-layer blanketing meeting the following requirements and have a functional longevity of approximately 12 months:

1. The top layer shall be a lightweight photodegradable polypropylene of 1.5 /1,000 ft2 weight.
2. The middle layer shall be made of 100% agricultural straw fiber of 0.5 lbs/ yd2 weight.
3. Bottom layer shall be a lightweight, photodegradable polypropylene of 1.50 lbs/1,000 ft2 weight.
4. Stitching shall be a photodegradable thread.

2.4 SILT FENCE

A. Synthetic Filter Fabric: Woven geotextile, 36 inches maximum height, conforming to the following:

Properties	Requirement	Unit
Grab Tensile Strength (ASTM D4632):	124	Lbs
Grab Tensile Elongation (ASTM D4632):	15	Percent
Puncture Strength (ASTM D4833):	60	Lbs
Flow Rate (ASTM D4491):	10	Gal/Min/Sq. Ft.
UV Resistance(at 500 hours) (Retained strength) (ASTM D4355):	80	Percent

2.5 POSTS

A. Hardwood Stakes: 1.5-inch by 1.5-inch by 42-inches, minimum.

2.6 SILT FENCE FASTENERS

A. Staples, tie wires or hog rings, as recommended by manufacturer.

1. Staples: Heavy-duty wire, 1-inch long minimum.

2.7 SEDIMENT DEWATERING BAG

A. Filter Bag (Silt Bag): Manufactured non-woven geotextile fabric bag, sewn with high-strength thread, with a spout to accommodate a 4-inch discharge hose (maximum), and attached straps.

1. Available Product and Manufacturer:

a. Dirtbag® by ACF Environmental, Richmond, VA.

b. Dandy Dewatering Bag by Dandy Products, Inc., Dublin, OH.

c. Or equal.

B. Non-woven Geotextile Fabric:

Properties	Test Method	Units
Grab Tensile Strength	ASTM D4632	250 lbs
Puncture	ASTM D4833	165 lbs.
Flow Rate	ASTM D4491	70 Gal/Min/Sq. Ft.
Permitivity	ASTM D4491	1.3 sec-1
Mullen Burst	ASTM D3786	550 psi.
UV Resistance	ASTM D4355	70 percent
Apparent Opening Size Percent Retained	ASTM D4751	40 US Sieve 100 percent

2.8 CONSTRUCTION ENTRANCE

A. Stone: Stone size M2.01.1 per The Commonwealth of Massachusetts Department of Transportation Standard Specifications for Highways and Bridges

2.9 DUST CONTROL

A. Calcium Chloride: ASTM D98, Type 1 or Type 2.

B. Water: Potable.

PART 3 - EXECUTION

3.1 GENERAL

A. Minimize environmental damage during construction. Prevent discharge of fuel, oil, lubricants, and other fluids. Mitigate effects of discharge.

B. Install erosion and sediment control measures prior to clearing, demolition, or construction.

C. Construct erosion and sediment control measures in accordance with standards and specifications of the Massachusetts erosion and Sediment Control Guidelines for Urban and Suburban Areas.

1. Attend a preconstruction meeting with the Engineer, to review permit conditions and construction methods.

2. Provide additional sedimentation and erosion controls as required by the Engineer to address field conditions.

3. Do not discharge turbid water directly from dewatering to inland wetlands or watercourses.

4. Inspect site weekly and prior to any anticipated rain event. Ensure that erosion controls are properly maintained and functioning.

5. Supply a 24-hour contact name and number as part of the erosion control plan.

D. Install additional control measures, if deemed necessary by the State, City, or Owner.

E. Control dust and wind erosion. Control dust to prevent a hazard to traffic on adjacent roadways. Dust control includes sprinkling of water and uniform application of calcium chloride on exposed soils and haul roads.

F. Do not discharge directly into wetlands or watercourses where dewatering is necessary. Utilize methods and devices as permitted by authorities having jurisdiction and appropriate regulations to minimize and retain suspended solids including pumping water into a temporary sedimentation bowl, providing surge protection at inlet and outlet of pumps, floating pump intake.

1. If pumping operation results in turbidity problems, stop pumping until means of controlling turbidity are determined and implemented.

G. Where control measures are required for longer than 60 days, use silt fence instead of hay bales.

H. Fill Areas

1. Initiate slope stabilization with mulch or grass within 30 days of start of fill installation.

I. Within 7 days of completing slope construction, stabilize slopes with vegetation or matting to minimize exposure.

J. Stockpiles

1. Side Slopes: 2:1 maximum.
2. Surround stockpiles by a sediment barrier.
3. Stabilize stockpiles left bare for more than 15 days with temporary vegetation or mulch.

K. Final Grading

1. If final grading is delayed for more than 30 days after land disturbances cease, stabilize soils with temporary vegetation or mulch.

L. Planting Season for Temporary Vegetation

1. March 1 to June 15 and August 1 to October 1.
2. After September 15, stabilize areas with hay bale check, filter fabric, or woodchip mulch.

M. Areas to Be Left Bare Prior to Finished Grading and Seeding

1. Within Planting Seasons
   a. Temporarily seed with Perennial Ryegrass
   b. Apply at a rate of 2 pounds per 1000 sq. ft. at a depth of 1/2 inch.
   c. Where grass predominates, fertilize according to a soil test at a minimum application rate of one pound per acre.
2. Outside of Planting Seasons
   a. Apply air-dried wood chip mulch, free of coarse matter.
   b. Apply at a rate of 185 to 275 pounds per 1000 sq. ft.

3.2 CONTROL SYSTEM

A. Silt Fence

1. Install fencing at locations indicated on plans or where directed by the Engineer. Maintain pitch of 2 to 20 degrees, with inclination toward potential silt source.
2. Install bottom 6 inches of fabric by trenching and burying the fabric into the notched ground.

3. Drive posts into ground a minimum of 12 inches.

4. Locate fabric splices at posts only. Provide 6-inch overlap and seal.

B. Sedimentation Control Straw Bales

1. Install at locations indicated on plans or as directed by the Engineer. Place hay bales lengthwise with ends tight abutting one another. Install bales with bindings located on the sides.

2. Entrench bales 4 inches and backfill. Place backfill toward potential silt source.

3. Secure in place with 2 stakes per bale and insert straw in voids between bales.

C. Turbidity Barrier

1. Install and maintain as indicated on the Drawings and in accordance with the manufacturer's written instructions.

3.3 SEDIMENT DEWATERING BAGS

A. Install fabric filter bag so incoming water flows downhill or towards drainage system through the filter without creating erosion. Place filter bag on non-woven geotextile fabric layer to maximize water flow through surface area of bag and protect subgrade during handling of the dewatering bag.

B. Dispose of fabric bag when it can no longer efficiently filter sediment or pass water at a reasonable rate.

3.4 DUST CONTROL

A. Apply water and calcium chloride uniformly over the surface when dust becomes a nuisance or when directed by the Engineer.

3.5 MAINTENANCE

A. Control System

1. Inspect control system immediately after each rainfall and daily during prolonged rainfall. Make repairs immediately.

2. Remove and dispose of accumulated sediments when sediment reaches approximately one-third the height of the control system, or when directed by the Engineer.

3. Replace control system promptly if fabric decomposes or system becomes ineffective prior to the expected usable life.

4. Maintain or replace system until no longer necessary for the intended purpose.

B. Construction Entrance

1. Maintain in good condition throughout construction period.

2. Sweep adjacent roadways daily to remove tracked material from pavement.

3.6 REMOVAL

A. Remove and dispose of control system after area stabilizes with new growth or as directed by the Engineer.

END OF SECTION

SECTION 32 12 16

BITUMINOUS CONCRETE PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Bituminous concrete paving.
2. Pavement-marking paint.

1.2 DEFINITIONS

A. Bituminous Concrete Base Course: Asphalt-aggregate layer placed over subgrade, aggregate subbase course, or aggregate base course; and beneath bituminous concrete surface course.

B. Bituminous Concrete Surface Course: The asphalt-aggregate top course of a bituminous concrete pavement, sometimes called a wearing course.

C. DOT: Department of Transportation.

1.3 SYSTEM DESCRIPTION

A. Provide bituminous concrete paving according to materials, workmanship, and other applicable requirements of standard specifications of state or local DOT.

1.4 SUBMITTALS

A. Job-Mix Design Certification: For each job mix proposed for the Work, signed by the supplier.

B. Qualification Data: For bituminous concrete supplier.

C. Material Certificates: For each paving material, signed by manufacturers.

1.5 QUALITY ASSURANCE

A. Supplier Qualifications: A qualified supplier, registered with and approved by MassDOT

B. Asphalt-Paving Publication: Comply with AI MS-22, "Construction of Hot Mix Asphalt Pavements," unless more stringent requirements are indicated.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver pavement-marking materials to Project site in original packages with unbroken seals and bearing manufacturer's labels containing brand name and type of material, date of manufacture, and directions for storage.

B. Store pavement-marking materials in a clean, dry, protected location within temperature range required by manufacturer. Protect stored materials from direct sunlight.

C. Transport bituminous concrete mixture in tight body trucks that have been previously cleaned of foreign material.
   1. Tightly cover trucks with waterproof canvas or other suitable covers.

D. Deliver mixture within 25 deg F of approved job mix formula temperature.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp or if the following conditions are not met:
   1. Prime and Tack Coats: Minimum surface temperature of 60 deg F.
   2. Bituminous Concrete Base Course: Minimum surface temperature of 40 deg F and rising at time of placement.
   3. Bituminous Concrete Surface Course: Minimum surface temperature of 60 deg F at time of placement.

B. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 50 deg F and not exceeding 95 deg F.

PART 2 - PRODUCTS

2.1 BITUMINOUS CONCRETE

A. Tack Coat: AASHTO M 140 Grade SS-1 or SS-1H, emulsified asphalt or AASHTO M 208 Grade CSS-1 or CSS-1H, cationic emulsified asphalt, slow setting, diluted in half with water.

2.2 AUXILIARY MATERIALS

A. Waterborne Pavement-Marking Paint:
   1. Non-Heat-Applied: Article M7.01.23 of Form 816, with a 15 minute drying time.
      a. Color: As indicated.

2.3 MIXES

A. Bituminous Concrete: Dense, hot-laid, bituminous concrete plant mixes approved by authorities having jurisdiction and complying with the following requirements:

1. Provide mixes with a history of satisfactory performance in geographical area where Project is located.
2. Course Depth:
    a. Gravel subbase: 12 inches minimum
    b. Binder course: 2 inches
    c. Top course: 2 inches

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that surface to receive paving is dry and in suitable condition to support paving and imposed loads.

B. Proof-roll subbase or aggregate base course using heavy, pneumatic-tired rollers to locate areas that are unstable or that require further compaction.

C. Proceed with paving only after unsatisfactory conditions have been corrected.

3.2 COORDINATION

A. Paving and Irrigation Installers to coordinate location and installation of pavement sleeves for irrigation piping and wiring."

3.3 REPAIRS

A. Tack Coat: Apply uniformly to vertical surfaces abutting or projecting into new, bituminous concrete paving at a rate of 0.05 to 0.15 gal./sq. yd.

1. Allow tack coat to cure undisturbed before applying bituminous concrete paving.
2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

B. Temporary Repair: Fill excavated pavement area with bituminous concrete base mix to indicated thickness and, while still hot, compact flush with adjacent surface.

C. Permanent Repair: Partially fill excavated pavement area with bituminous concrete base mix and, while still hot, compact. Cover bituminous concrete base course with compacted, bituminous concrete surface layer finished flush with adjacent surfaces.

3.4 SURFACE PREPARATION

A. General: Immediately before placing bituminous concrete, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.

1. Sweep loose granular particles from surface of unbound-aggregate base course. Do not dislodge or disturb aggregate embedded in compacted surface of base course.

B. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of 0.05 to 0.15 gal./sq. yd.

1. Allow tack coat to cure undisturbed before applying bituminous concrete paving.
2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

3.5 BITUMINOUS CONCRETE PLACING

A. Machine place hot bituminous concrete on prepared surface, spread uniformly, and strike off. Place by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.

1. Place bituminous concrete base course in number of lifts and thicknesses indicated.
2. Spread mix at minimum temperature of 250 deg F.
3. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes, unless otherwise indicated.
4. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in bituminous concrete paving mat.
5. In areas inaccessible to pavers, use staked forms to maintain indicated line and grade. Prevent segregation of mix when placing mix by hand.

B. Place paving in consecutive strips not less than 10 feet wide unless edge strips of a lesser width are required.

1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete a section of bituminous concrete base course before placing bituminous concrete surface course.

C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot bituminous concrete to prevent segregation of mix; use suitable hand tools to smooth surface.

3.6 JOINTS

A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions with same texture and smoothness as other sections of bituminous concrete course.

1. Clean contact surfaces and apply tack coat to joints.
2. Offset longitudinal joints, in successive courses, a minimum of 6 inches.
3. Offset transverse joints, in successive courses, a minimum of 24 inches.
4. Construct transverse joints as described in AI MS-22, "Construction of Hot Mix Asphalt Pavements."
5. Compact joints as soon as bituminous concrete will bear roller weight without excessive displacement.
6. Compact material at joints to a density within 2 percent of specified course density.

3.7 COMPACTION

A. General: Begin compaction as soon as placed paving material will bear roller weight without excessive displacement. Compact material with hot, hand tampers or vibratory-plate compactors in areas inaccessible to rollers.

1. Complete compaction before mix temperature cools to 185 deg F.

B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.

C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while bituminous concrete is still hot enough to achieve specified density. Continue rolling until course has been uniformly compacted to the following density:

1. Average Density: 95 percent of reference maximum theoretical density according to AASHTO T 209, but not less than 92 percent nor greater than 97 percent.

D. Finish Rolling: Finish roll paved surfaces to remove roller marks while bituminous concrete is still warm.

E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while material is still hot; compact thoroughly.

F. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh material. Compact by rolling to specified density and surface smoothness.

G. Protection: After the final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.8 INSTALLATION TOLERANCES

A. Thickness: Compact each course to produce the thickness indicated within the following tolerances:

1. Binder Course: 2 inches finish rolled thickness, plus or minus 1/4 inch.
2. Surface Course: 2 inches finish rolled thickness plus 1/4 inch, no minus.

B. Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:

1. Base Course: 3/8 inch.
2. Surface Course: 1/4 inch.
3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch.

C. Variation from Design Elevation: 1/4 inch.

3.9 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and to prepare test reports.
1. Testing agency will conduct and interpret tests and state in each report whether tested Work complies with or deviates from specified requirements.

B. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

C. Thickness: In-place compacted thickness of bituminous concrete courses will be determined according to ASTM D 3549.

D. Surface Smoothness: Finished surface of each bituminous concrete course will be tested for compliance with smoothness tolerances.

E. In-Place Density: Testing agency will take samples of uncompacted paving mixtures and compacted pavement according to AASHTO T 168.

1. Reference maximum theoretical density will be determined by averaging results from four samples of bituminous concrete mixture delivered daily to site, prepared according to AASHTO T 209, and compacted according to job-mix specifications.

2. In-place density of compacted pavement will be determined by testing core samples according to ASTM D 1188 or ASTM D 2726.

   a. One core sample will be taken for every 1000 sq. yd. or less of installed pavement, with no fewer than 3 cores taken.

   b. Field density of in-place compacted pavement may also be determined by nuclear method according to ASTM D 2950 and correlated with ASTM D 1188 or ASTM D 2726.

F. Remove and replace or install additional bituminous concrete where test results or measurements indicate that it does not comply with specified requirements.

3.10 DISPOSAL

A. Remove excess material from Project site and legally dispose of them off-site.
   1. Do not allow excess materials to accumulate on-site.

END OF SECTION

SECTION 32 16 14
CURBING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Hot mix asphalt curb

1.3 SUBMITTALS

A. Material Certification. For each product, certifying material meets the Specification requirements.

1.4 QUALITY ASSURANCE

A. Standard Specifications: "Commonwealth of Massachusetts Department of Transportation Standard Specifications for Highways and Bridges"

PART 2 - PRODUCTS

2.1 MATERIALS

A. Hot mix asphalt curb: MassDOT Standard Specifications 2025 Division III- Materials Specifications Section M3.07

B. MassDOT Construction Standard Details Section 500: Curb and Edging –
1. 570.0.1 Hot Mix Asphalt Curbs – Type 2

PART 3 - EXECUTION

3.1 INSTALLATION

A. Excavate, prepare subbase and pad, set curb, and point joints in accordance with MassDOT standard.

1. Saw cut and cleanly match new curbing to existing at project limits.

B. Transition Curbing. Provide transition curbing for driveways where indicated.

C. Backfill behind curbing with fill, and loam. Restore area.

3.2 INSTALLATION TOLERANCES

A. Curb Alignment: 1/4-inch maximum, as determined by using a 10-foot straight edge along front face of curb.

END OF SECTION

SECTION 32 30 51

HIGHWAY GUARD

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes steel rail elements fastened to posts and terminal ends as indicated.

1. Posts: Galvanized steel or wood.
2. Rails: Galvanized steel or weathering steel.
3. System: Steel Beam Highway Guard Type MTL-3.

1.3 SUBMITTALS

A. Material and Product Certificates: For each type of material required for a complete rail system.

B. Prior to rail installations, submit proposed methods for temporarily terminating the end section.

1.4 QUALITY ASSURANCE

A. Standard Specifications: "Commonwealth of Massachusetts Department of Transportation Standard Specifications for Highways and Bridges"

PART 2 - PRODUCTS

2.1 HIGHWAY GUARD SYSTEM

A. Steel Posts: Standard Specification Subsection, M8.07.0.A.1.

B. Wood Posts: Standard Specification Subsection M8.07.0.A.2.

C. Rail Element and Terminal Sections: Standard Specification Subsection M8.07.0.C.

D. Bolts, Washers, and Nuts: Standard Specification Subsection M8.07.D.

2.2 MISCELLANEOUS ELEMENTS

A. Non-shrink Grout: Form 816, Sub article M.03.01-12.

B. Chemical Anchoring Material: Form 816, Subarticle M.03.01-15.

C. Demountable Reflectorized Delineators: Standard Specification Subsection M9.30.7.

PART 3 - EXECUTION

3.1 GENERAL

A. Install highway guard rail system in accordance with the following and Standard Specification Section 601 Highway Guard.

B. Post Installation

1. Set posts plumb and in alignment with the rail or rail treatments.
2. Drive steel posts. Protect posts and galvanized surfaces from damage during driving operations.
3. Set wood posts in holes. Backfill holes with suitable material and compact.
4. Remove rock or boulders when encountered in driving. Excavate a hole of sufficient size to remove rock. After removal, backfill hole and compact with suitable material. Resume driving the post into compacted backfill.

C. Block Outs, Brackets, Rub Rails, and Rail Elements. Erect elements to produce a smooth continuous rail. Lap terminal connectors, rubrails, and rail elements in direction of traffic.

D. Anchorages, Channels, Terminal Sections and Fittings. Install as indicated.

1. Backfill anchorage excavations with suitable material and compact in 6-inch layers.

E. Furnish extra length posts at transition areas or where field conditions warrant to maintain indicated embedment depth.

3.2 WELDING

A. Weld steel plates and posts according to the applicable requirements of American Welding Society Specifications for Welded Highway and Railway Bridges as supplemented and revised by the following:

1. Engineer will perform visual inspection of welds.
2. Correct welds found unacceptable by the Engineer.

3.3 ANCHORING TO ROCK

A. Drill holes in rock to align with bolt holes. Blow clean holes with air jet.

1. Maximum Diameter of Drilled Holes: Twice the diameter of bolts.

B. Install bolts and fill holes with nonshrink grout. After installation of steel plate, backfill plate and spalled areas with nonshrink grout.

3.4 REPAIRS

A. Before final erection, clean and paint damaged galvanized surfaces with two coats of zinc-rich touch-up material.

3.5 CLEAN UP

A. Remove and dispose of surplus and unsuitable backfill material immediately after completion of installation.

END OF SECTION

SECTION 32 40 00

SITE RESTORATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions, General Requirements, and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Providing and grading topsoil on the dam embankment.
2. Seeding or hydroseeding.
3. Restoration of disturbed areas.

1.3 DEFINITIONS

A. Finish Grade: Elevation of finished surface of topsoil.

B. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill immediately beneath topsoil.

1.4 SUBMITTALS

A. Material or Product Certificates: For topsoil, soil amendments, fertilizers, seed, wetland mitigation plants, and mulch, signed by material or product manufacturer.

B. Written 2-year guarantee.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Seed, Lime, and Fertilizer: Deliver in original sealed, labeled, and undamaged containers.

1.6 SCHEDULING

A. Planting Restrictions: Plant during one of the following periods.

1. Spring Planting: April 1 to June 1.
2. Fall Planting: August 15 to October 1.

B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit.

1.7 PLANT MAINTENANCE

A. Begin maintenance immediately after each area is planted and continue until a satisfactory turf is established.
   1. Maintain and establish plantings by watering, fertilizing, weeding, replanting, and other operations.
   2. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Prevent walking over muddy or newly planted areas.

PART 2 - PRODUCTS

2.1 SEED

A. Upland Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Journal of Seed Technology; Rules for Testing Seeds" for purity and germination tolerances.

The seed mix of the upland areas on the downstream slope will consist of the permanent seed Mix No. 4 listed in the Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas, 2003. The mix will consist of the following seed types and proportions:

Flat Peat	0.60 lbs/1,000 square feet
Red Top	0.10 lbs/1,000 square feet
Perennial Ryegrass	0.35 lbs/1,000 square feet

B. Topsoil: ASTM D 5268, pH range of 5.5 to 7, a minimum of 6 percent and a maximum of 20 percent organic material content; free of stones 1 inch or larger in any dimension and other extraneous materials harmful to plant growth.

C. Wetland Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Journal of Seed Technology; Rules for Testing Seeds" for purity and germination tolerances.

The seed mix of the wetland areas on the downstream slope will consist of the permanent seed Mix No. 7 listed in the Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas, 2003. The mix will consist of the following seed types and proportions:

Switchgrass	0.25 lbs/1,000 square feet
Virginia Wild Rye	0.10 lbs/1,000 square feet
Big Bluestem	0.35 lbs/1,000 square feet
Red Top	0.10 lbs/1,000 square feet

2.2 INORGANIC SOIL AMENDMENTS

A. Lime: ASTM C 602, agricultural limestone containing a minimum 80 percent calcium carbonate equivalent and as follows:

1. Provide lime in form of dolomitic limestone, Class S, with a minimum of 95 percent passing a No. 100 sieve.

2.3 ORGANIC SOIL AMENDMENTS

A. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 3/4-inch sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:

1. Organic Matter Content: 50 to 60 percent of dry weight.

2. Approved Products: AllGro, 4 Liberty Lane West, Hampton, NH 03842 (1-800-662-2440), or equal.

2.4 MULCHES

A. Straw Mulch: Provide air-dry, clean, mildew- and seed-free, hay or threshed straw of wheat, rye, oats, or barley; free of weeds, reeds, and twigs; maximum moisture content of 15 percent. Do not use salt hay.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive plants for compliance with requirements and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.

B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.3 SATISFACTORY PLANTING

A. Satisfactory Seeded Lawn: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft.

B. Reestablish plants that do not comply with requirements and continue maintenance until plantings are satisfactory.

C. Provide 2-year guarantee for achievement of Satisfactory Plantings.

3.4 CLEANUP, PROTECTIN, AND REPAIR

A. Promptly remove soil and debris created by planting work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Erect barricades and warning signs as required to protect newly planted areas from construction, and vehicular and pedestrian traffic. Maintain barricades throughout maintenance period and remove after turf is established.
   1. Where young plants have been damaged, rework soil to a suitable seedbed, and replant with full amounts of the specified materials.

C. Remove erosion-control measures after planting establishment period.

3.5 SITE RESTORATION

A. Staging Areas
   1. Remove temporary construction access ramp on the dam embankment. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, guard rail and sidewalks at temporary entrances and staging areas.

B. Other Areas Outside Construction Limits
   1. Repair any disturbance from the construction activities outside the limits of construction indicated on the Drawings at no additional cost.

END OF SECTION

SECTION 32 90 70

PLANTING RESTORATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Summary: This section addresses planting restoration at the McKinstry Pond Dam site. It does not apply to the Wetland Mitigation Area site. Please refer to section 32 92 00 Wetland Mitigation Area Restoration specification for restoration requirements in the mitigation area.

B. Drawings and general provisions of the Contract, including General Conditions, Supplementary Conditions, and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. Providing and grading topsoil at the dam.
   2. Seeding or hydroseeding.
   3. Mulching.
   4. Restoration of disturbed areas.

1.3 DEFINITIONS

A. Finish Grade: Elevation of finished surface of topsoil.

B. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill immediately beneath topsoil.

1.4 SUBMITTALS

A. Material or Product Certificates: For topsoil, soil amendments, fertilizers, seed, and mulch, signed by material or product manufacturer.

B. Written 2-year guarantee per Article 3.3 of this Section.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Seed, Lime, and Fertilizer: Deliver in original sealed, labeled, and undamaged containers.

1.6 SCHEDULING

A. Planting Restrictions: Plant during one of the following periods.
   1. Spring Planting: April 1 to June 1.
   2. Fall Planting: August 15 to October 1.

B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit.

1.7 PLANT MAINTENANCE

A. Begin maintenance immediately after each area is planted and continue until a satisfactory turf is established.
   1. Maintain and establish plantings by watering, fertilizing, weeding, replanting, and other operations.
   2. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Prevent walking over muddy or newly planted areas.

PART 2 - PRODUCTS

2.1 SEED

A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Journal of Seed Technology; Rules for Testing Seeds" for purity and germination tolerances.

B. Topsoil: ASTM D 5268, pH range of 5.5 to 7, a minimum of 6 percent and a maximum of 20 percent organic material content; free of stones 1 inch or larger in any dimension and other extraneous materials harmful to plant growth.

C. Seed Mix: Shall comply with the seed mix indicated on the project Drawings.

2.2 INORGANIC SOIL AMENDMENTS

A. Lime: ASTM C 602, agricultural limestone containing a minimum 80 percent calcium carbonate equivalent and as follows:
   1. Provide lime in form of dolomitic limestone, Class S, with a minimum of 95 percent passing a No. 100 sieve.

2.3 ORGANIC SOIL AMENDMENTS

A. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 3/4-inch sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:
   1. Organic Matter Content: 50 to 60 percent of dry weight.

2. Approved Products: AllGro, 4 Liberty Lane West, Hampton, NH 03842 (1-800-662-2440), or equal.

B. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth.

2.4 Mulches

A. Straw Mulch: Provide air-dry, clean, mildew- and seed-free, hay or threshed straw of wheat, rye, oats, or barley; free of weeds, reeds, and twigs; maximum moisture content of 15 percent. Do not use salt hay.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive plants for compliance with requirements and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.

B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.3 SATISFACTORY PLANTING

A. Satisfactory Plantings: A healthy, stand of plants has been established, with less than 10 percent of plants failing.

B. Reestablish plants that do not comply with requirements and continue maintenance until plantings are satisfactory.

C. Provide 2-year guarantee for achievement of Satisfactory Plantings.

3.4 CLEANUP, PROTECTION, AND REPAIR

A. Promptly remove soil and debris created by planting work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Erect barricades and warning signs as required to protect newly planted areas from construction, and vehicular and pedestrian traffic. Maintain barricades throughout maintenance period and remove after turf is established.
   1. Where young plants have been damaged, rework soil to a suitable seedbed, and replant with full amounts of the specified materials.

3.5 SITE RESTORATION

A. Staging Area(s)
   1. Remove temporary gravel access roads and temporary paving not intended for or acceptable for integration into permanent paving. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, guard rail and sidewalks at temporary entrances and staging areas.

B. Other Areas Outside Construction Limits
   1. Repair any disturbance outside the limits of construction indicated on the Drawings at no additional cost.

END OF SECTION

SECTION 32 92 00

WETLAND MITIGATION AREA

PART 1 - GENERAL

1.1 Related Documents

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes the following related to the construction and restoration of the wetland mitigation area:
   1. Planting Soil
   2. Soil Amendments (inorganic and organic)
   3. Seeding and Seed Mixture (both temporary and permanent)
   4. Plant Material
   5. Live Stakes
   6. Mulches
   7. Erosion-control material(s)

1.3 DEFINITIONS

A. Container-Grown Stock: Healthy, vigorous, well-rooted plants grown in a container, with a well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for type and size of plant required.

B. Duff Layer: A surface layer of soil, typical of forested areas, that is composed of mostly decayed leaves, twigs, and detritus.

C. Finish Grade: Elevation of finished surface of planting soil.

D. Imported Soil: Soil that is transported to Project site for use.

E. Planting Area: Areas to be planted.

F. Planting Soil: Existing, on-site topsoil or imported loam borrow that has been modified with soil amendments and fertilizers, as necessary, to produce a soil mixture best for desired plant growth.

G. Subgrade: The surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

H. Surface Soil: Soil that is present at the top layer of the existing soil profile. In undisturbed areas, surface soil is typically called "topsoil"; but in disturbed areas such as urban environments, the surface soil can be subsoil.

I. Upland Areas: Those Areas that are not currently or proposed to be Wetland Areas.

J. Wetland Areas: Those areas that are currently (existing wetlands) or proposed (mitigation wetlands) to be inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

1.4 Coordination

A. Planting Coordination with Seeding: Plant shrubs and live stakes after finish grades are established within the wetland mitigation area approximately one year after completion of the seeding operations (during the following fall season).
   1. Protect turf/seeded areas during planting operations, and promptly repair damage caused by planting operations.

1.5 Pre-installation Meetings

A. Pre-installation Conference: Conduct conference at Project site.

1.6 Action Submittals

A. Product Data: For each type of product.
   1. Plant Materials: Include quantities, sizes, quality, and sources for plant materials.
   2. Plant Photographs: Include color photographs in 3- by 5-inch (76- by 127-mm) print format of each required species and size of plant material as it will be furnished to Project. Take photographs from an angle depicting true size and condition of the typical plant to be furnished. Include a scale rod or other measuring device in each photograph. For species where more than 20 plants are required, include a minimum of three photographs showing the average plant, the best quality plant, and the worst quality plant to be furnished. Identify each photograph with the full scientific name of the plant, plant size, and name of the growing nursery.
   3. Material Certificates for Imported Soil: For imported loam borrow to be used as planting soil within the wetland mitigation area before delivery to the site, according to the following:
      a. Manufacturer's qualified testing agency's certified analysis of standard products.

4. Material Certificates for On-site Stripped or Excavated Soil: For on-site stripped topsoil or excavated soil to be used as planting soil within the wetland mitigation area, according to the following:
   a. Manufacturer's qualified testing agency's certified analysis of soils.
   b. Include recommendations for application and use.
   c. Include test data substantiating that on-site stripped topsoil or excavated soil complies with requirements.
   d. Include sieve analyses for soil materials.

B. Samples for Verification: For each of the following:
   1. Shrubs and Live Stakes: Three samples of each variety and size delivered to site for review. Maintain approved Samples on-site as a standard for comparison.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For each testing agency and landscape Installer.

B. Certification of Grass Seed: From seed vendor for each grass-seed monoculture or mixture, stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.

C. Preconstruction Test Reports: For preconstruction soil analyses specified in "Preconstruction Testing" Article.

D. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data for Seeding: Recommended procedures to be established by Owner for maintenance of turf within wetland mitigation area during a calendar year. Submit before expiration of required maintenance periods.

B. Maintenance Data for Plantings: Recommended procedures to be established by Owner for maintenance of plants during a calendar year. Submit before expiration of required maintenance periods.

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent, state-operated, or university-operated laboratory; experienced in soil science, soil testing, and plant nutrition; with the experience and capability to conduct the testing indicated; and that specializes in types of tests to be performed.
   1. Laboratories: Subject to compliance with requirements, provide testing by the following:
      a. University of Massachusetts Extension, Center for Agriculture.

B. Installer Qualifications: A qualified landscape installer whose work has resulted in successful turf establishment and establishment of plants.
   1. Professional Membership: Installer shall be a member in good standing of either the Professional Landcare Network or the American Nursery and Landscape Association.
   2. Experience: Three years' experience in turf and landscape installation in addition to requirements in Section 014000 "Quality Requirements."
   3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
   4. Personnel Certifications: Installer's field supervisor or personnel assigned to the Work shall have certification in one of the following categories from the Professional Landcare Network:
      a. Landscape Industry Certified Technician - Exterior.
      b. Landscape Industry Certified Lawncare Manager.
      c. Landscape Industry Certified Lawncare Technician.

C. Provide quality, size, genus, species, and variety of plants indicated, complying with applicable requirements in ANSI Z60.1.
   1. Selection of plants purchased under allowances is made by Engineer, who tags plants at their place of growth before they are prepared for transplanting.

D. Measurements: Measure according to ANSI Z60.1. Do not prune to obtain required sizes.
   1. Shrubs: Measure with branches and trunks or canes in their normal position. Take height measurements from or near the top of the root flare for field-grown stock and container-grown stock. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip to tip.
   2. Other Plants: Measure with stems, petioles, and foliage in their normal position.

E. Plant Material Observation: Engineer may observe plant material either at place of growth or at site before planting for compliance with requirements for genus, species, variety, cultivar, size, and quality. Engineer may also observe trees and shrubs further for size and condition of balls and root systems, pests, disease symptoms, injuries, and latent defects and may reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.
   1. Notify Engineer of sources of planting materials seven days in advance of delivery to site.

1.7 Preconstruction Testing

A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction soil analyses on existing, on-site soil and imported loam borrow to be used within wetland mitigation area.

1. Notify Engineer seven days in advance of the dates and times when laboratory samples will be taken.

B. Preconstruction Soil Analyses: For each unamended soil type, perform testing on soil samples and furnish soil analysis and a written report containing soil-amendment recommendations by a qualified testing agency performing the testing according to "Soil-Sampling Requirements" and "Testing Requirements" articles.
1. Have testing agency identify and label samples and test reports according to sample collection and labeling requirements.

1.7 SOIL-SAMPLING REQUIREMENTS

A. General: Extract soil samples according to requirements in this article.

B. Sample Collection and Labeling: Have samples taken and labeled by Contractor in presence of Engineer or state-certified, -licensed, or -registered soil scientist under the direction of the testing agency.
1. Number and Location of Samples: Minimum of six representative soil samples, two samples per each wetland mitigation cell area in locations as directed by Engineer, for on-site soils to be used or amended for landscaping purposes or as a planting soil within the wetland mitigation area.
2. Procedures and Depth of Samples: According to USDA-NRCS's "Field Book for Describing and Sampling Soils."
3. Division of Samples: Split each sample into two, equal parts. Send half to the testing agency and half to Owner for its records.
4. Labeling: Label each sample with the date, location keyed to a site plan or other location system, visible soil condition, and sampling depth.

1.8 TESTING REQUIREMENTS

A. General: Perform tests on soil samples according to requirements in this article.

B. Physical Testing:
1. Soil Texture: Soil-particle, size-distribution analysis by one of the following methods according to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods":
a. Sieving Method: Report sand-gradation percentages for very coarse, coarse, medium, fine, and very fine sand; and fragment-gradation (gravel) percentages for fine, medium, and coarse fragments; according to USDA sand and fragment sizes.
b. Hydrometer Method: Report percentages of sand, silt, and clay.
2. Bulk Density: Analysis according to core method of SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods."
3. Total Porosity: Calculate using particle density and bulk density according to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods."

4. Water Retention: According to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods."
5. Saturated Hydraulic Conductivity: According to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods"; at 85% compaction according to ASTM D 698 (Standard Proctor).

C. Chemical Testing:
1. CEC: Analysis by sodium saturation at pH 7 according to SSSA's "Methods of Soil Analysis - Part 3- Chemical Methods."
2. Clay Mineralogy: Analysis and estimated percentage of expandable clay minerals using CEC by ammonium saturation at pH 7 according to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods."
3. Metals Hazardous to Human Health: Test for presence and quantities of RCRA metals including aluminum, arsenic, barium, copper, cadmium, chromium, cobalt, lead, lithium, and vanadium. If RCRA metals are present at concentrations that exceed the reportable concentrations for soil (S1) as provided in the Massachusetts Oil and Hazardous Materials List, the soil shall not be used.
4. Phytotoxicity: Test for plant-available concentrations of phytotoxic minerals including aluminum, arsenic, barium, cadmium, chlorides, chromium, cobalt, copper, lead, lithium, mercury, nickel, selenium, silver, sodium, strontium, tin, titanium, vanadium, and zinc.

D. Fertility Testing: Soil fertility analysis according to standard laboratory protocol of SSSA NAPT NCR-13, including the following:
1. Percentage of organic matter.
2. CEC, calcium percent of CEC, and magnesium percent of CEC.
3. Soil reaction (acidity/alkalinity pH value).
4. Buffered acidity or alkalinity.
5. Nitrogen ppm.
6. Phosphorous ppm.
7. Potassium ppm.
8. Manganese ppm.
9. Manganese-availability ppm.
10. Zinc ppm.
11. Zinc availability ppm.
12. Copper ppm.
13. Sodium ppm and sodium absorption ratio.
14. Soluble-salts ppm.
15. Presence and quantities of problem materials including salts and metals cited in the Standard protocol. If such problem materials are present, provide additional recommendations for corrective action.
16. Other deleterious materials, including their characteristics and content of each.

E. Organic-Matter Content: Analysis using loss-by-ignition method according to SSSA's "Methods of Soil Analysis - Part 3-Chemical Methods."

F. Recommendations: Based on the test results, state recommendations for soil treatments and soil amendments to be incorporated to produce satisfactory planting soil suitable for healthy, viable plants indicated.
   1. Soil Amendment Rates: State recommendations in weight per 1000 sq. ft. (100 sq. m) for 6-inch (150-mm) depth of soil.
   2. Soil Reaction: State the recommended liming rates for raising pH or sulfur for lowering pH according to the buffered acidity or buffered alkalinity in weight per 1000 sq. ft. (100 sq. m) for 6-inch (150-mm) depth of soil.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with state and Federal laws, as applicable.

B. Bulk Materials:
   1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
   2. Provide erosion-control measures to prevent erosion or displacement of bulk materials; discharge of soil-bearing water runoff; and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
   3. Accompany each delivery of bulk materials with appropriate certificates.

C. Field Conditions: Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of plants during shipping and delivery. Do not drop plants during delivery and handling.

D. Handle planting stock by root ball.

E. Apply antidesiccant to trees and shrubs using power spray to provide an adequate film over trunks (before wrapping), branches, stems, twigs, and foliage to protect during digging, handling, and transportation.
   1. If deciduous trees or shrubs are moved in full leaf, spray with antidesiccant at nursery before moving and again two weeks after planting.

F. Wrap shrubs with burlap fabric over trunks, branches, stems, twigs, and foliage to protect from wind and other damage during digging, handling, and transportation.

G. Deliver plants after preparations for planting have been completed, and install immediately. If planting is delayed more than six hours after delivery, set plants and trees in their appropriate aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.
   1. Do not remove container-grown stock from containers before time of planting.

2. Water root systems of plants stored on-site deeply and thoroughly with a fine-mist spray. Water as often as necessary to maintain root systems in a moist, but not overly wet condition.

H. Live Stakes: If live stakes cannot be installed immediately when they arrive at the job site, they must be properly stored. Place materials out of direct sunlight in a cool, wet place, such as under straw or burlap. If packaged, open the pallets, boxes, and plastic bags so they can be thoroughly watered. Do not allow them to dry out. Soaking before planting significantly increases their survival and growth rate. Planting is best done during dormancy.

1.10 Field Conditions

A. Planting Restrictions for Permanent Seeding and Shrubs: Install permanent seed and shrubs during one of the following periods. Coordinate seeding periods with initial maintenance periods to provide required maintenance from date of planting completion.
1. Spring Planting: April 1 through June 15.
2. Fall Planting: August 15 through October 15.

B. Planting Restrictions for Temporary Seeding: Install temporary seed during one of the following periods.
1. Annual Ryegrass or Oats: April 1 through June 1 and August 15 through September 15.
2. Foxtail Millet: May 1 through June 30.
3. Winter Rye: August 15 through October 15.

If temporary seeding is performed between October 15 and March 31, mulching shall be applied immediately after planting. If seeding is performed between June 30 and August 15, watering of the seed shall be necessary.

C. Live Stake Planting Restrictions: Plant during the following period which is considered to be the dormant season:
1. November 1 through December 15.

D. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions.

1.11 Warranty

A. Special Warranty: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.
1. Failures include, but are not limited to, the following:

a. Death and unsatisfactory growth, except for defects resulting from abuse, lack of adequate maintenance, or neglect by Owner.
b. Structural failures including plantings falling or blowing over.

2. Warranty Periods: From date of planting completion.
   a. Shrubs and live stakes: 12 months.
3. Include the following remedial actions as a minimum:
   a. Immediately remove dead plants and replace unless required to plant in the succeeding planting season.
   b. Replace plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.
   c. A limit of one replacement of each plant is required except for losses or replacements due to failure to comply with requirements.
   d. Provide extended warranty for period equal to original warranty period, for replaced plant material.

PART 2 - PRODUCTS

2.1 PLANTING SOILS SPECIFIED ACCORDING TO PERFORMANCE REQUIREMENTS

A. Planting Soil for Wetland Mitigation Area (Wetland Planting Soil): Existing, on-site surface soil (with the duff layer, if any, retained) and imported loam borrow; modified to produce viable planting soil. Using preconstruction soil analyses and materials specified in other articles of this Section, amend existing, on-site surface soil or imported loam borrow to become planting soil complying with the following requirements:
   1. Particle Size Distribution by USDA Textures: Classified as sandy loam, loam, or clay loam according to USDA textures and shall contain a mixture of sand, silt and clay particles as to exhibit sandy and clayey properties in and about equal proportions.
   2. Percentage of Organic Matter: Shall contain not less than 4% nor more than 20% as determined by the loss on ignition of oven-dried samples. Test samples shall be oven-dried to a constant weight at a temperature of 230 degrees Fahrenheit plus or minus nine degrees.
   3. Sources for Imported Soil: Take imported, un-amended soil from sources that are naturally well-drained sites where topsoil occurs at least 4 inches (100 mm) deep, not from agricultural land, bogs, or marshes; and that do not contain undesirable organisms; disease-causing plant pathogens; or obnoxious weeds and invasive plants including, but not limited to, common reed, reed canary grass, purple loosestrife, garlic mustard and oriental bittersweet.
   4. Soil shall be free of the following:
      a. Unacceptable Materials: Concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials that are harmful to plant growth.

b. Unsuitable Materials: Stones, roots, plants, sod, heavy or stiff clay lumps, and pockets of coarse sand that exceed a combined maximum of 8 percent by dry weight of the imported soil.
c. Large Materials: Stones, clods, roots, clay lumps, and pockets of coarse sand exceeding 1 inch (25 mm) in any dimension.

5. Soil shall have a pH of between 5.5 and 7.5.

B. Planting Soil for Upland Areas (Upland Planting Soil): Existing, on-site surface soil (with the duff layer, if any, retained) and imported loam borrow. Soil

2.2 Inorganic Soil Amendments

A. Lime: ASTM C 602, agricultural liming material containing a minimum of 80 percent calcium carbonate equivalent and as follows:
1. Class: O, with a minimum of 95 percent passing through No. 8 (2.36-mm) sieve and a minimum of 55 percent passing through a No. 60 (0.25-mm) sieve.
2. Form: Provide lime in form of ground dolomitic limestone or calcitic lime depending on results of soil testing and need for magnesium.

B. Sulfur: Granular, biodegradable, and containing a minimum of 90 percent elemental sulfur, with a minimum of 99 percent passing through a No. 6 (3.35-mm) sieve and a maximum of 10 percent passing through a No. 40 (0.425-mm) sieve.

C. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.

D. Agricultural Gypsum: Minimum 90 percent calcium sulfate, finely ground with 90 percent passing through a No. 50 (0.30-mm) sieve.

E. Sand: Clean, washed, natural or manufactured, free of toxic materials, and according to ASTM C 33/C 33M.

2.3 Organic Soil Amendments

A. Compost: Well-composted, stable, and weed-free organic matter produced by composting feedstock, and bearing USCC's "Seal of Testing Assurance," and as follows:
1. Feedstock: Limited to leaves, animal bedding, greenhouse waste, and yard waste.
2. Reaction: pH of 5.5 to 7.5.
3. Soluble-Salt Concentration: Less than 4 dS/m.
4. Moisture Content: 35 to 55 percent by weight.
5. Organic-Matter Content: 30 to 40 percent of dry weight.
6. Particle Size: Minimum of 98 percent passing through a 1-inch (25-mm) sieve.

B. Sphagnum Peat: Partially decomposed sphagnum peat moss, finely divided or of granular texture with 100 percent passing through a 1/2-inch (13-mm) sieve, a pH of 3.4 to 4.8, and a soluble-salt content measured by electrical conductivity of maximum 5 dS/m.

C. Muck Peat: Partially decomposed moss peat, native peat, or reed-sedge peat finely divided or of granular texture with 100 percent passing through a 1/2-inch (13-mm) sieve, a pH of 6 to 7.5, a soluble-salt content measured by electrical conductivity of maximum 5 dS/m, having a water-absorbing capacity of 1100 to 2000 percent, and containing no sand.

D. Wood Derivatives: Shredded and composted, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture and free of chips, stones, sticks, soil, or toxic materials.
   1. Partially Decomposed Wood Derivatives: In lieu of shredded and composted wood derivatives, mix shredded and partially decomposed wood derivatives with ammonium nitrate at a minimum rate of 0.15 lb/cu. ft. (2.4 kg/cu. m) of loose sawdust or ground bark, or with ammonium sulfate at a minimum rate of 0.25 lb/cu. ft. (4 kg/cu. m) of loose sawdust or ground bark.

E. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, debris, and material harmful to plant growth.

2.2 SEED

A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Rules for Testing Seeds" for purity and germination tolerances.

B. Permanent Grass-Seed Mix: Proprietary seed mix as follows:
   1. Products: Subject to compliance with requirements, provide the following:
      a. For Upland Areas (in locations indicated on the Drawings): New England Conservation/Wildlife Mix as manufactured by New England Wetland Plants, Inc., or approved equal.
      b. For Wetland Cells (in locations indicated on the Drawings): New England Wetmix as manufactured by New England Wetland Plants, Inc., or approved equal.

C. Temporary Grass-Seed Mix: Shall consist of the following species for upland areas only:
   1. Annual Ryegrass;
   2. Foxtail Millet;
   3. Oats; or
   4. Winter Rye.

2.3 LIVE STAKES

A. Live Stakes: Dormant, live woody plant material with side branches removed and the bark intact. They shall conform to the species indicated on the Drawings. They shall be prepared from 1/2 to 2-inch diameter stock and cut into lengths of 2 to 3 feet. The basal or butt ends shall be cleanly cut at an angle to facilitate easy insertion into the soil. The top should be cut square or blunt.

2.4 PLANT MATERIAL

A. General: Furnish nursery-grown plants true to genus, species, variety, cultivar, stem form, shearing, and other features indicated in Plant List, Plant Schedule, or Plant Legend indicated on Drawings and complying with ANSI Z60.1; and with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock, densely foliated when in leaf and free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.
   1. Trees with damaged, crooked, or multiple leaders; tight vertical branches where bark is squeezed between two branches or between branch and trunk ("included bark"); crossing trunks; cut-off limbs more than 3/4 inch (19 mm) in diameter; or with stem girdling roots are unacceptable.
   2. Collected Stock: Do not use plants harvested from the wild, from native stands, from an established landscape planting, or not grown in a nursery unless otherwise indicated.

B. Provide plants of sizes, grades, and ball or container sizes complying with ANSI Z60.1 for types and form of plants required. Plants of a larger size may be used if acceptable to Engineer, with a proportionate increase in size of roots or balls.

C. Labeling: Label at least one plant of each variety, size, and caliper with a securely attached, waterproof tag bearing legible designation of common name and full scientific name, including genus and species. Include nomenclature for hybrid, variety, or cultivar, if applicable for the plant.

D. If formal arrangements or consecutive order of plants is indicated on Drawings, select stock for uniform height and spread, and number the labels to assure symmetry in planting.

2.5 Mulches

A. Straw Mulch: Provide air-dry, clean, mildew- and seed-free, salt hay or threshed straw of wheat, rye, oats, or barley.

B. Organic Mulch: Free from deleterious materials and suitable as a top dressing of shrubs, consisting of one of the following:
   1. Type: Shredded hardwood.

2. Size Range: 3 inches (76 mm) maximum, 1/2 inch (13 mm) minimum.

C. Sphagnum Peat Mulch: Partially decomposed sphagnum peat moss, finely divided or of granular texture, and with a pH range of 3.4 to 4.8.

D. Muck Peat Mulch: Partially decomposed moss peat, native peat, or reed-sedge peat, finely divided or of granular texture, with a pH range of 6 to 7.5, and having a water-absorbing capacity of 1100 to 2000 percent, and containing no sand.

E. Compost Mulch: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 7.5; moisture content 35 to 55 percent by weight; 100 percent passing through 1-inch (25-mm) sieve; soluble salt content of 2 to 5 dS/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:
1. Organic Matter Content: 50 to 60 percent of dry weight.
2. Feedstock: Agricultural, food, or industrial residuals; biosolids; yard trimmings; or source-separated or compostable mixed solid waste.

F. Fiber Mulch: Biodegradable, dyed-wood, cellulose-fiber mulch; nontoxic and free of plant-growth or germination inhibitors; with a maximum moisture content of 15 percent and a pH range of 4.5 to 6.5.

2.5 EROSION CONTROL MATERIALS

A. Erosion-Control Blankets: Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a photodegradable plastic mesh. Include manufacturer's recommended steel wire staples.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
a. North American Green, BioNet S75BN or approved equal.

B. Turf Reinforcement Matting: Cellular, nonbiodegradable slope-stabilization mats composed of a permanent, high-strength, three-dimensional matting structure, incorporated with a 100% coconut-fiber matrix that supplements the permanent matting structure's initial mulching and erosion control capabilities for up to 36 months. Include manufacturer's recommended anchorage system for slope conditions.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
a. North American Green, C350VMax or approved equal.

PART 3 - EXECUTION

3.1 PHASE 1 CONSTRUCTION

A. Construct temporary access to proposed wetland replication area.

B. Remove aboveground and buried piping, concrete supports, valves and other appurtenances from within the construction limits.

C. Dispose of construction debris off site.

D. Strip approximately four inches of topsoil from within the limit of disturbance associated with wetland mitigation area. Stockpile topsoil on site for re-use as planting soil in upland areas (un-amended) or wetland areas (amended).

E. Excavate material from Wetland Cells A and B as indicated on the Drawings (including the existing berms) to a depth of approximately 12 inches below final grade or until confining layer is reached.

F. Dispose of subsoil on site, within one mile of the mitigation areas. Subsoil may be re-used as planting soil in upland areas (un-amended) or wetland areas (amended).

G. Grade and compact Berm 1 between Wetland Cells A and B

H. Grade and compact Berm 2 surrounding Wetland Cells A and B.

I. Do not construct Notches 1, 2 or 3

J. Allow area to remain unfinished for a period of two to eight weeks. The actual length of this period will be determined by Engineer and/or a Professional Wetland Scientist.

3.2 Phase 2 Construction

A. Construct temporary access to Wetland Cell C.

B. Demolish and remove concrete retaining walls, piping and other appurtenances from within the limits of construction.

C. Dispose of construction debris off site.

D. Strip approximately four inches of topsoil from within the limit of disturbance associated with Wetland Cell C.

E. Dispose of topsoil on site, within one mile of the mitigation areas. Topsoil may be re-used as planting soil in upland areas (un-amended) or wetland areas (amended).

F. Excavate soil from Wetland Cell C to a depth of approximately 12 inches below final grade. Dispose of soil on site, within one mile of the mitigation areas.

G. Maintain temporary berm between Wetland Cell C and Hatchet Brook to elevation 680.0 feet.

H. Install temporary drainage pipe to convey flow from Wetland Cell C to Hatchet Brook. Install and stake double row of straw bales on upstream of side of drainage pipe.

I. Install approximately four inches of upland planting soil within upland areas (at and above elevation 685) disturbed by construction of the wetland mitigation area.

J. Install approximately 12 inches of wetland planting soil within Wetland Cells A, B and C and then create hydraulic connection between Wetland Cell C and Hatchet Brook. Prepare and amend on-site soils to be used as planting soil in accordance with the pertinent sections. Planting soil must contain minimum 6% organic carbon by dry weight in emergent wetland areas and minimum of 12% organic carbon by dry weight in scrub/shrub wetland areas.

K. Install permanent wetland seed within Wetland Cells A, B and C and within disturbed upland areas as indicated on the plans. Install seed in accordance with the pertinent subsequent sections.

3.3 Phase 3 Construction

A. Remove section of berm to create Notches 1 and 2

B. Install rip-rap from Wetland Cell A and Wetland Cell C (Notch 1) and Wetland Cell B and Wetland Cell C (Notch 2) in accordance with the Drawings.

C. Remove section of berm between Wetland Cell B and the isolated vegetated wetlands (IVW) to the north of Wetland Cell B (Notch 3) and create spillway in accordance with the Drawings.

D. Apply permanent seeding to disturbed areas.

E. The following fall, after approximately one year of installation of seeding associated with this phase of construction, install shrubs and live stakes within Zone 3 and Zone 4 Areas within the wetland mitigation area if determined by Owner and/or Engineer to be considered part of this Project. If determined to be installed as part of this Project, install plantings in accordance with the following sections.

3.2 PREPARATION OF ON-SITE SOIL BEFORE AMENDING

A. On-site soil to be utilized as planting soil shall be tested prior to re-use. The material shall remain in stockpile until amended (if determined necessary by testing).

B. Clean soil of concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials that are harmful to plant growth.

C. Screening: Pass un-amended soil through a 3-inch (75-mm) sieve to remove large materials.

3.3 PLACING AND MIXING PLANTING SOIL OVER EXPOSED SUBGRADE

A. General: Apply and mix unamended soil with amendments on-site to produce required planting soil. Do not apply materials or till if existing soil or subgrade is frozen, muddy, or excessively wet.

B. Subgrade Preparation: Till subgrade to a minimum depth of 4 inches (100 mm). Remove stones larger than 2 inches (50 mm) in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
1. Apply, add soil amendments, and mix approximately half the thickness of unamended soil over prepared, loosened subgrade according to "Mixing" Paragraph below. Mix thoroughly into top 4 inches (100 mm) of subgrade. Spread remainder of planting soil.

C. Placement of On-Site (Unamended) Stripped Topsoil: Spread unamended soil to total depth of 4 inches (100 mm). Do not spread if soil or subgrade is frozen, muddy, or excessively wet.
1. Amendments: Apply soil amendments, if required, evenly on surface, and thoroughly blend them with unamended soil to produce planting soil.

D. Placement of Imported Loam Borrow: Spread loam borrow soil to the depth required to meet finish grades after natural settlement. Do not spread if previously installed soil is frozen, muddy, or excessively wet.
1. Lifts: Apply planting soil in lifts not exceeding 12 inches (300 mm) in loose depth for material compacted by compaction equipment, and not more than 6 inches (150 mm) in loose depth for material compacted by hand-operated tampers.

E. Compaction: Compact each lift of planting soil to 80 to 85 percent of maximum Standard Proctor density according to ASTM D 698 except where a different compaction value is indicated on Drawings.

F. Finish Grading: Grade planting soil to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

3.4 Upland Area Preparation

A. Moisten prepared area before seeding if soil is dry. Water thoroughly and allow surface to dry before seeding. Do not create muddy soil.

B. Before seeding, obtain Engineer's acceptance of finish grading; restore seeded areas if eroded or otherwise disturbed after finish grading.

C. Protect structures; utilities; sidewalks; pavements; and other facilities, trees, shrubs, and plantings from damage caused by potential seeding operations.
   1. Protect adjacent and adjoining areas from hydroseeding and hydromulching overspray.
   2. Protect grade stakes set by others until directed to remove them.

3.5 Seeding

A. Sow seed with spreader or seeding machine. Do not broadcast or drop seed when wind velocity exceeds 5 mph (8 km/h).
   1. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.
   2. Do not use wet seed or seed that is moldy or otherwise damaged.
   3. Do not seed against existing trees. Limit extent of seed to outside edge of planting saucer.

B. Sow seed at the following rates:
   1. Upland Area Permanent Seed Mix – 25 lbs. per acre.
   2. Wetland Area Permanent Seed Mix – 18 lbs. per acre.
   3. Temporary Seed Mix
      a. Annual Ryegrass – 40 lbs. per acre.
      b. Foxtail Millett – 30 lbs. per acre.
      c. Oats – 80 lbs. per acre.
      d. Winter Rye – 120 lbs. per acre.

C. Rake seed lightly into top 1/8 inch (3 mm) of soil, roll lightly, and water with fine spray.

D. Protect seeded areas with slopes exceeding 3 (horizontal) to 1 (vertical) with erosion-control blankets installed and stapled according to manufacturer's written instructions.

E. Protect seeded areas (excluding areas where erosion control blanketing has been installed) from hot, dry weather or drying winds by applying mulching within 24 hours after completing seeding operations. Soak areas, scatter mulch uniformly to a thickness of 3/16 inch (4.8 mm), and roll surface smooth.

3.4 HYDROSEEDING

A. Hydroseeding: Mix specified seed and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.
   1. Mix slurry with fiber-mulch manufacturer's recommended tackifier.
   2. Spray-apply slurry uniformly to all areas to be seeded in a one-step process. Apply slurry at a rate so that mulch component is deposited at not less than 1500-lb/acre (15.6-kg/92.9 sq. m) dry weight, and seed component is deposited at not less than the specified seed-sowing rate.

3. Spray-apply slurry uniformly to all areas to be seeded in a two-step process. Apply first slurry coat at a rate so that mulch component is deposited at not less than 500-lb/acre (5.2-kg/92.9 sq. m) dry weight, and seed component is deposited at not less than the specified seed-sowing rate. Apply slurry cover coat of fiber mulch (hydromulching) at a rate of 1000 lb/acre (10.4 kg/92.9 sq. m).

3.5 PLANTING PREPARATION

A. Lay out individual shrub locations and areas for multiple plantings. Stake locations, outline areas, adjust locations when requested, and obtain Engineer's acceptance of layout before excavating or planting. Make minor adjustments as required.

3.6 EXCAVATION FOR SHRUBS

A. Planting Pits and Trenches: Excavate circular planting pits.
1. Excavate planting pits with sides sloping inward at a 45-degree angle. Excavations with vertical sides are unacceptable. Trim perimeter of bottom leaving center area of bottom raised slightly to support root ball and assist in drainage away from center. Do not further disturb base. Ensure that root ball will sit on undisturbed base soil to prevent settling. Scarify sides of planting pit smeared or smoothed during excavation.
2. Excavate approximately three times as wide as ball diameter for container-grown stock.
3. Excavate at least 12 inches (300 mm) wider than root spread and deep enough to accommodate vertical roots for bare-root stock.
4. Do not excavate deeper than depth of the root ball, measured from the root flare to the bottom of the root ball.
5. If area under the plant was initially dug too deep, add soil to raise it to the correct level and thoroughly tamp the added soil to prevent settling.
6. Maintain angles of repose of adjacent materials to ensure stability. Do not excavate subgrades of adjacent paving, structures, hardscapes, or other new or existing improvements.
7. Maintain supervision of excavations during working hours.
8. Keep excavations covered or otherwise protected after working hours.

B. Backfill Soil: Planting soil and subsoil removed from excavations may be used as backfill soil unless otherwise indicated.

C. Obstructions: Notify Engineer if unexpected rock or obstructions detrimental to shrubs are encountered in excavations.

D. Drainage: Notify Engineer if subsoil conditions evidence unexpected water seepage or retention in shrub planting pits.

E. Fill excavations with water and allow to percolate away before positioning trees and shrubs.

3.7 Shrub Planting

A. Inspection: At time of planting, verify that root flare is visible at top of root ball according to ANSI Z60.1. If root flare is not visible, remove soil in a level manner from the root ball to where the top-most root emerges from the trunk. After soil removal to expose the root flare, verify that root ball still meets size requirements.

B. Roots: Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly; do not break.

C. Container-Grown Stock: Set each plant plumb and in center of planting pit or trench with root flare 2 inches (50 mm) above adjacent finish grades.
   1. Backfill: Planting soil.
   2. Carefully remove root ball from container without damaging root ball or plant.
   3. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
   4. Place planting tablets equally distributed around each planting pit when pit is approximately one-half filled. Place tablets beside the root ball about 1 inch (25 mm) from root tips; do not place tablets in bottom of the hole.
      a. Quantity: As indicated on Drawings.
   5. Continue backfilling process. Water again after placing and tamping final layer of soil.

D. Slopes: When planting on slopes, set the plant so the root flare on the uphill side is flush with the surrounding soil on the slope; the edge of the root ball on the downhill side will be above the surrounding soil. Apply enough soil to cover the downhill side of the root ball.

3.7 LIVE STAKING

A. Live stakes shall be installed in the areas shown on the Drawings. The Contractor shall determine the configuration and spacing of the stakes to achieve the quantities specified on the Drawings. The configuration and spacing shall then be approved by the Engineer prior to installation. The cuttings shall be tamped into the ground at right angles to the slope to a firm hold and a minimum depth of 18 inches. Where soils are soft and 24 inch stakes are not solid (i.e., if they can be moved by hand) 36 inch stakes shall be used. Where soils are compacted or frozen and 24-inch stakes cannot be tamped into the ground without splitting, pilot holes may be drilled using an auger or reinforcing rod. Pilot holes shall be narrower in diameter than the live stakes.

3.8 SHRUB PRUNING

A. Remove only dead, dying, or broken branches. Do not prune for shape.

B. Prune, thin, and shape shrubs as directed by Engineer.

C. Prune, thin, and shape shrubs according to standard professional horticultural and arboricultural practices. Remove only injured, dying, or dead branches from shrubs; and prune to retain natural character.

D. Do not apply pruning paint to wounds.

3.9 TURF RENOVATION

A. Renovate existing turf where damaged by Contractor's planting operations.

B. Renovate turf damaged by Contractor's operations, such as storage of materials or equipment and movement of vehicles.
   1. Reestablish turf where settlement or washouts occur or where minor regrading is required.
   2. Install new planting soil as required.

C. Remove vegetation from unsatisfactory turf areas; do not bury in soil.

D. Remove topsoil containing foreign materials, such as oil drippings, fuel spills, stones, gravel, and other construction materials resulting from Contractor's operations, and replace with new planting soil.

E. Mow, dethatch, core aerate, and rake existing turf.

F. Remove weeds before seeding. Where weeds are extensive, apply selective herbicides as required. Do not use pre-emergence herbicides.

G. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation, and turf, and legally dispose of them off Owner's property.

H. Till stripped, bare, and compacted areas thoroughly to a soil depth of 6 inches (150 mm).

I. Apply seed and protect with straw mulch as required.

J. Water newly planted areas and keep moist until new turf is established.

3.10 Turf Maintenance

A. General: Maintain and establish turf throughout construction by watering, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.

1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and turf damaged or lost in areas of subsidence.
2. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
3. Apply treatments as required to keep turf and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.

B. Watering: Install and maintain temporary piping, hoses, and turf-watering equipment to convey water from sources and to keep turf uniformly moist to a depth of 4 inches (100 mm).
1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
2. Water turf with fine spray at a minimum rate of 1 inch (25 mm) per week unless rainfall precipitation is adequate.

3.11 Plant Maintenance

A. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, adjusting and repairing tree-stabilization devices, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings.

B. Fill in, as necessary, soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.

C. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated pest management practices when possible to minimize use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.

3.12 Satisfactory Turf

A. Turf installations shall meet the following criteria as determined by Engineer:
1. Satisfactory Seeded Turf: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. (0.92 sq. m) and bare spots not exceeding 5 by 5 inches (125 by 125 mm).

B. Use specified materials to reestablish turf that does not comply with requirements and continue maintenance until turf is satisfactory.

3.10 REPAIR AND REPLACEMENT

A. General: Repair or replace existing trees or new plants that are damaged by construction operations, in a manner approved by Engineer.
   1. Submit details of proposed pruning and repairs.
   2. Perform repairs of damaged trunks, branches, and roots within 24 hours, if approved.
   3. Replace trees and other plants that cannot be repaired and restored to full-growth status, as determined by Engineer.

B. Remove and replace trees (not scheduled to be removed) that are damaged during construction operations that Engineer determines are incapable of restoring to normal growth pattern.
   1. Provide new trees of same size as those being replaced for each tree of 4 inches (100 mm) or smaller in caliper size.
   2. Provide one new tree of 4-inch (100-mm) caliper size for each tree being replaced that measures more than 4 inches (100 mm) in caliper size.
   3. Species of Replacement Trees: Species selected by Engineer.

3.11 CLEANING AND PROTECTION

A. During seeding and planting, keep adjacent paving and construction clean and work area in an orderly condition. Promptly remove soil and debris created by seeding and planting work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of them off Owner's property.

C. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.

D. Protect plants from damage due to landscape operations and operations of other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.

E. After installation of plantings, remove nursery tags, nursery stakes, tie tape, labels, wire, burlap, and other debris from plant material, planting areas, and Project site.

F. Remove non-degradable erosion-control measures after grass establishment period.

END OF SECTION

SECTION 33 40 23

STORM DRAINAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes site storm drainage including:

1. Pipes and fittings.
2. Catch basins, manholes, pretreatment oil-grit separator, and drop inlets.

1.3 DEFINITIONS

A. HDPE: High density polyethylene.

B. PVC: Polyvinyl chloride plastic.

1.4 PERFORMANCE REQUIREMENTS

A. Gravity-Flow, Nonpressure-Piping Pressure Ratings: At least equal to system test pressure.

1.5 SUBMITTALS

A. Shop Drawings: Include plans, elevations, details, and attachments for the following:

1. Catch basins and manholes: precaster clock drawings
    a. Height, thickness of base, wall thickness, sump depth, and riser dimensions
    b. Steel reinforcement size and location.
    c. Inlet and outlet pipe orientation, types and sizes.
    d. Layout of appurtenances.

e. Step / ladder details.

2. Drop inlets:
   a. Dimensions.
   b. Steel reinforcement size and location.
   c. Inlet and outlet pipe orientation, types and sizes.
   d. Layout of appurtenances.
   e. Step / ladder details.
3. Pretreatment Oil-Grit Separator
   a. Dimensions
   b. Height, thickness of base, wall thickness
   c. Inlet and outlet pipe orientation, types and sizes.
   d. Layout of appurtenances.e. Step / ladder details.

B. Product Data For:
   1. Pipes and fittings
   2. Catch basins, manholes, pretreatment oil-grit separator, and drop inlets
   3. Frames and grates
   4. Crushed gravel.
   5. Geotextile fabric

C. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Do not store plastic structures, pipe, and fittings in direct sunlight.

B. Protect pipe, pipe fittings, and seals from dirt and damage.

C. Handle all products according to manufacturer's written rigging instructions.

1.7 PROJECT CONDITIONS

A. Site Information:
   1. Perform site survey, research public utility records, and verify existing utility locations.

B. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after

arranging to provide temporary utility services according to requirements indicated:

1. Notify Owner not less than 2 days in advance of proposed utility interruptions.
2. Notify "Call Before You Dig" in accordance with the Contract Documents.
3. Notify Aquarion Water Company when excavating within 3-ft of the water main.
4. Do not proceed with utility interruptions without Engineer's written permission.

PART 2 - PRODUCTS

2.1 PIPES AND FITTINGS

A. HDPE Pipe and Fittings: AASHTO M 294, Type S, corrugated with smooth waterway for coupling joints.
   1. Soiltight Couplings: AASHTO M 294, corrugated, matching pipe and fittings to form soiltight joints.
   2. Flared end and all appurtenances shall be provided by the same manufacturer and designed for the application and pipe that is installed.

B. Catch Basins:
   1. Description: Comply with ASTM C 478 for reinforced precast concrete structures, of depth indicated, with provision for rubber gasketed joints. All precast sections shall be designed and constructed in accordance with ASTM C 890 as appropriate for AASHTO HS-25 loads and the general dimensions shown on the Drawings.
   2. Base Section: Minimum floor slab and walls and base riser section thickness, and having separate base slab or base section with integral floor, as specified on the Contract Drawings.
   3. Ballast / Anti-Flotation Collar: Increase thickness of one or more precast concrete sections, add concrete to manhole as required, or provide exterior concrete anti-floatation collar to prevent flotation.
   4. Riser Sections: Lengths to provide depth indicated on Contract Drawings. Minimum thickness as specified on the Contract Drawings.
   5. Top Section: Eccentric-cone type, unless concentric-cone or flat-slab-top type is indicated. Top of cone of size that matches grade rings.
   6. Gaskets: ASTM C 443, rubber.
   7. Joint Sealant: ASTM C 990, bitumen or butyl rubber.

8. Grade Rings: Include two or three reinforced-concrete rings, of 6- to 9-inch total thickness, that match 24-inch diameter frame and grate.
9. Steps: Fiberglass, individual steps or ladder. Include width that allows worker to place both feet on one step and is designed to prevent lateral slippage off step. Cast steps or anchor ladder into base, riser, and top section sidewalls at 12- to 16-inch intervals. Omit steps for structures less than 60 inches deep.
10. Pipe Connectors: ASTM C 923, resilient, of size required, for each pipe connecting to base section.
11. Brick: ASTM C32, Grade MS.
12. Mortar: Composed by volume, of one part Portland cement and two parts sand.
13. Grout: ASTM C476.

C. Frames and Grates: Form 816, Section M.08.02-5, Type C or C-L. All castings: EJ or an American-made equal.

2.2 MANHOLES

A. Manholes

1. Description: ASTM C 478, precast, reinforced concrete, of depth indicated, with provision for sealant joints.
2. Shape: As indicated on the Contract Drawings.
3. Ballast / Anti Floatation Collar: Increase thickness of precast concrete sections or add concrete to base section as required to prevent flotation.
4. Base Section: Minimum floor slab and walls and base rise section thickness and having separate base slab or base section with integral floor, as specified on the Contract Drawings.
5. Riser Sections: Lengths to provide depth indicated on Contract Drawings. Minimum thickness as specified on the Contract Drawings.
6. Top Section: Eccentric-cone type unless concentric-cone or flat-slab-top type is indicated, and top of cone of size that matches grade rings.
7. Joint Sealant: ASTM C 990, bitumen or butyl rubber.
8. Resilient Pipe Connectors: ASTM C 923, cast or fitted into manhole walls, for each pipe connection.
9. Steps: Individual FRP steps or ASTM A 615/A 615M, deformed, 1/2-inch steel reinforcing rods encased in ASTM D 4101, PP wide enough to allow worker to place both feet on one step and designed to prevent lateral slippage off step. Cast or anchor steps into sidewalls at 12- to 16-inch

intervals. Omit steps if total depth from floor of manhole to finished grade is less than 60 inches.

10. Grade Rings: Reinforced-concrete rings, 6- to 9-inch total thickness, to match diameter of manhole frame and cover, and height as required to adjust manhole frame and cover to indicated elevation and slope.
11. Brick: ASTM C32, Grade MS.
12. Mortar: Composed by volume, of one part Portland cement and two parts sand.
13. Grout: ASTM C476.

2.3 CONCRETE

A. General: Cast-in-place concrete according to ACI 318, ACI 350R, and the following:
   1. Cement: ASTM C 150, Type II.
   2. Fine Aggregate: ASTM C 33, sand.
   3. Coarse Aggregate: ASTM C 33, crushed gravel.
   4. Water: Potable.

B. Portland Cement Design Mix: 4000 psi minimum, with 0.45 maximum water-cementitious ratio.
   1. Reinforcement Bars: ASTM A 615/A 615M, Grade 60, deformed steel.

2.4 PRETREATMENT OIL-GRIT SEPARATOR

A. General: Precast concrete dual chamber oil/water separator with design loading per AASHO HS20-44.
   1. Concrete: 5000 psi at 28 days
   2. Dimensions: As indicated on Contract Drawings.
   3. Joint Sealant: Cast joint sealed with flexible butyl resin sealant.
   4. Frames and Covers: 24-inch diameter. Frame heights shall not exceed 4-inches in height
   5. Bedding: 6-inch deep layer of ¾-inch crushed stone
   6. Outlets: Outlets shall be fitted with hoods as indicated on the Contract Drawings.
   7. Anti-buoyancy slab: As indicated on the Contract Drawings.

2.5 MISCELLANEOUS

A. Brick: ASTM C32, Grade MS.

B. Mortar: Composed by volume, of one part portland cement and two parts sand.

C. Grout: Form 816, Section M.03.01-14.

D. Filter Fabric: Form 816, Section M.08.01-26.

PART 3 - EXECUTION

3.1 IDENTIFICATION

A. Arrange for installing green warning tapes directly over piping and at outside edges of underground structures.

1. Use warning tape or detectable warning tape over ferrous piping.

2. Use detectable warning tape over nonferrous piping and over edges of underground structures.

3.2 INSTALLATION, GENERAL

A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground storm drainage piping. Location and arrangement of piping layout take design considerations into account. Install piping as indicated, to extent practical.

B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements. Maintain swab or drag in line, and pull past each joint as it is completed.

C. Use structures for changes in direction, unless fittings are indicated. Use fittings for branch connections, unless direct tap into existing sewer is indicated.

D. Use proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.

E. Install gravity-flow piping and connect to building's storm drains, of sizes and in locations indicated. Terminate piping as indicated.

1. Install piping pitched down in direction of flow, at minimum slope of 1 percent, unless otherwise indicated.

F. Extend storm drainage piping and connect to building's storm drains, of sizes and in locations indicated. Terminate piping as indicated.

3.3 PIPE JOINT CONSTRUCTION AND INSTALLATION

A. General: Join and install pipe and fittings according to installations indicated.

B. HDPE Pipe and Fittings: As follows:

1. Install according to ASTM D 2321 and manufacturer's written instructions.
2. Install corrugated piping according to the Corrugated Polyethylene Pipe Association's "Recommended Installation Practices for Corrugated Polyethylene Pipe and Fittings."

C. PVC Sewer Pipe and Fittings: As follows:

1. Join pipe and fittings with gaskets according to ASTM D 2321 and manufacturer's written instructions.
2. If full entry of pipe joint is not achieved, remove pipe and replace with new unit and gasket.

D. Join piping made of different materials or dimensions with couplings made for this application. Use couplings that are compatible with and that fit both systems' materials and dimensions.

3.4 MANHOLE INSTALLATION

A. General: Install manholes, complete with appurtenances and accessories indicated.

B. Install precast concrete manhole sections with sealants according to ASTM C 891.

C. Where specific manhole construction is not indicated, follow manhole manufacturer's written instructions.

D. Set tops of frames and covers flush with finished surface of manholes that occur in pavements. Set tops 3 inches above finished surface elsewhere unless otherwise indicated.

3.5 CATCH-BASIN INSTALLATION

A. Construct catch basins to sizes and shapes indicated.

B. Set frames and grates to elevations indicated.

3.6 PRETREATMENT OIL-GRIT SEPARATOR INSTALLATION

A. General: Install pretreatment oil-grit separator, complete with appurtenances and accessories indicated.

B. Install precast concrete sections with sealants according to ASTM C 891.

C. Where specific pretreatment oil-grit separator construction is not indicated, follow manufacturer's written instructions.

D. Set tops of frames and covers flush with finished surface of separators that occur in pavements. Set tops 3 inches above finished surface elsewhere unless otherwise indicated.

3.7 FIELD QUALITY CONTROL

A. Clear interior of piping and structures of dirt and superfluous material as work progresses. Maintain swab or drag in piping, and pull past each joint as it is completed.

1. In large, accessible piping, brushes and brooms may be used for cleaning.
2. Place plug in end of incomplete piping at end of day and when work stops.
3. Flush piping between manholes and other structures to remove collected debris, if required by authorities having jurisdiction.

B. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.

1. Defects requiring correction include the following:
   a. Alignment: Less than full diameter of inside of pipe is visible between structures.
   b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
   c. Crushed, broken, cracked, or otherwise damaged piping.
   d. Infiltration: Water leakage into piping.
   e. Exfiltration: Water leakage from or around piping.
2. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
3. Reinspect and repeat procedure until results are satisfactory.

END OF SECTION

SECTION 35 01 40

PROTECTION OF DAM

PART 1 - GENERAL

1.1 SUMMARY

A. The Section includes protecting the dam from damage during construction activities, including but not limited to dewatering, demolition excavation, fill placement, and compaction as required.

B. Potentially dangerous situations during construction include but are not limited to:

1. Grading for temporary construction access on the downstream slope.
2. Sliplining procedures for the low-level outlet pipes.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Provide equipment and materials as required to protect the dam during construction.

PART 3 - EXECUTION

3.1 GENERAL

A. Materials, procedures, and methods employed by the Contractor for dam protection shall allow access to all portions of the dam throughout construction.

B. The Contractor shall prepare and submit to the Engineer for review an emergency response plan detailing the materials to be used and actions to be taken in the event of an emergency, such as a large storm approaching when the dam or low-level outlet is exposed during construction.

C. Protect the dam throughout the Contract period. Care shall be exercised while operating equipment on and adjacent to the dam. The Contractor shall be responsible to assure that the equipment which is utilized does not cause damage to the dam or its appurtenances.

D. Access to various portions of the dam for the construction of improvements shall be undertaken in such a manner that the dam is protected at all times. Access ways shall be constructed, maintained and protected with erosion and sediment controls to prevent damage from erosion during a major storm event.

E. Placement and compaction of fill materials adjacent to the existing structures shall be completed in such a manner that the dam and appurtenances are protected from damage at all times.

F. Dewatering systems and measures to block flow at the spillway weir structure shall be installed, operated, maintained and removed in such manners to protect the dam and appurtenances from damage at all times.

G. Structures and other existing features adjacent to work including, but not limited to, the existing culvert at the downstream side of the spillway chute, existing buried utilities at the spillway chute shall be protected from damage.

END OF SECTION

SECTION 35 01 70

WATER CONTROL SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Temporary water control measures and systems including design and sequencing of proposed system, construction, installation, maintenance, and removal of temporary protective facilities and appurtenances required to convey surface or subsurface water beyond or around the work area. Temporary measures and appurtenances may include but are not limited to:

a. surface and subsurface dams (including cofferdams)

b. flow diversions

c. special linings for erosion protection

d. pipes

e. barriers

f. sedimentation pools;

g. prefabricated sediment containment devices

h. watertight seals.

i. pumps and pumping systems.

j. well point systems.

2. Drawdown of water in the pond.

3. Dewatering of areas for construction of structures, or permanent repairs to structures.

4. Safe conveyance of water and flood flows.

5. Protection of existing structures and dam, constructed improvements, work in progress, and downstream areas at all times, including during significant rainfall and high water.

B. The Contractor is responsible for protection of the dam from failure during the Construction period. Nothing in this Specification relieves the Contractor of this responsibility.

C. Construct water control system in phases as required to maintain a minimum stream flow in downstream watercourses and to protect existing structures.

D. Adhere to Chapter 91 permit restrictions for all Dam-related construction activities.

1.2 DEFINITIONS

A. Conveyance Structures: Temporary systems for conveying water flows from impoundment area to downstream areas, with a minimum capacity to safely pass a 10-year return frequency flood event for the watershed.

B. Impoundment Area: Coffer-dammed area of pond or lake water remaining after drawdown.

1.3 PERFORMANCE REQUIREMENTS

A. Design, furnish, install, monitor, and maintain water control system capable of supporting and resisting hydrostatic pressure and flood flow.

1. Provide professional engineering services needed to assume engineering responsibility, including preparation of Shop Drawings and a comprehensive engineering analysis by a qualified licensed Massachusetts professional engineer.

2. Water is conceptually proposed to be diverted as indicated on the Project Plans. The diversion and selection of the cofferdam is subject to the Contractor's selected means and methods. Cofferdams and diversion structures should be designed to pass a minimum 10 year flood inflow. The inflow is to be determined by the Contractor's licensed professional engineer.

3. The return frequency and flood elevation shall be evaluated by the Contractor's licensed professional engineer. The return frequency recommended should consider the duration of the project and the hazard potential within the downstream area. The minimum return frequency shall be ten (10) years.

4. Control and safely convey flood flows in excess of the diversion flow in such a manner that the dam and other areas are protected from damage.

5. The Contractor shall temporarily draw down McKinstry Pond to no lower than elevation 490.0 feet. The Contractor is required to draw the pond down prior to construction.

B. Install water control system without damaging existing structures, dam, and other adjacent improvements.

C. Conveyance Structures:

1. Design system to prevent blockage of system by debris, including trees, branches, boats, docks, and ice or any other material.

2. Water Runoff. The amount of runoff from significant rainfall events varies depending upon the conditions at the dam at the time of event. Include the following parameters into the design of water control system. At a minimum, utilize values at time of system installation. Adjust parameters for duration of installed system.

a. Existing soil saturation in watershed.

b. Amount of snow cover and anticipated melt due to rainfall event.

c. Level of water in impoundment and anticipated increase due to rainfall event.

d. Response time of watershed due to impervious cover, and availability of storage within watershed.

e. Impact of dewatering methods on downstream areas.

f. Average values.

D. Evaluate need for larger minimum capacity due to Project factors including construction duration and risk of damage to structure.

E. Include controls to protect living resources within impoundment area and downstream watercourses.

F. Maintain aquatic base flow rates in water course channels below dam spillway outlet structures. If flow into pond is less than base flow rate, allow in-flows to exit directly downstream. Minimum downstream flow shall be 0.5 cfs per square mile of watershed area.

G. Alternative water control methods will be considered, providing proposed methods conform to applicable local, state and federal codes; will not require an extension of contract time; and will not result in increase of construction costs.

1. The Engineer is not obligated to accept alternative methods and may impose additional requirements as condition of acceptance.

1.4 SUBMITTALS

A. Water Control System Plan: The Water Control System Plan is subject to approval by the engineer. The Water control System Plan shall include the following for review and approval by the engineer.

1. Materials.

2. Schedule of operations.

3. Method for controlling water.

4. Method for crossing water courses.

5. Emergency plan.

6. List of emergency contact personnel and 24-hour contact number(s).

7. Submit field-required modifications to approved water control plan to Engineer, prior to actual construction of modification.

B. Shop Drawings for Information: Prepared by or under the supervision of a qualified professional engineer. Include plans, sections and details of water control system

and accessory items, locations of discharge lines; means of discharge and disposal of water.

1. Include Shop Drawings signed and sealed by the qualified professional engineer responsible for their preparation indicating extent and elevations of temporary cofferdams, locations of sumps, pumps and groundwater control and discharge treatment measures, and other proposed elements and procedures to monitor the site, communicate and coordinate flood precautions and preparations with relevant local and regional emergency response agencies, List of emergency contact personnel and 24-hour contact number(s), observe and control seepage conditions at the dam, and ensure protection of existing site structures, adjacent properties and downstream persons and infrastructure.

2. Submit field-required modifications to approved water control plan to Engineer, prior to actual construction of modification.

3. The Water Control Plan: shall also include the following, if applicable:

   a. Materials.

   b. Schedule of operations.

   c. Method for crossing water courses.

4. The Water Control Plans shall be submitted to the Engineer for review 10 business day prior to installing the Water Control Systems.

C. Photographs or video, sufficiently detailed, of existing conditions of adjoining construction and site improvements before installation of water control system, and after drawdown.

1.5 PROJECT CONDITIONS

A. The Contractor is responsible for initiating and maintaining the temporary drawdown with coordination with the Owner. The level in the pond shall not be artificially lowered by the Contractor below the temporary drawdown elevation of 488.0 feet.

B. Protect aquatic life within impoundment area and downstream watercourses. Incorporate additional controls during drawdown and dewatering.

C. Emergency Notification. Immediately notify appropriate entities listed in the attached Emergency Action Plan when significant flood flows endanger the dam, existing structures, or downstream properties. Contractor shall function as Owner for purposes of this Emergency Action Plan during construction.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Provide materials that are either new or in serviceable condition, and utilize manufactured items for their intended use.

B. Sand: Clean, inorganic, well-graded, granular material with 100 percent passing a 1-inch sieve.

C. Sandbags: Burlap or polypropylene, approximately one cubic yard capacity.

D. Other products or materials as necessary to implement the water control system plan.

PART 3 - EXECUTION

3.1 GENERAL

A. Do not begin work within the pond until water levels have been lowered, and minimum water level depths within impoundment area have been achieved and maintained.

3.2 PREPARATION

A. Investigate and verify existing surface and subsurface ground water conditions at the dam.

B. Evaluate type of protective facility, appurtenances, and measured required. Develop and submit Water Control System Plan.

C. Prior to commencing drawdown, provide 14 calendar day written notice to Owner, Engineer, Town and property owners as dewatering or lowering may affect private water supply wells along impoundment area.

3.3 PROTECTION

A. Since water level is dependent on the flow in the contributing watershed, water level can be expected to vary. The potential for major flood events is always a possibility. Ensure safety of dam and downstream areas.

B. Provide additional measures as needed to control resulting increases in water surface elevations and water flows, and to convey flood flows to downstream watercourses, without damage or risk of failure to dams.

C. Maintain personnel and equipment on-site during predicted heavy rainfall, flood watches, flashflood watches and flood warnings to mitigate potential damage during flood events.

D. Water Control System Plan: Perform actions outlined in the accepted Water Control Plan and Protection of Dam procedures for significant rainfall events, in addition to other measure necessary to control water during construction.

3.4 DRAWDOWN

A. The Contractor will complete and maintain the initial drawdown at McKinstry Pond Dam.

B. Install conveyance structure through the work area to divert inflow to the work area in accordance with the Plans. Ensure that the rate of discharge does not exceed the capacity of the downstream watercourse channel, bridges, and flood channel banks; or cause erosion, sedimentation, or piping of soil.

C. Provide a precipitation gage for the site during construction.

D. Provide a staff gage to measure the pond water elevation during construction.

3.5 WATER CONTROL

A. Construct water control system of cofferdams or other methods accepted by the Engineer, to allow construction of permanent structures and repairs.

1. Install bulkheads, culverts, ditching, sheet piles, and diking as required.
2. Design devices for intended use and anticipated soil and water pressures. Provide watertight seals with devices where required, to prevent damage, water seepage, piping erosion, or collapse.
3. Perform pumping and related work.
4. Provide dewatering siphons, pumps, well points, or other measures for excavations or structures located below drawdown elevation or where subsurface water must be removed.
5. Provide erosion and sedimentation controls to ensure no sediment is discharged to downstream watercourses.

B. The proposed cofferdam and conveyance structure in the work area shall be removed in their entirety as soon as is practicable.

C. The Owner is responsible for restoring the impoundment at the end of the drawdown period.

3.6 MAINTENANCE

A. Monitor water control system daily. Promptly correct seepage, breakage, or other evidence of movement to ensure that water control system remains stable.

B. Provide additional materials, equipment and manpower, as required, to resist damage to or failure of temporary water control measures and dam.

1. During predicted periods of significant rainfall or flooding events, provide 24-hour, on-site coverage to assure timely response.

3.7 REMOVAL AND REPAIRS

A. Correct movements or failures of temporary protection facilities and appurtenances, which prevents proper completion of permanent work, or damages existing structures and downstream areas.

B. Remove water control systems when permanent construction has progressed sufficiently to accommodate hydrostatic pressures. Remove in stages to avoid damage to structures.

1. Repair or replace adjacent work damaged or displaced by construction operations at no additional cost.

END OF SECTION

SECTION 35 20 16

ALUMINUM WEIRBOARDS

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. The CONTRACTOR shall furnish all labor, materials, equipment and incidentals required to install and ready for operation aluminum stop logs, guide frames and stop log lifters as shown on the Contract Drawings and as specified herein.

1.2 SUBMITTALS

A. Provide the following information to confirm compliance with the specification in addition to the submittal requirements specified in Division 1 Section "Submittals".

1. Complete description of all materials including the material thickness of all structural components of the stop logs, guide frames and stop log lifter.
2. Installation drawings showing all details of construction, details required for installation, dimensions and anchor bolt locations.
3. Maximum bending stress and deflection of the stop logs under the maximum design head.
4. The location of the company headquarters and the location of the principle manufacturing facility. Provide the name of the company that manufactures the equipment if the supplier utilizes an outside source.

1.3 QUALITY ASSURANCE

A. Qualifications

1. All of the equipment specified under this Section shall be furnished by a single manufacturer with a minimum of 20 years experience designing and manufacturing stop logs. The manufacturer shall have manufactured stop logs for a minimum of 50 projects.

PART 2 - EQUIPMENT

2.1 GENERAL

A. Stop log assemblies shall be as specified herein and have the characteristics and dimensions shown on the Contract Drawings.

B. Leakage shall not exceed 0.05 gpm/ft of wetted seal perimeter.

C. The stop logs shall be provided with a continuous resilient seal along the bottom and both sides. The guide frames shall not incorporate seals.

D. Stop logs shall be of the height as shown in the Contract Drawings and they shall be designed to function properly when stacked in any order.

E. Stop logs shall be designed to drop into place under their own weight without any downward pressure necessary. Stacking stop plates are not acceptable in lieu of stop logs.

F. All structural components of the stop logs shall be fabricated of aluminum and shall have adequate strength to prevent distortion during normal handling, during installation and while in service.

G. All structural components of the guide frames shall be fabricated of aluminum and shall have adequate strength to prevent distortion during normal handling, during installation and while in service.

H. All welds shall be performed by welders with AWS certification.

I. Finish: Mill finish on aluminum and stainless steel. All aluminum in contact with concrete shall be shop coated with a heavy coat of bitumastic paint. Welds on aluminum shall be cleaned to provide a uniform finish. Welds on stainless steel shall be sandblasted to remove weld burn and scale.

J. Materials:

Components	Materials
Frame Guides and Invert	6061-T6 Aluminum
Stop Logs	6061-T6 Aluminum
Lip Seal	Urethane, EPDM or Neoprene ASTM D-2000
Anchor Studs, Fasteners and Nuts	Stainless Steel, Type 316, ASTM A276

2.2 FRAME GUIDES

A. The frame guides or grooves and invert member shall be constructed of extruded aluminum with a minimum thickness of 1/4-inch.

1. Frame design shall allow for embedded mounting or mounting directly to a wall with stainless steel anchor bolts and grout. Mounting style shall be as shown on the Contract Drawings.
2. An invert member shall be provided across the bottom of the guides. The invert member shall be of the flushbottom type.
3. Frame mounted seals are not acceptable.

2.3 STOP LOGS

A. The stop logs shall be constructed of extruded aluminum shapes with a minimum thickness of 5/16-inch.

1. Each stop log shall be 18 inches tall unless otherwise indicated on the Contract Drawings.
2. Maximum bending stress shall not exceed 7600 psi at the maximum operating head.

3. Adequate drainage shall be provided for each stop log.
4. Two slots shall be provided in the top of each stop log for removal and installation via the stop log lifter.
5. Each stop log shall be outfitted with an identification tag indicating the manufacturer, width of the opening and maximum head rating at a minimum. Additional tags shall be included on each stop log that indicate "dry side" and "wet side". Tags shall be welded to each log.

2.4 SEALS

A. Each stop log shall be outfitted with a continuous resilient lip seal along the bottom and both sides to restrict leakage in accordance with the requirements listed in this specification.
   1. The continuous lip seal shall be constructed of urethane or rubber and shall be mechanically retained to the stop log.
   2. The lip seal shall be activated by a combination of the weight of the stop log and the differential water pressure, which pushes the seal against the inside of the groove assembly.
   3. Stop logs that utilize rubber "J" seals or "P" seals are not acceptable.

2.5 ANCHOR BOLTS

A. Anchor bolts shall be provided by the stop log manufacturer for mounting the guide frames and storage racks (if applicable).
   1. Quantity and location shall be determined by the stop log manufacturer.
   2. If epoxy type anchor bolts are provided, the stop log manufacturer shall provide the studs and nuts.
   3. Anchor bolts shall have a minimum diameter of 1/2-inch.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Installation of the stop logs, guide frames and appurtenances shall be done in a workmanlike manner. It shall be the responsibility of the CONTRACTOR to handle, store and install the equipment specified in this Section in strict accordance with the manufacturer's recommendations.

B. The CONTRACTOR shall review the installation drawings and installation instruction prior to installing the guide frames.

C. The guide frames shall be installed in a true vertical plane, square and plumb.

D. The CONTRACTOR shall fill the void in between the guide frames and the wall with non-shrink grout as shown on the installation drawing and in accordance with the manufacturer's recommendations.

3.2 FIELD TESTING

A. After installation, all stop logs shall be field tested in the presence of the ENGINEER and OWNER to ensure that all items of equipment are in full compliance with this Section. The stop logs shall be inserted into the guide frames to confirm that they operate in accordance with the specification. Each stop log assembly shall be water tested by the CONTRACTOR, at the discretion of the ENGINEER and OWNER, to confirm that leakage does not exceed the specified allowable leakage.

END OF SECTION

Appendix A

MEPA Expanded Environmental Notification form and Environmental Impact Report

The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Charles D. Baker
GOVERNOR

Karyn E. Polito
LIEUTENANT GOVERNOR

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SECRETARY

Tel: (617) 626-1000
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http://www.mass.gov/envir

April 15, 2022

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
EXPANDED ENVIRONMENTAL NOTIFICATION FORM

PROJECT NAME	: McKinstry Pond Dam Repairs
PROJECT MUNICIPALITY	: Oxford
PROJECT WATERSHED	: French
EEA NUMBER	: 16523
PROJECT PROPONENT	: Town of Oxford Department of Public Works
DATE NOTICED IN MONITOR	: February 9, 2022

Pursuant to the Massachusetts Environmental Policy Act (MEPA; M.G.L. c. 30, ss. 61-62L) and Sections 11.06 of the MEPA Regulations (301 CMR 11.00), I have reviewed the Expanded Environmental Notification Form (EENF) and hereby determine that this project **requires** the submission of an Environmental Impact Report (EIR). In accordance with Section 11.06(8) of the MEPA regulations, the Proponent requested that I allow a Single EIR to be submitted in lieu of the usual two-stage Draft and Final EIR process. I hereby grant the request to file a Single EIR, which the Proponent should submit in accordance with the Scope included in this Certificate.

Project Description

As described in the EENF, the McKinstry Pond Dam is subject to a Dam Safety Order requiring repair or removal of the dam. To prevent failure to the dam, the Proponent proposes the following repairs:

1. Remove existing concrete and mortared stone masonry intake structure and internal components including pipes, concrete weir, and low-level outlet.

2. Install a new weir board structure within the existing intake structure that can be accessed through steel grating over the structure. Flow through the structure will be controlled by two sets of aluminum weir boards.
3. Install trash racks at the upstream end of the weir board structure to minimize debris entering the structure or moving downstream.
4. Remove and replace existing stone culvert and downstream headwall and replace with two (2) 24-inch HDPE pipes supported by a concrete cradle. The downstream dry stack masonry headwall will be replaced with a cast-in-place concrete headwall.
5. Replace upstream wing walls and remove upstream granite blocks/masonry support. Upstream wing walls will be replaced, and the upstream face will be regraded and flatted to a uniform slope to replace the existing granite blocks and masonry supporting portions of the embankment.
6. Regrade the dam embankment, including the upstream face, portions of the downstream face around the proposed headwall, and the dam crest.
7. Install 18 inches of stone armoring on the upstream face of the dam to help protect the embankment from erosion. An 18-inch thick apron will be installed in the downstream channel.
8. Improve the existing stormwater system. Collapsing storm culverts entering the structure will be replaced with HDPE pipes. Additional stormwater infrastructure will be installed along the dam portion of Waite Street to reduce stormwater flow issues at the site and on the dam crest.
9. Repair Waite Street including reconstruction of the dam portion of Waite Street to resolve some previously identified deficiencies associated with the dam crest. Improvements include installation of curbing to contain stormwater flow within the street and some subsurface improvements associated with the installation of new stormwater infrastructure.
10. Security of the structure, which has been subject to vandalism in the past, will be addressed with a chain link fence, gate, and lock, around the perimeter of the structure.

According to the EENF, temporary water controls are required to dewater the work area and to convey base flows through the dam. The water controls will consist of a combination of water level draw down in the pond and coffer damming around the work area. The pond will be lowered by approximately 3.4 feet (ft) impacting approximately 9 acres of Land Under Waterbodies and Waterways (LUWW). As stated in the EENF, this provides an effective water control system as inflow can be managed by storage available within the partially drawdown pond with cofferdams to protect the work area and dam during storm conditions. The cofferdams are anticipated to retain 2 ft of water under normal conditions.

Project Site

The McKinstry Pond Dam is located on the east end of McKinstry Pond along Waite Street in Oxford. The project is located on three parcels, one owned by the Town of Oxford (Town) and two owned by residents. As stated in the EENF, the McKinstry Pond Dam is classified as a Significant Hazard Potential dam in Poor condition. A dam is deemed to be of Significant Hazard Potential where dam failure may cause loss of life and damage to homes, industrial or commercial facilities, secondary highways or railroads or cause interruption of use

or service of relatively important facilities. Based on inspection findings that call out structural deficiencies and rate the dam condition as Poor, the Massachusetts Office of Dam Safety (ODS) has determined that McKinstry Pond Dam does not meet dam safety standards and is a potential threat to public safety.

McKinstry Pond Dam consists of an earthen embankment supporting a public road along its crest. The upstream face is armored with stone masonry with granite capstone blocks. The downstream face consists of earthen slopes and a stone masonry headwall at the discharge channel. The dam has a maximum height of 6.5 ft and a crest width of 55 to 60 ft. The dam crest length varies from approximately 160 ft on the upstream side of the dam to approximately 60 ft on the downstream side. The dam spillway is located about two-thirds of the way along the upstream face from the left abutment. Flow through the spillway discharges is through a stone culvert to an unnamed downstream channel and then into a large wetland area.

The existing spillway has concrete wing walls and stone masonry/concrete training walls. The spillway weir is a broad crested weir with a total length of 9.2 ft. A thinner concrete weir plate, 7.5 inches high and 2.5 inches thick, has been secured on top of the main spillway with a 2-ft gap for normal flows. The culvert downstream of the spillway is a stone masonry box culvert and has a height and width of approximately 2 ft. The headwall of the stone culvert is dry-laid stone masonry which abuts the downstream end of the concrete training walls. A metal low-level outlet pipe with a diameter of 12 inches has an outlet point immediately downstream of the spillway, at the upstream end of the box culvert. The manual valve control wheel is at the outlet of the pipe.

State and local wetland resource areas located within the project area include Riverfront Area (RA), Bank, LUWW, Bordering Land Subject to Flooding, Bordering Vegetated Wetland (BVW), and the 100-foot Buffer Zone to BVW. There are no Outstanding Resource Waters (ORWs) or Areas of Critical Environmental Concern (ACECs) located on or adjacent to the project site. According to Massachusetts Natural Heritage and Endangered Species Program (NHESP) Atlas (August 1, 2021, 15th Edition), the site is not located within Estimated or Priority Habitats of Rare Species.

The project site is located within 1 mile of two Environmental Justice (EJ) populations in Oxford, one characterized by Minority and the other by Income. The site is located within five miles of four additional EJ populations within the Town of Webster. Two of these populations are characterized by Income and two by Minority and Income. The EENF identified the "Designated Geographic Area" (DGA) for the project as 1 mile around EJ populations, included a review of potential impacts and benefits to the EJ populations within this DGA, and described public involvement efforts undertaken to date.

Environmental Impacts and Mitigation

Potential environmental impacts associated with the project include permanent and temporary impacts to wetland resource areas including 399 square feet (sf) of BVW (172 sf temporary and 227 sf permanent), 394,627 sf (9.1 acres) of LUWW (9 acres temporary drawdown, 1,462 sf temporary coffer/check dams, and 1,125 sf permanent), 100 linear feet (lf)

of Bank (permanent), 255 sf BLSF, and 9,356 sf RA (temporary and permanent – no quantities listed).

Potential environmental impacts are described as alteration of 0.31 acres of land with no new impervious area, although the project description includes construction of a permanent gravel access drive from Waite Street to the proposed concrete weir board structure. Wetland impacts include temporary and permanent alteration of BVW, LUWW, Bank, BLSF, and RA. The majority the alteration is associated with the drawdown of the pond and the installation of the coffer dam and stone check dam.

Measures to avoid, minimize and mitigate these impacts include implementation of Stormwater Pollution Prevention Plan (SWPP) during the construction period and installation of stormwater management controls for dewatering and sedimentation. As described in the EENF, mitigation for impacts to wetland resource areas include restoration of all disturbed areas with native wetland seed mix and native shrubs. The EENF states that impacts associated with the temporary pond drawdown will be limited in duration and the rate of drawdown will be controlled to minimize adverse effects to aquatic species in the pond. Base flows will be conveyed around the dam during construction through siphons and pumping when necessary. A dewatering basin will be used to minimize turbidity and high velocity flows from entering the stream. Timber construction mats or comparable will be implemented within areas of LUWW which will be accessed by machine following drawdown and dewatering.

Jurisdiction and Permitting

The project is subject to MEPA review because it requires Agency Action and exceeds MEPA review thresholds at 301 CMR 11.03 (3)(b)(1)f. for alteration of ½ or more acres of any other wetland. The project is required to prepare an EIR pursuant to 301 CMR 11.06(7)(b) because it is located within 1 mile of an EJ Population. The project requires a Chapter 253 Dam Safety Permit from the Department of Conservation and Recreation (DCR) and may also require a Chapter 91 License from Massachusetts Department of Environmental Protection (MassDEP). The project is not subject to MEPA's Greenhouse Gas (GHG) Policy and Protocol (GHG Policy) because it does not exceed any mandatory EIR thresholds and is not expected to generate 2,000 or more tpy of GHG (CO2) emissions from conditioned spaces that are likely to be used or occupied by EJ populations.

A Project Notification Form was submitted to the Massachusetts Historic Commission (MHC) under M.G.L. c. 9, Section 26-27C and/or Section 106 of the National Historic Preservation Act of 1966. Following review, MHC has submitted a response (included in the EENF) indicating the project is unlikely to affect significant historic or archaeological resources.

The project will require an Order of Conditions (OOC) from the Oxford Conservation Commission (or in the case of an appeal, a Superseding Order of Conditions from MassDEP). According to the EENF, the project qualifies as a limited project in accordance with 310 CMR 10.53(3)(i) of the Wetlands Protection Act (WPA) Regulations. It will require a National Pollutant Discharge Elimination System (NPDES) Stormwater General Permit from the United States Environmental Protection Agency (EPA).

Because the project is seeking Financial Assistance from an Agency (EOEEA Dam and Seawall Grant), MEPA jurisdiction is broad and extends to all aspects of the project that are likely, directly, or indirectly, to cause Damage to the Environment as defined in the MEPA regulations.

Request for Single EIR

The MEPA regulations at 301 CMR 11.06(8) indicate that a Single EIR may be allowed provided I find that the EENF:

a) describes and analyzes all aspects of the project and all feasible alternatives, regardless of any jurisdictional or other limitation that may apply to the Scope;
b) provides a detailed baseline in relation to which potential environmental impacts and mitigation measures can be assessed; and,
c) demonstrates that the planning and design of the project use all feasible means to avoid potential environmental impacts.

For any Project for which an EIR is required in accordance with 301 CMR 11.06(7)(b), I must also find that the EENF:

d) describes and analyzes all aspects of the Project that may affect Environmental Justice Populations located in whole or in part within the Designated Geographic Area around the Project; describes measures taken to provide meaningful opportunities for public involvement by Environmental Justice Populations prior to filing the expanded ENF, including any changes made to the Project to address concerns raised by or on behalf of Environmental Justice Populations; and provides a detailed baseline in relation to any existing unfair or inequitable Environmental Burden and related public health consequences impacting Environmental Justice Populations in accordance with 301 CMR 11.07(6)(n)1.

Consistent with this request, the EENF was subject to an extended comment period under 301 CMR 11.05(8).

Review of the EENF

The EENF includes a project description, an alternatives analysis, existing and proposed conditions plans, estimates of project-related impacts, and a resource area delineation report; it also identifies preliminary measures to avoid, minimize and mitigate environmental impacts. Consistent with the MEPA Interim Protocol on Climate Change Adaptation and Resiliency, the EENF contained an output report from the MA Climate Resilience Design Standards Tool ("MA Resilience Design Tool")[1]. It also contained an assessment of the public health impacts of the project and information related to impacts on EJ populations in accordance with 301 CMR 11.06(13).

The Proponent provided supplemental information to the MEPA Office on March 17, 2022, to expand the submitted ENF to an EENF requesting a Single EIR. This supplemental

[1] https://resilientma.org/rmat_home/designstandards/

information included additional project alternatives, an EJ analysis, and proposed Section 61 Findings. Supplemental information also included Phase I (June 17, 2014) and Phase II (July 22, 2019) Dam Investigations Reports and an H&H Model Report (November 2017). This supplemental information was circulated to the MEPA Distribution List.

Comments from DCR are supportive of the project and state that successful completion of the project will address several of the dam's documented deficiencies and will result in significant improvement to overall dam condition, operability, and public safety.

Alternatives Analysis

The EENF included an alternatives analysis which evaluated alternatives to address the existing deficiencies, ensure that the dam can safely pass the required Spillway Design Flood (SDF), and bring the dam into compliance with the Office of Dam Safety design regulations and current dam safety design practices.

Under the No-Action alternative, the project would not proceed. As stated above, the dam is subject to a Dam Safety Order requiring repair or removal of the dam. Based on the deficiencies noted in the Phase I and II inspection reports, the condition of the dam will likely worsen if left in its current state.

Dam Removal was also evaluated. However, the EENF states the impoundment is actively used for recreation and Waite Street is located on the dam crest. The Town's primary objective to continue to operate the dam is inconsistent with a dam removal alternative; therefore, this alternative was dismissed.

The EENF evaluated spillway alternatives including repairing the stone masonry or constructing an auxiliary spillway. Due to the level of deterioration of the stone masonry, retrofitting or repairing the stone masonry was not considered feasible. The EENF states this alternative results in reduced wetland impacts but does not improve the resiliency of the dam against future increases in precipitation. An auxiliary spillway was considered to provide additional capacity to provide freeboard during the design storm. Given the need to replace the spillway due to the structural condition, providing an auxiliary spillway is not a cost effective alternative and results in higher wetland impacts. Thus, the EENF states this alternative was not considered further.

The EENF also detailed water control alternatives to facilitate dewatering during construction. These included full pond drawdown, maintenance of the full pond, and partial pond drawdown under two scenarios. The EENF states that full pond drawdown would impact approximately 16 acres of LUWW and was not selected due to the higher environmental impacts.

Maintaining the full pond during construction would result in the fewest environmental impacts but, according to the EENF, will make maintaining a dry work area difficult due to increased seepage forces beneath the coffer dam. Also, during storm events, the pond will have less storage available to accommodate flow entering the pond, leading to additional stress on the

temporary coffer dam. The EENF states that a cofferdam failure may result in an uncontrolled water release, serious flooding in the downstream area, damage to exposed portions of the dam embankment, uncontrolled soil release to the downstream area, and additional expense associated with restoration of the dam and downstream area. For these reasons, performing excavations in dams with cofferdams supporting the full pressure of the pond is not optimal and this alternative is not recommended.

The EENF presents two partial pond drawdown scenarios. Under Scenario #1, the pond level would be lowered approximately 4.0 ft resulting in 12 acres of LUWW impacts. This alternative provides an effective water control system as the pond can be managed by storage available within the partially drawn down pond with cofferdams to protect the work area and dam during storm conditions. It is noted that the project was first submitted with this water control scenario proposed. However, the impacts exceed the 10-acre mandatory EIR threshold for Wetlands per 11.03(3)(a)(1)b of the MEPA regulations. The accepted filing presented Scenario #2 which proposes lowering the pond level by approximately 3.4 feet to elevation 490 ft resulting in approximately 9 acres of LUWW impacts. According to the EENF, this alternative also provides an effective water control system as inflow to the pond can be managed by storage available within the partially drawdown pond with cofferdams to protect the work area and dam during storm conditions. The cofferdams are anticipated to retain 2 feet of water under normal pond conditions. The Single EIR should review the information used to determine the area of LUWW that will be exposed and provide details of how the area of impact will be kept to less than 10 acres during the drawdown process.

Environmental Justice

As noted above, the project site is located within 1 mile of two Environmental Justice (EJ) populations in Oxford, one characterized by Minority and the other by Income. The site is within five miles of four additional EJ populations within the Town of Webster, two characterized by Income and two by Minority and Income. Within the census tracts containing the above EJ populations, there are no languages identified as spoken by 5% of more of residents who also identify as not speaking English very well.

Effective January 1, 2022, all new projects in "Designated Geographic Areas" ("DGA," as defined in 301 CMR 11.02, as amended) around EJ populations are subject to new requirements imposed by Chapter 8 of the Acts of 2021: *An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy* (the "Climate Roadmap Act") and amended MEPA regulations at 301 CMR 11.00.[2] Two related MEPA protocols—the MEPA Public Involvement Protocol for Environmental Justice Populations (the "MEPA EJ Public Involvement Protocol") and MEPA Interim Protocol for Analysis of project Impacts on Environmental Justice Populations (the "MEPA Interim Protocol for Analysis of EJ Impacts")—are also in effect for new projects filed on or after January 1, 2022.[3] Under the new regulations and protocols, all projects located in a DGA around one or more EJ populations must take steps to enhance public

[2] MEPA regulations have been amended to implement Sections 55-60 of the Climate Roadmap Act, and took effect on December 24, 2021. More information is available at https://www.mass.gov/service-details/information-about-upcoming-regulatory-updates.
[3] Available at https://www.mass.gov/service-details/eea-policies-and-guidance.

involvement opportunities for EJ populations, and must submit analysis of impacts to such EJ populations in the form of an EIR.

The EENF indicates that the DGA for the project is 1 mile, and states that EJ populations within this DGA are not likely to be negatively impacted by the project because the project will not generate emissions or increased traffic, will not result in the release of contaminated soil or sediment, and will not increase the water or air temperature. In addition, this project will not substantially increase the footprint of the current dam or clear any vegetation from the project site and therefore, will not create heat-island effect or contribute to extreme heat issues.

The EENF indicates that the project will offer public benefits for EJ populations, including improving climate resiliency of the dam by accounting for future increases in extreme precipitation as discussed below. In addition, the EENF states that the project will ensure the proper function of the dam preventing possible dam failure which may result in loss of life and damage to homes or cause interruption of use/service of important facilities and infrastructure (including to those in EJ populations downstream of the dam). The dam also impounds McKinstry Pond and provides opportunity for recreational activities which are available to all community members. The Single EIR should provide additional information about recreational facilities available to the community and how EJ populations might be impacted by the closure of these facilities during the project (estimated to occur late spring to early fall).

The EENF described public involvement activities conducted prior to filing, including email correspondence to a list of Community Based Organizations (CBOs) and tribes/indigenous organizations provided by the EEA EJ Director. The proponent circulated an EJ screening form with an overview of the project to these entities, and notified such entities in advance of the MEPA remote consultation session. The Single EIR should describe a public involvement plan that the project intends to follow for EJ populations within the DGA for the remainder of the MEPA review process and should provide an analysis of impacts on EJ populations consistent with the Scope below.

The EENF contained a baseline assessment of any existing unfair or inequitable Environmental Burden and related public health consequences impacting EJ Populations in accordance with 301 CMR 11.07(6)(n)1. and the MEPA Interim Protocol for Analysis of EJ Impacts. According to the EENF, the data surveyed do not appear to indicate an existing "unfair or inequitable" burden impacting the identified EJ populations. Specifically, the EENF notes that the DPH EJ Tool does not identify any census tract or municipality in which the EJ populations are located as exhibiting "vulnerable health EJ criteria"; this term is defined in the DPH EJ Tool to include any one of four environmentally related health indicators that are measured to be 110% above statewide rates based on a five-year rolling average.[4] In addition, the EENF

[4] See https://matracking.ehs.state.ma.us/Environmental-Data/ej-vulnerable-health/environmental-justice.html. Four vulnerable health EJ criteria are tracked in the DPH EJ Viewer, of which two (heart attack hospitalization and
childhood asthma) are tracked on a municipal level, and two (childhood blood lead, and low birth weight) are tracked on a census tract level.

indicates that the following sources of potential pollution exist within 5-miles of the identified EJ populations, based on the mapping layers available in the DPH EJ Tool:

- Major air and waste facilities: 2
- M.G.L. c. 21E sites: 2
- "Tier II" toxics use reporting facilities: 6
- MassDEP sites with AULs: 1
- MassDEP groundwater discharge permits: 1
- Wastewater treatment plants: 0
- MassDEP public water suppliers: 1
- Underground storage tanks: 5
- EPA facilities site: 0
- Road infrastructure: 3 (State Route 12, Interstate 395, US Route 20)
- MBTA and rapid transit: 1
- Other transportation infrastructure: 3
- Region transit agencies: 1
- Energy generation and supply: 0

In reviewing this data on the DPH tool, I find that the numbers indicated above appear to be for the 1-mile radius of the project site as there are more facilities shown within a 5-mile radius on the DPH EJ Tool. The DGA for this project is 1-mile and therefore, the proponent was not required to conduct an assessment over a larger radius. The assessment of impacts on EJ populations should be supplemented in accordance with the Scope.

Wetlands, Waterways and Stormwater

As stated above, the project includes both temporary and permanent impacts to Bank, BVW, LUWW, BLSF, and RA. The EENF breaks out the impacts by resource area:

BVW (172 sf temporary, 227 sf permanent): The proposed project includes 62 sf of temporary impacts from the cofferdam and 110 sf of temporary impacts due to the stone check dam. Permanent impacts include 7 sf of upstream stone armoring and grading, 5 sf of the replacement of the end wall, and 215 sf of downstream stone armoring and grading. Comments received from MassDEP state that portions of the project represent an expansion of existing conditions and therefore fail to meet the Limit Project standards as outlined in 310 CMR 10.53(3)(i). The Single EIR should provide additional information as outlined in the Scope below.

LUWW (9 acres (392,040 sf) + 1,462 sf temporary, 1,125 sf permanent): The pond drawdown will impact approximately 9 acres of LUWW. Additional temporary impacts include 1,404 sf from the cofferdam and 58 sf from the stone check dam. Permanent impacts to LUWW include 668 sf of upstream stone armoring and grading, 123 sf from replacing the spillway, 69 sf from replacement of the culvert, 30 sf of the replacement of the end wall, and 235 sf of downstream stone armoring and grading. MassDEP comments state that impacts to LUWW

exceed those stated in 310 CMR 10.56(4)4 and requests that the Single EIR include a wildlife habitat analysis as outlined in 310 CMR 10.60 and the Scope below.

RA: Temporary and permanent impacts to RA within the 0-100 ft offset are 8,823 sf. This includes the spillway and culvert replacement, end wall replacement, roadway crest grading and paving, stormwater structure improvements, asphalt curbing installation, access road, fencing, stone armoring temporary erosion and sedimentation controls, and temporary cofferdam. There are also 533 sf of temporary and permanent impact to RA within the 100-200 ft offset, which includes stormwater structure improvements and asphalt curbing installation. MassDEP comments indicate that portions of the proposed project represent an expansion over existing conditions include work proposed on the downstream side of the dam and dam crest and the construction gravel access road. The Single EIR should identify the specific infrastructure resulting in permanent RA impacts and demonstrate how the proposed work complies with the performance standards of the Wetlands Protection Act (WPA) Regulations.

Bank: The project will permanently impact 100 lf of bank. Although not required for a Limited Project, approximately 100 lf of the Bank will be replicated in-situ in accordance with 310 CMR 10.54(4) of the Wetlands Protection Act Regulations. Comments received from MassDEP state that impacts to Bank exceed those presumed to have no impact on the capacity of a Bank resource to provide important wildlife habitat functions. Therefore, the Single EIR should include a wildlife habitat analysis as outlined in 310 CMR 10.60 and the Scope below.

The largest wetland impact (9.06 acres) is to LUWW and is primarily associated with pond drawdown. The EENF provides additional details regarding mitigation for this impact including that the drawdown rate will be limited to 3 inches per day and that the length of the drawdown will be approximately 4 months. According to the EENF, the pond will be restored to the normal level post construction. During the drawdown and re-impoundment period, base flows downstream will be maintained. No details are provided on how the drawdown will occur, although the existing spillway contains control structures which can be adjusted to allow increased outflow. Additional information regarding drawdown methods should be provided in the Single EIR in accordance with the Scope outlined below.

In addition, the EENF states there is no time of year restriction proposed and the need for earthwork and concrete construction make work during freezing temperatures infeasible; therefore, construction will occur during the spring, summer, and early fall. The EENF states that winter construction may result in significant project delays and increased cost. As detailed below, the Single EIR should provide further details on the drawdown process and mitigation measures to address drawdown impacts including those to water quality, in-water habitat, and resident aquatic species.

The existing structure does not have a current Chapter 91 License or Permit and the EENF states that emails exchanged with MassDEP Waterways indicated that further review would be required to confirm applicability. The Single EIR should contain the status of permitting required with MassDEP Waterways under Chapter 91.

The EENF states that according to 310 CMR 10.05(6)(p), the Massachusetts Stormwater Management Standards (SMS) do not apply to this project since the SMS apply only to

stormwater runoff from industrial, commercial, institutional, office, residential and transportation projects. MassDEP comments state that any work not directly associated with dam repair that fails to meet any additional exemptions will be subject to the SMS.

Climate Change Adaptation and Resiliency

Governor Baker's Executive Order 569: Establishing an Integrated Climate Change Strategy for the Commonwealth was issued on September 16, 2016. The Order recognizes the serious threat presented by climate change and direct Executive Branch agencies to develop and implement an integrated strategy that leverages state resources to combat climate change and prepare for its impacts. The urgent need to address climate change was again recognized by Governor Baker and the Massachusetts Legislature with the recent passage of St. 2021, c. 8, *An Act Creating a Next Generation Roadmap for Massachusetts Climate Policy*, which sets a goal of Net Zero emissions by 2050. I note that the MEPA statute directs all Agencies to consider reasonably foreseeable climate change impacts, including additional greenhouse gas emissions, and effects, such as predicted sea level rise, when issuing permits, licenses and other administrative approvals and decisions. M.G.L. c. 30, § 61.

The Town is a participant in the Commonwealth's Municipal Vulnerability Preparedness (MVP) program, which is a community-driven process to define natural and climate-related hazards, identify existing and future vulnerabilities and strengths of infrastructure, environmental resources, and vulnerable populations, and develop, prioritize, and implement specific actions the town can take to reduce risk and build resilience. The Town is currently in the process of updating its Hazard Mitigation Plan in combination with completing its first MVP Plan.

Effective October 1, 2021, all MEPA projects are required to submit an output report from the MA Resilience Design Tool to assess the climate risks of the project. Based on the output of the MA Resilience Design Tool provided in the EENF, the McKinstry Pond Dam and Waite Street stormwater infrastructure are rated high risk for the following climate parameters: extreme precipitation from riverine flooding and extreme heat. Both areas are at moderate risk from extreme precipitation due to urban flooding. Based on the 50-yr self-assessed useful life and criticality for the dam, the output report generated from the Tool recommends a return period associated with a 50-year (2% chance) storm event when designing the dam. The Tool recommends a return period associated with a 10-year (10% chance) storm event when designing the roadway stormwater infrastructure. These recommendations appear to be associated with "Medium" and "Low" critical assets, respectively, based on user-generated criticality assessments. For "High" critical assets, the Tool recommends planning for a 100-year storm for flood control structures with a 11 to 50 year planning horizon, and a 50-year storm for utilities including stormwater infrastructure.[5]

The EENF states that the significant hazard class of McKinstry Pond Dam dictates that the spillway must safely pass the 100-year storm (the Spillway Design Flood, or SDF) per 302

[5] https://eea-nescaum-dataservices-assets-prd.s3.amazonaws.com/cms/GUIDELINES/20210401Section3ClimateResilienceDesignStandardsOverview.pdf (p. 19).

CMR 10.00. According to the EENF, adequate freeboard is generally preferred between the maximum water surface elevation and the top of the dam such that waves do not cause overtopping. For a relatively small impoundment such as McKinstry Pond, adequate freeboard is considered to be one foot. The Proponent utilized NOAA Atlas 14 and modeled the current 100-year storm (consisting of 7.94 inches of precipitation in 24 hours). This rainfall was routed through the pond to assess the spillway capacity, and to design a new spillway that safely conveys the SDF. The results of the analysis indicate that the proposed spillway safely conveys the SDF and satisfied the goal of providing one foot of freeboard. The maximum water surface elevation for the 100-year flood is shown to be 494.64 feet, which is approximately 1.2 feet below the minimum dam embankment elevation.

The EENF states future rainfall and flooding conditions were assessed utilizing EPA's Climate Resilience Evaluation and Awareness Tool (CREAT) application to estimate future 100-year, 24-hour rainfall. [6] Using an estimated precipitation depth of 8.72 inches (9.8% greater than current precipitation values), the maximum pond elevation reached 494.78 feet, approximately 1.02 feet below the minimum dam embankment elevation. The EENF should clarify what timeframe this future rainfall amount is associated with. It is anticipated that the MA Resilience Design Tool will be updated to provide 24-hour rainfall volumes associated with multiple storm scenarios and planning horizons. The Single EIR should clarify if the output from the CREAT application aligns with rainfall volumes provided in the Tool for a 2070 100-year storm for flood control structures such as dams. The Single EIR should also assess resiliency of the stormwater management system in light of future climate conditions.

Construction Period

The EENF describes temporary construction period impacts including the loss of the pond as a recreational resource for an approximately 4-month period. Additional impacts include the closure of Waite Street in the immediate vicinity of the dam. According to the EENF, this residential street serves local traffic only and there are alternate access/egress routes available for impacted residents. Signage will be provided, and residents will be notified before construction commences.

All construction and demolition activities should be managed in accordance with applicable MassDEP's regulations regarding Air Pollution Control (310 CMR 7.01, 7.09-7.10), and Solid Waste Facilities (310 CMR 16.00 and 310 CMR 19.00, including the waste ban provision at 310 CMR 19.017). The project should include measures to reduce construction period impacts (e.g., noise, dust, odor, solid waste management) and emissions of air pollutants from equipment, including anti-idling measures in accordance with the Air Quality regulations (310 CMR 7.11). I encourage the Proponent to require that its contractors use construction equipment with engines manufactured to Tier 4 federal emission standards or select project contractors that have installed retrofit emissions control devices or vehicles that use alternative fuels to reduce emissions of volatile organic compounds (VOCs), carbon monoxide (CO) and particulate matter (PM) from diesel-powered equipment. Off-road vehicles are required to use ultra-low sulfur diesel fuel (ULSD). If oil and/or hazardous materials are found during

[6] Climate Resilience Evaluation and Awareness Tool (CREAT) Risk Assessment Application for Water Utilities | US EPA

construction, the Proponent should notify MassDEP in accordance with the Massachusetts Contingency Plan (310 CMR 40.00). All construction activities should be undertaken in compliance with the conditions of all State and local permits. I encourage the Proponent to reuse or recycle construction and demolition (C&D) debris to the maximum extent.

Conclusion

Based on review of the EENF, consultation with Agencies, and consideration of public comments, I am granting the request to file a Single EIR. The Proponent should submit a Single EIR that provides updated project information and analyses as specified in the Scope below. If the Single EIR fails to adequately respond to the Scope included in this Certificate, additional review in the form of a Supplemental Single EIR may be required.

SCOPE

General

The Single EIR should follow Section 11.07 of the MEPA regulations for outline and content and provide the information and analyses required in this Scope. It should clearly demonstrate that the Proponent will avoid, minimize, and mitigate Damage to the Environment to the maximum extent practicable through project alternatives and design Project Description and Permitting.

Project Description and Permitting

The Single EIR should describe any changes to the project since the filing of the EENF. If necessary, the Single EIR should include updated site plans for existing and post-development conditions at a legible scale. The Single EIR should include a list of required State Permits, Financial Assistance, or other State, local and federal approvals and provide an update on the status of each of these pending actions.

Environmental Justice

The Single EIR should establish a public involvement plan to engage EJ populations located within the identified DGA for the project. The Single EIR should contain a description of measures the Proponent intends to undertake to promote public involvement by such EJ populations during the remainder of the MEPA review process, including a discussion of any of the best practices listed in the MEPA EJ Public Involvement Protocol that the project intends to employ or has employed by the time of the Single EIR filing. It is my expectation that the proponent will commence activities under the public involvement plan well in advance of filing the Single EIR, and will not rely solely on a notification to the EJ reference list provided by the MEPA Office to satisfy the requirements for outreach. In particular, if there are identified EJ populations that will be directly impacted or benefited by the project, for instance, through improvements to downstream flooding conditions or impacts to recreational access and facilities, the proponent should take steps to identify those specific neighborhoods and conduct outreach such as establishing repositories of project information in community setting or holding

community-based meetings or seminars. The Single EIR, or a summary thereof, should be distributed to all entities included in the EJ reference list that was utilized to provide notice of the ENF, unless any such entity has requested to be excluded or the MEPA Office and EEA EJ Director have provided an alternative list.

The Single EIR should supplement the assessment presented in the EENF of baseline conditions in EJ populations. Specifically, it should provide a narrative description of the types of facilities that were identified within 1 mile of the project site and any potential pollution risks associated with them, with an emphasis on major air and waste facilities, M.G.L. c. 21E sites, "Tier II" toxics use reporting facilities, MassDEP sites with AULs, and MassDEP groundwater discharge permits. The Single EIR should also include an analysis of the project's impacts to determine whether the project may result in disproportionate adverse effects, or increase the risks of climate change, on the identified EJ population, in accordance with 301 CMR 11.07(6)(n)2.-5. and the MEPA Interim Protocol for Analysis of EJ Impacts. The EENF states that the site use and design features do not exacerbate the vulnerabilities identified during the review. Resiliency against extreme riverine flooding is incorporated into the design by magnifying the design precipitation, providing freeboard between the peak pond level and the dam crest, and providing bio-engineered bank treatments at the dam to reduce scour potential and protect the critical infrastructure of the dam against catastrophic failure. The project should include the potential for impacts of downstream flooding on EJ populations and provide additional information on the measures taken to incorporate resiliency into the design (see Climate Change section below). The Single EIR should provide additional information about recreational facilities available to the community and how EJ populations might be impacted by the closure of these facilities during the project (estimated to occur late spring to early fall). The Single EIR should provide a comprehensive discussion of the impact of construction period activities on EJ populations, including a narrative describing the extent of construction period truck traffic and whether it will be routed through EJ census blocks.

Public Health

The Single EIR should include a separate section on "Public Health," and discuss any known or reasonably foreseeable public health consequences that may result from the environmental impacts of the project including the closure of this recreational resource during the summer months.

Stormwater

As indicated in the EENF, the proposed dam replacement activities are exempt from the Massachusetts SMS. However, as noted above, the Proponent has proposed to improve site drainage and provide pretreatment of stormwater runoff from the site. Comments from MassDEP note that any work not directly associated with dam repair that fails to meet any additional exemptions will be subject to the Massachusetts SMS. The Single EIR should provide documentation of how stormwater infrastructure not directly related to dam repair will meet the Massachusetts SMS. As further explained below, the applicant has chosen a 50-year useful life for the Waite Street portion of the project. The Single EIR should describe how the proposed stormwater best management practices (BMPs) were sized including the storm scenario (and

associated rainfall volume) that was used and how climate change was considered in the design. In addition, stormwater BMPs should be designed to remove total suspended solids (TSS) and total phosphorous (TP) in accordance with the requirements of the NPDES MS4 Permit. The Single EIR should include a discussion of how these requirements will be met.

Wetlands

As described above and in the EENF, the pond level will be lowered by approximately 3.4 feet to allow for construction to occur. This will expose 9 acres of LUWW. As stated above, this impact exceeds those stated in 310 CMR 10.56(4)4 which are presumed to have no adverse impact on the capacity of a LUWW resource to provide important wildlife habitat. Bank alterations (100 lf) also exceed those presumed to have no impact on the capacity of Bank to provide important wildlife habitat functions. As stated in MassDEP comments, the Single EIR and NOI should include a wildlife habitat analysis as outlined in 310 CMR 10.60.

Additional analysis of drawdown impacts should include those on aquatic vegetation, aquatic mammals, and birds. Any additional impacts expected on water quality and those that might affect nearby residents including potential odors associated with exposed sediment and fish kills, loss of recreation value, and potential impacts to nearby wells (if any). Dewatering methods should include details of how the drawdown will be limited to 3.4 ft, including the starting water elevation, and how the exposed area will be limited to 9 acres. Work is proposed during the summer months and a description of how drought conditions might impact the drawdown. Mitigation to address expected impacts should also be detailed. The Single EIR should also describe the process and timing for refilling the pond including the rate of water level change and number of days to achieve the normal pond level. All proposed monitoring both during and after construction should be described.

The Single EIR should also address portions of the project that represent an expansion over existing conditions as indicated by MassDEP's comment letter. This includes additional work proposed on the downstream side of the dam and dam crest, including wing wall placement, armoring of the outfall, portions of the proposed stormwater treatment train, and the construction of the gravel access road. This work must comply with the RA performance standards found in 310 CMR 10.58(4) and the redevelopment standards found in 310 CMR 10.58(5). According to MassDEP comments, the downstream headwall and rip rap placement at the outfall also fail to meet the Limited Project standards as outline in 310 CMR 10.53(3)i. Accordingly, the Single EIR and the NOI filed with the Oxford Conservation Commission should contain a wetland replication plan detailing how impacts to BVW will be mitigated.

Climate Change

The Single EIR should include a comprehensive discussion of the potential effects of climate change on the project site and describe features incorporated into the project design that will increase the resiliency of the site to these changes. The Single EIR should identify the projected climate conditions and assumptions, such as temperature and precipitation rates, that will be used to design the project's resiliency measures. As stated above, the single EIR should clarify if the output from the CREAT application aligns with the rainfall volumes for extreme

precipitation 24-hour storm depth provided through the MA Resilience Design Tool. This description should also include how the new stormwater infrastructure was sized. Based on the 50-year useful life identified for the project, the MA Resilience Design Tool recommends a planning horizon of 2070 and a return period associated with a 50-year (2% chance) storm event for "High" critical utility (including stormwater) infrastructure and a 25-year storm event for "Medium" critical utility assets. The Single EIR should discuss whether stormwater design is anticipated to align with these recommendations.

In addressing climate change resiliency as described above, the project should consider incorporating the following climate adaption and resiliency features into the project design to the maximum extent practicable:

- Ecosystem-based adaptation measures to reduce heat island effect and mitigate stormwater runoff, such as integration of tree canopy cover, rain gardens, and LID stormwater management techniques;
- Stormwater management system design that will accommodate rainfall under projected climate conditions;
- Use of on-site renewable energy systems that may provide added resiliency during periods of power loss during storms;
- Protection of emergency generator fuel supplies from effects of extreme weather and flood-proofing of structures.

Mitigation and Section 61 Findings

The Single EIR included a separate section summarizing all proposed mitigation measures including construction-period measures. This chapter should also include a comprehensive list of all commitments made by the Proponent to avoid, minimize, and mitigate the environmental and related public health impacts of the project. The filing should contain clear commitments to implement these mitigation measures, estimate the individual costs of each proposed measure, identify the parties responsible for implementation, and contain a schedule for implementation. The list of commitments should be provided in a tabular format organized by subject matter (land, water/wastewater, GHG, environmental justice, etc.) and identify the Agency Action or Permit associated with each category of impact. Draft Section 61 Findings should be separately included for each Agency Action to be taken on the project. The filing should clearly indicate which mitigation measures will be constructed or implemented based upon project phasing to ensure that adequate measures are in place to mitigate impacts associated with each project phase.

Responses to Comments

The Single EIR should contain a copy of this Certificate and a copy of each comment letter received. In order to ensure that the issues raised by commenters are addressed, the Single EIR should include direct responses to comments to the extent that they are within MEPA

jurisdiction. This directive is not intended, and shall not be construed, to enlarge the scope of the Single EIR beyond what has been expressly identified in this certificate.

The Proponent should consult with the MEPA Office prior to filing the Single EIR to determine whether additional distribution requirements may be warranted to surrounding local communities in accordance with the EJ public involvement plan required in the Scope. Pursuant to 301 CMR 11.16(5), the Proponent may circulate copies electronically. However, the Proponent must make a reasonable number of hard copies available to accommodate those without convenient access to a computer and distribute these upon request on a first-come, first-served basis.

Circulation

In accordance with 301 CMR 11.16(3), the Proponent should circulate the Single EIR to those parties who commented on the EENF, each Agency from which the Proponent will seek permits or approvals, and to any parties specified in this Scope. A copy of the Single EIR should be made available for review in the Oxford Public Library.

K. Theoharides

April 15, 2022
Date

Kathleen A. Theoharides

Comments received:

03/25/2022 Department of Conservation and Recreation (DCR)
04/08/2022 Massachusetts Department of Environmental Protection (MassDEP) Central Regional Office (CERO)

KAT/JH/jh

dcr
Massachusetts

March 25, 2022

Secretary Kathleen A. Theoharides
Executive Office of Energy and Environmental Affairs
MEPA Office Attn: Jennifer Hughes
100 Cambridge Street, Suite 900
Boston, Massachusetts 02114

Re: EEA #16523 McKinstry Pond Dam Repairs (Oxford) ENF

Dear Secretary Theoharides:

The Department of Conservation and Recreation ("DCR" or "Department") Office of Dam Safety ("ODS") has reviewed the Environmental Notification Form ("ENF") submitted by Fuss & O'Neill, Inc. on behalf of the Town of Oxford Department of Public Works (the "Proponent") for the rehabilitation of McKinstry Pond Dam in Oxford (the "Project").

As described in the ENF, the Project's scope of work includes: replacement of the dam's spillway structure, outflow conduit and downstream headwall with a new concrete outflow control structure, dual 24" outflow conduits and a new headwall; installation of a stone armoring at the outfall of the spillway conduits; removal of the stone masonry and granite capstones on the dam's upstream slope and replacement with a flatter slope armored with modified rockfill; removal of an existing catch basin and corrugated metal storm drain pipe and installation of new drainage structures and pipe; reconstruction of the portion of Waite Street along the crest of the dam including regrading, repaving and the installation of curbing; and installation of security fencing around the outflow control structure.

ODS notes that McKinstry Pond Dam is classified as a Significant Hazard Potential dam in Poor condition. A dam is deemed to be of Significant Hazard Potential where dam failure may cause loss of life and damage to homes, industrial or commercial facilities, secondary highways or railroads or cause interruption of use or service of relatively important facilities. Based on inspection findings that call out structural deficiencies and rate the dam condition as Poor, ODS has determined that McKinstry Pond Dam does not meet dam safety standards and is a potential threat to public safety.

Structural deficiencies documented in past inspections of the dam include: several sinkholes in the vicinity of the spillway, possibly due to collapsed storm drain piping; sloughing of a portion of the dam's upstream slope; a non-functional low-level outlet; and undulations in the dam crest. Successful project completion will address several of the dam's documented deficiencies and will result in significant improvement to overall dam condition, operability and public safety.

ODS acknowledges the Proponent's proposal to perform the work while the impoundment is in a drawn-down condition, with the water level maintained 3.4' below normal pool elevation. This will reduce risk to both public safety and the safety of construction personnel during execution of the work and will provide for improved site conditions to ensure higher quality construction.

Rehabilitation of McKinstry Pond Dam will require the submission of a Chapter 253 Dam Safety Permit application to ODS. ODS staff will communicate with the Proponent's design engineer as part of the permit process to ensure all required documentation is provided. Upon receipt and review of all required technical information demonstrating compliance with ODS regulations, a Chapter 253 Dam Safety Permit will be prepared and issued by ODS.

DCR appreciates the opportunity to comment on this Project. Please contact David Ouellette at david.ouellette@mass.gov with any questions or to request additional information or coordination with ODS.

Sincerely,

Stephanie Cooper

Stephanie C. Cooper
Acting Commissioner

cc: William Salomaa, Priscilla Geigis, Patrice Kish, Tom LaRosa

Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

Central Regional Office • 8 New Bond Street, Worcester MA 01606 • 508-792-7650

Charles D. Baker
Governor

Karyn E. Polito
Lieutenant Governor

Kathleen A. Theoharides
Secretary

Martin Suuberg
Commissioner

April 8, 2022

Secretary Kathleen A. Theoharides
Executive Office of Environmental Affairs
100 Cambridge Street, 9th Floor
Boston, MA 02114

Attention: MEPA Unit – Jennifer Hughes

Re: Environmental Notification Form (ENF)
McKinstry Pond Dam Repairs
Oxford
EEA #16523

Dear Secretary Theoharides,

The Massachusetts Department of Environmental Protection's ("MassDEP") Central Regional Office has reviewed the ENF for the proposed McKinstry Pond Dam Repairs Project (the "Project"). The Town of Oxford (the "Proponent") is proposing to repair an existing dam located on a public road in a residential area. The Project includes removal of the existing intake structure and internal components; replacement of the weir board structure; installation of a trash rack; removal and replacement of the existing stone culvert and downstream headwall; replacement of upstream wing walls and removal of upstream granite blocks/masonry support; regrading of the dam embankment; stone armoring installation; stormwater system improvements; improvements to Waite Street; and installation of a chain link fence, gate, and lock around the perimeter of the structure.

The Project is under MEPA review because it meets or exceeds the following review threshold:

- CMR 301 11.03(3)(b)(1)(f) - alteration of ½ or more acres of any other wetlands.

The Project requires the following State Agency Permits:

- MassDEP - Superseding Order of Conditions (if local Order of Conditions is appealed);

- Massachusetts Department of Conservation and Recreation - Chapter 253 Dam Safety Permit.

- As indicated in the ENF the Project may also require a Ch. 91 license from MassDEP.

The Project will be funded through a grant from the EOEEA Dam and Seawall Grant Program so MEPA jurisdiction is broad. An EIR is required in accordance with 301 CMR 11.06(7)(b).

MassDEP offers the following comments:

Wetlands

The Project will result in the alteration of wetland resource areas totaling 9.3 acres, including 399 square feet (sf) of Bordering Vegetated Wetland (BVW), 9,356 sf of Riverfront Area (RA), 100 linear feet (lf) of Bank, 255 sf of Bordering Land Subject to Flooding (BLSF) and 9.06 acres of Land Under Waterbodies (LUW). The Project will alter 9,681 sf of Buffer Zone.

The Project requires the filing of a Notice of Intent (NOI) with the Oxford Conservation Commission and MassDEP, which has not yet been filed. Upon receipt of NOI materials, MassDEP may provide additional comments on the Project including whether the work complies with the Massachusetts Wetland Protection Act Regulations, 310 CMR 10.00 et.al, and the Massachusetts Stormwater Standards. The Project may require a Superseding Order of Conditions or a Final Order of Conditions from MassDEP if the local decision is appealed.

Permanent alteration of BVW will be associated with the replacement and installation of a new downstream head wall, rip rap armoring and grading associated with these activities and will total 227 sf. The remaining 172 sf of impact to BVW will be temporary in nature and associated with coffer dam and check dam placement during the construction period. As described in the ENF, this work does not appear to meet all provisions in 310 CMR 10.55(4)(c). The Proponent may decide to file for a Limited Project, but replacement of the downstream headwall and rip rap placement at the outfall appear to represent an expansion over existing conditions and therefore fail to meet the Limited Project standards as outlined in 310 CMR 10.53(3)(i). Accordingly, the NOI and SEIR should provide a wetland replication plan detailing how impacts to BVW resource area will be mitigated.

Alterations of RA totaling 9,356 sf will be associated with spillway and culvert replacement, head wall replacement, roadway crest grading and paving, stormwater structure improvements, curbing installation, security fencing, up and downstream rip rap armoring as well as temporary erosion controls, coffer dams and stone check dams. The Proponent has indicated that given the current condition of the dam and the existing uses of the pond that the proposed repair efforts represent the preferred alternative, with the only other available alternative being full dam removal, which would diminish the current community use of McKinstry Pond. The Proponent states that as proposed, the Project meets the exemptions established under 310 CMR 10.58(6)(a) as the Project constitutes the maintenance of a

municipally owned dam and does not represent the significant increase in size over existing conditions.

While MassDEP agrees that many aspects of the proposed work will occur primarily within the footprint of existing comparable features and therefore do not represent expansion, additional work proposed on the downstream side of the dam and dam crest, including wing wall placement, armoring of the outfall, portions of the proposed stormwater treatment train, and the construction of the gravel access road, appear to represent expansion over existing conditions. The NOI and SEIR should provide information demonstrating how the proposed work complies with the performance standards found in 310 CMR 10.58(4) or the redevelopment standards found in 310 CMR 10.58(5).

Proposed repair activities will result in Bank alterations totaling 100 lf. Bank resource is proposed to be restored in kind. The proposed Bank alterations exceed those presumed to have no impact on the capacity of a Bank resource to provide important wildlife habitat functions. Therefore, the NOI and SEIR should include a wildlife habitat analysis as outlined in 310 CMR 10.60.

The ENF and accompanying narrative note the alteration of 255 sf of BLSF but do not provide a detailed discussion of these impacts or how the proposed work will comply with the performance standards contained in 310 CMR 10.57(4). Based on Project plans, alterations to BLSF are presumed to be permanent and are associated with the dredging of a cumulative eight cubic yards of material from both McKinstry Pond and the wetland system immediately below the outfall of the culvert conveying flow from the dam. While these alterations appear to meet the performance standards for work in BLSF, any future NOI and SEIR filed in relation to the Project should include a detailed description of the work within this resource area, and how the applicable standards are met.

Permanent alteration of LUW totaling 1,125 sf will be associated with both up and downstream rip rap armoring, replacement of the existing spill way and culvert and any grading associated with these activities. The remaining direct impact to LUW, totaling 1,462 sf will be temporary in nature and will be associated with check dam and cofferdam placement during the construction period and the work that will occur within those bounds. Timber construction mats or comparable approved mats will be implemented within areas of LUW which will be accessed by machine following drawdown and dewatering.

An additional 9.1 acres of LUW will be indirectly impacted by the temporary pond drawdown required to complete Project construction. The proposed drawdown of McKinstry Pond will be 3.4 feet to elevation 490 ft. Pond drawdown is proposed to be implemented gradually and for the minimum amount of time to minimize adverse impacts to aquatic species. Total proposed impacts to LUW exceed those stated in 310 CMR 10.56(4)4, which are presumed to have no adverse impact on the capacity of a LUW resource to provide important wildlife habitat. The NOI and SEIR should include a wildlife habitat analysis as outlined in 310 CMR 10.60.

Stormwater

As indicated in the EN, the proposed dam replacement activities are exempt from the Massachusetts Stormwater Management Standards (the "Standards"). However, the Proponent has proposed to improve site drainage and provide pretreatment of stormwater runoff from the site. MassDEP notes that any work not directly associated with dam repair that fails to meet any additional exemptions will be subject to the Massachusetts Stormwater Management Standards.

Construction period stormwater management will be achieved through the implementation of sedimentation barriers at the limit of work and surrounding materials stockpiles, as well as a hydrocarbon absorption boom and stone check dam placed below the outfall of the culvert. The Proponent will implement a settling basin to which dewatering pumps will be directed prior to discharge to downgradient wetland resource areas.

Improvements to the stormwater management system proposed under current design consist of the installation of six (6) new hooded deep sump catch basins and two (2) proprietary oil-grit separators. Asphalt berm curbing is proposed to be installed along both sides of Waite Street to better direct runoff towards the proposed catch basins and treatment train for TSS removal prior to discharge.

Environmental Justice (EJ)

The Proponent identified two EJ populations within a one-mile radius of the Project. One of the EJ populations is classified based on minority criteria and the other is classified under income criteria. The Proponent identified an additional EJ population within a five-mile radius of the Project. The third EJ population is classified based on minority and income criteria. The EJ Maps Viewer used by the Proponent did not identify any languages besides English as being spoken by these EJ populations. An EIR is required in accordance with 301 CMR 11.06(7)(b).

MassDEP appreciates the opportunity to comment on the Project. If you have any questions regarding these comments, please do not hesitate to contact JoAnne Kasper-Dunne, Central Regional Office MEPA Coordinator, at (508) 767-2716.

Very truly yours,

Mary Jude Pigsley
Regional Director

cc: Commissioner's Office, MassDEP

The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Maura T. Healey
GOVERNOR

Kimberley Driscoll
LIEUTENANT GOVERNOR

Rebecca L. Tepper
SECRETARY

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http://www.mass.gov/eea

October 16, 2023

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
SINGLE ENVIRONMENTAL IMPACT REPORT

PROJECT NAME	: McKinstry Pond Dam Repairs
PROJECT MUNICIPALITY	: Oxford
PROJECT WATERSHED	: French
EEA NUMBER	: 16523
PROJECT PROPONENT	: Town of Oxford Department of Public Works
DATE NOTICED IN MONITOR	: September 8, 2023

Pursuant to the Massachusetts Environmental Policy Act (MEPA; M.G.L. c. 30, ss. 61-62L) and Section 11.08 of the MEPA regulations (301 CMR 11.00), I have reviewed the Single Environmental Impact Report (Single EIR) and hereby determine that it **adequately and properly complies** with MEPA and its implementing regulations.

Project Description

As described in the Single EIR, McKinstry Pond Dam is subject to a Dam Safety Order requiring its repair or removal. The Proponent proposes the following repairs to prevent failure of the dam:

1. Remove existing concrete and mortared stone masonry intake structure and internal components including pipes, concrete weir, and low-level outlet
2. Install a new weir board structure within the existing intake structure that can be accessed through steel grating over the structure (flow through the structure will be controlled by two sets of aluminum weir boards)
3. Install trash racks at the upstream end of the weir board structure to minimize entry of debris
4. Remove and replace existing stone culvert and downstream headwall with two 24-inch HDPE pipes supported by a concrete cradle and replace the downstream dry stack masonry headwall with a cast-in-place concrete headwall
5. Replace upstream wing walls and remove upstream granite blocks/masonry support (the upstream face will be regraded and flatted to a uniform slope to replace the existing granite

blocks and masonry supporting portions of the embankment)
6. Regrade the dam embankment, including the upstream face, portions of the downstream face around the proposed headwall, and the dam crest
7. Install 18 inches of stone armoring on the upstream face of the dam to help protect the embankment from erosion and install an 18-inch-thick apron in the downstream channel
8. Improve the existing stormwater system by replacing collapsing storm culverts entering the structure with HDPE pipes and installing additional stormwater infrastructure along the dam portion of Waite Street to reduce stormwater flow issues at the site and on the dam crest
9. Repair Waite Street including reconstruction of the dam portion of Waite Street to resolve previously identified deficiencies associated with the dam crest (improvements include installation of curbing to contain stormwater flow within the street and subsurface improvements associated with the installation of new stormwater infrastructure)
10. Address security of the structure, which has been subject to vandalism in the past, with a chain link fence, gate, and lock, around the perimeter of the structure

According to the Single EIR, temporary water controls are required to dewater the work area and to convey base flows through the dam. The water controls will consist of a combination of water level draw down in the pond and coffer damming around the work area to allow management of inflow via storage available within the partially drawdown pond and protection of the work area and dam during storm conditions with cofferdams. The pond will be lowered by ±3.4 feet (ft) impacting ±9 acres of Land Under Waterbodies and Waterways (LUWW). Cofferdams are anticipated to retain 2 ft of water under normal conditions.

Project Site

McKinstry Pond Dam is located on the east end of McKinstry Pond along Waite Street in Oxford. The project is located on three parcels, one owned by the Town of Oxford (Town) and two owned by residents. McKinstry Pond Dam is classified as a Significant Hazard Potential dam in Poor condition. A dam is deemed to have Significant Hazard Potential where dam failure may cause loss of life and damage to homes, industrial or commercial facilities, secondary highways or railroads or cause interruption of use or service of relatively important facilities. A Poor condition rating is assigned when structural deficiencies are identified and the dam condition presents a significant risk to the public located downstream from the dam. Based on inspection findings that call out structural deficiencies and rate the dam condition as Poor, the Massachusetts Department of Conservation and Recreation (DCR) Office of Dam Safety (ODS) has determined that McKinstry Pond Dam does not meet dam safety standards and is a potential threat to public safety.

McKinstry Pond Dam consists of an earthen embankment supporting a public road (Waite Street) along its crest. The upstream face is armored with stone masonry with granite capstone blocks. The downstream face consists of earthen slopes and a stone masonry headwall at the discharge channel. The dam has a maximum height of 6.5 ft and a crest width of 55 to 60 ft. The dam crest length varies from ±160 ft on its upstream side to ±60 ft on its downstream side. The dam spillway is located about two-thirds of the way along the upstream face from the left abutment. The spillway discharges flow through a stone culvert to an unnamed downstream channel and then into a large wetland area.

The existing spillway has concrete wing walls and stone masonry/concrete training walls. The spillway weir is a broad crested weir with a total length of 9.2 ft. A thinner concrete weir plate, 7.5

inches high and 2.5 inches thick, has been secured on top of the main spillway with a 2-ft gap for normal flows. The culvert downstream of the spillway is a stone masonry box culvert and has a height and width of ±2 ft. The headwall of the stone culvert is dry-laid stone masonry which abuts the downstream end of the concrete training walls. A metal low-level outlet pipe with a diameter of 12 inches has an outlet point immediately downstream of the spillway, at the upstream end of the box culvert. The manual valve control wheel is at the outlet of the pipe.

State and local wetland resource areas located within the project area include Riverfront Area (RA), Bank, LUWW, Bordering Land Subject to Flooding (BLSF), Bordering Vegetated Wetland (BVW), and the 100-foot Buffer Zone to BVW.

The project site is located within one mile of one Environmental Justice (EJ) population[1] in Oxford characterized by Income.[2] The site is located within five miles of five additional EJ populations. Two of these populations are characterized by Minority, one by Income, and two by Minority and Income. As described below, the Expanded Environmental Notification Form (EENF) and Single EIR identify the "Designated Geographic Area" (DGA, as defined in 301 CMR 11.02) for the project as one mile, include a review of potential impacts and benefits to EJ populations within this DGA, and describe public outreach efforts undertaken to date.

Environmental Impacts and Mitigation

Potential environmental impacts associated with the project include alteration of 0.31 acres of land with no new impervious area (construction of a permanent gravel access drive from Waite Street to the proposed concrete weir board structure) and permanent and temporary impacts to wetland resource areas including 399 square feet (sf) of BVW (172 sf temporary and 227 sf permanent), 394,627 sf (9.1 acres) of LUWW (9 acres temporary drawdown, 1,462 sf temporary coffer/check dams, and 1,125 sf permanent), 100 linear feet (lf) of Bank (permanent), 255 sf BLSF, and 9,356 sf RA (temporary and permanent – no quantities listed). The majority of the alteration is associated with the drawdown of the pond and the installation of the coffer dam and stone check dam.

Measures to avoid, minimize and mitigate these impacts include implementation of Stormwater Pollution Prevention Plan (SWPPP) during the construction period and installation of stormwater management controls for dewatering and sedimentation; restoration of all disturbed areas with native wetland seed mix and native shrubs; limitation of the duration of temporary pond drawdown and control of the rate of drawdown to minimize adverse effects to aquatic species in the pond; conveyance of base flows around the dam during construction through siphons and pumping when necessary; use of a dewatering basin to minimize turbidity and high velocity flows from entering the stream; and implementation of timber construction mats or comparable within areas of LUWW which will be accessed by machine following drawdown and dewatering.

Jurisdiction and Permitting

The project is subject to MEPA review because it requires Agency Action and exceeds a MEPA

[1] "Environmental Justice Population" is defined in M.G.L. c. 30, § 62 under four categories: Minority, Income, English Isolation, and a combined category of Minority and Income.
[2] This is a correction from the information noted in the Certificate on the EENF, which noted two EJ populations in the DGA.

review threshold at 301 CMR 11.03(3)(b)(1)(f) for alteration of one-half or more acres of other wetland (LUWW). The project is required to prepare an EIR pursuant to 301 CMR 11.06(7)(b) because it is located within one mile of an EJ Population. The project requires a Chapter 253 Dam Safety Permit from DCR ODS. The Single EIR clarifies that a Chapter 91 (c. 91) Minor Project Modification will be required from the Massachusetts Department of Environmental Protection (MassDEP). The project is not subject to MEPA's Greenhouse Gas (GHG) Policy and Protocol (GHG Policy) because it does not exceed any mandatory EIR thresholds and is not expected to generate 2,000 or more tpy of GHG (carbon dioxide (CO_2)) emissions from conditioned spaces that are likely to be used or occupied by EJ populations.

The project will require an Order of Conditions (OOC) from the Oxford Conservation Commission (or in the case of an appeal, a Superseding Order of Conditions from MassDEP) and a National Pollutant Discharge Elimination System (NPDES) Stormwater General Permit from the U.S. Environmental Protection Agency (EPA). A Project Notification Form was submitted to the Massachusetts Historic Commission (MHC) under M.G.L. c. 9, Section 26-27C and/or Section 106 of the National Historic Preservation Act of 1966. MHC submitted a response indicating the project is unlikely to affect significant historic or archaeological resources.

Because the project is seeking Financial Assistance from an Agency (EOEEA Dam and Seawall Grant), MEPA jurisdiction is broad and extends to all aspects of the project that are likely, directly, or indirectly, to cause Damage to the Environment as defined in the MEPA regulations.

Review of the Single EIR

The Single EIR describes changes to the project since the filing of the EENF and provides updated existing and proposed conditions plans and estimates of project-related impacts; it also identifies preliminary measures to avoid, minimize and mitigate environmental impacts. Project changes include a 215-sf wetland replacement area on the west bank of McKinstry Pond to mitigate for permanent alterations to BVW associated with the proposed activities and revision of the slope of the proposed stormwater pipes to provide additional capacity to account for future increases in precipitation in accordance with the updated MA Climate Resilience Design Standards Tool ("MA Resilience Design Tool")[3]. The Single EIR includes a list of required Permits, Financial Assistance, and other state, local and federal approvals; it provides an update on the status of each of these pending actions.

Comments from DCR identify support for the project and stated that its successful completion will address several of the dam's documented deficiencies and result in significant improvement to overall dam condition, operability, and public safety.

Environmental Justice

As noted above, the project site is located within 1 mile of on EJ population characterized by Income. The site is within five miles of five additional EJ populations characterized by Minority, Income, and Minority and Income. Within the census tracts containing the above EJ populations, there are no languages identified as spoken by 5% of more of residents who also identify as not speaking English very well.

[3] https://resilientma.org/rmat_home/designstandards/

According to the Single EIR, a fact sheet summarizing the project, project benefits, and contact information was distributed to the list of Community Based Organizations (CBOs) and tribes/indigenous organizations provided by the EEA EJ Director (the EJ Reference list), and hard copies were posted in town libraries, Town Hall, and Senior Center, and other locations around the town. In addition, the Oxford public television posted the flyer. The goal of the flyer was to inform the public of the proposed project and how to seek additional information or provide comments. The Single EIR was distributed to all entities included in the EJ Reference List.

The Single EIR includes a separate section on "Public Health," and discusses public health consequences that may result from the environmental impacts of the project including the closure of this recreational resource during the summer months. It supplements the assessment presented in the EENF of baseline conditions in EJ populations. It describes the types of facilities that were identified within 1 mile of the project site from the Massachusetts Department of Health (DPH) Tool. Within the DGA, there are two large quantity major air and waste facilities, two M.G.L. c. 21E sites, three "Tier II" toxics use reporting facilities, two MassDEP sites with AULs, five MassDEP public water suppliers, four underground storage tanks, and one transmission line. Of the above, within the EJ census block group in the DGA, there are two "Tier II" toxics use reporting facilities (Verizon Oxford and the Home Depot Store) and one MassDEP site with AULs (McMarthy Motors). As previously indicated in the EENF, no census tract or municipality within 1 mile in which EJ populations are located was identified as exhibiting "vulnerable health EJ criteria as defined in the DPH EJ Tool. Based on this and the additional mapping layers, the Single EIR asserts that unfair or inequitable burdens may not exist for the EJ population within the DGA. I note, however, that the output report from the MA Resilience Design Tool previously provided in the EENF showed that the McKinstry Pond Dam and Waite Street stormwater infrastructure are rated high risk for the following climate parameters: extreme precipitation from riverine flooding and extreme heat. The EENF Scope required further analysis of flooding risks to downstream EJ populations in light of climate risks at this location.

The Single EIR provides additional information about recreational facilities available to the community and how EJ populations might be impacted by the closure of these facilities during the project (estimated to occur late spring to early fall). Construction activities and partial pond drawdown will disrupt fishing at the dam and birdwatching from the dam. However, birdwatching can occur from outside of the immediate project area and residents interested in fishing can visit other ponds within Town including Carbuncle Pond and Hodges Village Pond both within one mile of the McKinstry Pond Dam. Carbuncle Pond is stocked with Trout by the Massachusetts Department of Fish and Game and is a 15-minute walk from McKinstry Pond Dam via side streets. The Single EIR maintains that due to the proximity and locations of adjacent ponds, the temporary loss of fishing at McKinstry Pond does not pose a significant impact to the community since the closure is temporary in nature and there are several nearby alternatives.

Dam repair will mitigate the risk to the downstream EJ population by reducing potential dam failure. The Single EIR provides additional information on the measures taken to incorporate resiliency into the design. Resiliency against extreme riverine flooding is incorporated into the design by adjusting the design based on higher precipitation values provided by the MA Resilience Design Tool associated with future climate conditions, providing freeboard between the peak pond level and the dam crest, and providing bio-engineered bank treatments at the dam to reduce scour potential and protect the critical infrastructure of the dam against catastrophic failure.

The Single EIR provides a discussion of the impact of construction period activities on EJ populations. Transporting construction equipment to the site will result in a minor increase in heavy equipment potential on the roads through the EJ population mapped within the DGA southeast of the dam on Route 12, which is a busy thoroughfare though Oxford's commercial center. Given the scale of the project, construction traffic is not anticipated to increase traffic on Route 12. Closure of Waite Street will not impact the EJ population; this residential street serves local traffic only and there are alternate access/egress routes available for impacted residents. Signage will be provided, and residents will be notified before construction commences.

Wetlands and Waterways

As stated above, the project includes temporary and permanent impacts to Bank, BVW, LUWW, BLSF, and RA. The Oxford Conservation Commission will review the project for its consistency with the Wetlands Protection Act (WPA), Wetlands Regulations (310 CMR 10.00) and associated performance standards including stormwater management standards (SMS). MassDEP will review the project for its consistency with the c. 91 Waterways Regulations (310 CMR 9.00) as a Minor Project Modification.

As described in the Single EIR, the pond level will be lowered by ±3.4 feet to allow for construction to occur, which will expose ±9.06 acres of LUWW; this impact exceeds those stated in 310 CMR 10.56(4)4 which are presumed to have no adverse impact on the capacity of LUWW to provide important wildlife habitat. Bank alterations (100 lf) also exceed those presumed to have no impact on the capacity of Bank to provide important wildlife habitat functions. The Single EIR includes a Wildlife Habitat Evaluation, which concludes that McKinstry Pond and the wetland complex east (downstream) of the dam provide valuable habitat (aquatic and terrestrial) for wildlife species; however, the presence and quality of wildlife habitat features and resources are very limited within project areas. Proposed dam repairs will occur within the extents of previously disturbed areas of the existing dam with limited disturbance to existing natural banks. The project will remove the granite block wall along the upstream bank and the area will be regraded to create a uniform slope. Natural stone with soil backfill and native seed will be used to provide slope stability on the dam. The downstream bank disturbance will be replicated in-situ. Impacts to existing Bank are primarily to the upstream and downstream faces of the earthen dam and the associated road-stream crossing structure. The project will not substantially reduce the site's capacity to provide wildlife habitat functions nor adversely impact wildlife at the site by avoiding removal or disturbance of large wood debris downstream of the proposed outlet; avoiding cutting of trees overhanging the pond where possible; and conducting two years of post-construction vegetation monitoring during the growing season to monitor the potential for invasive species.

The Single EIR provides information regarding the drawdown process and mitigation measures to address drawdown impacts. The temporary drawdown at the pond is required to limit the risk to the earthen embankment dam during the construction period. The Single EIR reaffirms that the drawdown will expose less than 10 acres of LUWW; the contractor will be required to perform a drone survey or alternative survey of the drawdown area and remaining refuge pool to ensure that the total acreage of LUWW impacted by the drawdown does not exceed ±9 acres. Work will be performed according to performance-based criteria to reduce the risk of adverse effects to aquatic mammals, birds, and fish. Impacts associated with the temporary drawdown will be mitigated by limiting the duration of the drawdown (four to six months) and the rate of the drawdown (three inches per day) as well as

maintaining a refuge pool to minimize adverse effects to aquatic species in the pond. The pond will be allowed to restore in a controlled manner after construction, which may take between two and four weeks. Base flows will be maintained in the downstream channel throughout the project and re-fill period. It is estimated that the pond level increase will be limited to a maximum of 4 inches per day. Construction observations will be provided throughout construction and post-construction, including inspection of temporary best management practices (BMPs) and vegetation establishment period. The Single EIR states that there are no known shallow wells which would be impacted by drawdown activities.

The Single EIR states that portions of the project expansion within RFA which do not meet the definitions of a Limited Project for dam repair/maintenance as described in 310CMR 10.53(3)(i) are required to comply with ODS regulations and therefore, have no viable alternative that avoids impacts to wetland resource areas. The project will result in the permanent loss of BVW within expansion of the dam footprint beyond existing conditions. The Single EIR describes proposed mitigation of these impacts through the construction of 215 sf of BVW replication at the west end of the pond. Although impacts to BVW will occur below the spillway, suitable areas for replication within the same reach fall on private property and were determined not to be available for replication placement. The Single EIR notes that additional areas of BVW impact in the locations of the proposed armoring of downstream areas, indicated to be permanent in the EENF, will be restored in-situ through the maintenance of existing grades and the reestablishment of wetland vegetation within altered areas. The Single EIR addresses MassDEP's comments on the EENF. MassDEP comments do not request further information as part of the MEPA process but note that additional information may be requested during permitting.

Stormwater

The collapsing storm culverts located beneath Waite Street will be replaced with HDPE pipes. Additional stormwater infrastructure will be installed along the dam portion of Waite Street to reduce stormwater flow issues in the roadway and along the dam crest. The Single EIR describes how the proposed stormwater management system meets the SMS. The Single EIR contains information demonstrating that the proposed stormwater management system includes pretreatment units for Total Suspended Solids (TSS) and Total Phosphorus (TP). The stormwater management system was designed to accommodate the projected 2070 50-year storm. The Single EIR addresses MassDEP comments on the EENF. MassDEP comments note that it may request additional information during the permitting process.

Climate Change Adaptation and Resiliency

The Single EIR provides a discussion of the potential effects of climate change on the project site and a revised hydrologic/hydraulic (H&H) analysis to model future precipitation rates. Resiliency against extreme riverine flooding is incorporated into the design by increasing the design precipitation, providing freeboard between the peak pond level and the dam crest, and providing bio-engineered bank treatments at the dam to reduce scour potential and protect the critical infrastructure of the dam against catastrophic failure.

According to the Single EIR, future rainfall and flooding conditions were previously assessed

using EPA's CREAT[4] application to estimate future 100-year, 24-hour rainfall around 2070 to size the proposed dam spillway. Applying this increase to the NOAA Atlas 14 estimated 100-year, 24-hour rainfall total (present day) of 7.94 inches results in a predicted year 2077 total of 9.82 inches (23.7% increase). According to the MA Resilience Design Tool, however, the projected 100-year, 24-hour precipitation event in 2070 is 10.8 inches, which represents a +36.0% increase from present day conditions and is higher than the 2077 estimate provided in the CREAT application. The H&H analysis performed for the project concluded that only 0.53 feet of freeboard is anticipated during this 2070 condition. The table below summarizes water surface elevations (WSE), and freeboard based on NOAA Atlas 14, CREAT and MA Resilience Design Tool precipitation values.

100-Year Precipitation (Inches)	100-Year Pond WSE, feet (NAVD88)	Top of Dam El., feet (NAVD88)	Freeboard (feet)	Top El. of Weir Boards in Spillway, feet (NAVD88)
7.94 (Present Day)	494.60	495.80	1.20 feet	493.35
8.80 (+10.8% Increase)	494.80	495.80	1.00 feet	493.35
9.82 (CREAT 2077/ +23.7% Increase)	495.04	495.80	0.76 feet	493.35
10.8 (RMAT 2070/ +36.0% Increase)	**495.27**	**495.80**	**0.53 feet**	**493.35**

According to the Single EIR, one of the project design goals is to achieve a minimum of one foot of embankment freeboard for the future condition (2070) 100-year Spillway Design Flood (SDF). Further modeling (summarized in the table below) demonstrates that this goal could be achieved through adaptive operational procedures that include either removing both spillway boards down to 492.35 feet (from 493.35 feet) or removing spillway boards in one of the spillway openings down to 492.85 (from 493.35 feet) and down to 492.35 feet in the other opening in advance of the anticipated 100-year storm. As shown below, these operating procedures could achieve freeboard of 1.16 to 1.22 feet even based on 2070 rainfall volumes as presented in the MA Resilience Design Tool.

100-Year Precipitation (Inches)	100-Year Pond WSE, feet (NAVD88)	Top of Dam El., feet (NAVD88)	Freeboard (feet)	Top El. of Weir Boards in Spillway, feet (NAVD88)
10.8 (RMAT 2070/ +36.0% Increase)	**494.64**	**495.80**	**1.16 feet**	**492.85 (in one opening) / 492.35 (in other opening)**
10.8 (RMAT 2070/ +36.0% Increase)	**494.58**	**495.80**	**1.22 feet**	**492.35 (in both openings)**

According to the Single EIR, the previous stormwater pipe network was designed to accommodate a current 10-year design storm with the ability to pass a projected (2070) 10-year design storm as well. Minor modifications are now proposed to the slopes (i.e. invert elevations) of the proposed pipes entering or exiting proposed structures DCB-5, DCB-6, DMH-4, DMH-5, and OGS-02 to increase the full-flow capacities of associated pipes to accommodate the projected 2070 50-year design storm as recommended by the MA Resilience Design Tool for a "High" critical utility.

[4] Climate Resilience Evaluation and Awareness Tool (CREAT) Risk Assessment Application for Water Utilities | US EPA

Mitigation and Section 61 Findings

The Single EIR provides draft Section 61 Findings for use by Agencies, which are summarized below. The Section 61 Findings should be provided to Agencies to assist in the permitting process and issuance of final Section 61 Findings.

Environmental Justice

- Eliminate risk of dam failure and associated hazards (i.e., downstream flooding, serious damage to homes, public infrastructure, and potential loss of life)
- Enhance climate resiliency of the dam by improving dam operation during extreme precipitation events and refining design and operational procedures to align with anticipated 2070 100-year storm event (10.8 inches 24-hour rainfall volume) as indicated by MA Resilience Design Tool
- Enhance opportunity for recreational activities (i.e., bird watching, fishing, etc.) through the increased safety of the dam and the continued impoundment of the pond
- Implement BMPs during construction to mitigate noise and dust impacts

Wetlands and Waterways

- Replicate BVW (215-sf area)
- Use erosion, sediment, and turbidity controls, including filtering discharge water
- Maintain a refuge pool to support aquatic organisms
- Maintain base flow to the downstream channel while pond is impounding
- Limit pond drawdown rate to allow aquatic organisms to migrate to refuge pool
- Perform a drone survey to monitor the area dewatered due to the drawdown to ensure it is less than 10 acres
- Follow specific conditions provided by MassDEP and Oxford Conservation Commission in the Order of Conditions
- Conduct fueling operations away from resource areas whenever possible
- Avoid removal or disturbance of large wood debris downstream of the proposed outlet
- Avoid cutting trees overhanging the McKinstry Pond where possible
- Conduct two years of post-construction vegetation monitoring during the growing season to monitor the potential colonization by invasive plant species and ensure vegetation has established after one growing season
- Restore temporarily disturbed wetland resource areas

Stormwater

- Stormwater management system designed to accommodate the projected 2070 50-year storm

Adaptation and Resiliency

- Renovation of dam with significant hazard potential
- Proposed dam spillway will adequately pass the required spillway design flood for present day and future projected precipitation as measured by the MA Resilience Design Tool (2070

100-year event or 10.8 inches 24-hour rainfall volume)
- Design incorporates at least one foot of freeboard between the peak pond level and the dam crest elevation to provide additional resiliency (i.e., via removal of spillway boards to provide freeboard of 1.16 to 1.22 feet as described above)

Construction Period

- Refuel equipment at pre-approved, designated area with appropriate spill prevention and control measures
- Install erosion and sedimentation control measures
- Limit construction to between 7AM and 5PM from Monday to Friday
- Use dust control measures
- Restrict on and off-road idling to the maximum extent practicable
- Encourage contractors to use construction equipment with engines manufactured to Tier 4 federal emission standards
- Select contractors that have installed retrofit emissions control devices or vehicles that use alternative fuels to reduce emissions of volatile organic compounds (VOCs), carbon monoxide (CO) and particulate matter (PM) from diesel-powered equipment to the maximum extent practicable
- Require off-road vehicles to use ultra-low sulfur diesel fuel (ULSD)
- Provide signage for temporary closure of Waite Street

Conclusion

Based on a review of the Single EIR and consultation with Agencies, I find that the Single EIR adequately and properly complies with MEPA and its implementing regulations. The project may proceed to permitting. Participating Agencies should forward copies of the final Section 61 Findings to the MEPA Office for publication in accordance with 301 CMR 11.12.

October 16, 2023
Date

Rebecca L. Tepper

Comments received:

10/10/2023 Massachusetts Department of Environmental Protection (MassDEP) – Central Regional Office (CERO)
10/10/2023 Massachusetts Department of Conservation and Recreation (DCR)

RLT/PPP/ppp

Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

Central Regional Office • 8 New Bond Street, Worcester MA 01606 • 508-792-7650

Maura T. Healey
Governor

Kimberley Driscoll
Lieutenant Governor

Rebecca L. Tepper
Secretary

Bonnie Heiple
Commissioner

October 10, 2023

Secretary Rebecca Tepper
Executive Office of Environmental Affairs
100 Cambridge Street, 9th Floor
Boston, MA 02114

Attention: MEPA Unit – Purvi Patel

Re: Single Environmental Impact Report (SEIR)
McKinstry Pond Dam Repairs
Oxford
EEA #16523

Dear Secretary Tepper,

The Massachusetts Department of Environmental Protection's ("MassDEP") Central Regional Office has reviewed the SEIR for the proposed McKinstry Pond Dam Repairs Project (the "Project"). The Town of Oxford (the "Proponent") is proposing to repair an existing dam located on a public road in a residential area. The Project includes removal of the existing intake structure and internal components; replacement of the weir board structure; installation of a trash rack; removal and replacement of the existing stone culvert and downstream headwall; replacement of upstream wing walls and removal of upstream granite blocks/masonry support; regrading of the dam embankment; stone armoring installation; stormwater system improvements; improvements to Waite Street; and installation of a chain link fence, gate, and lock around the perimeter of the structure.

The Project is under MEPA review because it meets or exceeds the following review threshold:

- CMR 301 11.03(3)(b)(1)(f) - alteration of ½ or more acres of any other wetlands.

The Project requires the following State Agency Permits:

- MassDEP - Superseding Order of Conditions (if local Order of Conditions is appealed);
- MassDEP - Ch. 91 license for Minor Project Modification;

- Massachusetts Department of Conservation and Recreation - Chapter 253 Dam Safety Permit.

Changes in the Project since the Expanded Environmental Notification Form (EENF) include a 215-square-foot wetland replacement area on the west bank of McKinstry Pond to mitigate permanent alterations to BVW associated with the proposed activities, and changes to the proposed stormwater pipes to provide additional capacity to account for future increases in precipitation in accordance with the updated MA Resilience Design Tool

The Project will be funded through a grant from the EOEEA Dam and Seawall Grant Program so MEPA jurisdiction is broad. One or more Environmental Justice Populations are located within the Designated Geographic Area around the Project. The Proponent requested permission to prepare an SEIR in lieu of a Draft and Final EIR. The Secretary of Energy and Environmental Affairs granted permission for the SEIR in the Certificate on the EENF issued February 9, 2022. MassDEP offers the following comments:

Wetlands

In response to MassDEP's comments on the EENF, the SEIR includes a Wildlife Habitat Evaluation. The SEIR states that the proposed gradual drawdown and maintenance of a refuge pool will reduce the risk of fish kills to the maximum extent practicable and will mitigate any long-term impacts to aquatic mammals and birds. The SEIR also includes stipulations that the contactor will conduct drone or alternative methods of survey of the drawdown area and remaining refuge pool to ensure that the total acreage of Land Under Waterbodies resource impacted by the drawdown does not exceed nine acres.

The Scope of the Certificate on the EENF requested that the Proponent address potential impacts to any nearby drinking water wells. The SEIR includes information detailing that no known shallow wells which would be impacted by drawdown activities are located within the vicinity of the Project.

The SEIR acknowledged that portions of the Project expansion within the Riverfront Area which do not meet the definitions of a Limited Project for dam repair/maintenance as described in 310CMR 10.53(3)(i) are required to comply with Office of Dam Safety regulations and therefore have no viable alternative. The Project will result in the permanent loss of Bordering Vegetated Wetland (BVW) within expansion of the dam footprint beyond existing conditions. The SEIR describes proposed mitigation of these impacts through the construction of 215 sf of BVW replication at the west end of the pond. Although impacts to BVW will occur below the spillway, suitable areas for replication within the same reach fall on private property and were therefore determined not to be available for replication placement. The SEIR indicates that additional areas of BVW impact in the locations of the proposed armoring of downstream areas, indicated to be permanent in the EENF, will be restored in-situ through the maintenance of existing grades and the reestablishment of wetland vegetation within altered areas. The information in the SEIR addresses MassDEP's comments. MassDEP may request additional info during the permitting process.

Stormwater

As required in the Certificate on the EENF Scope, the SEIR contains information demonstrating that the proposed stormwater management system includes pretreatment units for Total Suspended Solids (TSS) and Total Phosphorus (TP). The information in the SEIR addresses MassDEP's comments. MassDEP may request additional info during the permitting process.

MassDEP appreciates the opportunity to comment on the Project. If you have any questions regarding these comments, please do not hesitate to contact JoAnne Kasper-Dunne, Central Regional Office MEPA Coordinator, at (508) 767-2716.

Very truly yours,

Mary Jude Pigsley
Regional Director

cc: Commissioner's Office, MassDEP

dcr
Massachusetts

October 12, 2023

Secretary Rebecca L. Tepper
Executive Office of Energy and Environmental Affairs
Attn: Purvi Patel, MEPA Office
100 Cambridge Street, Suite 900
Boston, Massachusetts 02114

Re: EEA #16523 McKinstry Pond Dam Repairs (Oxford) Single EIR

Dear Secretary Tepper:

The Department of Conservation and Recreation ("DCR") Office of Dam Safety ("ODS") has reviewed the Single Environmental Impact Report ("SEIR") for the McKinstry Pond Dam Repair Project (the "Project") located in Oxford, submitted by Fuss & O'Neill on behalf of the Town of Oxford (the "Proponent" and "Owner").

From information presented in the SEIR, ODS understands the project scope includes: replacement of the dam's spillway outflow control structure with a new concrete structure equipped with weir boards and trash racks; replacement of the existing stone masonry box culvert spillway conduit with dual 24" HDPE pipes; replacement of the dam's upstream wing walls with new concrete walls and regrading of the upstream dam embankment slope; replacement of the masonry headwall at the spillway conduit outfall with a concrete headwall; regrading of the dam crest and portions of the downstream embankment slope; installation of stone armoring on the dam's upstream slope and in the discharge channel; improvements to the roadway traversing the dam crest including replacement and upgrading of the stormwater management system, roadway repaving, and installation of bituminous berms along the roadway edges; and the installation of security fencing.

McKinstry Pond Dam, which is subject to ODS jurisdiction, is classified as a Significant Hazard Potential Dam in Poor condition. A dam is deemed to be of Significant Hazard Potential where dam failure may cause loss of life and damage to home(s), industrial or commercial facilities, secondary highway(s) or railroad(s) or cause interruption of use or service of relatively important facilities. A Poor condition rating is assigned when structural deficiencies are identified and the dam condition presents a significant risk to the public located downstream from the dam.

Implementation of the project design will address several dam deficiencies which have been documented during past inspections of the dam. Successful project completion will result in significant improvement to overall dam condition and public safety.

This dam repair project will require a Chapter 253 Dam Safety Permit. The permit application must be submitted to ODS for review. ODS staff will communicate with the Proponent's design engineer as part of the permit process to ensure all required documentation is provided. After receipt of all required technical information demonstrating compliance with ODS regulations, a Chapter 253 Dam Safety Permit

will be prepared and issued by ODS. ODS is available to provide additional guidance through the permitting process.

DCR appreciates the opportunity to comment on this project. Please contact David Ouellette at (617) 549-3553 or david.ouellette@mass.gov with any questions or to request additional information or coordination with ODS.

Sincerely,

Brian Arrigo
Commissioner

cc: Priscilla Geigis, Patrice Kish, Peter Mulcahy, Robert Lowell, Dam Safety File

Appendix B

Oxford Conservation Commission
Order Of Conditions

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
255-883
MassDEP File #

eDEP Transaction #

OXFORD
City/Town

A. General Information

Please note: this form has been modified with added space to accommodate the Registry of Deeds Requirements

1. From: Oxford Conservation Commission
Conservation Commission

2. This issuance is for (check one): a. ☒ Order of Conditions b. ☐ Amended Order of Conditions

3. To: Applicant:

Kevin
a. First Name

Duffy
b. Last Name

Town of Oxford DPW
c. Organization

450 Main Street
d. Mailing Address

Oxford
e. City/Town

MA
f. State

01540
g. Zip Code

4. Property Owner (if different from applicant):

See Page 1A
a. First Name

b. Last Name

c. Organization

d. Mailing Address

e. City/Town

f. State

g. Zip Code

5. Project Location:

McKinstry Pond/Waite Street
a. Street Address

Oxford
b. City/Town

29D;29C
c. Assessors Map/Plat Number

A07&A61;B06&B08
d. Parcel/Lot Number

Latitude and Longitude, if known: d m s
d. Latitude

d m s
e. Longitude

Property Owners:

Parcel: 29C-B06 – 6 Waite St.
Sandra Gregson
6 Waite Street
Oxford, MA 01540

Parcel 29C-B08 - 2 Waite St.
Joyce M. O'Keefe
185 Kent K-Bldg K
West Palm Beach, FL 33417

Parcels 29D-A07 & A61 – 0 Forest St.
Town of Oxford
325 Main St.
Oxford, MA 01540

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A. General Information (cont.)

6. Property recorded at the Registry of Deeds for (attach additional information if more than one parcel):

Worcester
a. County

b. Certificate Number (if registered land)

5483
c. Book

157
d. Page

7. Dates: 4/4/2024 a. Date Notice of Intent Filed; 6/5/2024 b. Date Public Hearing Closed; 6/26/2024 c. Date of Issuance

8. Final Approved Plans and Other Documents (attach additional plan or document references as needed):

McKinstry Pond Dam Repairs Design Plans (13 sheets)
a. Plan Title

Fuss & O'Neill
b. Prepared By

Phillip Forzley
c. Signed and Stamped by

June 3, 2024
d. Final Revision Date

various
e. Scale

f. Additional Plan or Document Title

g. Date

B. Findings

1. Findings pursuant to the Massachusetts Wetlands Protection Act:

Following the review of the above-referenced Notice of Intent and based on the information provided in this application and presented at the public hearing, this Commission finds that the areas in which work is proposed is significant to the following interests of the Wetlands Protection Act (the Act). Check all that apply:

a. ☐ Public Water Supply b. ☐ Land Containing Shellfish c. ☒ Prevention of Pollution

d. ☐ Private Water Supply e. ☒ Fisheries f. ☒ Protection of Wildlife Habitat

g. ☒ Groundwater Supply h. ☒ Storm Damage Prevention i. ☒ Flood Control

2. This Commission hereby finds the project, as proposed, is: (check one of the following boxes)

Approved subject to:

a. ☒ the following conditions which are necessary in accordance with the performance standards set forth in the wetlands regulations. This Commission orders that all work shall be performed in accordance with the Notice of Intent referenced above, the following General Conditions, and any other special conditions attached to this Order. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, these conditions shall control.

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B. Findings (cont.)

Denied because:

b. ☐ the proposed work cannot be conditioned to meet the performance standards set forth in the wetland regulations. Therefore, work on this project may not go forward unless and until a new Notice of Intent is submitted which provides measures which are adequate to protect the interests of the Act, and a final Order of Conditions is issued. **A description of the performance standards which the proposed work cannot meet is attached to this Order.**

c. ☐ the information submitted by the applicant is not sufficient to describe the site, the work, or the effect of the work on the interests identified in the Wetlands Protection Act. Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides sufficient information and includes measures which are adequate to protect the Act's interests, and a final Order of Conditions is issued. **A description of the specific information which is lacking and why it is necessary is attached to this Order as per 310 CMR 10.05(6)(c).**

3. ☐ Buffer Zone Impacts: Shortest distance between limit of project disturbance and the wetland resource area specified in 310 CMR 10.02(1)(a) — 0 a. linear feet

Inland Resource Area Impacts: Check all that apply below. (For Approvals Only)

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
4. ☒ Bank	245 a. linear feet	245 b. linear feet	245 c. linear feet	245 d. linear feet
5. ☒ Bordering Vegetated Wetland	585 a. square feet	585 b. square feet	585 c. square feet	585 d. square feet
6. ☒ Land Under Waterbodies and Waterways	3980 a. square feet	3980 b. square feet	4170 c. square feet	4170 d. square feet
	19 e. c/y dredged	19 f. c/y dredged		
7. ☒ Bordering Land Subject to Flooding	260 a. square feet	260 b. square feet	260 c. square feet	260 d. square feet
Cubic Feet Flood Storage	e. cubic feet	f. cubic feet	g. cubic feet	h. cubic feet
8. ☐ Isolated Land Subject to Flooding	a. square feet	b. square feet		
Cubic Feet Flood Storage	c. cubic feet	d. cubic feet	e. cubic feet	f. cubic feet
9. ☐ Riverfront Area	5540 a. total sq. feet	5540 b. total sq. feet		
Sq ft within 100 ft	5370 c. square feet	5370 d. square feet	e. square feet	f. square feet
Sq ft between 100-200 ft	170 g. square feet	170 h. square feet	i. square feet	j. square feet

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B. Findings (cont.)

Coastal Resource Area Impacts: Check all that apply below. (For Approvals Only)

	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
10. ☐ Designated Port Areas	Indicate size under Land Under the Ocean, below			
11. ☐ Land Under the Ocean	a. square feet	b. square feet		
	c. c/y dredged	d. c/y dredged		
12. ☐ Barrier Beaches	Indicate size under Coastal Beaches and/or Coastal Dunes below			
13. ☐ Coastal Beaches	a. square feet	b. square feet	c. cu yd nourishment	d. cu yd nourishment
14. ☐ Coastal Dunes	a. square feet	b. square feet	c. cu yd nourishment	d. cu yd nourishment
15. ☐ Coastal Banks	a. linear feet	b. linear feet		
16. ☐ Rocky Intertidal Shores	a. square feet	b. square feet		
17. ☐ Salt Marshes	a. square feet	b. square feet	c. square feet	d. square feet
18. ☐ Land Under Salt Ponds	a. square feet	b. square feet		
	c. c/y dredged	d. c/y dredged		
19. ☐ Land Containing Shellfish	a. square feet	b. square feet	c. square feet	d. square feet
20. ☐ Fish Runs	Indicate size under Coastal Banks, Inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above			
	a. c/y dredged	b. c/y dredged		
21. ☐ Land Subject to Coastal Storm Flowage	a. square feet	b. square feet		
22. ☐ Riverfront Area	a. total sq. feet	b. total sq. feet		
Sq ft within 100 ft	c. square feet	d. square feet	e. square feet	f. square feet
Sq ft between 100-200 ft	g. square feet	h. square feet	i. square feet	j. square feet

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B. Findings (cont.)

* **#23.** If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.5.c (BVW) or B.17.c (Salt Marsh) above, please enter the additional amount here.

23. ☐ Restoration/Enhancement *:

a. square feet of BVW | b. square feet of salt marsh

24. ☐ Stream Crossing(s):

a. number of new stream crossings | b. number of replacement stream crossings

C. General Conditions Under Massachusetts Wetlands Protection Act

The following conditions are only applicable to Approved projects.

1. Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order.
2. The Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.
3. This Order does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state, or local statutes, ordinances, bylaws, or regulations.
4. The work authorized hereunder shall be completed within three years from the date of this Order unless either of the following apply:
   a. The work is a maintenance dredging project as provided for in the Act; or
   b. The time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance. If this Order is intended to be valid for more than three years, the extension date and the special circumstances warranting the extended time period are set forth as a special condition in this Order.
   c. If the work is for a Test Project, this Order of Conditions shall be valid for no more than one year.
5. This Order may be extended by the issuing authority for one or more periods of up to three years each upon application to the issuing authority at least 30 days prior to the expiration date of the Order. An Order of Conditions for a Test Project may be extended for one additional year only upon written application by the applicant, subject to the provisions of 310 CMR 10.05(11)(f).
6. If this Order constitutes an Amended Order of Conditions, this Amended Order of Conditions does not extend the issuance date of the original Final Order of Conditions and the Order will expire on June 26, 2027 unless extended in writing by the Department.
7. Any fill used in connection with this project shall be clean fill. Any fill shall contain no trash, refuse, rubbish, or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles, or parts of any of the foregoing.

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C. General Conditions Under Massachusetts Wetlands Protection Act

8. This Order is not final until all administrative appeal periods from this Order have elapsed, or if such an appeal has been taken, until all proceedings before the Department have been completed.

9. No work shall be undertaken until the Order has become final and then has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of the registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done. The recording information shall be submitted to the Conservation Commission on the form at the end of this Order, which form must be stamped by the Registry of Deeds, prior to the commencement of work.

10. A sign shall be displayed at the site not less then two square feet or more than three square feet in size bearing the words,

"Massachusetts Department of Environmental Protection" [or, "MassDEP"]

"File Number 255-883 "

11. Where the Department of Environmental Protection is requested to issue a Superseding Order, the Conservation Commission shall be a party to all agency proceedings and hearings before MassDEP.

12. Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to the Conservation Commission.

13. The work shall conform to the plans and special conditions referenced in this order.

14. Any change to the plans identified in Condition #13 above shall require the applicant to inquire of the Conservation Commission in writing whether the change is significant enough to require the filing of a new Notice of Intent.

15. The Agent or members of the Conservation Commission and the Department of Environmental Protection shall have the right to enter and inspect the area subject to this Order at reasonable hours to evaluate compliance with the conditions stated in this Order, and may require the submittal of any data deemed necessary by the Conservation Commission or Department for that evaluation.

16. This Order of Conditions shall apply to any successor in interest or successor in control of the property subject to this Order and to any contractor or other person performing work conditioned by this Order.

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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

17. Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by the Conservation Commission.

18. All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited in a wetland or water body. During construction, the applicant or his/her designee shall inspect the erosion controls on a daily basis and shall remove accumulated sediments as needed. The applicant shall immediately control any erosion problems that occur at the site and shall also immediately notify the Conservation Commission, which reserves the right to require additional erosion and/or damage prevention controls it may deem necessary. Sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by this Order.

19. The work associated with this Order (the "Project")
    (1) ☒ is subject to the Massachusetts Stormwater Standards
    (2) ☐ is NOT subject to the Massachusetts Stormwater Standards

    If the work is subject to the Stormwater Standards, then the project is subject to the following conditions:

    a) All work, including site preparation, land disturbance, construction and redevelopment, shall be implemented in accordance with the construction period pollution prevention and erosion and sedimentation control plan and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Construction General Permit as required by Stormwater Condition 8. Construction period erosion, sedimentation and pollution control measures and best management practices (BMPs) shall remain in place until the site is fully stabilized.

    b) No stormwater runoff may be discharged to the post-construction stormwater BMPs unless and until a Registered Professional Engineer provides a Certification that:
    i. all construction period BMPs have been removed or will be removed by a date certain specified in the Certification. For any construction period BMPs intended to be converted to post construction operation for stormwater attenuation, recharge, and/or treatment, the conversion is allowed by the MassDEP Stormwater Handbook BMP specifications and that the BMP has been properly cleaned or prepared for post construction operation, including removal of all construction period sediment trapped in inlet and outlet control structures;
    ii. as-built final construction BMP plans are included, signed and stamped by a Registered Professional Engineer, certifying the site is fully stabilized;
    iii. any illicit discharges to the stormwater management system have been removed, as per the requirements of Stormwater Standard 10;

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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

iv. all post-construction stormwater BMPs are installed in accordance with the plans (including all planting plans) approved by the issuing authority, and have been inspected to ensure that they are not damaged and that they are in proper working condition;

v. any vegetation associated with post-construction BMPs is suitably established to withstand erosion.

c) The landowner is responsible for BMP maintenance until the issuing authority is notified that another party has legally assumed responsibility for BMP maintenance. Prior to requesting a Certificate of Compliance, or Partial Certificate of Compliance, the responsible party (defined in General Condition 18(e)) shall execute and submit to the issuing authority an Operation and Maintenance Compliance Statement ("O&M Statement) for the Stormwater BMPs identifying the party responsible for implementing the stormwater BMP Operation and Maintenance Plan ("O&M Plan") and certifying the following:

i.) the O&M Plan is complete and will be implemented upon receipt of the Certificate of Compliance, and

ii.) the future responsible parties shall be notified in writing of their ongoing legal responsibility to operate and maintain the stormwater management BMPs and implement the Stormwater Pollution Prevention Plan.

d) Post-construction pollution prevention and source control shall be implemented in accordance with the long-term pollution prevention plan section of the approved Stormwater Report and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Multi-Sector General Permit.

e) Unless and until another party accepts responsibility, the landowner, or owner of any drainage easement, assumes responsibility for maintaining each BMP. To overcome this presumption, the landowner of the property must submit to the issuing authority a legally binding agreement of record, acceptable to the issuing authority, evidencing that another entity has accepted responsibility for maintaining the BMP, and that the proposed responsible party shall be treated as a permittee for purposes of implementing the requirements of Conditions 18(f) through 18(k) with respect to that BMP. Any failure of the proposed responsible party to implement the requirements of Conditions 18(f) through 18(k) with respect to that BMP shall be a violation of the Order of Conditions or Certificate of Compliance. In the case of stormwater BMPs that are serving more than one lot, the legally binding agreement shall also identify the lots that will be serviced by the stormwater BMPs. A plan and easement deed that grants the responsible party access to perform the required operation and maintenance must be submitted along with the legally binding agreement.

f) The responsible party shall operate and maintain all stormwater BMPs in accordance with the design plans, the O&M Plan, and the requirements of the Massachusetts Stormwater Handbook.

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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

g) The responsible party shall:
1. Maintain an operation and maintenance log for the last three (3) consecutive calendar years of inspections, repairs, maintenance and/or replacement of the stormwater management system or any part thereof, and disposal (for disposal the log shall indicate the type of material and the disposal location);
2. Make the maintenance log available to MassDEP and the Conservation Commission ("Commission") upon request; and
3. Allow members and agents of the MassDEP and the Commission to enter and inspect the site to evaluate and ensure that the responsible party is in compliance with the requirements for each BMP established in the O&M Plan approved by the issuing authority.

h) All sediment or other contaminants removed from stormwater BMPs shall be disposed of in accordance with all applicable federal, state, and local laws and regulations.

i) Illicit discharges to the stormwater management system as defined in 310 CMR 10.04 are prohibited.

j) The stormwater management system approved in the Order of Conditions shall not be changed without the prior written approval of the issuing authority.

k) Areas designated as qualifying pervious areas for the purpose of the Low Impact Site Design Credit (as defined in the MassDEP Stormwater Handbook, Volume 3, Chapter 1, Low Impact Development Site Design Credits) shall not be altered without the prior written approval of the issuing authority.

l) Access for maintenance, repair, and/or replacement of BMPs shall not be withheld. Any fencing constructed around stormwater BMPs shall include access gates and shall be at least six inches above grade to allow for wildlife passage.

Special Conditions (if you need more space for additional conditions, please attach a text document):

Conditions Continue on Pages 9A-9D.

20. For Test Projects subject to 310 CMR 10.05(11), the applicant shall also implement the monitoring plan and the restoration plan submitted with the Notice of Intent. If the conservation commission or Department determines that the Test Project threatens the public health, safety or the environment, the applicant shall implement the removal plan submitted with the Notice of Intent or modify the project as directed by the conservation commission or the Department.

General Conditions (continued)

21. The ORDER OF CONDITIONS AGREEMENT FORM must be filled out and signed by the Applicant and Owner, and submitted to the Conservation Office within 14 days of Issuance of the Order of Conditions. No work shall commence until the completed form is submitted.

22. In addition to the recording requirements of Condition # 9, this Order shall be recorded prior to the sale or transfer of the property. Upon sale or transfer of the property while this Order is still open, the applicant shall notify the Conservation Commission in writing of the new owner's name, address and phone number.

23. All requirements of this Order of Conditions shall continue in force until a Certificate of Compliance is issued and has been recorded at the Registry of Deeds or the Land Court for the district which it is located, within the chain of title of the affected property.

24. The Commission shall be informed in writing of all changes that may be made to the approved plans. All changes affecting jurisdictional resource areas or buffer zones shall be presented to the Commission and may require additional approvals should the Commission deem necessary.

25. The applicant and/or landowner shall notify the Commission in writing at least five (5) business days prior to commencing with any activity on the project site.

26. During the construction phase of this project, the on-site foreman, directing engineer or design construction manager, shall have a copy of this Order at the site and familiarize themselves with the conditions of this Order and adhere to its conditions.

27. A copy of this Order of Conditions shall be onsite at all times while construction activities regulated by this order are being performed.

28. The Commission reserves the right to impose additional conditions to protect the interests of the Wetland Protection Act and its Regulations 310 CMR 10.00 if any activity in conjunction with this project results in un-permitted alteration to the identified wetland resource area or any noticeable degradation of surface water quality discharging from the site.

29. Any damage caused as a direct result of this project to any wetland resource area shall be the responsibility of the applicant and/or the landowner to repair, restore or replace the wetland features, which have been altered. The Commission shall be notified immediately as to any wetland alteration, which has occurred on the project site. Any plans to abate the problem or restoration of the wetland shall be submitted to the Commission for their approval prior to any further work.

30. Floating oil absorbent booms shall be used in the water whenever there is any hydraulic equipment within 40 feet of any waterline, in the event of a hydraulic leak. The booms must be strung in a contiguous line and secured to the bank a minimum of 20 feet on either side of the proposed activity. The booms must be positioned in the water to capture a possible oil leak/spray up to 40 feet from the equipment. Oil absorbent pads shall also be kept on site whenever hydraulic equipment is on site. Used booms and pads shall be stored in a leak-proof container and disposed of properly.

31. The applicant shall ensure that no invasive plant species, as defined and listed as Invasive, Likely Invasive, or Potentially Invasive by the Massachusetts Invasive Plant Advisory Group, https://www.massnrc.org/MIPAG/, are introduced or spread around the site by construction activities including but not limited to improperly cleaned construction equipment and importation of infected materials such as fill, compost, nursery stock, seed, or hay bales. Corrective measures, if necessary, shall be made by the applicant for as long as necessary to eliminate the introduced invasive plant species and prevent re-establishment of same.

Erosion & Sediment Control

32. The erosion and sedimentation control (ESC) shall be installed and located on the property, in accordance with the approved design plan, sketch and/or details provided with the Notice of Intent filing.

33. The location of the ESC shall be established and delineated in the field by a licensed surveyor or professional engineer according to the approved plans for all engineered projects.

34. Once the ESC is installed, the applicant shall contact the Conservation Commission at 508-987-6044 for an inspection. No clearing of vegetation, cutting of trees, or disturbance of soil shall occur prior to the Commission's inspection and approval of the ESC.

35. Sedimentation shall be removed from the ESC once the height of the sediment reaches halfway up the control. Sediment shall also be removed prior to replacement/removal of the sediment control. All stockpile material, excavated material, vegetation debris, and other materials shall not be placed up against the ESC.

36. The location of the sediment controls on the site shall provide a defined limit of construction activities. No work shall be performed beyond the sediment control line.

37. All areas of construction shall be inspected at the close of each construction day by the Site Supervisor. Sediment and erosion control measures shall be inspected and maintained or reinforced as needed at this time and prior to any further construction activities.

Site Stabilization

38. Interim and permanent stabilization measures shall be instituted on all disturbed or exposed soil surfaces as soon as practicable but no more than 14 days after construction activity has ceased on that portion of the site. Surfaces shall be stabilized in accordance with the Massachusetts Department of Environmental Protection Erosion and Sediment Control Guidelines for Urban and Suburban Areas.

Material Storage

39. All soil, debris, fill and excavated materials shall be stockpiled outside of the 100-foot buffer zone to wetland resource areas wherever feasible.

40. Construction materials and equipment shall be stored in a manner and location that will limit compaction of soils and the concentration of the surface runoff.

41. All toxic substances used in construction or for equipment, i.e. oil, gasoline, fuels, lubricants, etc. shall be stored outside of the 100-foot buffer zone to wetland resource areas. The manner in which these items are stored shall prevent others from gaining access to such toxic substances or from having any possible spillage and eventual alteration to the wetland area.

Wetland Replication

42. Massachusetts Inland Wetland Replication Guidelines, DEP, shall be used as a guide in construction of the wetland replication. Replication construction activities must be supervised by a wetland specialist who shall be a professional with experience in wetland replication, wetland hydrology and a working knowledge of botany. Such a person shall be retained by the applicant and/or owner to supervise and monitor construction of the wetland replication areas until the replication area meets the requirements of this Order of Conditions.

43. Following construction of the replication area, the wetland specialist shall certify to the Commission that the area has been constructed in compliance with the Order of Conditions. Such certification shall be accompanied by a plan showing the limits of the replication area and final grades as surveyed by a licensed land surveyor, which meet grades shown on the plans approved in this Order of Conditions.

44. A Replication Monitoring Report prepared by the wetland scientist shall be provided to the Commission two years after construction of the replicated wetland or upon request for a Certificate of Compliance if within two years. The reports shall describe using narratives, plans, and color photographs, the physical characteristics of the wetland replication areas with respect to stability, soil characteristics, survival of vegetation and plant mortality, aerial extent and distribution, species diversity and vertical stratification (i.e. herb, shrub and tree layers).

Stormwater Management

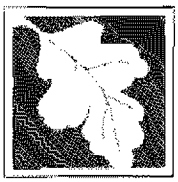
45. This Order of Conditions shall serve as the Land Disturbance Administrative Approval in accordance with the Town of Oxford General By-Laws Chapter 66.

46. All underground drainage and stormwater conveyance structures must be inspected by a representative of the Town of Oxford prior to backfilling. The applicant must contact the Oxford DPW at 508-987-6006 to schedule such inspection.

47. An as-built plan showing the location of all approved structures and site improvements including final grades and the designer's certification, stating that the work has been completed in accordance with the approved plan and this Order, shall be submitted with the Request for Certificate of Compliance or a request for occupancy. Said certification shall be preferably from the same engineer as on the approved stamped plans on file. The certification shall bear the engineer's professional seal, signature and date and shall include a statement indicting that the stormwater management system required by the Oxford General By-Laws, as constructed, is built in accordance with the approved plan and this Order. Occupancy or use shall not be allowed until this condition is satisfied.

Post Construction

48. Upon completion of the project, all disturbed areas shall be permanently stabilized with rapidly growing cover with sufficient topsoil to assure long term stabilization. A Certificate of Compliance will not be issued for any project until a dense cover of vegetation can be shown over all areas which were disturbed.



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 – Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
255-883
MassDEP File #

eDEP Transaction #

OXFORD
City/Town

D. Findings Under Municipal Wetlands Bylaw or Ordinance

1. Is a municipal wetlands bylaw or ordinance applicable? ☐ Yes ☒ No

2. The _____ hereby finds (check one that applies):
Conservation Commission

   a. ☐ that the proposed work cannot be conditioned to meet the standards set forth in a municipal ordinance or bylaw, specifically:

   1. Municipal Ordinance or Bylaw | 2. Citation

   Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides measures which are adequate to meet these standards, and a final Order of Conditions is issued.

   b. ☐ that the following additional conditions are necessary to comply with a municipal ordinance or bylaw:

   1. Municipal Ordinance or Bylaw | 2. Citation

3. The Commission orders that all work shall be performed in accordance with the following conditions and with the Notice of Intent referenced above. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, the conditions shall control.
   The special conditions relating to municipal ordinance or bylaw are as follows (if you need more space for additional conditions, attach a text document):

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
255-883
MassDEP File #

eDEP Transaction #

OXFORD
City/Town

E. Signatures

This Order is valid for three years, unless otherwise specified as a special condition pursuant to General Conditions #4, from the date of issuance.

6/26/2024
1. Date of Issuance

Please indicate the number of members who will sign this form.
This Order must be signed by a majority of the Conservation Commission.

5
2. Number of Signers

The Order must be mailed by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate Department of Environmental Protection Regional Office, if not filing electronically, and the property owner, if different from applicant.

Signature	Printed Name
	Paul Cunningham
	Arthur Firl
	Tom O'Neill
	Sheila P. Conroy
	William Zoldak
	Wayne McFarland

☒ by hand delivery on 6/26/2024
Date

☐ by certified mail, return receipt requested, on
Date

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 – Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
255-883
MassDEP File #

eDEP Transaction #
OXFORD
City/Town

F. Appeals

The applicant, the owner, any person aggrieved by this Order, any owner of land abutting the land subject to this Order, or any ten residents of the city or town in which such land is located, are hereby notified of their right to request the appropriate MassDEP Regional Office to issue a Superseding Order of Conditions. The request must be made by certified mail or hand delivery to the Department, with the appropriate filing fee and a completed Request for Departmental Action Fee Transmittal Form, as provided in 310 CMR 10.03(7) within ten business days from the date of issuance of this Order. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

Any appellants seeking to appeal the Department's Superseding Order associated with this appeal will be required to demonstrate prior participation in the review of this project. Previous participation in the permit proceeding means the submission of written information to the Conservation Commission prior to the close of the public hearing, requesting a Superseding Order, or providing written information to the Department prior to issuance of a Superseding Order.

The request shall state clearly and concisely the objections to the Order which is being appealed and how the Order does not contribute to the protection of the interests identified in the Massachusetts Wetlands Protection Act (M.G.L. c. 131, § 40), and is inconsistent with the wetlands regulations (310 CMR 10.00). To the extent that the Order is based on a municipal ordinance or bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
255-883
MassDEP File #

eDEP Transaction #

OXFORD
City/Town

G. Recording Information

Prior to commencement of work, this Order of Conditions must be recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land subject to the Order. In the case of registered land, this Order shall also be noted on the Land Court Certificate of Title of the owner of the land subject to the Order of Conditions. The recording information on this page shall be submitted to the Conservation Commission listed below.

Oxford Conservation Commission
Conservation Commission

Detach on dotted line, have stamped by the Registry of Deeds and submit to the Conservation Commission.

To:

Conservation Commission

Please be advised that the Order of Conditions for the Project at:

Project Location MassDEP File Number

Has been recorded at the Registry of Deeds of:

County Book Page

for: Property Owner

and has been noted in the chain of title of the affected property in:

Book Page

In accordance with the Order of Conditions issued on:

Date

If recorded land, the instrument number identifying this transaction is:

Instrument Number

If registered land, the document number identifying this transaction is:

Document Number

Signature of Applicant

Appendix C

Project Notification Form

APPENDIX A
MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD
BOSTON, MASS. 02125
617-727-8470, FAX: 617-727-5128

PROJECT NOTIFICATION FORM

Project Name: McKinstry Pond Dam Repairs

Location / Address: McKinstry Pond Dam/Waite Street (42.126514 N, 71.867654 W)

City / Town: Oxford

Project Proponent

Name: Mr. Peter Gerhard, Town of Oxford Department of Public Works

Address: 450 Main Street

City/Town/Zip/Telephone: Oxford, MA 01540 (508) 987-6006

Agency license or funding for the project (list all licenses, permits, approvals, grants or other entitlements being sought from state and federal agencies).

Agency Name	Type of License or funding (specify)
Oxford Conservation Commission	Wetlands Protection Act - Order of Conditions
USACE	Section 404 General Permit
MADCR	MA Chapter 253 Dam Safety Permit

Project Description (narrative):
See attached

Does the project include demolition? If so, specify nature of demolition and describe the building(s) which are proposed for demolition.
No demolition of buildings.

Does the project include rehabilitation of any existing buildings? If so, specify nature of rehabilitation and describe the building(s) which are proposed for rehabilitation.
No rehabilitation of buildings.

Does the project include new construction? If so, describe (attach plans and elevations if necessary).
The proposed project does not include new construction.

After review of MHC files and the materials you submitted, it has been determined that this project is unlikely to affect significant historic or archaeological resources.
RC.69244

2/4/21
Jonathan K. Patton Date
Archaeologist / Preservation Planner
Massachusetts Historical Commission

APPENDIX A (continued)

To the best of your knowledge, are any historic or archaeological properties known to exist within the project's area of potential impact? If so, specify.
No historic or archaeological properties are known to exist within the proposed project area.

What is the total acreage of the project area?

Woodland	acres	Productive Resources:	
Wetland	acres	Agriculture	acres
Floodplain	acres	Forestry	acres
Open space	acres	Mining/Extraction	acres
Developed 0.31	acres	Total Project Acreage	acres

What is the acreage of the proposed new construction? N/A acres

What is the present land use of the project area?
The upstream pond is currently used for recreation; the outlet structure currently conveys water discharging from the pond beneath Waite Street through a 2'x2' stone culvert. Surrounding land use is residential.

Please attach a copy of the section of the USGS quadrangle map which clearly marks the project location.

This Project Notification Form has been submitted to the MHC in compliance with 950 CMR 71.00.

Signature of Person submitting this form: Kristin J. Connell Date: January 14, 2021

Name: Kristin Connell

Address: 146 Hartford Road

City/Town/Zip: Manchester, CT 06040

Telephone: (860) 646-2469 x5201

REGULATORY AUTHORITY

950 CMR 71.00: M.G.L. c. 9, §§ 26-27C as amended by St. 1988, c. 254.

Melissa Gualtieri

From: Kristin Connell
Sent: Friday, January 15, 2021 6:17 AM
To: 'david.s.robinson@mass.gov'
Cc: Andrea Judge; Shawn King
Subject: McKinstry Pond Dam Project Notification
Attachments: 20210113_MHC_pkg.pdf

Hi David,
I hope this email finds you well. I have attached a copy of the Massachusetts Historical Commission Project Notification for proposed work at the McKinstry Pond Dam, located along Waite Street in Oxford. Please let me know if you have any questions or require any additional information.

Thank you,
Kristin

Kristin Connell
Project Manager
Fuss & O'Neill, Inc. | 146 Hartford Road | Manchester, CT 06040
860.646.2469 x5201 | kconnell@fando.com
www.fando.com | twitter | facebook | linkedin

Proud to be named a 2020 Zweig Group "Best Firm to Work For".

Melissa Gualtieri

From: Kristin Connell
Sent: Friday, January 15, 2021 6:21 AM
To: '106Review@mwtribe-nsn.gov'
Cc: 'David.Weeden@mwtribe-nsn.gov'; Andrea Judge; Shawn King
Subject: McKinstry Pond Dam Notification - Oxford, MA
Attachments: Mashpee Wampanoag Tribe.pdf

To Whom It May Concern:

I have attached project notification for proposed repairs at McKinstry Pond Dam located along Waite Street in Oxford, Massachusetts. Please let me know if you have any questions or require any additional information.

Thank you,
Kristin

Kristin Connell
Project Manager
Fuss & O'Neill, Inc. | 146 Hartford Road | Manchester, CT 06040
860.646.2469 x5201 | kconnell@fando.com
www.fando.com | twitter | facebook | linkedin

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Melissa Gualtieri

From: Kristin Connell
Sent: Friday, January 15, 2021 6:23 AM
To: 'tashtesook@aol.com'; 'dhnithpo@gmail.com'
Cc: Andrea Judge; Shawn King
Subject: McKinstry Pond Dam Notification - Oxford, MA
Attachments: Narragansett Indian Longhouse.pdf

To Whom It May Concern:

I have attached project notification for proposed repairs at McKinstry Pond Dam located along Waite Street in Oxford, Massachusetts. Please let me know if you have any questions or require any additional information.

Thank you,
Kristin

Kristin Connell
Project Manager
Fuss & O'Neill, Inc. | 146 Hartford Road | Manchester, CT 06040
860.646.2469 x5201 | kconnell@fando.com
www.fando.com | twitter | facebook | linkedin

Proud to be named a 2020 Zweig Group "Best Firm to Work For".

Melissa Gualtieri

From: Kristin Connell
Sent: Friday, January 15, 2021 6:22 AM
To: 'bettina@wampanoagtribe.net'
Cc: Andrea Judge; Shawn King
Subject: McKinstry Pond Dam Notification - Oxford, MA
Attachments: Wampanoag Tribe of Gay Head (Aquinnah).pdf

To Whom It May Concern:

I have attached project notification for proposed repairs at McKinstry Pond Dam located along Waite Street in Oxford, Massachusetts. Please let me know if you have any questions or require any additional information.

Thank you,
Kristin

Kristin Connell
Project Manager
Fuss & O'Neill, Inc. | 146 Hartford Road | Manchester, CT 06040
860.646.2469 x5201 | kconnell@fando.com
www.fando.com | twitter | facebook | linkedin

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Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection
100 Cambridge Street 9th Floor Boston, MA 02114 • 617-292-5500

Maura T. Healey
Governor

Kimberley Driscoll
Lieutenant Governor

Rebecca L. Tepper
Secretary

Gary Moran
Acting Commissioner

January 12, 2023

Jared Duval, Town of Oxford
c/o Alison Baranovic, Fuss & O'Neill
146 Hartford Road
Manchester, CT 06040

RE: 22-WWAR-0071-APP – Denial of Request for Minor Project Modification
McKinstry Pond Dam Repairs, Waters of McKinstry Pond, Oxford, Worcester County

Dear Mr. Duval,

The Massachusetts Department of Environmental Protection Waterways Regulation Program (the "Department") received the above-referenced submittal on December 13, 2022, requesting approval as a Minor Project Modification for proposed dam repairs to the McKinstry Pond dam.

The submittal included:

- WWAR Application Form;
- Letter describing the current dam condition and proposed work;
- McKinstry Pond Dam Repairs Design Plans (11 sheets) prepared by Fuss & O'Neill and dated January 2022 (unstamped);

Based on the Department's review of the referenced materials, we find that portions of the proposed work waterward of the ordinary high-water mark upstream and downstream of the dam are geographic areas subject to Chapter 91 jurisdiction pursuant to 310 CMR 9.04(1)(e). Readily available aerial photography appears to demonstrate that one could float a canoe, kayak or raft upstream year-round and downstream during periods of high water.

The installation of stone armoring upstream and downstream of the dam will require dredging and placement of fill below ordinary high water. Based on the information submitted to-date, these activities require a Chapter 91 license pursuant to 310 CMR 9.05(1)(a) and/or permit pursuant to 310 CMR 9.05(2)(b). The letter states that the upstream armoring and downstream apron "*will be installed to help protect the bank from erosion*" and asserts that the work is exempt from Chapter 91 requirements pursuant to 310 CMR 9.05(3)(g) "*because calculations indicate that stone armor is required to protect against bank erosion."* However, the submittal does not include may documentation to substantiate this assertion. Furthermore, the exemption at 310 CMR 9.05(3)(g) requires that the work be approved by an Order of Conditions. We understand a Notice of Intent has not yet been filed with the Oxford Conservation Commission and no Order of Conditions has been issued.

Accordingly, the Department finds that the proponent has not demonstrated that the proposed work meets the requirements of 310 CMR 9.22(3) or any exemption stipulated in 310 CMR 9.05(3). Please note that

the portions of the proposed work located landward of the Ordinary High Water Mark which will be located outside of Chapter 91 jurisdiction do not require authorization by the Department.

The Department will retain this correspondence along with the referenced submittal in our records. If you have any questions, please contact us at DEP.Waterways@mass.gov.

Sincerely,

Daniel J. Padien
Program Chief
Waterways Regulation Program

cc: Jared Duval, Director, Oxford Department of Public Works
Andrea Judge, Fuss & O'Neill

Appendix D

MADCR
Chapter 253 Dam Safety Permit

dcr
Massachusetts

Certified Mail No. 7017 2620 0000 7561 1720
Return Receipt Requested

M.G.L. Chapter 253
Dam Safety Permit
Permit No. 204-2024-432

Applicant

Philip Forzley, PE
Fuss & O'Neill, Inc.
205 Billings Farm Road, Suite 6B
White River Junction, VT 05001

On behalf of:
Town of Oxford
Department of Public Works
Attn: Kevin Duffy, Director
450 Main Street
Oxford, MA 01540

Re: McKinstry Pond Dam Repairs
National Dam ID: MA01953
Registry Location: Worcester South, Deed Book 5483, Page 157
Owner: Town of Oxford
Dam Location: Oxford

Date: July 24, 2024

Dear Mr. Forzley:

Reference is made to the application dated April 2024 and supplemental information provided by Fuss & O'Neill, Inc. (F&O). These were submitted for Department of Conservation and Recreation (DCR) Office of Dam Safety (ODS) regulatory review of the above-referenced dam rehabilitation project.

Permission is hereby granted under M.G.L. Chapter 253, as amended, to perform work indicated on the drawings titled "**McKinstry Pond Dam Repairs, Dam # MA01953, Oxford,**

Department of Conservation and Recreation
180 Beaman Street
West Boylston, MA 01583
508-792-7423 508-792-7805 Fax
www.mass.gov/dcr

Maura T. Healey
Governor

Kimberley Driscoll
Lt. Governor

Rebecca L. Tepper, Secretary
Executive Office of Energy & Environmental Affairs

Brian Arrigo, Commissioner
Department of Conservation & Recreation

Massachusetts" dated August 2023 (revised June 2024) and as described in supporting documentation provided by F&O.

Permission is granted subject to the following conditions:

(a) At least 21 days before the start of construction, the dam owner shall provide the DCR/ODS - Permits Section a completed **DAM SAFETY IMPROVEMENTS – NOTICE OF CONSTRUCTION** (form attached) with a construction schedule and proof of recording of the Ch. 253 Permit at the Registry of Deeds in the county where the dam lies. If the Notice of Construction provided to ODS lacks a construction schedule, proof of recording of the permit, or an explanation of why permit recording is not possible, ODS will return the Notice of Construction to the dam owner indicating the Notice of Construction is incomplete and informing the owner that construction shall not commence until ODS has received a complete Notice of Construction with the required attachments.

(b) For all features of the project, the Dam Engineer (F&O) shall notify ODS of any design change from the original design submitted with the permit application due to regulatory requirements, changes in field conditions or any other unanticipated occurrence. This notification shall be a formal submittal to ODS which includes all relevant revised plans, computations and data (survey, geotechnical, etc.) supporting the design change(s). This submittal shall be forwarded to ODS by registered mail, return receipt requested, and will require an amendment to the permit. Review time may vary based upon the complexity of the design change(s), however, ODS will generally issue the permit amendment within five (5) business days of receipt of a complete design revision submittal.

(c) The Dam Engineer must report to ODS any unforeseen incidents that occur at the work site during project work. Unforeseen incidents include, but are not limited to, significant uncontrolled seepage into the work area, significant earth support failures or slope failures. The report must explain in detail what occurred, corrective measures taken to mitigate the occurrence and any impacts the occurrence may have had on the project. If the incident results in a design change, ODS must be provided revised design documents (refer to Condition (b), above).

(d) During construction, a copy of the dam's Emergency Action Plan (EAP) shall be maintained on-site by the resident engineer.

(e) The following shall be prepared by the contractor, approved by the Dam Engineer, and submitted to ODS prior to construction:

- Cofferdam designs. The cofferdams shall be carefully designed to resist anticipated forces without failing and to ensure that seepage around, under, or through the cofferdams is manageable;
- A water control and diversion plan describing methods to be employed to allow work to be performed "in the dry" and to manage both the water level in

McKinstry Pond and outflow from McKinstry Pond while construction is in progress; and

- A flood response plan. While construction is underway, weather forecasts, stream flows and water levels shall be monitored to allow adequate time to respond to rising water levels at the construction site. If high water levels are expected, equipment and materials shall be removed from the work area and personnel evacuated. Sufficient materials and equipment required for flood response shall be maintained in a safe location at, or near, the construction site.

(f) A sufficient level of construction oversight shall be provided by the Dam Engineer to ensure the work conforms to: the project plans and specifications; the Ch. 253 Permit conditions; and generally-accepted dam construction practices as determined by the U.S. Army Corps of Engineers, the U.S. Bureau of Reclamation and/or the U.S. Natural Resources Conservation Service.

Guidance, procedures, checklists, worksheets, and references to aid in construction quality assurance are available in the United States Department of Agriculture Natural Resources Conservation Service National Engineering Handbook Part 645-Construction Inspection and can be accessed at this link: https://directives.sc.egov.usda.gov/viewerFS.aspx?hid=31701 .

(g) The Dam Engineer shall invite ODS to the preconstruction meeting, another project meeting at 50% completion and the final inspection meeting. ODS reserves the right to make site visits and inspections at any time during the permit period. ODS requests the following items be addressed at the pre-construction meeting:

- Identification of the
    - resident engineer (Owner's representative overseeing the project);
    - contractor's qualified site superintendent; and
    - Dam Engineer's representative overseeing the project.
- Provide emergency contact information for the contractor and resident engineer;
- Presentation of the resident engineer's weekly work schedule and discussion of the level of construction oversight to be provided by the resident engineer;
- Water control features anticipated and the process for the Dam Engineer to either develop or approve the overall control and diversion of water plan. Flood emergency warning and response procedures must be identified;
- Level of Dam Engineer construction oversight including: identification of any critical construction items to be overseen by the Dam Engineer; procedures for the Dam Engineer's review and approval of shop drawings and other submittals; documentation of Dam Engineer's approval of any design modifications; procedures for coordinating and scheduling the Dam Engineer's inspection of critical construction elements;
- Anticipated schedule of construction meetings and required attendees. It is expected that while construction is ongoing, weekly construction meetings will be held and

attended by the Dam Engineer, the resident engineer, the contractor's superintendent and other appropriate participants; and

- Presentation of the initial construction schedule with identification and discussion of major items.

ODS shall be provided a copy of the preconstruction meeting minutes.

(h) The Dam Engineer shall monitor the completed work once the cofferdams are removed and the pond is impounded against the embankment structure. If any instabilities or uncontrolled seepage is noted, ODS must be notified and the dam engineer must determine any additional actions or repairs that may be needed.

(i) The Dam Engineer shall provide ODS written documentation that he/she has reviewed and approved all pertinent submittals or samples concerning critical project dam features, including all materials used for bedding and backfilling of precast concrete structures and pipes. This documentation may be in the form of a submittal log which may be submitted as part of the "as-built" report, described below.

(j) Upon completion of work the Applicant shall submit to ODS a **DAM SAFETY CERTIFICATE OF COMPLETION** (form attached). With this certificate of completion submit one bound (utilizing plastic comb bindings) as-built report with 11"x17" record drawings signed and stamped by a registered professional civil engineer with contractor's signature attesting that all work was performed according to the plans and specifications. The as-built report shall include documentation of submittals reviewed and approved by the Dam Engineer, copies of any materials or construction testing reports and color photos of construction phases and appurtenant installations. Photograph numbers, location and direction in which each photo was taken must be identified. An electronic copy (as a .pdf) of the as-built report and record drawings shall be provided to ODS via email, .ftp site or on a USB flash drive.

(k) Once the project has been completed and the reservoir has returned to its normal elevation, the Dam Engineer shall perform a Phase I Inspection to document the condition of the dam.

(l) The Certificate of Completion, as-built report and Phase I Inspection report shall be provided to ODS within 90 days of substantial completion of work unless ODS agrees to later submission of these documents. Submission of these documents is required prior to ODS issuing a Certificate of Compliance.

Any permit issued by DCR shall be subject to revocation by order of the Commissioner if the permittee fails to conform to 302 CMR 10.00, Dam Safety Rules and Regulations, provisions of this permit, or any other applicable laws and regulations.

This permit does not release the applicant from the requirements of any other regulatory authority. Such authorizations and/or notifications include, but are not limited to:

Local Conservation Commission;
Massachusetts Department of Environmental Protection (DEP);
Massachusetts Department of Fish and Game (DFG);
Massachusetts Executive Office of Environmental Affairs (EOEA), MEPA Unit; and
U.S. Army Corps of Engineers.

This permit must be recorded by the applicant at the Registry of Deeds in the county where the dam lies. Recording must be done prior to the commencement of construction and a copy of the recorded permit filed with the Office of Dam Safety.

This permit remains valid for two (2) years from the date of issue: **July 24, 2024**.

Permit expiration date: **July 24, 2026**.

William Salomaa, Director
DCR, Office of Dam Safety

David Ouellette, Permit Engineer
DCR, Office of Dam Safety

Attachments: Dam Safety Improvements – Notice of Construction form
Dam Safety Certificate of Completion form

Informational (NOT TO BE RECORDED AT REGISTRY OF DEEDS)

Excerpts from Dam Safety Rules Regulations:

302 CMR 10.09(5): Recording a Chapter 253 Permit.

A permit to construct, drawdown, repair, alter, breach or remove a dam shall be recorded at the Registry of Deeds in the county where the dam lies. Recording must be done prior to the commencement of construction and a copy of the recorded permit filed with the Commissioner.

.

To: DCR, Office of Dam Safety – Permits Section
180 Beaman Street
West Boylston, MA 01583

DAM SAFETY IMPROVEMENTS - NOTICE OF CONSTRUCTION

Dam Owner/Applicant
Name:
Representative:
Address:
Phone:
Fax:
Email Address:

Project
Project location Town/City:
Dam name:
National Dam ID Number:
State Dam ID Number:
Nature of Dam Safety Improvements:
Chapter 253 Permit date of issue:
Chapter 253 Permit expiration date:
Permit Recorded at_____ Registry of Deeds
Dam Parcel Registry of Deeds Book Number:
Dam Parcel Registry of Deeds Page Number:
Recorded Permit Registry of Deeds Book Number:
Recorded Permit Registry of Deeds Page Number:
Copy of the recorded permit attached Yes ( )
Construction start date:
Construction schedule attached Yes ( )

Engineer
Company Name:
Representative:
Address:
Phone:
Fax:
Email Address:

Contractor
Company Name:
Representative:
Address:
Phone:
Fax:
Email Address :

Brief description of project, note location and dates of construction:

_____
_____
_____

By Contractor

Print name and title:_____

Signature and date:_____

By Engineer

Print name, title:_____

Signature and date:_____

By Dam Owner/Applicant

Print name and title:_____

Signature and date:_____

To: DCR, Office of Dam Safety – Permits Section
180 Beaman Street
West Boylston, MA 01583

DAM SAFETY CERTIFICATE OF COMPLETION

Dam Owner/Applicant
Name:
Representative:
Address:
Phone:
Fax:
Email Address:

Project
Project location Town/City:
Dam name:
National Dam ID Number:
State Dam ID Number:
Nature of Dam Safety Improvements:
Chapter 253 Permit date of issue:
Chapter 253 Permit expiration date:
Permit Recorded at_____ Registry of Deeds
Dam Parcel Registry of Deeds Book Number:
Dam Parcel Registry of Deeds Page Number:
Recorded Permit Registry of Deeds Book Number:
Recorded Permit Registry of Deeds Page Number:
Project completion date:

Engineer
Company Name:
Representative:
Address:
Phone:
Fax:
Email Address:

Contractor
Company Name:
Representative:
Address:
Phone:
Fax:
Email Address :

Brief description of project and dates of construction:

_____
_____
_____

Statement of project completion in accordance with plans, specifications, dam safety permit conditions and standard construction practices:

_____
_____
_____

By Contractor

Print name and title:_____

Signature and date:_____

By Engineer

Print name, title and PE stamp here:_____

Signature and date:_____

By Dam Owner/Applicant

Print name and title:_____

Signature and date:_____

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 VIRGINIA ROAD
CONCORD MA 01742-2751

July 10, 2024

Regulatory Division
File Number: NAE-2024-00903

Kevin Duffy
Town of Oxford
450 Main Street
Oxford, Massachusetts 01540
(Via Email): Kduffy@oxfordma.us

Dear Kevin Duffy:

This regards your application submitted to the U.S. Army Corps of Engineers (USACE) to permanently impact 1,325 square feet and temporarily impact 3,250 square feet of WOTUS below the Ordinary High Water (OHW) mark for the purposes of repairing an existing dam and an adjacent culvert. Associated activities will include removal of existing concrete and mortared stone masonry intake structure and internals, replacement of the weir board structure, installation of a new weir board structure within the existing intake structure, trash rack installation, removal and replacement of existing stone culvert and downstream headwall, replacement of upstream wing walls and removal of upstream granite blocks/masonry support, regrading of the dam embankment, stone armoring installation, and improvement of the stormwater system. The existing 2 feet X 2 feet culvert will be replaced with two 24-inch culvert pipes. The project activities will result in permanent impacts of 1,110 square feet and temporary impacts of 3,250 square feet in the pond and the stream. The permanent impacts will come from the placement of the new culvert pipes, stone armoring, and spillway reinforcement. The temporary impacts will come from pond bottom that would remain dry due to temporary cofferdam installation. Installation of these structures will result in temporary fill of 19 cubic yards, and permanent fill of 107 cubic yards. This project is located on Unnamed Stream and McKinstry Pond, Waite Street, Oxford, Massachusetts 01540 at site coordinates 42.126512, -71.867657. The work is shown on the enclosed plans titled “MCKINSTRY POND DAM REPAIRS” on 13 sheets and dated “AUGUST 2023”.

Based on the information that you have provided, we verify that the activity is authorized under General Permit # 23 and # 24 of the June 2, 2023, federal permit known as the Massachusetts General Permits (GPs). The GPs are available at https://www.nae.usace.army.mil/Missions/Regulatory/State-General-Permits/Massachusetts-General-Permit.

Please review the enclosed GPs carefully, in particular the general conditions beginning on page 35, and ensure that you and all personnel performing work authorized

by the GPs are fully aware of and comply with its terms and conditions. A copy of the GPs and this verification letter shall be available at the work site as required by General Condition 17. You must perform this work in compliance with the following special condition(s):

1) You must complete and return the enclosed Work Start Notification Form to this office at least two weeks before the anticipated start date. The form shall be emailed to Maninder Singh at Maninder.Singh@usace.army.mil and cenae-r@usace.army.mil; or mailed to Maninder Singh, Regulatory Division, U.S. Army Corps of Engineers, New England District, 696 Virginia Road, Concord, Massachusetts 01742-2751.

2) You must complete and return the enclosed Compliance Certification Form to this office within one month of the completion of work. The form shall be emailed to Maninder Singh at Maninder.Singh@usace.army.mil and cenae-r@usace.army.mil; or mailed to Maninder Singh, Regulatory Division, U.S. Army Corps of Engineers, New England District, 696 Virginia Road, Concord, Massachusetts 01742-2751.

This authorization expires on June 1, 2028. You must commence or have under contract to commence the work authorized herein by June 1, 2028, and complete the work by June 1, 2029. If not, you must contact this office to determine the need for further authorization and we recommend you contact us *before* the work authorized herein expires. Please contact us immediately if you change the plans or construction methods for work within our jurisdiction as we must approve any changes before you undertake them. Performing work within our jurisdiction that is not specifically authorized by this determination or failing to comply with the special condition(s) provided above or all the terms and conditions of the GPs may subject you to the enforcement provisions of our regulations.

This authorization does not obviate the need to obtain other federal, state, or local authorizations required by law. Applicants are responsible for applying for and obtaining any other approvals.

We continually strive to improve our customer service. To better serve you, we would appreciate your completing our Customer Service Survey located at https://regulatory.ops.usace.army.mil/customer-service-survey.

Please contact Maninder Singh of my staff at (978) 318-8967 or (978)-257-6884 or Maninder.Singh@usace.army.mil if you have any questions.

Sincerely,

Paul Maniccia

Paul Maniccia
Chief, Massachusetts Section
Regulatory Division

Enclosures

Cc:
Alison Baranovic, FUSS & O'NEILL, Alison.Baranovic@fando.com
Ed Reiner, U.S. EPA, Region 1, Boston, MA, reiner.ed@epa.gov
Rachel Croy, U.S. EPA, Region 1, Boston, MA, croy.rachel@epa.gov
DEP CERO, Wetlands and Waterways, Worcester, MA; cero_noi@mass.gov
David Robinson, MA Board of Underwater Archaeological Resources (BUAR); david.s.robinson@mass.gov
Oxford Conservation Commission, jlochner@town.oxford.ma.us

Appendix E

US Army Corps of Engineers
Section 404 Pre Construction Notification

US Army Corps of Engineers®
New England District

WORK-START NOTIFICATION FORM

(Minimum Notice: Two weeks before work begins)

****

EMAIL TO: Maninder.Singh@usace.army.mil and cenae-r@usace.army.mil; or

MAIL TO: Maninder Singh
Regulatory Division
U.S. Army Corps of Engineers, New England District
696 Virginia Road
Concord, Massachusetts 01742-2751

****

Corps of Engineers Permit No. **NAE-2024-00903** was issued to **Kevin Duffy**. This work is located in **unnamed Stream and McKinstry Pond, Waite Street, Oxford, Massachusetts 01540 at site coordinates 42.126512, -71.867657** and authorized to permanently impact 1,325 square feet and temporarily impact 3,250 square feet of WOTUS below the Ordinary High Water (OHW) mark for the purposes of repairing an existing dam and an adjacent culvert. Associated activities will include removal of existing concrete and mortared stone masonry intake structure and internals, replacement of the weir board structure, installation of a new weir board structure within the existing intake structure, trash rack installation, removal and replacement of existing stone culvert and downstream headwall, replacement of upstream wing walls and removal of upstream granite blocks/masonry support, regrading of the dam embankment, stone armoring installation, and improvement of the stormwater system. The existing 2 feet X 2 feet culvert will be replaced with two 24-inch culvert pipes. The project activities will result in permanent impacts of 1,110 square feet and temporary impacts of 3,250 square feet in the pond and the stream. The permanent impacts will come from the placement of the new culvert pipes, stone armoring, and spillway reinforcement. The temporary impacts will come from pond bottom that would remain dry due to temporary cofferdam installation. Installation of these structures will result in temporary fill of 19 cubic yards, and permanent fill of 107 cubic yards.

The people (e.g., contractor) listed below will do the work, and they understand the permit's conditions and limitations.

PLEASE PRINT OR TYPE

Name of Person/Firm: _____

Business Address: _____

_____

_____

Phone & email: (___) _____ (___) _____ _____

Proposed Work Dates: **Start:** _____ **Finish:** _____

Permittee/Agent Signature: _____ **Date:** _____

Printed Name: _____ **Title:** _____

Date Permit Issued: _____ **Date Permit Expires:** _____

****

FOR USE BY THE CORPS OF ENGINEERS

PM: _____ Submittals Required: _____

Inspection Recommendation: _____

US Army Corps of Engineers®
New England District

COMPLIANCE CERTIFICATION FORM

(Minimum Notice: Permittee must sign and return notification within one month of the completion of work.)

Permit Number: NAE-2024-00903

Project Manager: Maninder Singh

Name of Permittee: Kevin Duffy

Permit Issuance Date: July 10, 2024

Please sign this certification and return it to our office upon completion of the activity.

****
* E-MAIL TO: cenae-r-ma@usace.army.mil; & Maninder.singh@usace.army.mil *
*
* MAIL TO: Massachusetts Section *
* Regulatory Division *
* U.S. Army Corps of Engineers, New England District *
* 696 Virginia Road *
* Concord, MA 01742-2751 *
****

Please note that your permitted activity is subject to a compliance inspection by an U.S. Army Corps of Engineers representative. If you fail to comply with this permit, you are subject to permit suspension, modification, or revocation.

I hereby certify that the work authorized by the above referenced permit was completed in accordance with the terms and conditions of the above referenced permit, and any required mitigation was completed in accordance with the permit conditions.

______________________________ ______________________________
Signature of Permittee Date

______________________________ ______________________________
Printed Name Date of Work Completion

( ) ______________________________ ( ) ______________________________
Telephone Number Telephone Number

Appendix F

Aquarion Water Company
Technical Specifications for
Water Supply & Distribution

AQUARION
Water Company

TECHNICAL SPECIFICATIONS FOR WATER SUPPLY AND DISTRIBUTION

Prepared by

TATA & HOWARD
INCORPORATED

APRIL 2006

FORWARD

The Aquarion Water Company (AWC) has standardized on the following construction practices and materials. All Contractor's constructing water infrastructure within the AWC water systems must comply with these Specifications. These Technical Specifications are intended to maintain the quality of materials and construction technique provided to the AWC by private Contractors.

TABLE OF CONTENTS

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DIVISION 1 GENERAL REQUIREMENTS

SECTION 01092

ABBREVIATIONS & DEFINITIONS

PART 1 GENERAL

1.01 DESCRIPTION

A. Listing of Abbreviations: The listing of abbreviations in this Specification Section represent the Standard Organization named.

B. Related Work
1. Documents affecting work of this section include, but are not necessarily limited to Sections in Division 1 of these Specifications.
2. All related Specification Sections shall be used in conjunction with this Section.

1.02 QUALITY ASSURANCE

A. For products or workmanship specified by association, trade, or Federal Standards, comply with requirements of the Standard, except when more stringent requirements are specified or are required by applicable codes.

B. Conform to reference standard by date of issue current on date for receiving bids.

1.03 LISTING OF STANDARD ORGANIZATIONS AND THEIR ABBREVIATIONS

AA	Aluminum Association
AAN	American Association of Nurserymen
AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
ACPA	American Concrete Pipe Institute
ADC	Air Diffusion Council
AGA	American Gas Association
AGCA	Associated General Contractors of America
AHDGA	American Hot Dip Galvanizers Association
AI	Asphalt Institute
AIA	American Institute of Architects
AISC	American Institute of Steel Constructors
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute
APA	American Plywood Association
API	American Petroleum Institute
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating, and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society of Testing and Materials
AWC	Aquarion Water Company
AWPA	American Wood Preservers Association

AWS	American Welding Society
AWWA	American Water Works Association
BIA	Brick Institute of America
CRSI	Concrete Reinforcing Steel Institute
CSA	Canadian Standards Association
DCAM	Comm. of Massachusetts Division of Capital Asset Management
DEP	Department of Environmental Protection
DHI	Door and Hardware Institute
DIPRA	Ductile Iron Pipe Research Association
EJCDC	Engineers Joint Contract Documents Committee
EPA	Environmental Protection Agency
FM	Factory Mutual
Fed. Spec.	Federal Specification
HI	Hydraulic Institute
IEEE	Institute of Electrical and Electronics Engineers
ISA	Instrument Society of America
ISO	International Standards Organization
MIA	Masonry Institute of America
MIL.	Military Specification
MSBC	Massachusetts State Building Code
MSS	Manufacturers Standardization Society of the Valve and Fitting Industry
NAAMM	National Association of Architectural Metal Manufacturers
NCMA	National Concrete Masonry Association
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NRCA	National Roofing Contractors Association
NSPC	National Standard Plumbing Code
OSHA	Occupational Safety and Health Administration
PCA	Portland Cement Association
PCI	Prestressed Concrete Institute
PPI	Plastic Pipe Institute
PS	Product Standards of the National Bureau of Standards
SDI	Steel Door Institute
SIGMA	Sealed Insulating Glass Manufacturers Association
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
SPI	Society of the Plastics Industry
SSPC	Steel Structures Painting Council
TCA	Tile Council of America
TPI	Truss Plate Institute
UL	Underwriters Laboratories

1.04 DEFINITIONS

A. Contractor - The person, firm or corporation working on infrastructure to be owned and/or maintained by the Aquarion Water Company (AWC).

B. "Directed", "Permitted", "Required", or words of like effect, shall mean that the direction, permission or the requirements of the AWC is intended. The words "approved", "acceptable", "satisfactory", or word of like import, shall mean approved, acceptable or satisfactory to the AWC.

Where indicated in these specifications that the Contractor is "required" or "directed" by the AWC, or in words of like import, to perform some action, provide some material or equipment or provide information, the cost of such actions or provisions shall be borne by the Contractor and paid for as part of the prices bid, unless otherwise specifically provided for in these specifications.

C. DEP - Commonwealth of Massachusetts, Department of Environmental Protection.

D. Drawings - The part of the approved project showing the characteristics and scope of the work to be performed and which have been prepared or approved by the AWC. The term "Drawings" is used interchangeably with the terms "Plans" and "Plates.".

E. Engineer - The person, firm or corporation named as a consultant by the AWC.

F. Final Completion - That date as certified by the Engineer when all work on the entire project has been fully completed, including all work on the punch list, with the possible exception of final paving.

G. Owner - A public or quasi-public body or authority, corporation, association, partnership, or individual for whom the Work is to be performed. The Aquarion Water Company will act as Owner.

H. Plans - The approved Drawings, or exact reproductions thereof, which show the scope, character, dimensions and details of the work and which have been prepared by the Contractor's Engineer.

I. Project - The undertaking to be performed as provided in the Contract Documents.

J. Resident Observer or Representative - The authorized representative of the AWC who is assigned to the Project or any part thereof.

K. Shop Drawings - All drawings, diagrams, illustrations, brochures, schedules and other data which are prepared by the Contractor, a Subcontractor, manufacturer, supplier or distributor, which illustrate how specific portions of the work shall be fabricated or installed.

L. Specifications - A part of the Technical Specifications consisting of written descriptions of a technical nature of materials, equipment, construction systems, standards and workmanship.

M. Special Conditions - Revisions or additions to the Conditions or Specifications applicable to an individual Project.

N. Subcontractor - An individual, firm or corporation having a direct Contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the site.

O. Substantial Completion - That date as certified by the Owner when the construction of the Project or a specified part thereof, is sufficiently completed, in accordance with the Technical Specifications, so that the Project or specified part can be utilized for the purposes for which it is intended.

P. Supplier - Any person or organization who supplies materials or equipment for the Work, including that fabricated to a special design, but who does not perform labor at the site.

Q. Surety - The Corporate Body which is bound with and for the Contractor, and which engages to be responsible for his payment of all debts pertaining to, and for his acceptable performance of the Work for which he has contracted, as more particularly set forth in the Performance Payment Bond.

R. Work - All labor necessary to produce the construction required by the approved Drawings and Technical Specifications, and all materials and equipment incorporated or to be incorporated in the Project.

S. Work on (at) the Project - Work to be performed at the Project, including the transportation of materials and supplies to or from the location of the Project by employees of the Contractor and any Subcontractor.

T. Written Notice - Any notice to any party of the Agreement relative to any part of his Agreement in writing and considered delivered and the service thereof completed, when posted by certified or registered mail to the said party at his last given address, or delivered in person to said party or his authorized representative on the Work.

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 GENERAL

1.01 DESCRIPTION

A. Work Included: Make submittals required by the Contract Documents, and revise and resubmit as necessary to establish compliance with the specified requirements.

1.02 RELATED WORK

A. Documents affecting work of this Section include, but are not necessarily limited to Sections in Division 1 of these Specifications.
   1. Individual requirements for submittals also may be described in pertinent Sections of these Specifications.

B. Work Not Included:
   1. Submittals which are not required shall not be reviewed by the Owner.
   2. The Contractor may require his subcontractors to provide drawings, setting diagrams and similar information to help coordinate the Work, but such data shall remain between the Contractor and his subcontractors and will not be reviewed by the Owner unless specifically called for within the Contract Documents.

1.03 SHOP DRAWINGS AND SAMPLES

A. The Contractor shall submit to the Owner for review six (6) clearly legible copies of all shop drawings, catalog cuts, 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 Contract Documents.
   1. Submittals which are incomplete or difficult to read shall be rejected.
   2. Deviations from the Contract Documents shall be called to the attention of the Owner at the time of the first submission of shop drawings and other drawings for consideration.
   3. The Owner's review of any drawings shall not release the Contractor from responsibility for such deviations.
   4. Shop drawings shall be submitted with such promptness as to cause no delay in his work or the work of any other Contractor.
   5. Schedules for reinforcing steel shall receive the Contractor's immediate attention, upon award of Contract.

B. When submitted for the Owners' review, all shop drawings shall bear the Contractor's certification that he has reviewed, checked and approved the shop drawings, that they are in compliance with the requirements of the Contract Documents, and that he has verified all field measurements and construction criteria, materials, catalog numbers and similar data.

C. All samples called for in the Specifications or required by the Owner shall be furnished by the Contractor and shall be submitted to the Owner for his review.
   1. Samples shall be furnished so as not to delay fabrication, and to allow the Owner 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.
   1. Any action shown is subject to the requirements of the Contract Documents.
   2. 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 for items on returned submittals marked "No Exception Taken" or "Make Corrections as Noted."
   1. 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.
   1. All samples of materials for tests shall be taken according to ASTM Specifications or as provided in the Specifications.

PART 2 MATERIALS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION

SECTION 01610

PRODUCT HANDLING

PART 1 GENERAL

1.01 DESCRIPTION

A. Work included: Protect products scheduled for use in the Work by means including, but not necessarily limited to, those described in this Section.

1.02 QUALITY ASSURANCE

A. Include within the Contractor's quality assurance program such procedures as are required to assure full protection of work and materials.

1.03 MANUFACTURER'S RECOMMENDATIONS

A. Comply with manufacturers' recommendations on product handling, storage and protection.

1.04 PACKAGING

A. Deliver products to the job site in their manufacturer's original container, with labels intact and legible.
   1. Maintain packaged materials with seals unbroken and labels intact until time of use.
   2. Promptly remove damaged material and unsuitable items from the job site, and promptly replace with material meeting the specified requirements, at no additional cost to the Owner.

B. The Owner may reject as non-complying such material and products that do not bear identification satisfactory to the Owner as to manufacturer, grade, quality and other pertinent information.

1.05 PROTECTION

A. Mechanical equipment subject to damage by the atmosphere if stored outdoors, shall be stored in a building with a controlled environment. The building may be a temporary structure on the site or a building off the site.

B. PVC pipe shall be covered to protect it from UV degradation.

1.06 REPAIRS AND REPLACEMENTS

A. In event of damage, promptly make replacements and repairs to the approval of the Owner at no additional cost to the Owner.

B. Additional time required to secure replacements and to make repairs will not be considered by the Owner to justify an extension in the Contract Time of Completion.

END OF SECTION

INDEX

DIVISION 2 SITE WORK

SECTION 02140

SITE DRAINAGE AND DEWATERING

PART 1 GENERAL

1.01 DESCRIPTION

A. Provide drainage and dewatering as required by these Specifications.
   1. In general the Contractor shall furnish all materials, equipment, labor and incidentals necessary to provide dewatering and drainage control during construction.

1.02 RELATED WORK

A. Documents affecting the work of this Section include, but are not necessarily limited to Sections in Division 1 of these Specifications.
   1. Section 02222 Earthwork for Water Dist. Systems
   2. Section 02611 Ductile Iron Pipe and Fittings

1.03 SUBMITTALS

A. None required.

PART 2 PRODUCTS

2.01 EROSION AND SEDIMENTATION CONTROL

A. Devices for erosion and sedimentation control for effluent of dewatering operations shall be as specified in Section 01120, Environmental Controls.

PART 3 EXECUTION

3.01 INSTALLATION

A. To insure proper conditions at all times during construction the Contractor shall provide and maintain ample means and devices with which to remove and dispose of all water entering trenches and other excavations.
   1. Means of water removal and disposal shall include but not be limited to wells, surface pumps, and/or well point systems, to the extent required to prevent "boils" or softening of the foundation soils.
   2. The Contractor shall pitch the ground around the excavation to prevent water from running into excavated areas and to prevent damage to other structures or work on adjacent property.
   3. The Contractor shall remove immediately any surface or seepage water or water from sewers, drains, creeks, or other sources, which may accumulate during the excavation and construction work.

B. Excavations shall be kept dry until the structures, pipes and appurtenances, to be built or installed therein, have been completed and

backfilled to such extent that they shall not float or otherwise be damaged by water in the excavation.

1. In no event shall water rise to cause unbalanced pressure on the pipe or other structures. The Contractor shall prevent flotation of the pipe or structures.
2. Pipe, masonry and concrete shall not be placed in water. Water shall not submerge new masonry or concrete within four (4) hours after placement.

C. Sufficient stand-by pumping equipment shall be installed and mounted for immediate use in case of emergencies. The Contractor shall be responsible for the adequacy of his dewatering equipment and system in controlling the water and for protection to adjacent public and private property from damage. Any damage to permanent work or existing property resulting from the failure of the Contractor to provide an adequate dewatering system shall be repaired by the Contractor at his expense.

1. Wells, well points and pump sumps shall be installed with adequate filters to prevent loss of fine grained soils.

3.02 DISPOSAL OF DRAINAGE WATER

A. All water pumped or drained from the work shall be disposed of in such a manner as to not cause injury to public health, damage to public or private property, interference with other work or adverse impacts to adjacent wetlands.

1. Effluent from dewatering operations shall not be discharged directly to wetlands or waterways and shall not be discharged to storm drain systems prior to being filtered through a siltation basin.
2. Discharge shall be such that no erosion occurs. Erosion protection shall be as specified in Section 01120, Environmental Controls.

END OF SECTION

SECTION 02160

SUPPORT OF EXCAVATION

PART 1 GENERAL

1.01 DESCRIPTION

A. Provide excavation support as required by these Specifications.
   1. In general this work shall consist of furnishing and placing timber and/or steel sheeting and shoring of the types and dimensions required for proper excavation support.

1.02 DEFINITIONS

A. Shoring shall mean the use of a steel trench box, steel sheeting, or timber sheeting braced as required.

B. Timber sheeting shall mean the use of tongue and groove wood sheeting or steel soldier beams with wood lagging braced as required.

C. Steel sheeting shall mean the use of steel sheet pilings with interlocking joints, braced by steel members as required.

1.03 RELATED WORK

A. Documents affecting the work of this Section include, but are not necessarily limited to Sections in Division 1 of these Specifications.
   1. Section 02140 Site Drainage and Dewatering
   2. Section 02222 Earthwork for Water Distribution Systems
   3. Section 02611 Ductile Iron Pipe and Fittings

B. As established in these Specifications, the Contractor is solely responsible for means and methods of construction and for the sequence and procedures to be used.

1.04 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
   1. The Contractor shall not perform excavations in unstable ground and shall employ a positive means of containing the unstable ground behind shoring, before excavation may proceed.

B. Employ a qualified Engineer, properly permitted to provide such services at the location of the work, to design the shoring system and to inspect and report on the quality of its construction.

C. Comply with all pertinent requirements of governmental agencies having jurisdiction.

1.05 STANDARDS

A. The following Standards form a part of this Specification as referenced:
   1. ASTM A328, Specification for Steel Sheet Piling
   2. Massachusetts DPW Standard Specifications, Section 950 Sheeting.
   3. Code of Federal Regulations (CFR), 29 CFR 1926, OSHA Standards -Excavation.

1.06 SUBMITTALS

A. Submit shoring design to OWNER for record purposes only.

PART 2 PRODUCTS

2.01 DESIGN

A. Design a shoring system which will safely and adequately prevent collapse of adjacent materials and which will permit construction of the Work to the arrangement shown on the Drawings.

B. All shoring systems shall be designed so as to support all vertical and lateral loads and other surcharge loads imposed on the system during construction, including earth pressures, utility loads and other surcharged loads in order to provide safe and expeditious construction of the permanent structures and prevent movement and/or damage to adjacent soil, buildings, structures and utilities.

C. Secure all needed approvals, including those of governmental agencies having jurisdiction and of adjacent property owners if required, at no additional cost to the Owner.

2.02 MATERIALS

A Material shall include, but not necessarily be limited to sheet piling, solder piles, lagging, bracing members such as wales, struts, shores and tieback anchors.

B. Lumber for Timber Sheeting and Shoring.
   1. Shall be sound Spruce, Douglas Fir, white or yellow Lodgepole, Ponderosa pine, or western hemlock plank, planed on one side and either tongue and grooved or splined.

C. Steel Sheeting.
   1. Shall be of approved section and quality, either new or secondhand, conforming to the requirements of ASTM A328.

PART 3 EXECUTION

3.01 SURFACE CONDITIONS

A. Examine the areas and conditions under which the work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.

3.02 INSTALLATION

A. Construct and install the shoring system in strict accordance with the OWNER's requirements.
   1. When using soldier piles and lagging, where boulders or cobbles are encountered, soldier piles shall be installed in pre-augered holes over the full depth as required to prevent misalignment and damage.
   2. Vibration monitoring during installation and extraction of braced excavation shall be provided wherever the excavation is within 100 feet of existing structures.

3.03 SHEETING LEFT IN PLACE

A. Sheeting left in place, for the purpose of preventing injury to structures, utilities or other property, shall be cut-off 3 feet below finished grade.
   1. The right of the Owner to order sheeting left in place shall not be construed as creating any obligation on his part to issue such orders. His failure to exercise his right to do so shall not relieve the Contractor from liability for damages to persons or property occurring from or upon the work occasioned by negligence or otherwise growing out of a failure, on the part of the Contractor, to leave in place sufficient sheeting to prevent movement of the ground.

3.04 SHEETING REMOVED

A. All sheeting not left in place shall be carefully removed in such manner as to not endanger the construction or other structures, utilities, or property.
   1. All voids left or caused by withdrawal shall be immediately refilled with approved material, and compacted with tools especially adapted to that purpose.
   2. Vibratory extraction methods shall be used only when it can be demonstrated that settling of pipe and structures will not occur. If such settling occurs, it shall be corrected at the Contractor's expense.

3.05 TRENCH BOX OR SHIELD

A. Use of a trench box or shield shall not relieve the Contractor of any liability for damages to persons or property growing out of a failure of the Contractor to leave in place sufficient sheeting and bracing to prevent the caving or moving of the ground or disturbance of the completed work.

1. Care shall be taken, when a trench box or shield is moved ahead, so as not to pull apart the joints of pipe already placed or leave voids around the pipe wall.
2. At no time shall the portable box or shield be allowed to be positioned below the spring line of the pipe.
3. The width of the trench box or shield shall be such that a minimum 6 inch horizontal clearance is maintained between the pipe and shield at all times.
4. If the pipe has moved, it shall be reset to the proper line and grade.
5. Any voids between the trench box or shield and the undisturbed trenchwall within the pipe zone (bottom of trench to top of cover material) shall be filled with crushed stone, bank run gravel, or approved material, immediately after the box or shield is positioned.

END OF SECTION

SECTION 02222

EARTHWORK FOR WATER DISTRIBUTION SYSTEMS

PART 1 GENERAL

1.01 DESCRIPTION

A. Work Included: Provide all earthwork as required by these Specifications.

B. In general the work of this Section shall include but not necessarily be limited to, excavation, trenching, filling, backfilling, compaction and grading for water distribution systems.

1.02 RELATED WORK

A. Documents affecting the work of this Section include, but are not necessarily limited to Sections in Division 1 of these Specifications.
1. Section 02140 Site Drainage and Dewatering
2. Section 02160 Support of Excavation
3. Section 02227 Rock removal
4. Section 02611 Ductile Iron Pipe and Fittings
5. Section 02640 Buried Valves and Appurtenances
6. Section 02650 Thrust Blocks and Joint Restraints
7. Section 02660 Service Connections
8. Section 02930 Loam and Seed

1.03 SITE INVESTIGATION

A. The grades and other site information have been compiled by field surveys.
1. The Contractor acknowledges that he has satisfied himself as to the nature and location of the work.
2. Failure by the Contractor to acquaint himself with all available information concerning the site will not relieve him from the responsibility, for estimating properly, the difficulty or cost of successfully performing the work.

1.04 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
1. Use equipment adequate in size, capacity, and numbers to accomplish the work in a timely manner.

1.05 PROTECTION OF PROPERTY AND UTILITIES

A. Extreme care shall be exercised to prevent damage to existing trees, shrubs, utilities, walls, sidewalks , fences and private property.
1. Any damage to these items as a result of work performed by the Contractor shall be repaired by the Contractor at his own expense.

2. Existing property boundary markers, control points and datum elevation markers or bench marks shall be preserved.
    a. All such items which are displaced or destroyed by the Contractor shall be replaced by a registered Engineer or Land Surveyor, as required, with all expenses paid by the Contractor.

B. Utility agencies shall be contacted and advised of proposed work prior to the start of work by the Contractor.
1. Notify Dig Safe.
2. Obtain information from the proper sources and authorities concerning locations of all utilities within the scope of this work.
3. If and when encountered, utilities shall be supported and protected, and the Owner shall be notified.
    a. Ample time shall be allowed for entrance and taking such measures as may be required for the continuance of such services by the utility owner.
4. Rules and regulations governing the respective utilities shall be observed. It is the Contractor's responsibilities to coordinate with all private utility companies with respect to utility locations, protection, interferences and relocations.

1.06 REFERENCE STANDARDS

A. The Contractor shall comply with the provisions of the following agencies as they apply to this project.
1. Associated General Contractors of America, Inc. (AGCA) "Manual of Accident Prevention in Construction."
2. Occupational Safety and Health Administration, United States Department of Labor Requirements
3. ANSI "Safety Regulations for Construction and Demolition".
4. American Society for Testing & Materials (ASTM)
5. American Water Works Association Standards
6. Massachusetts Highway Department “Standard Specifications for Highways and Bridges”

1.07 SUBMITTALS

A. Comply with pertinent provisions of Section 01300.

B. Testing and Samples:
1. Test reports on backfill materials, moisture density tests, in place density tests (ASTM D 1557 and D 1556).
2. Representative backfill and bedding samples and gradation tests (ASTM D 422).
3. Tests shall be in conformance with paragraph 3.16; compaction requirements and testing as specified herein.

1.08 TRAFFIC

A. While excavating and backfilling is in progress, traffic shall be maintained in a manner as specified in Section 01570 Traffic Regulations.

PART 2 MATERIALS

2.01 GENERAL

A. Except as specified for pipe bedding, pipe cover, roadway subbase, and refill for rock and unsuitable materials, backfill materials may be as follows:
   1. Suitable materials for trench backfill shall be the material excavated during the course of construction, but excluding debris, pieces of pavement, frozen materials, organic matter, silt, top soil, ledge excavation and rocks over six inches in largest dimension.
   2. Gradation of material shall be generally as specified for gravel borrow except that maximum size of stone shall be 6 inches.
   3. The suitability of existing material for use as backfill will be determined by the Owner.
   4. All unsuitable materials shall be disposed of as per paragraph 3.18 A.

2.02 PIPE BEDDING AND COVER MATERIAL

A. Ductile Iron Pipe:
   1. Gravel borrow shall be a granular material, well graded from fine to coarse, with a maximum size of 3 inches, obtained from approved natural deposits and unprocessed except for the removal of unacceptable material and stones larger than the maximum size permitted.
   2. It shall not contain vegetation, masses of roots, or individual roots.
   3. It shall be free from loam and other organic matter, clay, and other fine or harmful substances.
      4. Gravel borrow shall conform to requirements as specified in paragraph 2.05 herein.

B. Plastic Pipe or Copper Tubing:
   1. Sand borrow shall consist of clean inert, hard, durable grains of quartz or other hard durable rock free from loam or clay, surface coatings and deleterious materials.
   2. The allowable amount of material passing a No. 200 sieve as determined by AASHTO shall not exceed 10 percent by weight.
   3. The maximum particle size shall be 3/8 inch.

2.03 CONCRETE SAND

A. Concrete sand shall meet ASTM C-33 for fine aggregate.

2.04 STRUCTURAL FILL

A. Structural fill shall generally range from gravelly sand to gravel, free of organic material, trash, loam, ice, snow, frozen soil and other objectionable material, and shall conform to the following:

Sieve Size	Percent Passing by Weight
6 inch	100
No. 4	30-80
No. 40	5-35
No. 200	0-8

2.05 GRAVEL BORROW

A. Gravel borrow shall be a granular material, well graded from fine to coarse, with a maximum size of 3 inches, obtained from approved natural deposits and unprocessed except for the removal of unacceptable material and stones larger than the maximum size permitted.
   1. It shall not contain vegetation, masses of roots, or individual roots.
   2. It shall be substantially free from loam and other organic matter, clay, and other fine or harmful substances.
   3. Gravel borrow shall have the following gradation:

Sieve Size	Percent Passing by Weight
3 inch	95-100
1/2 inch	50-85
No. 4	40-75
No. 50	8-28
No. 200	0-8

2.06 PROCESSED GRAVEL FOR ROADWAY BASE

A. Shall meet the requirements of the Commonwealth of Massachusetts Department of Public Works Standard Specifications for Highways and Bridges, latest edition, M1.03.1.

Sieve Size	Percent Passing by Weight
3 inch	100
1 1/2 inch	70-100
1/4 inch	50-85
No. 4	30-60
No. 200	0-10

2.07 CRUSHED STONE (Hydrant Drains)

A. Crushed Stone: Shall consist of durable crushed stone or durable crushed gravel stone, washed, free from ice and snow, stone dust, sand, clay, loam, or other deleterious material. The crushed stone shall be uniformly blended and conform to the following:

Sieve Size	Percent Passing by Weight
5/8 inch	100
1/2 inch	85-100
3/8 inch	15-45
No. 4	0-15
No. 8	0-5

PART 3 EXECUTION

3.01 TRENCH EXCAVATION

A. The Contractor shall make all excavation in earth and in rock, necessary or incidental to the proposed construction under the terms of these Specifications and as herein specified or indicated on the Owner approved Drawings.

1. All trench excavation shall be accomplished by open cut method.
2. All excavation shall be made in such manner and to such widths as will give ample room for properly installing, constructing and inspecting pipe lines and structures they are to contain.
3. The width of trenches shall be sufficient to allow thorough compacting of the refill adjacent to the lower quarters of the pipe. At pipe joints such additional width and depth shall be excavated as is necessary to give ample room for properly making and inspecting the pipe joint.
4. Bracing and support of all trench excavation shall meet all requirements of Local and State ordinances and OSHA regulations.
   a. Sheeting and bracing, or the use of a steel support box shall be used where required to maintain a safe working condition and provide protection from collapse of the trench walls.
5. During excavations, material determined by the Owner to be suitable for backfilling, shall be placed a sufficient distance from the banks of the trench to avoid slides or cave-ins. Unsuitable material shall be disposed of as specified in paragraph 3.18 and replaced with surplus suitable material and gravel borrow to the extent necessary.
6. Should conditions make it impractical or unsafe to place material along the trench, it shall be hauled and stored at a location provided by the Contractor. When required, it shall be re-handled and used in backfilling the trench. No additional compensation will be made for re-handling this material.
7. Pipe trenches shall be backfilled as soon as practical after the pipes have been laid, jointed and inspected by the Owner. The extent of excavation open at any one time shall be no more than 50 linear feet of trench during working hours and no more than 20 linear feet during non-working hours.

3.02 EXCAVATION CLASSIFICATION

A. Earth excavation shall comprise all materials not classified as rock excavation and shall include clay, silt, sand, muck, gravel, hardpan, loose shale, pavement, pavement bases, loose stone in masses and boulders measuring less than one cubic yard in volume.

B. Rock: See Section 02227 Rock Removal.

3.03 TRENCH EXCAVATION IN PAVED ROADWAYS

A. In excavating trenches in roadways having an improved pavement, the Contractor shall cut the pavement twice; once prior to excavation and again prior to permanent resurfacing.
   1. The first cut may be made using a water cooled abrasive saw, pneumatic chisel or a wheel cutter attached to a front end loader.
   2. The second and final cut shall be made with a water cooled abrasive saw.
   3. In all cases a trial section shall be cut to indicate the performance of the equipment to be used.
   4. Pavement removed shall not be mixed with other excavated materials, but shall be disposed of away from the site of the work before the remainder of the excavation is made.
   5. Existing pavement and base course to remain shall be protected by the Contractor. All existing pavements and base courses which are to remain and have been damaged, shall be restored or replaced by Contractor to match existing pavements, base courses and grades, at no additional expense to the Owner.

3.04 UNSUITABLE MATERIAL

A. All pipes and structures are to be laid on a stable foundation. If material at grade is determined to be unsuitable by the Owner, the Contractor shall excavate a further depth and/or width, and refill with an approved material. Refill material shall be structural fill, gravel borrow or crushed stone as determined by the Owner.
   1. Where fine sand and silt are encountered at the bottom of the trench, it shall be the option of the Owner to require a 6-inch compacted depth of concrete sand meeting ASTM C-33 for fine aggregate to be installed beneath the pipe bedding to the full width of trench.
   2. Payment width limits shall be the same as specified for trench excavation, unless an additional width of trench is ordered by the Owner.
   3. Any excavation in excess of the amount ordered by the Owner shall be backfilled and compacted with an approved granular material, at the Contractors expense.

3.05 ROCK REMOVAL

A. See Specification Section 02227.

3.06 DEWATERING

A. See Specification Section 02140.

3.07 BACKFILLING AND COMPACTING

A. Backfill shall be placed in uniform layers. Each layer shall be thoroughly compacted by tamping or vibrating with mechanical compacting equipment.

1. Care shall be taken to compact the backfill materials throughout the full width of the excavation and beneath all pipes and structures.
2. The backfilling of trenches shall proceed as soon as the laying of the pipe (s) or installation of the structures will allow.
3. Pipe bedding shall be required below and up to the springline of all pipe.
    a. Pipe bedding shall be placed to the full width of the trench and to a depth of 6 inches below the bottom of the pipe barrel as indicated on the Drawings.
4. Pipe bedding shall be placed 12 inches beyond the widths of a utility structure foundation (base) and to a depth of 6 inches below the foundation (base) or as indicated on the Drawings.
5. After a pipe has been placed and bedded, the trench shall be filled to the centerline of the pipe with pipe bedding and compacted.
    a. Material under and around the pipe shall be carefully and thoroughly compacted and tamped with approved compacting equipment.
6. From the centerline of the pipe to a point 12 inches above the top of the pipe, the fill shall be pipe bedding.

B. Placement of Backfill Above the Pipe Bedding
1. Above the pipe bedding, backfill shall be suitable material from the excavation or, if ordered by the Owner, gravel borrow.
    a. This backfill shall be placed in layers 12 inches deep in loose measure, and each layer shall be thoroughly compacted.
    b. This backfill shall be placed up to the bottom of materials specified to be placed for surfacing requirements.

C. Roadway Trench
1. The following additions shall apply specifically to trenches within roadways:
    a. The top twelve (12) inches of trench refill, roadway sub-base, shall be comprised of processed gravel furnished, placed, graded and compacted by the Contractor. This material shall be placed during the backfilling operation.
    b. The Contractor shall fine grade the surface, apply dust control treatment and maintain the surface in a condition which will allow safe vehicular traffic until resurfacing is placed.
2. The length of unsurfaced trench shall not exceed 500 linear feet, and shall be maintained to the Owner's satisfaction, in a condition to allow safe vehicular traffic.
    a. If the trench is not maintained in a satisfactory condition, the allowable length of unsurfaced trench shall be reduced accordingly.

3.08 TRENCH SIZE

A. Trenches shall be excavated to the necessary width and depth for proper laying of pipe and placement of concrete and other materials and shall have vertical sides to 12 inches above the pipe.
1. Widths of trenches shall provide 12 inches clearance between the sides of the trench and the outside face of the pipe.

2. Maximum trench width (W) (to 12 inches above the pipe) for 12 inch nominal diameter and smaller pipe shall be 36 inches.
3. Maximum payment trench width (W) (to 12 inches above the pipe) for pipes larger than 12 inches in diameter shall be the outside diameter of the pipe plus 24 inches.
4. Above 12 inches over the pipe, the maximum trench width shall be as close to the above widths as installation requirements allow.
5. The depth of trench shall be a minimum 6 inches below the pipe barrel, or 1/4 of the pipe diameter, whichever is greater.

3.09 STRIPPING TOPSOIL

A. Topsoil shall be carefully stripped and separately stored to be used again for topsoiling and seeding on off-pavement areas within which excavations are to be made.

3.10 EXCAVATION NEAR EXISTING STRUCTURES AND UTILITIES

A. It is the Contractor's responsibility to locate utilities and other underground pipes along the course of the work. Information as to the location of said utilities and pipes is from the best available sources, but no guarantee is implied, nor is it to be assumed that such information is accurate or complete. Utility lines shall be crossed in the course of the work.

B. The Contractor shall exercise special care during his operations to avoid injury to all such underground utilities and structures.
1. When necessary, the Contractor shall cooperate with, and consult with representatives of the Owner and the utility companies in order to avoid damage to the utilities.
2. The Contractor shall arrange for or furnish and erect suitable supports and shoring or other means of protection where required to protect the utilities, all at no additional cost to the Owner.
3. Hand methods of excavating shall be used around buried utilities and is included in the work to be done under this Contract, at no additional cost to the Owner.
4. Interference between the proposed work and existing utilities, relocation of existing utilities, repair or damage to existing utilities, and protection and support of existing utilities during construction of the proposed work will be as specified herein.

3.11 EXCAVATION WITHIN BORDERING VEGETATED WETLAND (BVW)

A. All excavation within the BVW shall comply with the following:
1. Erosion control barrier shall be in place.
2. Heavy duty tarpaulins shall be laid alongside the work area, within the upland adjacent to the proposed wetland work area, for the temporary storage of soil.
   a. The tarpaulins shall be placed within the upland, near the point where the work enters the wetland to allow the temporary storage of soils.
3. During soil excavation within the wetland, organically enriched topsoil shall be excavated first and segregated on the tarpaulin noted above.

4. To the extent possible, plant material will be allowed to remain in the topsoil. This includes herbaceous vegetation (e.g. ferns) shrubs and saplings. Other soils shall be placed on the tarp and kept apart from the topsoil.
5. Subsoils excavated from below the topsoil layer from the next pipe section shall be utilized as backfill over the pipe and bedding for the previously laid pipe.
    a. Use of native subsoils for backfill will help to restore original patterns of groundwater movement.
6. Topsoil from the next pipe section, with as much plant material as possible being allowed to remain, shall be carefully cut out in sod-like sections, and placed over the backfilled prior pipe sections.
7. The above steps are to be repeated as necessary for the entire length of the wetland crossing.
8. All restored areas shall be immediately seeded with an herbaceous seed mix.

3.12 PROTECTION OF PROPERTY

A. The Contractor shall, at his own expense, preserve and protect from injury all property either public or private along and adjacent to the line of work, and be responsible for and repair any and all damage and injury thereto, arising out of or in consequence of any act or omission of the Contractor.
    1. All existing pipes, culverts, poles, wires, fences, mailboxes, stone walls, curbs, bounds, etc., shall be temporarily removed, supported in place or otherwise protected from injury, and shall be restored to at least as good condition as that in which they were found immediately prior to the start of work.
    2. Lawns, shrubs, bushes, planting beds and decorative trees disturbed or damaged shall be restored to a condition equal to that found prior to the start of construction, either by temporary transplant or replacement in kind, except as otherwise indicated on the Drawings.

3.13 SAFETY AND ACCOMMODATION

A. The Contractor shall provide, at his own expense, suitable bridges over trenches where required for the accommodation and safety of the traveling public, and provide facilities for access to private driveways for vehicular use.
    1. He shall erect suitable barriers around the excavation to prevent accidents to the public and shall place and maintain during the night, sufficient lights on or near the work.
    2. A space of twenty (20) feet shall be left so that free access may be had at all times to fire hydrants and proper precautions shall be taken so that the entrances to fire hydrants and fire stations shall not be blocked or obstructed.

3.14 DETOURS

A. It is the intent of this Contract to keep the roadways open to two way traffic at all times. In order to obtain permission for the closing of the roadway, the Contractor shall satisfy the Owner, Police Chief and Fire Chief, that his operations will allow emergency access at all times.

1. See Section 01570, Traffic Regulations.

3.15 UNIFORMED POLICE OFFICERS

A. The Contractor shall make all arrangements with the local Police Chief and/or the State Police for the services of uniformed police officers.
   1. If, in the opinion of the State Police, Police Chief or the Owner, uniformed police officers are required for protection of persons and control of traffic, the Contractor shall be responsible for making all arrangements for said uniformed police officers as may be required.

3.16 COMPACTION REQUIREMENTS AND TESTING

A. All backfill materials shall be thoroughly compacted by rolling, tamping or vibrating with approved mechanical or pneumatic compacting equipment so that pipe, structures, paving and other construction will not settle at the time of construction or in the future. The responsibility for thorough compaction is that of the Contractor irrespective of methods of backfill and depth of backfill layers placed.

B. All percentages of compaction specified herein shall be of the maximum dry density at the optimum moisture content as established by Method D of AASHTO Standard T180 (ASTM D1557) (Modified Proctor) and verified by AASHTO Standard T147 (ASTM D 1556). When the term "thoroughly compacted" is used in these specifications, it shall mean compaction to at least 95% of the maximum density of the soils at optimum moisture content.

C. The following numbers and types of soil tests shall be made where directed by the Owner. These tests shall be made by qualified personnel of an independent testing laboratory, acceptable to the Owner and paid by the Contractor.
   1. Particle-Size analysis of Soils and Backfill Materials in accordance with ASTM D422. A total of 5 satisfactory tests.
   2. Moisture-Density Relationship of soil in accordance with ASTM D1557, Method D. A total of 5 satisfactory tests.
   3. In-Place Density Tests of materials in accordance with ASTM D1556. One in-place density test shall be performed every 300 linear feet, or as directed by the Owner. Compaction tests will be taken at random on compaction layers below and at finished surfaces.
   4. Failed tests shall be repeated at the Contractor's expense.

D. The Owner reserves the right to have additional compaction tests performed by an independent laboratory with testing costs borne by the Owner, except that failed tests shall be repeated at the Contractor's expense.

E. If any of the field density test results fail to met the density as specified herein for the earthwork involved, then the Contractor shall remove all of the earthwork in that portion of the work involved as determined by the Owner, and shall replace it in accordance with these Specifications to the required density. After the work is replaced, additional field density tests will be made by an independent testing laboratory retained by the Owner,

and the Contractor shall reimburse the Owner for all costs for such additional testing.

1. Compaction shall be to the following densities:

Fill and Backfill Location	Modified Proctor Density (Percent)
Under structures and pipes	95
Beside structure foundation walls	95
Top two feet under pavements	95
Under pavements below top two feet	95
Trenches through unpaved areas	90
In embankment	90

F. Puddling and jetting of the backfill shall not be permitted except in special cases approved by the Owner.

3.17 TRENCH EXCAVATION IN FILL

A. Where the existing ground surface does not permit at least 4 feet of cover over the finished pipe, and where indicated on the approved Drawings, the Contractor shall place and compact suitable fill material to the depth necessary to provide the 4 foot minimum cover, including loam to a minimum top width of 6 feet, or as otherwise shown on the approved Drawings

1. Minimum side slopes shall be two horizontal to one vertical.
2. Fill material shall be from surplus suitable material or gravel borrow, and be clean, dry, and capable of satisfactory compaction, all as approved by the Owner, and shall be placed in layers not exceeding 8 inches thick and compacted.
3. The trench shall be excavated in the compacted fill and the remainder of the work shall be in accordance with other portions of these Specifications.

3.18 DISPOSAL OF SURPLUS AND UNSUITABLE EXCAVATED MATERIAL

A. All surplus excavated material and any material unsuitable for use shall be disposed of in disposal areas provided by the Contractor.

1. It is the Contractor's responsibility to dispose of unsuitable excavated material in an approved manner.
2. The Contractor shall not dispose of surplus materials on wetlands or other areas prohibited by the Corps of Engineers or the Commonwealth of Massachusetts Department of Environmental Protection, or any other local authority having jurisdiction.

3.19 DUST CONTROL

A. The Contractor shall perform dust control operations as specified in Section 01120.

3.20 CLEAN-UP

A. The Contractor shall remove all surplus materials (earth, pipe, fittings, storage and office trailers, barricades, etc.), from the construction site.
   1. All paved roadways affected by the construction shall have their full width swept clean (paved edge to paved edge) using methods which control the dust.
   2. Before the Contractor may proceed to another roadway, clean up of the previous roadway must be complete.

END OF SECTION

SECTION 02227

ROCK REMOVAL

PART 1 GENERAL

1.01 DESCRIPTION

A. Work included: Remove all rock encountered while excavating for structures, roadways, or utility trenches as required by these Specifications.

1.02 RELATED WORK

A. Documents affecting the work of this Section include, but are not necessarily limited to Sections in Division 1 of these Specifications.
   1. Section 02140 Site Drainage and Dewatering
   2. Section 02222 Earthwork for Water Distribution Systems

1.03 DEFINITIONS

A. Rock excavation: Rock which requires explosives, wedging or impact hammer for its removal. Concrete shall be classified as rock.

B. Boulders, slabs or other single pieces of material encountered, which are less than one (1) cubic yard shall not be considered rock.

1.04 STANDARDS

A. All handling of explosives and blasting shall be in compliance with the pertinent sections of Commonwealth of Massachusetts Regulations (CMR) 13.00.

1.05 QUALITY ASSURANCE.

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this section.

B. Comply with all pertinent requirements of governmental agencies having jurisdiction.

1.06 SUBMITTALS

A. Submit plans for proposed pre-blast survey (Record purposes only).

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.01 NOTIFICATION

A. When rock is encountered, it shall be uncovered and the Owner notified.
   1. The Contractor shall provide the Owner with cross sections of the rock surface or a profile of the rock where trenches are concerned.
   2. The Owner shall be present when the cross sections or profiles are taken.
   3. The average end area method shall be used in computing the volumes wherever practicable.

3.02 LIMITS OF EXCAVATION IN ROCK

A. Excavation in rock shall be performed, so that no projection shall come within vertical planes twelve (12) inches outside of the structure being built or twelve (12) inches below the bottom of the structure base slab and footings.

B. In trenches, the rock shall be removed to the limits shown on the typical trench section.
   1. Where excavation is carried beyond the above determined limits, the additional space shall be refilled at the Contractor's expense with concrete or other specified materials.

3.03 BLASTING

A. Pre-Blast Survey: Prior to any blasting, the Contractor shall submit a pre-blast survey.
   1. The survey shall satisfy the insurance requirements of the Contractor and be acceptable to the Contractor's insurance carrier, as well as provide data to assess damages to personal property and real estate due to blasting operations.
   2. The survey shall be complete as warranted by the nature of the work.

B. Take all precautions necessary to warn and/or protect any individuals exposed to his operations. Such precautions shall include but not be restricted to the following:
   1. Present written certificate of insurance showing evidence that his insurance includes coverage for blasting operations, before doing any blasting work.
   2. Make necessary arrangements as may be required by the applicable Federal, State, County or Municipal codes, rules, regulations and laws, and shall be responsible for compliance.
   3. Obtain a permit from the local authorities to perform blasting operations.
      a. The Owner shall be notified in writing that such permit has been obtained.
   4. Schedules for blasting shall be thoroughly coordinated with the proper authorities – Federal, State and Local.
      a. No blasting shall be done unless the Contractor has notified all concerned parties that he may blast.

SECTION 02513

ASPHALTIC CONCRETE PAVEMENT

PART 1 GENERAL

1.01 DESCRIPTION

A. Provide asphaltic concrete pavement and appurtenant items as required by these Specifications.
   1. In general the Contractor shall provide all labor, equipment, and materials, and perform all operations in connection with the installation of asphaltic concrete, infra-red treatment, pavement, berms, pavement markings, calcium chloride, final grade adjustments of valve boxes, manhole and catch basin castings, and preparation of the trench.

1.02 RELATED WORK

A. Documents affecting the work of this Section include, but are not necessarily limited to Sections in Division 1 of these Specifications.
   1. Section 02222 Earthwork for Water Distribution Systems

1.03 STANDARDS

A. All paving shall comply with the Commonwealth of Massachusetts Department of Public Works Standard Specifications for Highways and Bridges, hereinafter called Standard Specifications, as referenced.

1.04 SUBMITTALS

A. Comply with pertinent provisions of Section 01300.

B. Product data: Within 30 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
   1. Materials list of items proposed to be provided under this Section.
   2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.

PART 2 MATERIALS

2.01 GRAVEL SUBBASE (Processed Gravel)

A. Shall be as specified in Section 02222, Earthwork for Water Distribution Systems.

2.02 ASPHALTIC CONCRETE PAVEMENT

A. Binder and Top Course
   1. Shall be Class I asphaltic concrete conforming to Sections 420, 460 and M3 of the Standard Specifications.

2.03 ASPHALT TACK COAT

A. Shall consist of either emulsified asphalt, grade RS-1 conforming to Section M3.03.1, or cutback asphalt, grade RC-70 or RC-250 conforming to Section M3.02.0 of the Standard Specifications.

2.04 PAVEMENT MARKING PAINT

A. Shall be High Heat Rapid Drying Traffic Marking Material conforming to Section M7.01.09, (Yellow High Heat Rapid Drying Traffic Marking Material) of the Standard Specifications.

PART 3 EXECUTION

3.01 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.02 FINAL PREPARATION OF SUBGRADES

A. Processed Gravel Subbase
   1. Minimum compacted depth of 12 inches as measured from the bottom of the pavement.
   2. Spread and compacted in layers not exceeding 6 inches in depth, compacted measurement.
   3. All layers shall be compacted to not less than 95 percent of the maximum dry density of the material as determined by the standard AASHO Test Designation T99 Compaction Test Method C at optimum moisture content.

3.03 GENERAL

A. All asphaltic concrete thickness referred to in this Section shall be compacted thickness.

B. No asphaltic concrete shall be placed when the air temperature is below forty (40) degrees Fahrenheit, or when the material on which the mix is to be placed contains frost.

C. No permanent resurfacing shall be placed in roadways after November 15 or before April 1, unless permission to do so is granted in writing by the Owner.
   1. Roadway construction work which will require paving after the closing of the “hot-mix” plants shall be paved with “cold-mix”.

D. Maintain asphaltic concrete under this Contract during the guarantee period of one (1) year.
   1. Promptly refill and re-pave all areas which have settled or are otherwise unsatisfactory for traffic.

3.04 PLACEMENT OF ASPHALTIC CONCRETE PAVING

A. Temporary Pavement
   1. Place after underground facilities have been installed.
   2. Pavement shall be the type as specified in this Section except that “cold-mix” will be acceptable for repairs during seasonal closure of the asphalt concrete supplier.
   3. Compacted thickness shall be 1 1/2 inches.

B. Trench Base Course Resurfacing
   1. Shall be utilized as the base course of the permanent resurfacing.
   2. Remove temporary pavement, square up all edges and prepare base course as specified in this Section.
   3. Edges of the trench shall be cut back in a neat true line, twelve (12) inches outside all limits of the excavation with a water cooled abrasive saw.
   4. Edges of the existing pavement shall be brushed clean and the specified tack coat applied.
   5. Pavement compacted thickness shall be one and a half (1 1/2) inches, placed in a single lift.
   6. Placed with a self propelled spreader.
   7. Compaction shall be accomplished with a self propelled roller, with a weight of approximately 285 pounds per inch of roller width.
   8. Trench base course resurfacing shall be maintained by the Contractor until permanent top course resurfacing is placed.

C. Trench Top Course Resurfacing
   1. All “cold patch”, if any, used in the trench resurfacing shall be removed and replaced with the specified material.
   2. The trench base course resurfacing shall remain in place.
   3. The road surface shall be swept clean of all foreign matter and loose material.
   4. Depressions in the trench base course resurfacing shall have a leveling course applied before the permanent resurfacing begins.
   5. The surface receiving the permanent top course resurfacing shall be completely dry prior to the application of the tack coat.
   6. Tack coat shall be applied at the rate of 0.25 gallons per square yard. The contact surface of the curbing, castings and other structures shall be painted with the tack coat.
   7. Existing and new castings (frames and covers, valve boxes), shall be raised to finish grade before the permanent resurfacing is applied.
   8. The permanent resurfacing shall be keyed to the existing pavement at its beginning and end, by cutting a four (4) inch wide by one (1) inch deep key into the existing pavement. The key shall have tack coating applied. After the pavement has been placed a sand seal shall be applied to these edges.
   9. The equipment used for spreading and finishing shall be a mechanical self powered paver capable of spreading and finishing the mixture true to line, grade, width and crown by means of fully automated controls for both longitudinal and transverse slope.
   10. All joints between the base course and the top course shall be staggered a minimum of six (6) inches.

11. Pavement compacted thickness shall be one and a half (1 1/2) inches, placed in a single lift.
12. Compaction shall be accomplished with a self propelled roller with a weight of approximately 285 pounds per inch of roller width.

D. Full Width Resurfacing: Shall be installed at the locations indicated on the Drawings ninety (90) days following placement of the trench temporary course resurfacing.
1. The trench temporary course resurfacing shall remain in place.
2. Full depth pulverization of the existing paved surface and base shall be completed in accordance with Massachusetts Highway Specification Section 403.
   a. The depth of pulverization shall be twelve (12) inches.
   b. the pulverized material shall be mixed to produce a consistent homogeneous material, 100 percent passing a three (3) inch sieve.
   c. Process gravel, as specified in Section 02222, shall be mixed and blended with the pulverized material, as necessary, to produce a uniform blend suitable for use as a base course.
   d. Unsuitable material in the subgrade shall be removed and replaced with process gravel as requested by the Owner.
3. The pulverized roadway surface shall be fine graded in accordance with Massachusetts Highway Department Specification 402.61 to match existing grades.
4. The fine graded surfaces shall be compacted as specified in paragraph 3.02 of this Section.
5. Depressions in the binder course resurfacing shall have a leveling course applied before the permanent resurfacing begins, if necessary.
6. The surface receiving the full width resurfacing shall be completely dry prior to the application of the tack coat.
7. The tack coat shall be applied at the rate of 0.25 gallons per square yard. The contact surfaces of curbings, castings and other structures shall be painted with a tack coat.
8. Existing and new castings (frames/grates and covers, valve boxes) shall be raised to final grade before the permanent resurfacing is applied, if necessary.
9. The permanent resurfacing shall be keyed to the existing pavement at its beginning, its end, at all cross streets, and at all paved driveways, by cutting a four (4) inch wide by one (1) inch deep key into the existing pavement. The key shall have tack coating applied. After the pavement has been placed a sand seal shall be applied to these edges.
10 A four (4) foot wide paved apron shall be provided at all unpaved driveway entrances.
11. The equipment used for spreading and finishing shall be a mechanical self-powered paver capable of spreading and finishing the mixture true to line, grade, width and crown by means of fully automated controls for both longitudinal and transverse slope. The paver shall also be capable of installing a paved berm integral with the top course.
12. Berms shall be installed integral with the top course resurfacing as directed by the Owner.

13. Pavement compacted thickness shall be one and a half (1 1/2) inches for the binder course, placed in a single lift, and one and a half (1 1/2) inches for the top course, placed in a single lift.
14. Pavement width shall generally match the existing pavement width.
15. Compaction shall be accomplished with a self-propelled roller with a weight of approximately 285 lbs. per inch of roller width.

E. Full Width Overlay
1. The Contractor shall, in preparation for overlay, raise all manholes, catch basins, valve boxes, curb boxes, utility covers, etc. over the entire width of roadway to be paved as specified in this Section.
2. The surface of the original pavement shall be thoroughly patched, cleaned, and tack coated just prior to applying the overlay.
3. The surface receiving the overlay resurfacing shall be completely dry prior to the application of the tack coat.
4. Tack coat shall be applied at the rate of 0.25 gallons per square yard.
   a. The contact surface of the curbing, castings and other structures shall be painted with the tack coat.
5. The full width overlay shall consist of a 1 1/2 inch "hot" asphaltic concrete wearing course.
6. The temporary pavement shall not be removed.
   a. The Contractor shall remove and replace any loose or broken paving or cold patch with asphaltic concrete pavement as required.
7. After all loose and broken paving has been removed and replaced, the Contractor shall bring to grade, low or settled areas of temporary pavement and the existing pavement with a leveling course of asphaltic concrete.
8. The equipment used for spreading and finishing shall be a mechanical self powered paver capable of spreading and finishing the mixture true to line, grade, width and crown by means of fully automated controls for both longitudinal and transverse slope.
9. The overlay shall be keyed to the existing pavement at its beginning and end, by cutting a four (4) inch wide by one (1) inch deep key into the existing pavement.
   a. The key shall have tack coating applied.
   b. After the overlay has been placed a sand seal shall be applied to these edges.
10. Pavement markings shall be provided as specified in this Section.

F. Sand Seal
1. The but edges of all permanent resurfacing and overlays shall be sealed with a six (6) inch wide continuous strip of RS-1, completely covered with sand.

G. Infra-red Treatment
1. All trench resurfacing shall receive infra-red treatment.

3.05 CASTING ADJUSTMENTS

A. In roadway areas, where permanent resurfacing is to be applied, existing manhole and catch basin frames and valve boxes are to be adjusted to the grade of the new pavement.
   1. A neat line shall be cut in the pavement around the existing frames and valve boxes.
   2. The material; gravel, pavement and concrete collar (if there) shall be removed down to six (6) inches below the frame.
   3. The frame shall be freed from its existing grout bed and shimmed with steel shims of the appropriate thickness, at a minimum of four (4) alternate locations, so as to insure that the frame will not rock. The frame shall then be set into a full bed of grout, and a concrete collar placed around the frame, up to within two (2) inches of finish grade.
   4. The frame shall be protected from damage from traffic until the concrete has taken a firm set.

B. Castings owned by private utilities shall be raised by their own forces. The Contractor shall be responsible for the coordination of this work.

3.06 BERMS

A. Existing berms damaged during construction shall be replaced.
   1. Berms shall be class I asphaltic concrete Type I-1.
   2. The mixture shall be placed and compacted with a machine acceptable and approved by the Owner, for the type of berm required.
   3. Placing and forming of berms by hand shall not be allowed.

3.07 DUST CONTROL TREATMENT

A. Calcium chloride shall be applied only upon direction of the Owner.
   1. The roadway shall be swept clean and calcium chloride spread at a uniform rate over the prepared gravel trench surface.

3.08 PAVEMENT MARKINGS

A. Pavement markings shall be applied to replace damaged or removed sections or at locations directed by the Owner.
   1. Pavements shall have been in place 48 hours prior to the application.
   2. The surface shall be prepared to accept the application in compliance with the paint manufacturer's requirements.
   3. Applied to a dry film thickness of fifteen (15) mils.
   4. The temperature of the pavement shall be between forty (40) degrees and one hundred twenty (120) degrees Fahrenheit.
   5. No thinners are to be used for the pavement markings.
   6. The equipment used for the application of pavement markings, shall be of standard commercial manufacturer. All other equipment and devices necessary for the application of pavement markings and protection thereof and for the protection of the traveling public, shall be as usually required for work of this type, and shall be furnished by the Contractor.

7. Pavement markings shall be either a single continuous line or broken line, four (4) inches wide.
8. If for any reason material is spilled or tracked on the pavement or any markings applied by the Contractor the Contractor shall remove such material.
    a. The material shall be removed by a method that is not injurious to the roadway surface and is acceptable to the Owner.
    b. Clean the roadway surface and prepare the surface for a re-application of the pavement markings.

END OF SECTION

SECTION 02611

DUCTILE IRON PIPE AND FITTINGS

PART 1 GENERAL

1.01 DESCRIPTION

A. Work Included: Provide buried ductile iron water mains, fittings, and other appurtenances as required by these Specifications.

1.02 RELATED WORK

A. Documents affecting the work of this Section include, but are not necessarily limited to Sections in Division 1 of these Specifications.

1. Section 02140 Site Drainage and Dewatering
2. Section 02160 Support of Excavation
3. Section 02222 Earthwork for Water Distribution Systems
4. Section 02640 Buried Valves and Appurtenances
5. Section 02645 Hydrants
6. Section 02650 Thrust Blocks and Joint Restraints
7. Section 02675 Disinfection of Water Mains
8. Section 02676 Testing Piping Systems

1.03 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. All ductile iron pipe and fittings shall be of domestic manufacture.

C. Coordinate the work of this Section with the work of other related Sections.

1.04 INSPECTION, TESTS AND ACCEPTANCE

A. All pipe delivered to the job site shall be accompanied by test reports certifying that the pipe conforms to "AWWA Standard AWWA C151 for Ductile Iron Pipe, for Water and Other Liquids".

B. All tests shall be made in accordance with the methods prescribed by the above mentioned AWWA Standard, and the acceptance or rejection shall be based on the test results.

C. Pipe which does not conform to the requirements of this contract shall be immediately removed from the site and replaced by the Contractor with pipe which does conform.

1.05 STANDARDS

A. The following American Water Works Association (AWWA) standards form a part of this specification as referenced:
   1. AWWA C104 Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water
   2. AWWA C110 Ductile-Iron and Gray-Iron Fittings, 3 In. through 48 In. for Water and Other Liquids
   3. AWWA C111 Rubber-Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings
   4. AWWA C150 Thickness Design of Ductile-Iron Pipe
   5. AWWA C151 Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water and Other Liquids
   6. AWWA C153 Ductile-Iron Compact Fittings, 3 In. through 12 In., for Water and Other Liquids

1.06 SUBMITTALS

A. Comply with pertinent provisions of Section 01300.

B. Product data: Within 30 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
   1. Materials list of items proposed to be provided under this Section.
   2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.

PART 2 PRODUCTS

2.01 PIPE

A. Ductile Iron Pipe (Buried Service):
   1. Pipe shall be American made as manufactured Griffin Pipe Products, Atlantic States, Inc., or United Sates Pipe and Foundry.
   2. All pipe shall meet the requirements of ANSI/AWWA C151/A21.51.
   3. Class: 52
   4. Joints:
      a. Mechanical meeting the requirements of ANSI/AWWA C111/A21.11.
      b. Push-on meeting the requirements of ANSI/AWWA C111/A21.11.
   5. Gaskets: Conform to ANSI/AWWA C111/A21.11.
   6. Lining: Conforming to ANSI/AWWA C104/A21.4
   7. Thickness of cement-mortar lining:
      a. 1/8 inch for pipes 12 inches and smaller.
      b. 3/16 inch for pipe 14 inches and larger.
   8. Cement-mortar lining to be seal coated per AWWA C104.
   9. Tar Coating.
   10. Accessories: Pipe shall be provided with all necessary accessories to make-up the joint (glands, tee head bolts, hex nuts, etc.).

2.02 FITTINGS

A. Fittings:
   1. Fittings shall be American made as manufactured Griffin Pipe Products, Atlantic States, Inc., or United Sates Pipe and Foundry.
   2. Comply with ANSI/AWWA C153/A21.53.
   3. Pressure rating: 350 psi.
   4. Lining and coating: Same as pipe.
   5. Joint: Mechanical joint in compliance with ANSI/AWWA C111/A21.11.
   6. Markings on fittings: Comply with ANSI/AWWA C110/A21.10.

2.03 SPECIAL FITTINGS

A. Locking Hydrant Tees: Shall be mechanical joint, each having a bell and plain end, with a split mechanical joint on the plain end. Gate valve shall be secured directly to the tee by using the standard mechanical joint gasket and standard bolts.

B. Retainer Glands: Shall be cast of high strength ductile iron and fitted with ductile iron wedging devices and twist-off pressure nuts, four (4) each for six (6) inch pipe, six (6) each for eight (8) inch pipe, twelve (12) each for twelve (12) inch pipe, and sixteen (16) each for sixteen (16) inch pipe.

C. Couplings: Shall be cast or ductile iron, consisting of a middle ring, two (2) rubber gaskets, and the followers with stainless steel bolts and nuts. Coupling and gasket shall be sized for the particular application intended.

D. Plugs: Shall be ductile iron with mechanical or push-on joint and retainer feature.

E. Sleeves: Shall be ductile iron with mechanical joint, long body style meeting or exceeding the requirements of ANSI/AWWA C110/A21.10 or latest revision thereto.

F. Transition Couplings: As required for joining pipes of different diameters shall be furnished as required and designed for compatibility with the pipe and operating pressures encountered.
   1. Transition couplings shall be Dresser Style 162 as manufactured by Dresser Industries Inc., or an approved equal.

2.04 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Owner.

PART 3 EXECUTION

3.01 SURFACE CONDITIONS

A. Examine the areas and conditions under which the work of this Section will be performed. Correct conditions detrimental to timely and proper

completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.02 FIELD MEASUREMENTS

A. Make necessary measurements in the field to assure precise fit of the items.

3.03 GENERAL

A. Earthwork:
1. Trench, backfill and compact for the work of this Section in strict accordance with the pertinent provisions of Section 02222, Earthwork for Water Distribution Systems.
2. Shoring for the work of this Section shall be in strict accordance with Section 02160, Support of Excavation.
3. Control of ground and surface water shall be in strict accordance with Section 02140, Site Drainage and Dewatering.

3.04 PIPE HANDLING

A. Handling:
1. The Contractor shall take care not to damage pipe by impact, bending, compression, or abrasion during handling, and installation. Joint ends of pipe especially shall be kept clean.
2. Pipe shall be stored a minimum 4 inches above ground at a height no greater than 5 feet, and with even support for the pipe barrel.
3. Only nylon-protected slings shall be used for handling the pipe. No hooks or bare cables shall be permitted.
4. Gaskets shall be shipped in cartons and stored in a clean area, away from grease, oil, heat, direct sunlight and ozone producing electric motors.

3.05 INSTALLATION

A. Pipe:
1. Installation and jointing of ductile iron pipe shall be in accordance with AWWA C600 Sections 9b and 9c, latest revision, as applicable.
2. In general, jointing of ductile iron push-on pipe and fittings shall be done as follows.
3. The last 8 inches of the outside of the spigot end of the pipe and the inside of the bell end of pipe shall be thoroughly cleaned.
4. The joint surfaces and the gasket shall be painted with a lubricant, provided by the pipe manufacturer, just prior to making up the joint. The spigot end shall then be gently pushed home into the bell.
5. The position of the gasket shall be checked to insure that the joint has been properly made and is watertight.
6. Care shall be taken not to exceed the manufacturer's recommended maximum deflection allowed for each joint.
7. When laying is not in progress, including lunch time, the open ends of the pipe shall be closed by a watertight plug.

8. When cutting of pipe is required, the cutting shall be done by machine, leaving a smooth cut at right angles to the axis of the pipe.
    a. Cut ends of pipe to be used with a push-on type bell shall be beveled to conform to the manufactured spigot end.
    b. Cement lining shall be inspected for damage and shall be remortared as required to ensure a continuous lining.

B. Caps and Plugs:
1. Shall be provided with a threaded corporation or bleeder valve so that air and water pressure can be relieved prior to future connection.

C. Thrust Blocking for Fittings:
1. As specified in Section 02650, Thrust Blocks and Joint Restraints.

D. Couplings:
1. Contractor shall provide all adapters and fittings such as transition couplings, as determined in the field, necessary to complete all tie-ins, whether or not specifically stated in the Specifications.

3.06 SPECIAL CONDITIONS

A. Under no conditions shall ductile iron pipe be installed within 5 feet of gas lines without written permission from the Utility Company and the Owner at the discretion of the Owner.

3.07 TESTING

A. Comply with the pertinent sections of Section 02676, Testing Piping Systems.

3.08 DISINFECTING

A. Comply with the pertinent sections of Section 02675, Disinfection of Water Mains.

END OF SECTION

SECTION 02640

BURIED VALVES AND APPURTENANCES

PART 1 GENERAL

1.01 DESCRIPTION

A. Work included: Provide buried valves, valve boxes, and valve accessories, as required by these Specifications.

1.02 RELATED WORK

A. Documents affecting the work of this Section include, but are not necessarily limited to Sections in Division 1 of these Specifications
   1. Section 02140 Site Drainage and Dewatering
   2. Section 02160 Support of Excavation
   3. Section 02222 Earthwork for Water Distribution Systems
   4. Section 02611 Ductile Iron Pipe and Fittings

1.03 SUBMITTALS

A. Comply with pertinent provisions of Section 01300.

B. Product data: Within 30 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
   1. Materials list of items proposed to be provided under this Section.
   2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
   3. An exploded view diagram with a materials list.

1.04 STANDARDS

A. The following American Water Works Association (AWWA) standards form a part of this specification as referenced:
   1. AWWA C509 Resilient-Seated Gate Valves for Water Supply Service,
   2. AWWA C504 Rubber-Seated Butterfly Valves.

PART 2 MATERIALS

2.01 VALVES

A. Resilient Seated Gate Valves: Shall be used on all water mains less than sixteen (16) inches in diameter and all hydrant branches.
   1. Valves shall be American made as manufactured Mueller Company, ~~Waterous Company, Clow/Kennedy Valve Company, or United Sates Pipe and Foundry~~.
   2. Meet or exceed the requirements of ANSI/AWWA C509,
   3. Joints: Mechanical joint conforming to ANSI/AWWA C111/A21.11,
   4. Cast iron body,
   5. Bronze stem,

6. Resilient sealed wedge type:
   a. Wedge: Fully encapsulated; no exposed iron,
7. Double O-ring stem seal
8. Non rising stem,
9. Two (2) inch square operating nut,
10. Rated for 200 psi and tested to 400 psi,
11. Open: Valves shall open COUNTER CLOCKWISE (LEFT) in the Oxford Water Distribution System and CLOCKWISE (RIGHT) in the Millbury and Hingham/Hull Water Distribution Systems.
12. All internal and external surfaces except rubber coatings shall be coated with fusion bonded epoxy to a minimum thickness of 8 mils:
    a. Coating shall be non-toxic, impart no taste to water and shall conform to AWWA C-550.

B. Butterfly Valves: Shall be used on all water mains sixteen (16) inches in diameter and larger:
1. Butterfly Valves shall be as manufactured by Mueller Company, Clow Valve Company, or Henry Pratt Company.
2. Designed specifically for underground service meeting or exceeding ANSI/AWWA C504, Class 150,
3. Joints: Mechanical joint conforming to ANSI/AWWA C111/A21.11,
4. Cast iron body meeting or exceeding the requirements of ASTM A126, Class B,
5. Disc shall be ductile iron:
   a. Disc edge shall be 316 stainless steel,
6. Type 304 stainless steel shaft,
7. Shaft seal shall be 'V'-type Chevron,
8. Totally enclosed and permanently sealed gearing,
9. Two (2) inch square operating nut,
10. Rated for 250 psi and tested to 500 psi,
11. Open: Butterfly valves shall open COUNTER CLOCKWISE (LEFT) in the Oxford Water Distribution System CLOCKWISE (RIGHT) in the Millbury and Hingham/Hull Water Distribution Systems.
12. All internal iron surfaces shall be coated with fusion bonded epoxy to a minimum thickness of 8 mils:
    a. Coating shall be non-toxic, impart no taste to water and shall conform to AWWA C-550,

2.02 VALVE BOXES

A. Valve boxes shall be provided for each buried valve. They shall be:
1. Valve boxes shall be as manufactured by Brigham & Taylor or Quality Water Products,
2. Cast iron with a cast iron cover,
3. Cover shall have the word "WATER" and an arrow indicating the direction of opening cast into the cover in raised letters,
4. Valve box barrel shall not be less than (5-¼) inches in diameter,
5. Shall be two (2) piece sliding type, providing a minimum overlap of six (6) inches, with flared base,
6. The lower section shall enclose the operating nut and stuffing box/gear box of the valve and shall have a minimum diameter of 8 inches,
7. The box shall not transmit shock or stress to the valve.

PART 3 EXECUTION

3.01 HANDLING AND INSPECTION

A. Care shall be taken to prevent damage to valves, and appurtenances during handling and installation. All materials shall be carefully inspected for defects in workmanship and materials.

B. All operating mechanisms operated to check their proper functioning, and all nuts and bolts checked for tightness. Valves which do not operate easily or are otherwise defective shall be replaced at the Contractor's expense.

3.02 INSTALLATION

A. General:
   1. Construction methods for the work under this Section shall conform to the applicable portions of Section 02611, Buried Ductile Iron Pipe and Fittings, details as shown on the Contract Drawings, manufacturer's recommended installation procedures, and procedures specified herein.

B. Valves and Appurtenances:
   1. Generally, valves shall be set and aligned plumb, supported by a flat stone or solid concrete block, with the trench bottom being firmly compacted.
   2. Valve boxes shall be set centered and plumb over the operating nuts of all, direct burial valves. The top of each valve box shall be set to finished grade with at least 10 inches of overlap remaining between the upper sections for future vertical adjustment. Minimum overlap for lower, extension pieces shall be 6 inches.
   3. Valves, bolts and all other appurtenances shall be thoroughly cleaned and given a shop coat of asphaltum varnish.
   4. Ferrous surfaces obviously not to be painted shall be given a shop coat of grease or other suitable rust-resistant coating.

END OF SECTION

SECTION 02641

TAPPING SLEEVES AND VALVES

PART 1 GENERAL

1.01 DESCRIPTION

A. Work included: Provide tapping sleeves and valves, valve boxes, and accessories, as required by these Specifications.

1.02 RELATED WORK

A. Documents affecting the work of this Section include, but are not necessarily limited to Sections in Division 1 of these Specifications.
   1. Section 02140 Site Drainage and Dewatering
   2. Section 02160 Support of Excavation
   3. Section 02222 Earthwork for Water Distribution Systems
   4. Section 02611 Ductile Iron Pipe and Fittings

1.03 SUBMITTALS

A. Comply with pertinent provisions of Section 01300.

B. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
   1. Materials list of items proposed to be provided under this Section.
   2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.

1.04 STANDARDS

A. The following American Water Works Association (AWWA) standards form a part of this specification as referenced:
   1. AWWA C111 Rubber Gasket Joints for Ductile Iron Pressure Pipe and Fittings
   2. AWWA C509 Resilient-Seated Gate Valves for Water Supply Service

PART 2 MATERIALS

2.01 TAPPING SLEEVE

A. Shall be as manufactured by Mueller Company, Waterous Company, Clow/Kennedy Valve Company, or United States Pipe and Foundry.
   1. Size as required.
   2. Mechanical joint ends in compliance with ANSI/AWWA C111.
   3. Outlet flange dimensions and drilling shall comply with ANSI B16.1, Class 125 and with MSS SP-60.
   4. Stainless steel body.
   5. Epoxy coating.
   6. Rated for 200 psi and tested to 400 psi.

7. 1-inch NPT test plug.

2.02 TAPPING VALVE

A. Shall be as manufactured by Mueller Company, Waterous Company, Clow/Kennedy Valve Company, or United States Pipe and Foundry.
   1. Size as required.
   2. Joints: Mechanical joint by flanged end.
   3. Cast iron body meeting or exceeding the requirements of ASTM A126, Class B.
   4. Meet or exceed all applicable requirements of ANSI/AWWA C509 standards.
   5. Mechanical joint outlet in compliance with ANSI/AWWA C111 standard, with all accessories.
   6. Resilient- seated.
   7. Two (2) inch square wrench nut.
   8. O-ring sealed stuffing box.
   9. Maximum working pressure: 200 psig.
   10. Open: All tapping valves shall open COUNTER CLOCKWISE (LEFT) in the Oxford Water Distribution System, and CLOCKWISE (RIGHT) in the Millbury and Hingham/Hull Water Distribution Systems.
   11 Non-rising stem.
   12. All internal iron surfaces shall be coated with fusion bonded epoxy to a minimum thickness of 8 mils. Coating shall be non-toxic, impart no taste to water and shall conform to AWWA C-550.

2.03 VALVE BOXES

A. Valve boxes shall be provided for each valve. They shall be:
   1. Domestic manufacture.
   2. Cast iron with a cast iron cover.
   3. Cover shall have the word “WATER” and an arrow indicating the direction of opening cast into the cover in raised letters.
   4. Valve box barrel shall not be less than five (5 1/4) inches in diameter with flared base.
   5. The lower section shall enclose the operating nut and stuffing box/gear box of the valve and shall have a minimum diameter of 8 inches.
   6. The box shall not transmit shock or stress to the valve.

PART 3 EXECUTION

3.01 HANDLING AND INSPECTION

A. Care shall be taken to prevent damage to the tapping sleeves and valves, and appurtenances during handling and installation.
   1. All materials shall be carefully inspected for defects in workmanship and materials.
   2. All operating mechanisms operated to check their proper functioning, and all nuts and bolts checked for tightness.
   3. Valves which do not operate easily or are otherwise defective shall be replaced at the Contractor's expense.

3.02 INSTALLATION

A. General
   1. Construction methods for the work under this Section shall conform to the applicable portions of Section 02611, Ductile Iron Pipe and Fittings, details as shown on the Contract Drawings, manufacturer's recommended installation procedures, and procedures specified herein.

B. Quality Assurance
   1. The tapping sleeve and valve shall be installed by skilled workmen who are thoroughly trained and experienced and have the special equipment necessary for the proper performance of the work of this Section.

C. Tapping Sleeves and Valves
   1. A test pit shall be excavated prior to obtaining the tapping sleeve and valve to verify the existing water main size, material and orientation.
   2. Existing water main shall be thoroughly cleaned in the area of the proposed connection.
   3. Tapping sleeve and valve shall not be installed closer than four (4) feet to a pipe joint or repair collar.
   4. Tapping sleeve and valve shall be pressure tested before tap is started.
   5. Pipe tap shall be made under pressure.
   6. Valve boxes shall be set centered and plumb over the operating nuts of the valve.
      a. The top of each valve box shall be set to finished grade with at least 10 inches of overlap remaining between the upper sections for future vertical adjustment.
      b. Minimum overlap for lower, extension pieces shall be 6 inches.

END OF SECTION

SECTION 02645

HYDRANTS

PART 1 GENERAL

1.01 DESCRIPTION

A. Work included: Provide hydrants as required by these Specifications.

1.02 RELATED WORK

A. Documents affecting work of this Section include, but are not necessarily limited to Sections in Division 1 of these Specifications.
   1. Section 02222 Earthwork for Water Distribution Systems
   2. Section 02611 Ductile Iron Pipe and Fittings
   3. Section.02640 Buried Valves and Appurtenances
   4. Section 02650 Thrust Blocks and Joint Restraints

1.03 SUBMITTALS

A. Comply with pertinent provisions of Section 01300.
   1. Materials list of items proposed to be provided under this Section.
   2. Manufacturer's specifications and other data needed, to insure compliance with the specified requirements.

1.04 STANDARDS

A. The following American Water Works Association (AWWA) Standards form a part of this specification as referenced:
   1. AWWA C502 Dry-Barrel Fire Hydrants

PART 2 PRODUCTS

2.01 HYDRANTS

A. Hydrants shall be Mueller Super Centurion.
   1. Barrel sections shall be 5 1/4 inch diameter.
   2. Five (5) foot six (6) inch bury.
   3. Two (2) 2 1/2 inch hose nozzles.
   4. One (1) 4 1/2 inch pumper outlet.
   5. Replaceable brass nozzles.
   6. Breakaway flange.
   7. Mechanical joint shoe.
   8. Open COUNTER CLOCKWISE (LEFT) in the Oxford and Millbury Water Distribution Systems. Open CLOCKWISE (RIGHT) in the Hingham/Hull Water Distribution System.
   9. Be in full compliance with AWWA C502.
   10. Paint: Red body with silver caps and bonnets in the Oxford and Millbury Water Distribution Systems. Yellow public hydrants and red private hydrants in the Hingham/Hull Water Distribution System.

B. Hydrants shall conform to National Standard Specification sizes in threads and nuts. Caps shall have retainer chains and rubber gaskets.

2.02 HYDRANT EXTENSION

A. Extension Kit: If required to meet grade on site
   1. Shall be provided by the hydrant manufacturer.
   2. Length shall be as needed to meet finish grade.

PART 3 EXECUTION

3.01 SURFACE CONDITIONS

A. Examine the areas and condition under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.02 FIELD MEASUREMENTS

A. Make necessary measurements in the field to assure fit of items.

3.03 PROPOSED HYDRANT LOCATIONS

A. All new hydrant locations shall be subject to field location approval by the Owner.

3.04 INSTALLATION

A. Hydrants:
   1. Trench, backfill and compact for the work of this Section in strict accordance with pertinent provisions of Section 02222, Earthwork for Water Distribution Systems
   2. The hydrant drainage pit shall be approximately three (3) feet in diameter and filled with compacted crushed stone. While backfilling place additional crushed stone to at least six (6) inches above the hydrant drain ports.
   3. After being thoroughly cleaned, all iron work set below ground shall be painted with two coats of asphalt varnish as specified in AWWA C504.
   4. Thrust blocking shall be placed behind the shoe of the hydrants taking care not to block the drain outlets.
   5. The hydrant shall be set plumb and to the proper grade and shall remain properly supported until it is backfilled.
   6. All iron work left above ground shall be shop painted with two coats of paint of quality and color to correspond to the present standard of the Owner.
   7. After the hydrant has been set, it shall be entirely draped with burlap and remain covered until the water distribution system has been accepted and put into service.

END OF SECTION

SECTION 02650

THRUST BLOCKS AND JOINT RESTRAINTS

PART 1 GENERAL

1.01 DESCRIPTION

A. Work included: Provide thrust blocks and joint restraints for the relocated water mains as required by these Specifications.

1.02 RELATED WORK

A. Documents affecting work of this Section include, but are not necessarily limited to Sections in Division 1 of these Specifications.
   1. Section 02140 Site Drainage and Dewatering
   2. Section 02160 Support of Excavation
   3. Section 02222 Earthwork for Water Distribution Systems

1.03 SUBMITTALS

A. Comply with pertinent provisions of Section 01300.
   1. Materials list of items proposed to be provided under this Section.
   2. Manufacturer's specifications and other data needed, to insure compliance with the specified requirements.

PART 2 MATERIALS

2.01 CONCRETE

A. Concrete shall be as specified in Section 03300, Cast-In-Place Concrete.
   1. Minimum concrete strength shall be 3000 psi after 28 days.

2.02 JOINT RESTRAINTS

A. Mechanical joint restraint shall be Megalug 1100 Series as manufactured by EBAA Iron Sales Inc., Eastland, Texas, or an approved equal.
   1. Glands shall be manufactured of ductile iron conforming to ASTM A536.
   2. The wedges shall be ductile iron, heat treated to a minimum hardness of 370 BHN
   3. Shall have a minimum working pressure of 350 psi for pipe diameters up to 16 inches with a minimum safety factor of 2:1.
   4. Twist-off nuts.

2.03 OTHER MATERIALS

A Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Owner.

PART 3 EXECUTION

3.01 THRUST BLOCKS

A. Concrete thrust blocks shall be provided at all hydrants and fittings.
   1. The backs of thrust blocks shall be placed against undisturbed earth and the sides shall be formed.
   2. Felt roofing paper shall be placed to protect pipe joints.
   3. Concrete shall not be placed over bolts or nuts.

3.02 JOINT RESTRAINTS

A. Mechanical joint restraint devices shall be installed at all fittings in accordance with the manufacturer's written instructions.

END OF SECTION

SECTION 02660

SERVICE CONNECTIONS

PART 1 GENERAL

1.01 SUMMARY

A. Work included: Provide potable water service connections as required by these Specifications.

1.02 RELATED WORK

A. Documents affecting work of this Section include, but are not necessarily limited to Sections in Division 1 of these Specifications.
   1. Section 02222 Earthwork for Water Distribution Systems
   2. Section 02611 Ductile Iron Pipe and Fittings
   3. Section 02640 Buried Valves and Appurtenances

1.03 SUBMITTALS

A. Comply with pertinent provisions of Section 01300.
   1. Materials list of items proposed to be provided under this Section.
   2. Manufacturer's specifications and other data needed, to insure compliance with the specified requirements.

1.04 STANDARDS

A. The following Standards form a part of these Specifications as referenced:
   1. AWWA C800 Underground Service Line Valves and Fittings.
   2. AWWA C901 Polyethylene Pressure Pipe and Tubing, 1/2 Inch Through 3 Inch, For Water Service.

1.05 QUALITY ASSURANCE

A. Codes and Standards
   1. Plumbing Code Compliance: Comply with applicable portions of National Standard Plumbing Code pertaining to selection and installation of potable water system materials and products.
   2. Water Purveyor Compliance: Comply with requirements of Purveyor supplying water to project, obtain required permits and inspections.

B. Compliance
   1. The Owner may require an affidavit from the manufacturer or vendor that the products furnished comply with all applicable provisions of AWWA C800 and AWWA C901.

PART 2 PRODUCTS

2.01 GENERAL

A. All materials shall be of domestic manufacture.

B. The Owner has standardized on the following products listed in this Section for service connections.

2.02 SERVICE TUBING

A. Copper Water Tubing
   1. Conform to the provisions of ASTM B-88.
   2. Size: As required.
   3. Type K annealed (soft) AWWA Specifications 7S-CR or Federal Specification WWT-799.
   4. Seamless.

2.03 CORPORATION STOPS/CURB STOPS

A. Corporation Stop: Shall be as manufactured Ford Meter Box, Mueller, or A.Y. McDonald.
   1. Test pressure: 175 psi.
   2. Brass ball valve type.
   3. Corporation Stops shall open to the LEFT.
   4. Outlet Connection: flared copper connection end.
   5. Size: As required by the service tubing may range from 1/2-inch to 2-inches.
   6. Standard AWWA tapered threads, unless otherwise required.
   7. Comply with AWWA C800, Underground Service Line Valves and Fittings.

B. Curb Stops shall be as manufactured by Ford Meter Box or Mueller.
   1. Curb Stops shall open to the LEFT.
   2. Bronze body connection with ball valves.
   3. Double O-Ring seals.
   4. End connections shall be suitable for flared copper connection.
   5. Size: As required by the service tubing may range from 3/4-inch to 2-inches.

2.04 CURB BOXES

A. Curb boxes shall be of domestic manufacture as manufactured by Brigham & Taylor or Mueller.
   1. Erie type, tar coated, cast iron, arch pattern base with inlaid covers.
   2. Covers shall be arch base style with brass pentagon nut, flush mounted, plug cover, with a 24” rod and the word “Water” shall be cast into the cover.
   3. Curb boxes shaft shall have a minimum inside diamter of 1 inch.
   4. Adjustable from 18 inches to 66 inches.

2.05 SERVICE SADDLE

Service saddles used for 2"+ , would use for 1" if tapping into AC or plastic or on small diameter main.

A. Service saddle shall be of domestic manufacture as manufactured by Mueller or equal.
   1. Rated for 200 psi working pressure.
   2. Double strap design
   3. Brass body.
   4. O-ring sealed outlet.
   5. Meet all applicable parts of ANSI/AWWA C800.

PART 3 EXECUTION

3.01 INSPECTION

A. Service tubing which does not conform to the requirements of this specification shall be immediately removed from the site by the Contractor

3.02 HANDLING PIPE

A. The Contractor shall take care not to damage pipe by impact, bending, compression, or abrasion during handling, and installation. Joint ends of pipe especially, shall be kept clean.

3.03 SERVICE LOCATIONS AND SHUT-DOWNS

A. All new service locations shall be subject to field location approval by the Owner.

B. Where a water service must by shut-down, it shall be the Contractor's responsibility to contact the party owning the service to arrange a shut-down schedule prior to doing any work.
   1. All such schedules must be approved prior to shut-down.
   2. Shut-down time shall be kept to a minimum so as to keep service off for the shortest possible time.

3.04 INSTALLATION OF TUBING

A. Service Tubing.
   1. Where directed by the Owner, the Contractor shall install new services including 1-inch and 2-inch tubing.
   2. For services outside the paved areas, trench excavation shall be utilized, with tubing being carefully laid in the bottom of the trench, backfill placed and compaction completed.
      a. Care shall be taken to insure against kinks or crushed areas.
   3. Backfill around and to one (1) foot over the tubing shall not contain stones greater than one (1) inch in diameter.
   4. For services to be installed beneath paved surfaces, a pneumatic drive device such as “Hole Hog” or equal, trenchless method, may be utilized to drive the new service beneath the pavement.
   5. Service tubing between the corporation stop and the curb stop shall be one (1) piece.
   6. Service tubing between the curb stop and the house shall be one (1) piece. Coupling shall not be allowed except for two (2) inch services greater than 200 feet in length.
   7. Tubing shall be connected to the curb stop and compression joints tightened.

8. Duct tape shall be installed over the outlet end of curb stops, to be left for future connections.
9. A no. 12 trace wire shall be installed on all service lines.
    a. The trace wire on the service tubing between the corporation and curb stops shall be stripped at both ends, connected to the corporation and curb stop and looped around the service tubing every three (3) feet.
    b. The trace wire on the service tubing between the curb stop and residence shall be stripped at both ends, connected to the curb stop and the one (1) inch angle valve, and looped around the service tubing every three feet.

3.05 HOUSE CONNECTIONS

A. For complete service connections to homes (see par. 3.03):
1. Contractor shall coordinate work on private property with the individual homeowners.
2. Contractor shall inspect the property and interior service entrance locations prior to installation to become fully aware of potential obstructions.
3. Foundation of floor slabs shall be carefully cored for installation of service tubing and tracer wire.
4. Upon completion of the service tubing installation, wall/slab shall be completely sealed with water plug hydraulic cement from the exterior and the interior.
5. Interior service tubing stub shall be capped and shall be of adequate length for connection of meter spacer assembly.
6. Interior service installation and piping shall be completed by a state licensed plumber.

3.06 APPURTENANCES

A. Corporation Stops.
1. Provide the necessary tap, sized for the fitting.

B. Curb Stops and Boxes.
1. Place valve box over stop, taking care that it is installed plumb.
2. Curb stops shall be key checked after adjustment of curb box to final grade.
    a. If curb stop is not centered in the box the box shall be removed and reset over the curb stop.

END OF SECTION

SECTION 02675

DISINFECTING WATER MAINS

PART 1 GENERAL

1.01 DESCRIPTION

A. Work Included: Disinfecting water mains and their appurtenances.

B. The procedure for disinfecting water mains, as described in this section, generally consists of the following steps:

1. Flushing the new water mains.
2. Filling the new water mains with chlorinated water.
3. Disinfecting the new water mains with chlorine solution.
4. Flushing the chlorinated water from the new water mains.
5. Taking samples for bacteriological analysis.
6. Testing the samples at a state certified laboratory.
7. Placing the new water mains into service.

1.02 RELATED WORK

A. Documents affecting the work of this Section include, but are not necessarily limited to Sections in Division 1 of these Specifications.
1. Section 02611 Ductile Iron Pipe and Fittings

1.03 SUBMITTALS

A. The Contractor shall prepare a plan for disinfecting water mains and their appurtenances that describes the proposed schedule, the location of all sampling and flushing points, and the overall procedure for disinfecting. The plan shall also present the proposed chemicals to be employed, the strength of the chemicals and the equipment employed to apply them. The plan shall be presented to the Engineer for review not less than two weeks prior to the proposed time for disinfecting the water mains.

B. Copies of all test results, as specified herein, shall be submitted directly to the Engineer from the laboratory that conducted the tests.

1.04 STANDARDS

A. The following standards are referenced, in part, in this specification:

1. Specific sections, or portions thereof, of AWWA C651 (latest revision) Disinfecting Water Mains, as further described herein.

1.05 COST OF DISINFECTING WATER MAINS

A. All costs associated with disinfecting water mains, including water, chemicals and bacteriological analysis of samples, as further described in this Section, shall be paid for by the Contractor.

PART 2 MATERIALS

2.01 WATER

A. Water for flushing of water mains, preparation of chlorine solutions and filling of water mains for disinfection shall be potable drinking water.

2.02 CHEMICALS

A. Chlorine for preparation of chlorine solutions for disinfection shall be sodium hypochlorite or calcium hypochlorite and shall conform to the requirements of ANSI/AWWA B300. Chlorine shall be in the the form of Olin Pulsar CCH Tablests, 5G size, 65% available chlorine.

B. Chlorine solutions shall be neutralized prior to disposal using sodium bisulfite, sodium sulfite or sodium thiosulfate.

2.03 WATER SAMPLE BOTTLES

A. Sterile water sample bottles shall be obtained from a state certified laboratory.

1. Sterile bottles for bacteriological analyses shall be treated with sodium thiosulfate to neutralize any residual chlorine.
2. Two samples are required at each specified sampling point. One sample shall be analyzed for the presence of coliform bacteria and one sample shall be analyzed for the presence of heterotrophic plate count (HPC) bacteria.

PART 3 EXECUTION

3.01 WATER MAIN DISINFECTING

A. After completion of all water main related construction, except water service connection installation, all water mains, valves, hydrants, hydrant connections and other appurtenances installed under this Contract shall, be disinfected in accordance with AWWA Standard C651, Section 4.4.3 (Continuous Feed Method), as modified herein.

1. Taps for flushing, chlorination and sampling shall be installed by the Contractor at no additional expense to the Owner.
2. Flush the new water mains with potable water to remove any contaminants and debris that may have entered the water mains during construction.

3. The flushing velocity in the new water mains shall not be less than 2.5 feet per second. In the absence of a flow meter, flow rate shall be determined either by placing a pitot gage at the discharge or by measuring the time to fill a container of a known volume
4. Prepare a chlorine solution that will be continuously fed into the potable water that is used to fill the new water mains.
5. The chlorine solution shall be applied to the new water mains with a chemical feed pump designed to feed chlorine solutions
6. Completely fill the new water mains with the chlorinated, potable water to remove any air pockets. The point of application shall be no more than 10 feet downstream from the beginning of the new water mains.
7. The chlorine solution shall be of sufficient strength to provide a minimum residual chlorine concentration of 25 milligrams per liter (mg/l) in the filled water mains.
8. New valves and hydrants shall be operated to insure their proper disinfection.
9. Isolation valves shall be maintained in a closed position to prevent chlorinated water from entering the existing water distribution system.
10. Chlorinated water shall remain in the main for a minimum of 48 hours.
11. The minimum residual chlorine concentration at the end of the 48 hour holding period shall be 10 mg/l.
12. After the 48-hour retention period, chlorinated water shall be flushed from every hydrant branch on the main until the chlorine concentration leaving the main is no higher than that generally in the system or less than 1.0 mg/l.
13. Chlorinated water shall be discharged in a manner that will not adversely effect flora and fauna or drainage courses and shall conform to applicable State regulations for waste discharge.
14. Chlorinated water that is flushed from the mains shall be neutralized by the addition of a dechlorinating agent so that the residual chlorine concentration is zero.
15. The location of the discharge for the dechlorinated water shall be approved by the Engineer and the Owner.

3.02 BACTERIOLOGICAL TESTS

A. A minimum of 24 hours after flushing and before the new water mains are placed in service, the Owner shall collect water samples for testing of the bacteriological quality of the water.
   1. No hose or fire hydrant shall be used in the collection of samples.
   2. A sampling tap shall consist of a standard corporation stop installed in the main with a PVC gooseneck assembly.
   3. Samples for bacteriological testing shall be collected in sterile bottles treated with sodium thiosulfate and furnished by the state certified laboratory that will perform the tests.
   4. Unless otherwise directed by the Owner, the minimum number of samples for bacteriological analysis shall be as follows:
      a. One sample every 1,200 linear feet of newly installed water mains.

b. One sample at the end of the newly installed water mains.
c. One sample at each branch.

5. One round of sampling shall be conducted on water distribution systems that continuously maintain a chlorine residual.
6. Two rounds of sampling shall be conducted on water distribution systems that do not continuously maintain a chlorine residual. The second round of sampling shall be conducted a minimum of 24 hours after the first round of samples is taken.

B. All bacteriological tests shall be performed by a state certified laboratory.
   1. Two bacteriological tests shall be performed on all samples:
      a. one coliform bacteria, and
      b. one heterotrophic plate count (HPC) bacteria.
   2. Test results on all samples and a copy of the chain of custody shall be mailed directly to the Owner from the laboratory.
   3. The disinfection procedure shall be considered satisfactory only if the results of all tests confirm the following:
      a. the absence of coliform bacteria in all samples taken and
      b. the HPC bacteria are less than 500 colony forming units per milliliter (cfu/ml) in all samples taken (unless the water supplier has established a stricter HPC limit from baseline data for their water distribution system, in which case the results of the HPC bacteria tests shall meet the stricter limit).
   4. The new water mains may be placed in service if the results of the disinfection procedure are satisfactory and the Owner has granted permission.
   5. If the initial disinfection procedure fails to produce satisfactory results, the new water mains shall be flushed and resampled as described above. If the test results from the resampling also fail to produce satisfactory results, the entire disinfection procedure shall be repeated.

END OF SECTION

SECTION 02676

TESTING PIPING SYSTEMS

PART 1 GENERAL

1.01 DESCRIPTION

A. Work Included: Provide pressure/leakage tests as required by these Specifications.

1.02 RELATED WORK

A. Documents affecting the work of this Section include, but are not necessarily limited to Sections in Division 1 of these Specifications.
   1. Section 02611 Ductile Iron Pipe and Fittings
   2. Section 02640 Buried Valves and Appurtenances
   3. Section 02675 Disinfection of Water Mains

1.03 STANDARDS

A. The following American Water Works Association Standard shall form a part of this specification as referenced:
   1. AWWA C600 Installation of Ductile Iron Water Mains and Their Appurtenances.

PART 2 PRODUCTS

2.01 WATER

A. The Owner shall furnish water free, for flushing and testing the water main, if hydrants or other connection points are convenient to the work. Otherwise, the Contractor shall be responsible for securing an acceptable potable water supply at no additional cost to the Owner.

PART 3 EXECUTION

3.01 TESTING

A. A formal pressure/leakage test shall be required of the water mains, valves and appurtenances in the system constructed.
   1. The pressure/leakage test shall be conducted in accordance with these specifications and the applicable requirements of AWWA C600, Section 4.
   2. Where any section of a water main is provided with concrete thrust blocks, the test shall not be made until at least 5 days have elapsed since the concrete was placed.
   3. If high-early-strength cement is used in the concrete thrust blocks, the test shall not be made until at least 2 days have elapsed since the concrete was placed.

4. Prior to testing, the pipe line or section thereof, the section to be tested shall be thoroughly flushed, and all air expelled. All air shall be expelled by appropriate methods including the use of corporation stops installed by the Contractor, at no additional cost to the Owner, at high points along the water main.
5. After all the air has been expelled, and the corporation stops closed, the test pressure shall be applied by means of a pump connected to the pipe.
6. The pump, pipe connections, and all necessary apparatus including the gages, shall be furnished by the Contractor.
7. Unless otherwise specified the test pressure shall be 180 psi or 150 percent of the working pressure, which ever is greater, but in no case shall the pressure exceed 250 psi.
8. This pressure shall be maintained for 2 hours.
9. Any excessive indicated leakage, as determined by the pressure test, shall be located and repairs made. The total leakage from the pipeline or sections thereof shall not exceed the amount shown in Table No. 1 of this Specification Section.
10. Should the pipe line or sections thereof not come within the permissible leakage limits, the Contractor (at his own expense) shall be required to excavate and locate the source of leakage and make repairs.
11. After the Contractor has notified the Owner that repairs have been made, the test shall be repeated until the pipeline or sections thereof are within the allowable leakage.

Table No. 1

Ductile and Gray Cast Iron mains
Allowable Leakage per 1000 Ft.

Avg. Test Pressure (psi)	Nominal Pipe Diameter (inches)						
	6	8	10	12	16	20	24
350	0.84	1.12	1.40	1.69	2.25	2.81	3.37
300	0.78	1.04	1.30	1.56	2.08	2.60	3.12
250	0.71	0.95	1.19	1.42	1.90	2.37	2.85
200	0.64	0.85	1.06	1.28	1.70	2.12	2.55
150	0.55	0.74	0.92	1.10	1.47	1.84	2.21
100	0.45	0.60	0.75	0.90	1.20	1.50	1.80

* Leakage allowable based on gallons per hour per 1000 feet of main.

END OF SECTION

INDEX

DIVISION 3 CONCRETE

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 DESCRIPTION

A. Work included: Provide cast-in-place concrete as required by these Specifications.
   1. In general the Contractor shall furnish all labor, materials, equipment and incidentals necessary to do all concrete work required for cast-in-place structures and manholes, pipe encasements or cradle, thrust blocking, permanent trench patch and other miscellaneous items.

1.02 RELATED WORK

A. Documents affecting the work of this Section include, but are not necessarily limited to Sections in Division 1 of these Specifications.
   1. Section 02222 Earthwork for Water Dist. Systems
   2. Section 02611 Ductile Iron Pipe and Fittings
   3. Section 02650 Thrust Blocks and Joint Restraints

PART 2 MATERIALS

2.01 CEMENT

A. Cement shall be domestic Portland cement conforming to ASTM Designation C150, Type II.

2.02 AGGREGATES

A. General
   1. Provide hard rock aggregate complying with ASTM C-33, with additional attributes as specified in this Section.

B. Fine Aggregates
   1. Shall consist of washed inert natural sand conforming to the requirements of ASTM Specification C-33, and the following detailed requirements.

SIEVE	PERCENT RETAINED
No. 4	0-5
16	25-40
50	70-87
100	93-97

C Coarse Aggregates

1. Provide coarse aggregate consisting of clean, hard, fine grained, sound crushed rock or washed gravel, conforming to the requirements of ASTM Specification C-33.
2. Use aggregates of the largest practicable size for each condition of placement, subject to the following maximum size limitations.
   a. 2 inch for plain concrete.
   b. 1 inch for reinforced sections ten (10) inches and over in thickness.
   c. 3/4 inch for reinforced sections less than ten (10) inches in thickness.
3. Grade combined aggregates within the following limits:

Percentage by Weight Passing Sieve

Sieve Size or Inch	1-1/2" Aggregate		1" Aggregate		3/4" Aggregate	
Size in Inches	Min.	Max.	Min.	Max.	Min.	Max.
1 1/2"	95	----	----	----	----	----
1"	75	90	90	100	----	----
3/4"	55	77	70	90	90	100
3/8"	40	55	45	65	60	80
No. 4	30	40	31	47	40	60
No. 8	22	35	23	40	30	45
No. 30	10	20	10	23	13	23
No. 50	2	8	2	10	5	15
No. 100	0	3	0	3	0	5

2.03 WATER

A. Use only water which is clean and free from deleterious amounts of acid, alkali, salt and organic matter.

2.04 ADMIXTURES

A. Use only a standard brand of admixture for concrete, meeting or exceeding ASTM Specification C494.
   1. All concrete which is exposed to the elements shall be air entrained.
   2. The volume of air entrainment shall not exceed five (5) percent.

2.05 REINFORCEMENT AND ACCESSORIES

A. Bars
   1. Provide deformed billet steel bars complying with ASTM A615.
   2. Grade 60.

B. Steel Wire
   1. Comply with ASTM A82.
   2. For tie wire, comply with Fed. Spec. QQ-W-461, annealed steel, black, 16 gauge minimum.

C. Welded Wire Fabric
   1. Provide welded steel, complying with ASTM A185.

2.06 NON-SHRINK GROUT

A. Non-shrink grout shall be SikaSet Plug as manufactured by Sika Corporation, Lyndhurst, NJ or an approved equal.

2.07 WATERSTOPS

A. Ribbed type waterstop shall be six (6) inches by 3/16 inches with a center bulb. The waterstop shall be No. 789 by Greenstreak or an approved equal.

PART 3 EXECUTION

3.01 CONCRETE MIXING

A. Class A Concrete
   1. Class A concrete shall have a minimum compressive strength, at 28 days, of 3500 psi, with a maximum water content of 6.4 gal./100 lbs. and a minimum cement content of 520 lbs./cu. yd.
   2. Concrete for sidewalks, encasements, arches, cradles, and structures shall have a compressive strength of 3500 psi.

B. Class B Concrete
   1. Class B concrete shall have a minimum compressive strength at 28 days of 2500 psi, with a maximum water content of 7.4 gal./100 lbs. and a minimum cement content of 430 lbs./cu. yd.
   2. Class B concrete may be mixed on site using a 1: 2.5: 5 mix and made with not less than 4.5 bags of cement per cubic yard.

C. Ready Mix Concrete
   1. Ready mix concrete shall comply with ASTM C94.

D. Concrete Admixtures
   1. Air entrainment shall be from 3 to 5 percent.

3.02 REINFORCEMENT

A. Reinforcing shall be placed as shown and specified in the Contract Documents.
   1. Reinforcement, where required, shall be accurately placed.
   2. Secured against displacement with annealed iron wire ties or suitable clips at intersections, and shall have a clear space of 2-inches between the steel and face of forms unless otherwise indicated.
   3. Wire ties passing through the forms for the purpose of holding the steel in proper position will not be allowed.
   4. Concrete blocks with wire ties cast therein may be used where approved by the Owner for the purpose of maintaining the clearance between reinforcement and forms.
   5. Reinforcing bars shall be free from rust, scale, dirt, grease and injurious contaminants

3.03 FORMS

A. Forms shall be free from roughness and imperfections, substantially watertight and adequately braced and tied to prevent motion when concrete is placed.
   1. No wooden spreaders will be allowed in the concrete.
   2. Wire ties will not be allowed.
   3. Metal ties or anchorage's which are required within the forms shall be so constructed that the metal work can be removed for a depth of at least 1-inch from the surface of the concrete without injury to such surface by spalling or otherwise.
   4. Forms shall be thoroughly cleaned before using and shall be treated with oil, or other approved material.
   5. An average temperature of 50 deg. F or higher, inside forms shall be retained for at least 48 hours and outside forms for at least 24 hours.

3.04 PLACEMENT OF CONCRETE

A. Concrete shall be carefully placed to ensure dense, compact concrete.
   1. Thoroughly spaded or vibrated into position without disturbance of pipe lines or other materials.
   2. Placed with as little slump as practicable.
   3. Pipe shall be securely braced, both vertically and horizontally, if it is to be encased, to prevent flotation.
   4. The sides of thrust blocks shall be formed.
   5. Concrete shall not be placed over bolts or nuts so as to prevent the removal of the joint gland.
   6. Backfill shall not be placed on the concrete until the concrete has set firm.
   7. Concrete shall not be placed in water or submerged within 24 hours after placing, nor shall running water be permitted to flow over the surface of fresh concrete within four days after its placing.
   8. At the base of walls in manholes and structures and where construction joints are used, install waterstops as shown on the Drawings.

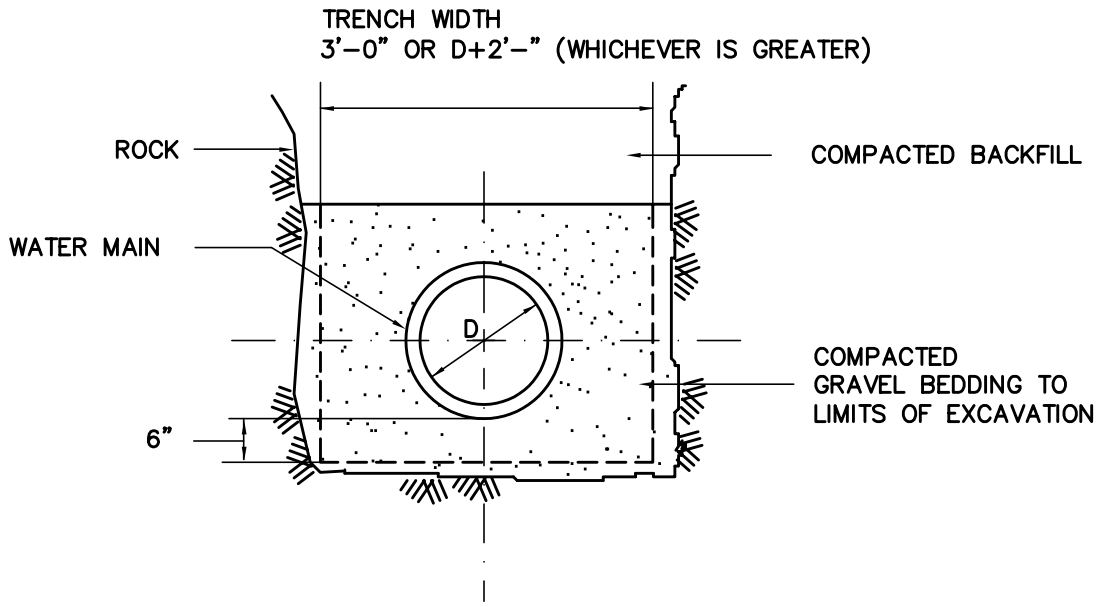
3.05 CONCRETE FINISH

A. Troweled Finish
   1. Concrete slabs shall receive a trowel finish.
      a. After the concrete has been placed, struck off, consolidated, screeded and darbied, and as soon as the condition of the slab permits, and before it has hardened appreciably, all water, film and foreign material which may work to the surface, shall be removed by means of lutes, or bull floats.

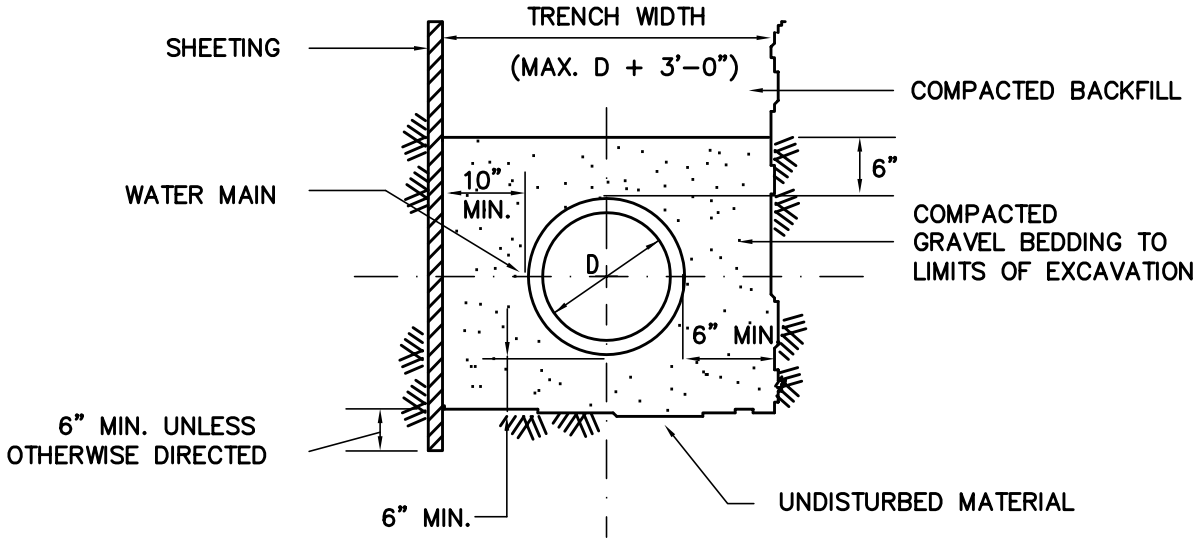
2. The surface shall be finished with hand trowels.
   a. Trowelings shall be done by hand after the surface has hardened sufficiently.
   b. The final troweling shall be done when a ringing sound is produced as the trowel is moved over the surface.
   c. The surface shall be thoroughly consolidated by the hand troweling operations.
   d. The finished surface shall be free of any trowel marks and uniform in texture and appearance.

END OF SECTION

APPENDIX A
STANDARD DETAILS



ROCK



SHEETED TRENCH OPEN TRENCH

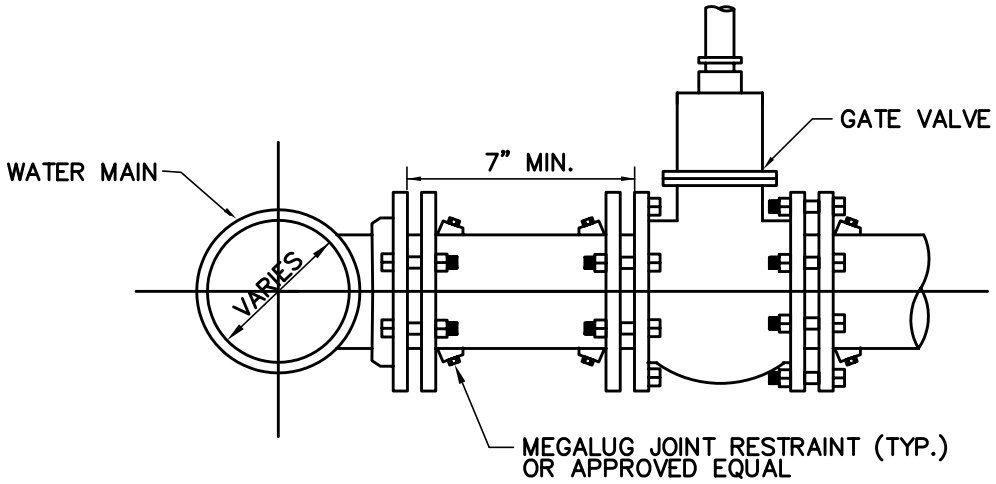
EARTH

TYPICAL TRENCH SECTIONS

SCALE : NONE

NOTE : MINIMUM DEPTH OF COVER ABOVE PIPE BARREL TO BE 5'-0"

Tata & Howard, Inc. Consulting Engineers Date: April 2006 Scale: None	Typical Trench Sections Standard Details Aquarion Water Company	Figure No. 1



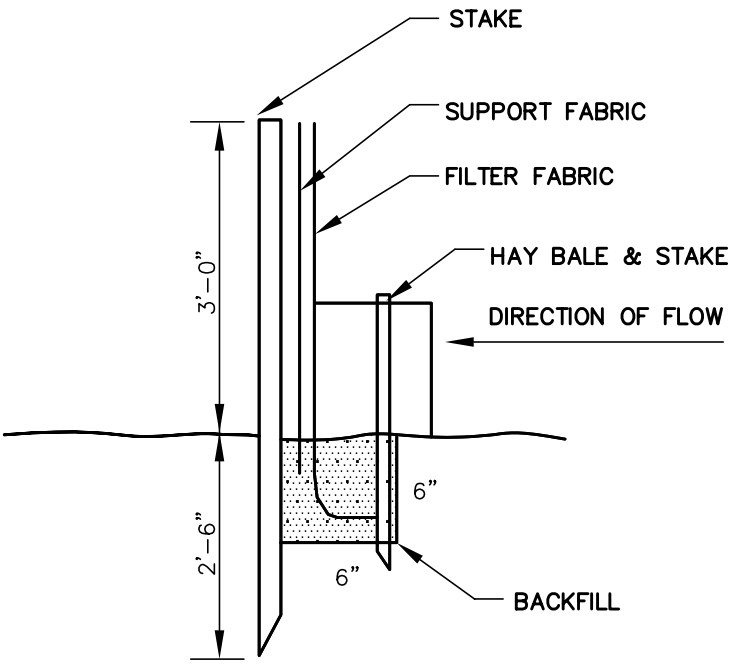
MECHANICAL JOINT RESTRAINT DETAIL

SCALE : NONE

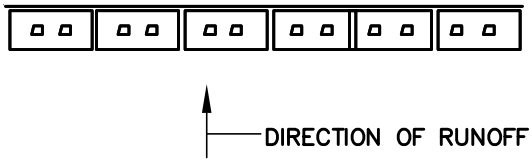
MINIMUM LENGTH OF PIPE TO BE RESTRAINED IN THE REQUIRED DIRECTION (IN FEET) Based on Ductile Iron Pipe with a 150 psi Test Pressure with 5.0 feet of Bury in Unified Soil Classification SM.					
PIPE SIZE IN.	1/4 BEND	1/8 BEND	1/16 BEND	TEES*	PLUG/CAP
6	16.0	7.0	3.0	29.0	29.0
8	21.0	9.0	4.0	29.0	38.0
10	26.0	11.0	5.0	38.0	46.0
12	33.0	14.0	6.0	48.0	69.0
16	42.0	17.0	8.0	57.0	89.0

(*) Lengths shown are for the Tee Branch. The required length of restraint for the Tee Run is 18 feet.

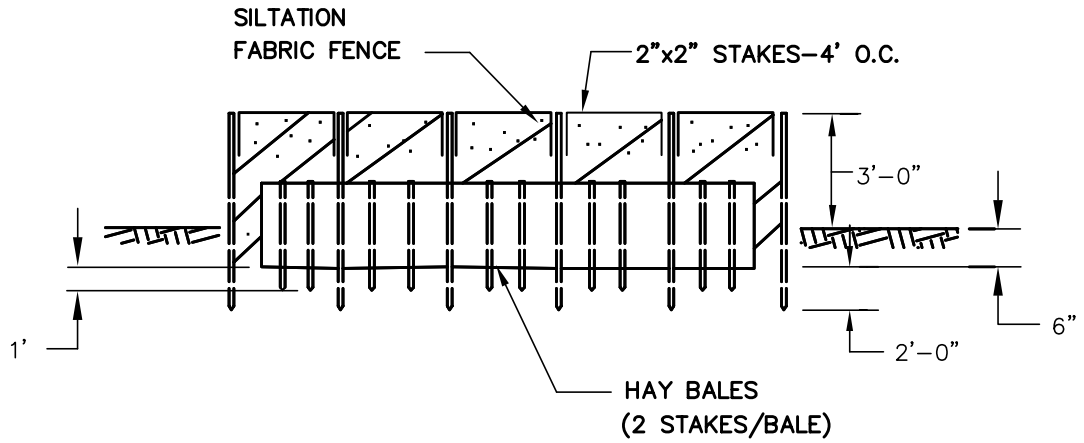
Tata & Howard, Inc. Consulting Engineers Date: April 2006 Scale: None	Mechanical Joint Restraint Details Standard Details Aquarion Water Company	Figure No. 2



SECTION



PLAN

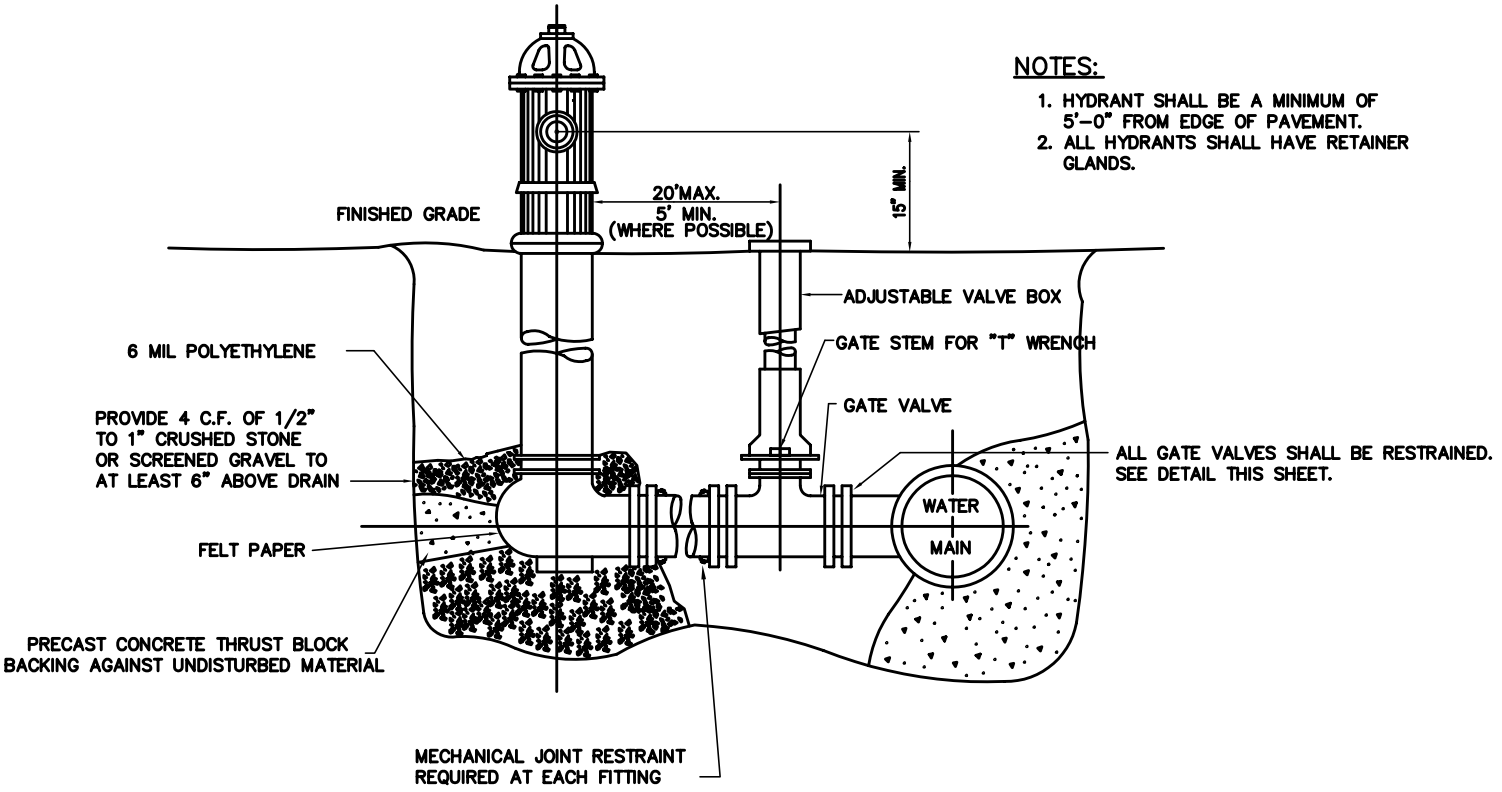


SECTION

SILT FENCE/HAY BALE EROSION CONTROL

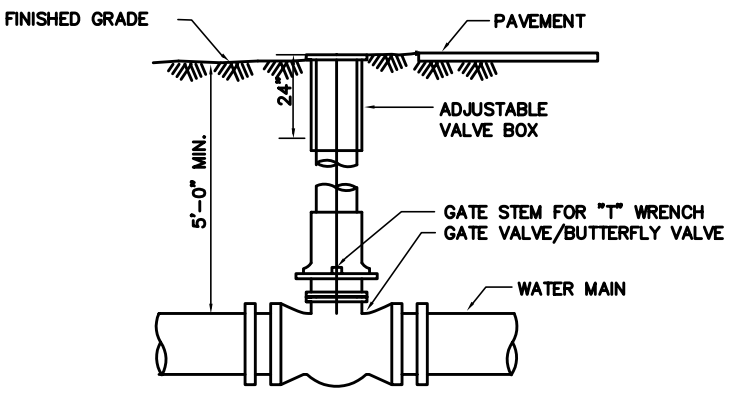
SCALE: NONE

Tata & Howard, Inc. Consulting Engineers Date: April 2006 Scale: None	Environmental Controls Details Standard Details Aquarion Water Company	Figure No. 3



TYPICAL HYDRANT AND VALVE DETAIL

SCALE: NONE

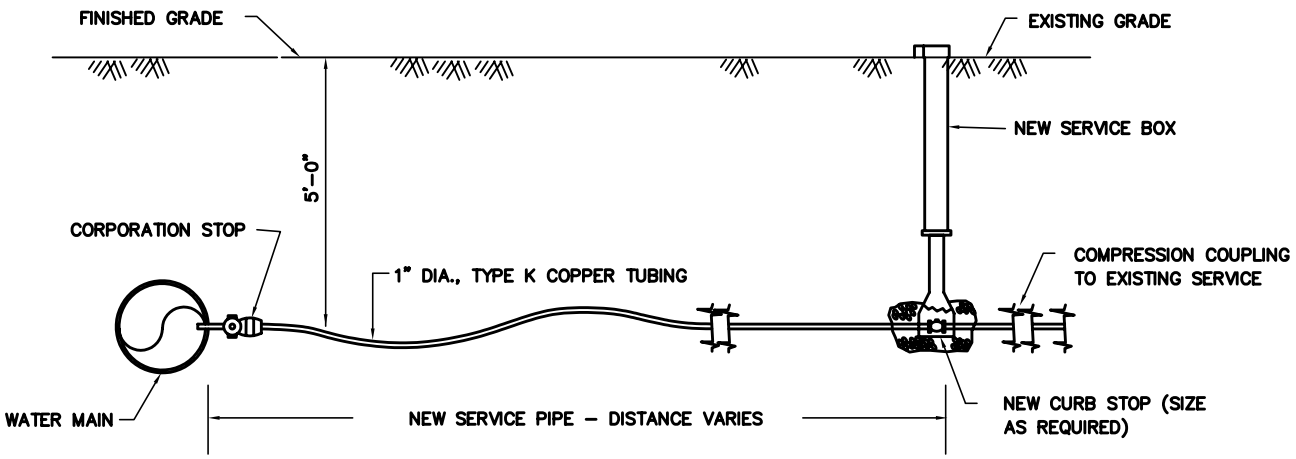


GATE VALVE DETAIL

SCALE : NONE

NOTE : ALL GATE VALVES SHALL BE RESTRAINED AS SPECIFIED

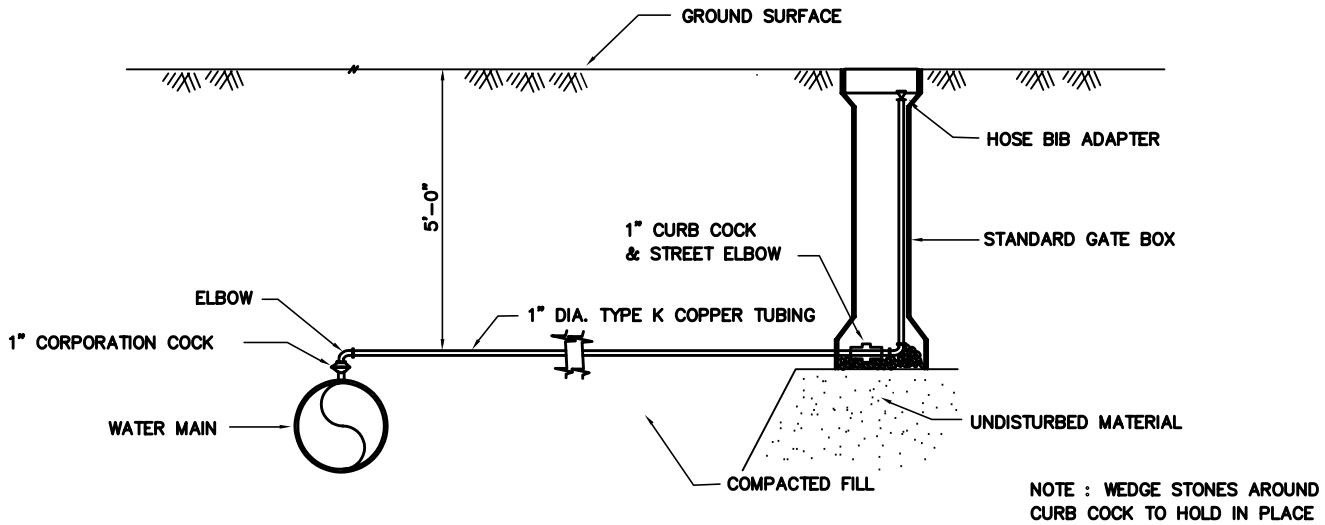
Tata & Howard, Inc. Consulting Engineers Date: April 2006 Scale: None	Typical Hydrant and Gate Valve Detail Standard Details Aquarion Water Company	Figure No. 4



TYPICAL HOUSE SERVICE CONNECTION

SCALE : NONE

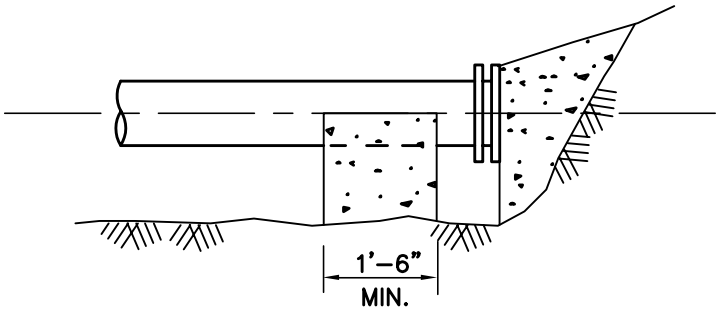
Tata & Howard, Inc. Consulting Engineers Date: April 2006 Scale: None	Typical House Service Connection Standard Details Aquarion Water Company	Figure No. 5



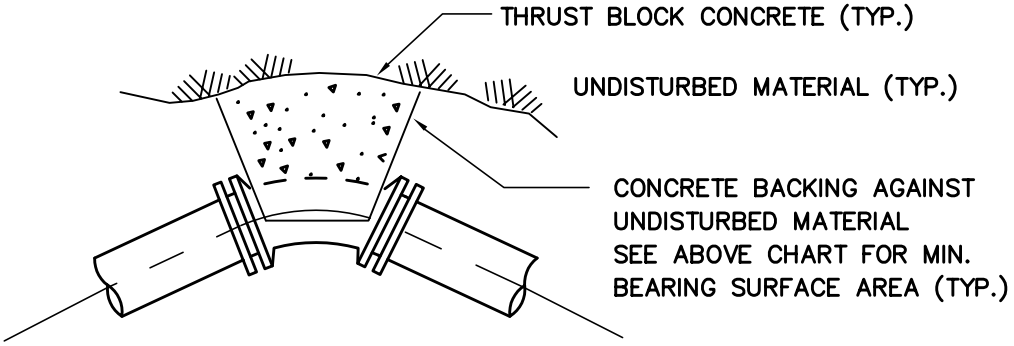
TYPICAL BLOW OFF DETAIL

SCALE : NONE

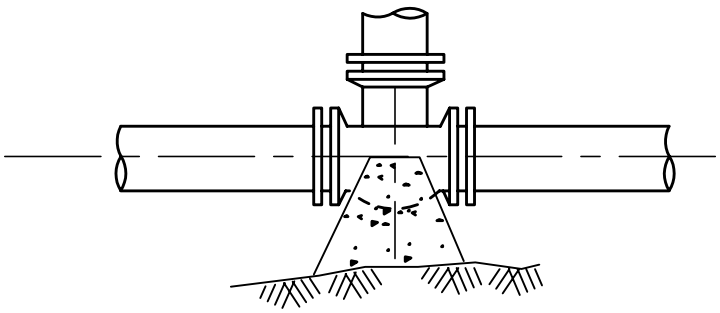
Tata & Howard, Inc. Consulting Engineers Date: April 2006 Scale: None	Typical Blowoff Detail Standard Details Aquarion Water Company	Figure No. 6



PLUG/CAP



BEND



TEE

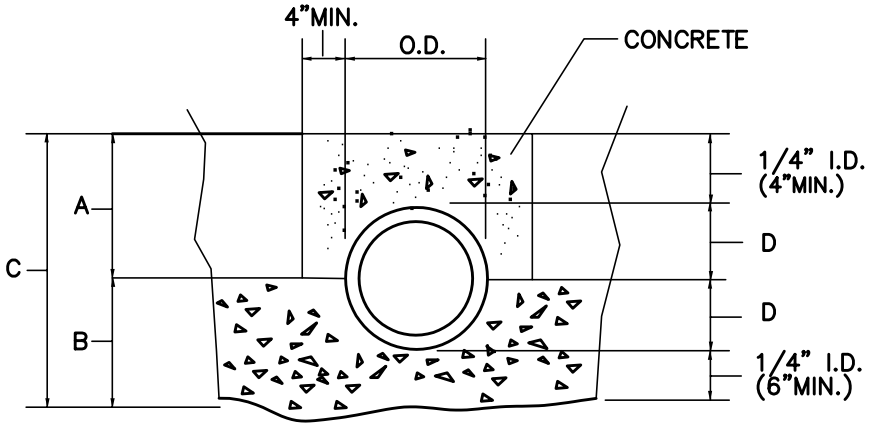
TYPICAL CONCRETE BACKING

SCALE : NONE

AREA OF BEARING FACE OF CONCRETE THRUST BLOCKS IN SQUARE FEET
Based on 250 P.S.I. & 1.5 ton/s.f. allowable soil bearing capacity

PIPE SIZE IN.	1/4 BEND	1/8 BEND	1/16 BEND	PLUG & TEES
4,6,8	6.0	11.8	2.3	4.5
10	9.6	6.7	2.3	6.7
12	13.3	5.2	3.7	9.6
16	24.0	2.9	3.7	17.0

Tata & Howard, Inc. Consulting Engineers Date: April 2006 Scale: None	Thrust Block Details Standard Details Aquarion Water Company	Figure No. 7

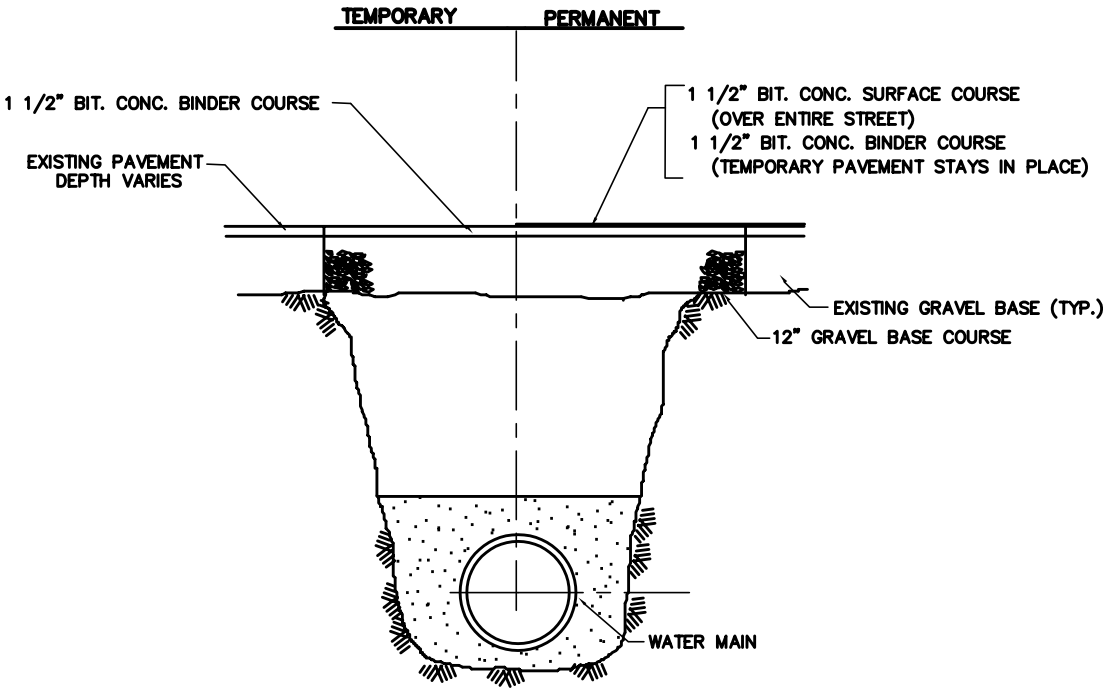


A – LIMITS FOR ENCASEMENT PLUS BEDDING.
B – LIMITS FOR CRADLE ENCASEMENT.
C – LIMITS FOR FULL ENCASEMENT.
D – 1/2 O.D.

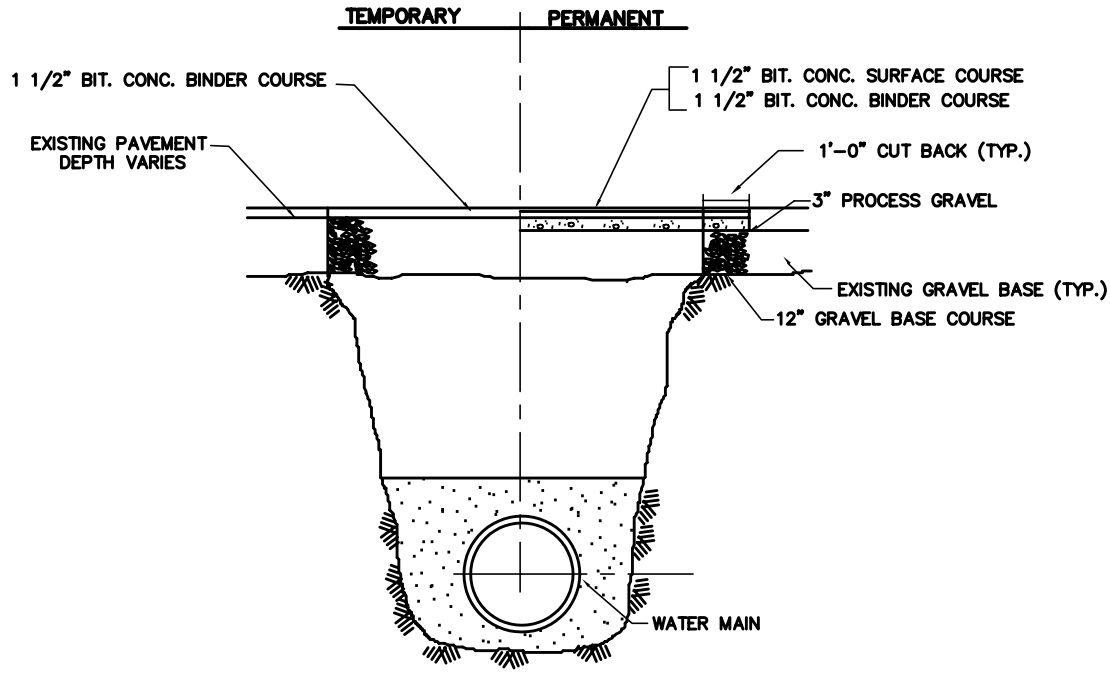
CONCRETE ENCASEMENT

SCALE : NONE

Tata & Howard, Inc. Consulting Engineers Date: April 2006 Scale: None	Typical Concrete Encasement Standard Details Aquarion Water Company	Figure No. 8



FULL WIDTH PAVEMENT
TEMPORARY OR PERMANENT
SCALE : NONE



TRENCH PAVEMENT
TEMPORARY OR PERMANENT
SCALE : NONE

Tata & Howard, Inc. Consulting Engineers Date: April 2006 Scale: None	Pavement Details Standard Details Aquarion Water Company	Figure No. 9

APPENDIX G

CONSTRUCTION DRAWINGS

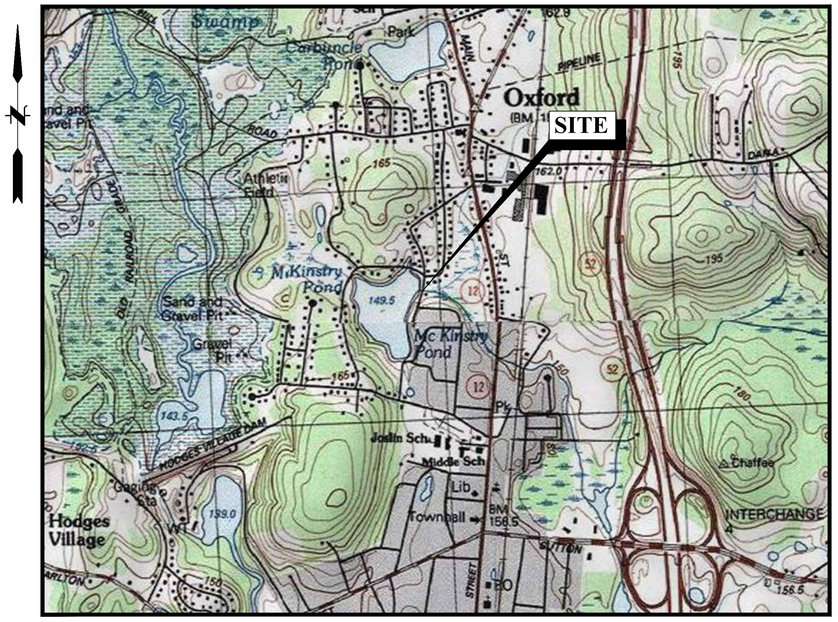
MCKINSTRY POND DAM REPAIRS

DAM # MA01953 · OXFORD · MASSACHUSETTS

CONSTRUCTION DOCUMENTS

APRIL 2025

SHEET INDEX



LOCATION MAP

SCALE: 1" = 1000'

COMMONWEALTH OF MASSACHUSETTS
MICHAEL V. NELSON
CIVIL
No. 49576
REGISTERED PROFESSIONAL ENGINEER

4/16/2025

PREPARED BY

FUSS & O'NEILL

108 MYRTLE STREET, SUITE 502
QUINCY, MA 02171
617.282.4675
www.fando.com

PREPARED FOR

TOWN OF OXFORD

PUBLIC WORKS DEPARTMENT
450 MAIN STREET
OXFORD, MA 01540

PROJ. No.: 20080026.A53
DATE: APRIL 2025

GI-001

CIVIL GENERAL NOTES

GENERAL

1. SYMBOLS AND LEGENDS OF PROJECT FEATURES ARE GRAPHIC REPRESENTATIONS AND ARE NOT NECESSARILY SHOWN ON THE DRAWINGS TO SCALE OR TO THEIR ACTUAL DIMENSION OR LOCATION. COORDINATE DETAIL SHEET DIMENSIONS, MANUFACTURERS' LITERATURE, SHOP DRAWINGS AND FIELD MEASUREMENTS OF SUPPLIED PRODUCTS FOR LAYOUT OF THE PROJECT FEATURES.
2. DO NOT RELY SOLELY ON ELECTRONIC VERSIONS OF DRAWINGS, SPECIFICATIONS, AND DATA FILES THAT ARE PROVIDED BY THE ENGINEER. FIELD VERIFY LOCATION OF PROJECT FEATURES.
3. PERFORM NECESSARY CONSTRUCTION NOTIFICATIONS, APPLY FOR AND OBTAIN NECESSARY PERMITS, PAY FEES, AND POST BONDS ASSOCIATED WITH THE WORK AS REQUIRED BY THE CONTRACT DOCUMENTS.
4. BASE PLAN: THE PROPERTY LINES SHOWN WERE DETERMINED BY MASSGIS STANDARDIZED "LEVEL 3" ASSESSORS' PARCEL MAPPING DATA. THE TOPOGRAPHY AND PHYSICAL FEATURES ARE BASED ON AN ACTUAL FIELD SURVEY PERFORMED ON THE GROUND BY FUSS & O'NEILL, INC. ON MAY 3, 2012.
5. TOPOGRAPHIC ELEVATIONS ARE BASED ON NAVD88 DATUM.
6. WETLANDS WERE DELINEATED BY FUSS & O'NEILL, INC. ON NOVEMBER 17, 2017.

WORK RESTRICTIONS

1. DO NOT CLOSE OR OBSTRUCT ROADWAYS, SIDEWALKS, FIRE HYDRANTS, AND UTILITIES WITHOUT APPROPRIATE PERMITS.
2. WORK IS RESTRICTED TO 8:00 AM TO 5:00 PM MONDAY THROUGH FRIDAY.

REGULATORY REQUIREMENTS

1. WITHIN LOCAL RIGHTS-OF-WAY, PERFORM THE WORK IN ACCORDANCE WITH LOCAL MUNICIPAL STANDARDS.
2. PROVIDE TRAFFIC SIGNAGE AND PAVEMENT MARKINGS IN CONFORMANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
3. BE RESPONSIBLE FOR SITE SECURITY AND JOB SAFETY. PERFORM CONSTRUCTION ACTIVITIES IN ACCORDANCE WITH OSHA STANDARDS AND LOCAL REQUIREMENTS.
4. DISPOSE OF DEMOLITION DEBRIS IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS, ORDINANCES AND STATUTES.

EROSION AND SEDIMENT CONTROL

1. INSTALL EROSION CONTROL MEASURES PRIOR TO STARTING ANY WORK ON THE SITE AS SHOWN ON SHEET CE-101 OR AS REQUIRED BY SITE CONDITIONS.
2. IMPLEMENT ALL NECESSARY MEASURES REQUIRED TO CONTROL STORMWATER RUNOFF, DUST, SEDIMENT, AND DEBRIS FROM EXITING THE SITE. PERFORM CORRECTIVE ACTION AS NEEDED FOR EROSION CLEANUP AND REPAIRS TO OFF SITE AREAS, IF ANY, AT NO COST TO OWNER.
3. PERFORM CONSTRUCTION SEQUENCING IN SUCH A MANNER TO CONTROL EROSION AND TO MINIMIZE THE TIME THAT EARTH MATERIALS ARE EXPOSED BEFORE THEY ARE COVERED, SEEDED, OR OTHERWISE STABILIZED.
4. DISTURBANCE OF SOIL SURFACES IS REGULATED BY STATE LAW AND LOCAL ORDINANCE. ALL WORK SHALL COMPLY WITH THE FOLLOWING CRITERIA AND OTHER PERMIT CONDITIONS TO PREVENT OR MINIMIZE SOIL EROSION AND SEDIMENTATION TO OFF-SITE AREAS.
5. THE CONTRACTOR SHALL COMPLY WITH THE LATEST EDITION OF THE "MASSACHUSETTS EROSION AND SEDIMENT CONTROL GUIDELINES FOR URBAN AND SUBURBAN AREAS" IN CONSTRUCTING THE EROSION AND SEDIMENT CONTROLS INDICATED ON THE PLANS. ALL EROSION AND SEDIMENT CONTROL MEASURES OR WORKS AND REHABILITATION MEASURES MUST CONFORM TO OR EXCEED THE SPECIFICATIONS OR STANDARDS SET OUT IN THIS DOCUMENT.
6. THE CONTRACTOR IS RESPONSIBLE FOR THE TIMELY INSTALLATION, INSPECTION, MAINTENANCE, AND/OR REPLACEMENT OF ALL TEMPORARY AND PERMANENT EROSION CONTROL DEVICES SHOWN ON THESE PLANS TO ENSURE PROPER OPERATION THROUGHOUT THE LIFE OF THE PROJECT. THE CONTRACTOR IS RESPONSIBLE FOR MAINTENANCE OF PERMANENT MEASURES UNTIL CONSTRUCTION OF THE PROJECT IS COMPLETED OR UNTIL IT IS ACCEPTED BY THE OWNER. REMOVE EROSION AND SEDIMENTATION CONTROLS AFTER STABLE VEGETATIVE GROWTH IS ESTABLISHED. DISPOSE OF SEDIMENT IN AN UPLAND AREA. DO NOT ENCUMBER OTHER DRAINAGE STRUCTURES AND PROTECTED AREAS.
7. THE CONTRACTOR SHALL INSPECT EROSION AND SEDIMENT CONTROL DEVICES ON A WEEKLY BASIS, AFTER EACH STORM EVENT, AND AT LEAST DAILY DURING PROLONGED RAINFALL. CLEAN OUT ACCUMULATED SEDIMENT BEHIND CONTROLS. REPAIR OR REPLACE CONTROLS PROMPTLY AS NEEDED. REMOVE ACCUMULATED SEDIMENT FROM BEHIND PERIMETER CONTROLS WHEN ONE-HALF OF THE ORIGINAL HEIGHT OF THE FILTER TUBES BECOME FILLED WITH SEDIMENT. REMOVE SEDIMENT FROM CATCH BASIN INLET PROTECTION IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS. DISPOSE OF REMOVED SEDIMENT IN ON-SITE FILL AREAS OR LAWFULLY OFF-SITE.
8. TREES AND OTHER EXISTING VEGETATION NOT WITHIN THE LIMITS OF DISTURBANCE SHALL BE PROTECTED FROM DAMAGE. VEGETATED AREAS AND/OR TREES DAMAGED THAT ARE NOT PLANNED FOR REMOVAL SHALL BE RESTORED TO THEIR ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE TOWN.
9. TEMPORARY VEGETATIVE COVER SHALL BE ESTABLISHED FOR ANY DISTURBED AREAS THAT HAVE NOT YET REACHED FINISHED GRADE AS SOON AS POSSIBLE, BUT NOT MORE THAN SEVEN (7) DAYS AFTER CONSTRUCTION ACTIVITY IN THAT AREA HAS TEMPORARILY CEASED, UNLESS THE ACTIVITY IS TO RESUME WITHIN THIRTY (30) DAYS. TEMPORARY VEGETATIVE COVER SHALL CONSIST OF 40% ANNUAL RYEGRASS AND 60% PERENNIAL RYEGRASS FROM APRIL 1 TO NOVEMBER 15 AND WINTER RYEGRASS BETWEEN NOVEMBER 15 AND MARCH 31. SEED AT A RATE OF 75 LBS/ACRE BY HAND.
10. PERMANENT VEGETATIVE COVER SHALL BE ESTABLISHED TO ALL DISTURBED AREAS THAT HAVE REACHED FINISHED GRADE AS SOON AS POSSIBLE, BUT NOT MORE THAN SEVEN (7) DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT AREA HAS PERMANENTLY CEASED. RECOMMENDED PERMANENT SEEDING DATES ARE APRIL 1 TO JUNE 30 AND SEPTEMBER 1 TO OCTOBER 1. PERMANENT VEGETATIVE COVER SEED MIXTURES AND APPLICATION RATES FOR SEDIMENT BASIN BOTTOM AND SIDE SLOPES ROADWAY SHOULDER AND DISTURBED AREAS OUTSIDE OF THE SEDIMENT BASIN SHALL BE IN ACCORDANCE WITH THE GRADING AND DRAINAGE PLAN. ALL PLANTINGS AND SEED SHALL BE COVERED BY A ONE-YEAR WARRANTY PERIOD; RESEEDING/RE-PLANTING SHALL BE COMPLETED TO ENSURE STABLE VEGETATIVE COVER IS ESTABLISHED OVER ALL DISTURBED AREAS.
11. IF PERMANENT SEEDING CANNOT BE COMPLETED IMMEDIATELY OR WITHIN THE RECOMMENDED SEEDING DATES, TEMPORARY BIODEGRADABLE EROSION CONTROL BLANKETING (CONTAINING NO PLASTIC COMPONENTS) OR MULCHING SHALL BE SPREAD/INSTALLED OVER ALL DISTURBED AREAS TO PROTECT THE SITE UNTIL ARRIVAL OF THE NEXT RECOMMENDED SEEDING PERIOD. MULCHING OR BLANKETING SHOULD BE INSTALLED AS SOON AS POSSIBLE IF SEEDING IS INSTALLED BETWEEN OCTOBER 1 AND MARCH 31, BUT NOT MORE THAN SEVEN (7) DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT AREA HAS TEMPORARILY CEASED UNLESS THE ACTIVITY IS TO RESUME WITHIN THIRTY (30) DAYS. IF PERMANENT SEEDING IS INSTALLED IN JULY AND AUGUST, APPLY WATER TO SEEDED AREAS ON A DAILY BASIS.
12. BLANKETING OR MULCHING MUST BE INSPECTED PERIODICALLY, IN PARTICULAR AFTER RAINSTORMS, TO CHECK FOR RILL EROSION. WHERE EROSION IS OBSERVED, ADDITIONAL MULCH MUST BE APPLIED OR BLANKETING REPAIRED OR REPLACED. INSPECTIONS SHALL TAKE PLACE UNTIL VEGETATION IS THOROUGHLY ESTABLISHED.
13. GOOD HOUSEKEEPING: THE PROJECT SITE SHALL PROVIDE FOR THE MINIMIZATION OF EXPOSURE OF CONSTRUCTION DEBRIS (INCLUDING, BUT NOT LIMITED TO, INSULATION, WIRING, PAINTS AND PAINT CANS, SOLVENTS, WALL BOARD, ETC.) TO PRECIPITATION BY MEANS OF DISPOSAL AND/OR PROPER SHELTER OR COVER. CONSTRUCTION WASTE MUST BE PROPERLY DISPOSED OF IN ORDER TO AVOID EXPOSURE TO PRECIPITATION AT THE END OF EACH WORKING DAY.
14. STORAGE AND DISPOSAL: MATERIALS WHICH COULD BE A POTENTIAL SOURCE OF STORMWATER POLLUTION SUCH AS GASOLINE, DIESEL FUEL, HYDRAULIC OIL, ETC., WILL BE STORED AT THE END OF EACH DAY IN A LOCKED STORAGE TRAILER OR COVERED LOCATION AND TAKEN OFF-SITE AND PROPERLY DISPOSED OF. ALL TYPES OF WASTE GENERATED AT THIS SITE WILL BE DISPOSED OF IN A MANNER CONSISTENT WITH STATE LAW AND/OR REGULATIONS.
15. SPILL/LEAK PROTECTION AND RESPONSE: FUEL VEHICLES AND EQUIPMENT AWAY FROM THE WETLAND AND DRAINAGE SYSTEM AND PREVENT CONTAMINATION OF SOIL, GROUNDWATER OR SURFACE WATER FROM SPILLS OR LEAKS.. DEPLOY BOOMS AND OTHER CONTAINMENT/CLEANUP MEASURES IN THE EVENT OF A SPILL OR LEAK. NOTIFY LOCAL FIRE DEPT. AND DEP IMMEDIATELY OF ANY SPILLS.
16. DEWATERING: DEWATERING SHALL BE IN ACCORDANCE WITH THE "MASSACHUSETTS EROSION AND SEDIMENT CONTROL GUIDELINES FOR URBAN AND SUBURBAN AREAS." THE CONTRACTOR SHALL SUBMIT A DEWATERING PLAN TO THE TOWN FOR REVIEW AND ACCEPTANCE PRIOR TO CONSTRUCTION.
17. TRACKING AND DUST CONTROL: IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CLEAN ADJACENT ROADS WHERE CONSTRUCTION VEHICLES HAVE TRACKED SEDIMENT FROM THE PROJECT, CONTROL DUST, AND TAKE ALL NECESSARY MEASURES TO ENSURE THAT THE SITE AND ALL ADJACENT ROADS BE MAINTAINED IN A MUD- AND DUST-FREE CONDITION AT ALL TIMES THROUGHOUT THE LIFE OF THE CONTRACT. ALL SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO THE SURROUNDING ROADWAYS MUST BE REMOVED IMMEDIATELY. DUST CONTROL MAY INCLUDE APPLICATION OF CONTROLLED AMOUNTS OF WATER ONTO AFFECTED AREAS OR OTHER CONTROL MEASURES APPROVED BY THE ENGINEER. THE TEMPORARY STONE CONSTRUCTION ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PAVED SURFACES. THE CONTRACTOR MUST PROVIDE PERIODIC TOP DRESSING WITH ADDITIONAL STONE OR ADDITIONAL LENGTH AS CONDITIONS DEMAND.
18. UPON COMPLETION OF CONSTRUCTION AND ESTABLISHMENT OF PERMANENT GROUND COVER, REMOVE AND DISPOSE OF TEMPORARY EROSION CONTROL MEASURES. CLEAN SEDIMENT AND DEBRIS FROM TEMPORARY MEASURES AND FROM PERMANENT STORM DRAIN AND SANITARY SEWER SYSTEMS.

STORMWATER INSPECTION AND MAINTENANCE PROGRAM

1. REPAIRS OR REPLACEMENT OF DRAINAGE STRUCTURES SHALL BE DONE WITHIN 30 DAYS OF DEFICIENCY REPORTS. IF AN EMERGENCY SITUATION IS IMMINENT THEN REPAIR/REPLACEMENT MUST BE DONE IMMEDIATELY TO AVERT FAILURE OR DANGER TO NEARBY RESIDENTS.
2. THE TOWN OF OXFORD SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF THE STORMWATER MANAGEMENT SYSTEM ONCE CONSTRUCTION IS COMPLETE.
3. THE FOLLOWING INSPECTION AND MAINTENANCE SCHEDULE IS REQUIRED FOR THE PROPOSED OIL-GRIT SEPARATORS AND DEEP-SUMP CATCH BASINS, FOLLOWING CONSTRUCTION:
   A. DEEP-SUMP CATCH BASINS AND OIL-GRIT SEPARATORS MUST BE INSPECTED FOUR TIMES PER YEAR. THE STRUCTURES MUST BE CLEANED TWO TIMES PER YEAR OR WHENEVER THE DEPTH OF THE SEDIMENT WITHIN THE STRUCTURES IS GREATER THAN OR EQUAL TO ONE HALF THE SUMP DEPTH.
4. THE FOLLOWING INSPECTION AND MAINTENANCE IS REQUIRED FOR STORM DRAIN PIPING AND DRAIN MANHOLES:
   A. INSPECT TWO TIMES PER YEAR (AT MINIMUM) TO CHECK FOR SEDIMENT AND DEBRIS BUILD-UP, IN ADDITION TO THE STRUCTURAL INTEGRITY OF (OR DAMAGE TO) MANHOLE STRUCTURES IN ADDITION TO THE PIPE NETWORK. SUCH DEFICIENCIES MUST BE CORRECTED IMMEDIATELY. DISPOSAL OF THE ACCUMULATED SEDIMENT AND HYDROCARBONS MUST BE IN ACCORDANCE WITH APPLICABLE LOCAL, STATE, AND FEDERAL GUIDELINES AND REGULATIONS.

CONSTRUCTION LAYOUT

1. PROVIDE PROPER TRANSITIONS BETWEEN EXISTING AND PROPOSED SITE IMPROVEMENTS. FIELD VERIFY EXISTING PAVEMENT AND GROUND ELEVATIONS AT THE INTERFACE WITH PROPOSED PAVEMENTS AND DRAINAGE STRUCTURES BEFORE START OF CONSTRUCTION.
2. PRIOR TO ORDERING MATERIALS AND BEGINNING CONSTRUCTION, FIELD VERIFY PROPOSED UTILITY ROUTES AND IDENTIFY ANY INTERFERENCES OR OBSTRUCTIONS WITH EXISTING UTILITIES OR PUBLIC RIGHTS-OF-WAY.
3. IMMEDIATELY INFORM THE ENGINEER IN WRITING IF EXISTING UTILITY CONDITIONS CONFLICT OR DIFFER FROM THAT INDICATED AND IF THE WORK CANNOT BE COMPLETED AS INDICATED.
4. DIMENSIONS ARE FROM FACE OF CURB, FACE OF BUILDING, FACE OF WALL, AND CENTER LINE OF PAVEMENT MARKINGS, UNLESS NOTED OTHERWISE.
5. BOUNDS OR MONUMENTATION DISTURBED DURING CONSTRUCTION SHALL BE SET OR RESET BY A PROFESSIONAL LICENSED SURVEYOR.

EARTHWORK

1. NOTIFY UTILITY LOCATOR SERVICE AT LEAST 72 HOURS BEFORE STARTING EXCAVATION. "DIG SAFE" AT 1-888-344-7233
2. STOP WORK IN THE VICINITY OF SUSPECTED CONTAMINATED SOIL, GROUNDWATER OR OTHER MEDIA. IMMEDIATELY NOTIFY THE OWNER SO THAT APPROPRIATE TESTING AND SUBSEQUENT ACTION CAN BE TAKEN. RESUME WORK IN THE IMMEDIATE VICINITY ONLY UPON DIRECTION BY THE OWNER.

UTILITIES

1. TERMINATE EXISTING UTILITIES IN CONFORMANCE WITH LOCAL, STATE AND INDIVIDUAL UTILITY COMPANY STANDARD SPECIFICATIONS AND DETAILS. COORDINATE UTILITY SERVICE DISCONNECTS WITH UTILITY REPRESENTATIVES.
2. THE TYPE, SIZE AND LOCATION OF DEPICTED UNDERGROUND UTILITIES ARE APPROXIMATE REPRESENTATIONS OF INFORMATION OBTAINED FROM FIELD LOCATIONS OF VISIBLE FEATURES, EXISTING MAPS AND PLANS OF RECORD, UTILITY MAPPING, AND OTHER SOURCES OF INFORMATION OBTAINED BY THE ENGINEER. ASSUME NO GUARANTEE AS TO THE COMPLETENESS, SERVICEABILITY, EXISTENCE, OR ACCURACY OF UNDERGROUND FACILITIES. FIELD VERIFY THE EXACT LOCATIONS, SIZES, AND ELEVATIONS OF THE POINTS OF CONNECTIONS TO EXISTING UTILITIES.
3. COORDINATE THE WORK AND WORK SCHEDULE WITH UTILITY COMPANIES. PROVIDE ADEQUATE NOTICE TO UTILITIES TO PREVENT DELAYS IN CONSTRUCTION.
4. INTERIOR DIAMETERS OF STORM DRAIN AND SANITARY SEWER STRUCTURES SHALL BE DETERMINED BY THE PRECAST MANUFACTURER, BASED ON THE INDICATED PIPE SYSTEM LAYOUT AND LOCAL MUNICIPAL STANDARDS.
5. RIM ELEVATIONS FOR MANHOLES, VALVE COVERS, GATE AND PULL BOXES, AND OTHER STRUCTURES ARE APPROXIMATE. SET OR RESET RIM ELEVATIONS AS FOLLOWS:

   IN PAVEMENTS AND CONCRETE SURFACES: FLUSH
   IN SURFACES ALONG ACCESSIBLE ROUTES: FLUSH
   IN LANDSCAPE, SEEDED, AND OTHER EARTH SURFACE AREAS:
   3-4" INCH ABOVE SURROUNDING AREA; TAPER EARTH TO RIM ELEVATION.

6. INSTALL PROPOSED PRIVATE UTILITY SERVICES ACCORDING TO THE REQUIREMENTS PROVIDED BY, AND APPROVED BY THE AUTHORITY HAVING JURISDICTION (WATER, SEWER, GAS, TELEPHONE, ELECTRIC, FIRE ALARM, ETC.). COORDINATE FINAL DESIGN LOADS AND LOCATIONS WITH OWNER AND ENGINEER.

SITE RESTORATION

1. PROVIDE 6 INCHES OF TOPSOIL AND SEED TO AREAS DISTURBED DURING CONSTRUCTION AND NOT DESIGNATED TO BE RESTORED WITH IMPERVIOUS SURFACES UNLESS OTHERWISE NOTED.
2. REPAIR DAMAGES RESULTING FROM CONSTRUCTION LOADS, AT NO ADDITIONAL COST TO OWNER.
3. RESTORE AREAS DISTURBED BY CONSTRUCTION OPERATIONS TO THEIR ORIGINAL CONDITION OR BETTER, AT NO ADDITIONAL COST TO OWNER.

CONSTRUCTION SEQUENCE

1. CALL "DIG SAFE" AT 1-888-344-7233 PRIOR TO ANY EXCAVATION ACTIVITIES.
2. MOBILIZE TO SITE.
3. DESIGNATE STAGING AND STOCKPILE AREAS AS INDICATED ON SHEET CE-101. INSTALL STAKED STRAWBALES SURROUNDED BY SILT FENCING AROUND STAGING AND STOCKPILE AREAS.
4. INSTALL EROSION AND SEDIMENTATION CONTROL MEASURES INDICATED ON SHEET CE-101.
5. ALLOW UNIMPEDED ACCESS TO ABUTTER DRIVEWAYS AT ALL TIMES DURING THE CONSTRUCTION PERIOD.
6. DRAW DOWN MCKINSTRY POND 3.4 FEET TO APPROXIMATE ELEVATION 490 FEET.
7. INSTALL TEMPORARY COFFERDAM AND WATER CONTROL MEASURES AS INDICATED ON SHEET CE-101. PUMPED WATER MUST BE DISCHARGED TO A SETTLING BASIN PRIOR TO DISCHARGING FROM THE WORK AREA TO THE DOWNSTREAM CHANNEL.
8. PROVIDE BYPASS FLOW REQUIRED TO THE DOWNSTREAM CHANNEL VIA A BYPASS CHANNEL, WASTE BLOCKS AND PLASTIC LINER, BULKBAGS OR SANDBAGS, PIPES, OR OTHER METHODS AS ACCEPTED BY THE ENGINEER.
9. PROTECT UTILITY POLE, GUY WIRE, AND OVERHEAD WIRES AS REQUIRED FOR PROPOSED IMPROVEMENTS.
10. REMOVE AND STORE FOR REUSE THE METAL GUARDRAIL ALONG THE DOWNSTREAM ENDWALL.
11. REMOVE AND DISPOSE OF EXISTING SPILLWAY AND ALL APPURTENANT STRUCTURES, INCLUDING TRAINING WALLS, CUTOFF WALLS, WEIR STRUCTURES, AND INTERNAL COMPONENTS WITHIN SPILLWAY STRUCTURE.
12. REMOVE AND DISPOSE OF EXISTING CATCH BASIN WITHIN PROJECT LIMITS. A NEW BENCHMARK PREVIOUSLY LOCATED AT THE EXISTING CATCH BASIN IS TO BE RE-ESTABLISHED ON SITE BY A PROFESSIONAL LAND SURVEYOR BACKFILL THE TRENCH WITH COMPACTED LOW PERMEABILITY FILL.
13. REMOVE AND DISPOSE OF EXISTING 2'X2' (APPROX.) STONE CULVERT AND STONE ENDWALL..
14. REMOVE AND DISPOSE OF UPSTREAM GRANITE BLOCK WALL.
15. CONSTRUCT PROPOSED CONCRETE WEIRBOARD STRUCTURE AS INDICATED ON SHEETS CS-101, STR-01, AND STR-02.
16. PROVIDE PROPOSED MAINTENANCE ACCESS LADDERS AND GALVANIZED STEEL GRATING COVERING FOR THE PROPOSED CONCRETE WEIRBOARD STRUCTURE.
17. CONSTRUCT PROPOSED CONCRETE CRADLE AND PROVIDE 2 - 24" HDPE PIPES AS INDICATED ON SHEETS CS-101, STR-01, STR-02, AND CD-503. BACKFILL HDPE PIPES AND CRADLE.
18. CONSTRUCT PROPOSED DOWNSTREAM CONCRETE HEADWALL AND FOOTING AS INDICATED ON SHEETS CS-101, STR-01, AND STR-02.
19. PROVIDE 18" THICK NATURAL STONE ARMOR APRON WITHIN THE DOWNSTREAM CHANNEL TO THE EXTENTS INDICATED ON SHEET CS-101.
20. PROVIDE ALUMINUM WEIRBOARDS AND STAINLESS STEEL TRASH RACK WITHIN PROPOSED CONCRETE WEIRBOARD STRUCTURE. SET TOP OF WEIR ELEVATION TO 493.35 FT.
21. REGRADE UPSTREAM SLOPE AND DAM EMBANKMENT CREST TO THE PROPOSED GRADES NOTED IN THE PLANS. THE TOP OF DAM IS TO BE SET TO ELEVATION 495.8 FEET.
22. PROVIDE 18" THICK NATURAL STONE ARMORING ON THE UPSTREAM FACE OF THE DAM EMBANKMENT AND WITHIN THE APPROACH AREA TO THE PROPOSED CONCRETE WEIRBOARD STRUCTURE.
23. PROVIDE AND INSTALL PROPOSED STORMWATER DRAINAGE STRUCTURES AS INDICATED ON SHEET CS-101. SEE SHEET CD-502 FOR ADDITIONAL DETAILS.
24. GRADE DOWNSTREAM AREA AROUND PROPOSED CONCRETE ENDWALL AS SHOWN ON SHEET CS-101 AND RESTORE ALL OTHER DISTURBED AREAS IN DOWNSTREAM AREA TO ORIGINAL OR IMPROVED CONDITION.
25. REPAIR WAITE STREET ALONG THE ROADWAY ALIGNMENT INDICATED ON SHEET CS-101. REMOVE EXISTING PAVEMENT WITHIN THE LIMITS OF WORK. ROADWAY REPAIR SECTIONS TO CONFORM TO MASS HIGHWAY DEPARTMENT AND TOWN OF OXFORD SUBDIVISION RULES AND REGULATIONS. SEE ROADWAY PROFILE ON SHEET STR-02. SEE SHEET CD-503 FOR A TYPICALROADWAY SECTION DETAIL.
26. PROVIDE HOT MIX ASPHALT CURBING ALONG WAITE STREET WITHIN PROJECT AREA PER MASSDOT CONSTRUCTION STANDARDS. SEE SHEET CD-502 FOR TYPICAL DETAILS.
27. CONSTRUCT GRAVEL ACCESS DRIVE FROM WAITE STREET TO THE PROPOSED CONCRETE WEIRBOARD STRUCTURE AS SHOWN ON SHEET CS-101.
28. PROVIDE ASPHALT DRIVEWAY APRONS AS INDICATED ON SHEET CS-101 TO PROTECT DRIVEWAY SURFACES AND PREVENT POOLING WATER.
29. PROVIDE CHAIN LINK FENCE AND GATE AROUND PROPOSED CONCRETE WEIRBOARD STRUCTURE. SEE SHEET CD-503 FOR TYPICAL DETAILS.
30. REINSTALL METAL GUARDRAIL ADJACENT TO THE PROPOSED CONCRETE ENDWALL AS SHOWN ON SHEET CS-101.
31. UPON COMPLETION OF CONSTRUCTION, REMOVE TEMPORARY COFFERDAMS, WATER CONTROL MEASURES, AND BYPASS SYSTEMS.
32. UPON COMPLETION OF CONSTRUCTION AND ESTABLISHMENT OF PERMANENT GROUND COVER, REMOVE AND DISPOSE OF TEMPORARY EROSION CONTROL MEASURES. CLEAN SEDIMENT AND DEBRIS FROM TEMPORARY MEASURES AND FROM PERMANENT STORM DRAIN AND SANITARY SEWER SYSTEMS.
33. RESTORE DISTURBED AREAS WITHIN THE PROJECT LIMITS TO THE ORIGINAL OR AN IMPROVED CONDITION. SEE "SITE RESTORATION NOTES"
34. DEMOBILIZE FROM SITE.

EXISTING CONDITIONS LEGEND

- UTILITY POLE
- GUY WIRE
- CATCH BASIN
- SIGN
- PINE TREE
- DECIDUOUS TREE
- EDGE OF WATER (DATE OBSERVED)
- EXISTING CONTOUR
- INDEX CONTOUR (00)
- WOOD RAIL FENCE
- GUARDRAIL
- STORM DRAINAGE PIPE
- OVERHEAD WIRES
- BORDERING VEGETATED WETLAND LIMIT (B100 / B101)
- MEAN HIGH WATER (MHW)
- APPROXIMATE PROPERTY LINE

PROPOSED CONDITIONS LEGEND

- LIMIT OF DISTURBANCE (LOD)
- TEMPORARY COFFERDAM ALIGNMENT
- SILT FENCE (SF)
- STRAWBALES
- TEMPORARY HYDROCARBON ABSORPTION BOOM (HB)
- PROPOSED CONTOUR (1') (100)
- PROPOSED CONTOUR (5')
- CHAIN LINK FENCE
- EDGE OF WATER
- GUARDRAIL
- NATURAL STONE ARMOR
- GRAVEL ACCESS DRIVE
- TEMPORARY CONSTRUCTION ACCESS
- PERMANENT RESOURCE AREA IMPACT
- TEMPORARY RESOURCE AREA IMPACT
- MISCELLANEOUS DEMOLITION
- BITUMINOUS PAVEMENT

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PC3: AUTOCAD PDF (GENERAL DOCUMENTATION).PC3 STB\CTB: FO.STB
MS VIEW: LAYER STATE:

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SEAL

COMMONWEALTH OF MASSACHUSETTS — MICHAEL V. NELSON — No. 49576 — REGISTERED PROFESSIONAL ENGINEER — CIVIL

4/16/2025

SEAL

SCALE:
HORZ.: NOT TO SCALE
VERT.:
DATUM:
HORZ.: -
VERT.: -

FUSS & O'NEILL
108 MYRTLE STREET, SUITE 502
QUINCY, MA 02171
617.282.4675
www.fando.com

TOWN OF OXFORD

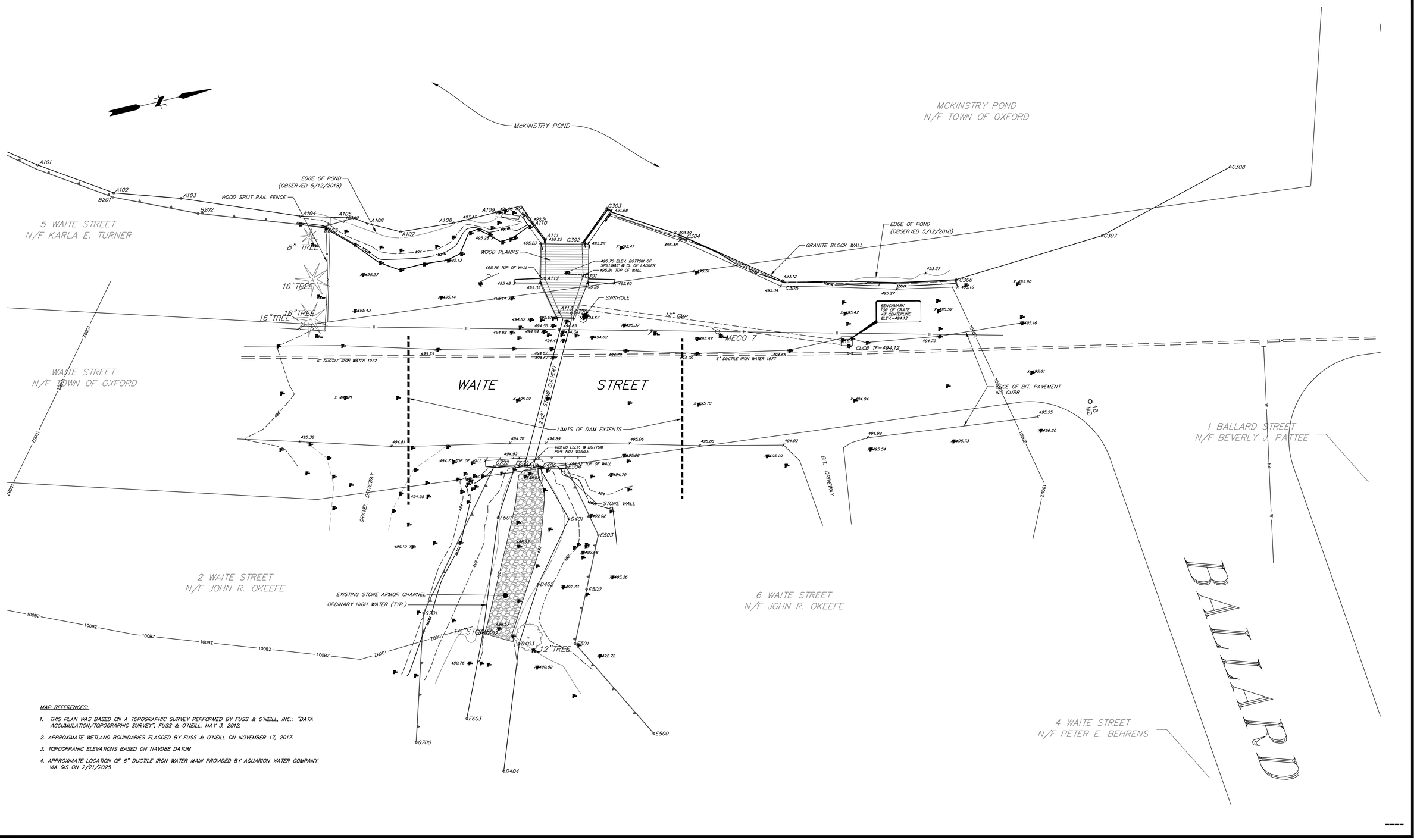
GENERAL NOTES AND INFORMATION

MCKINSTRY POND DAM REPAIRS

OXFORD MASSACHUSETTS

PROJ. No.: 20080026.A53
DATE: APRIL 2025

GI-002



MAP REFERENCES:

1. THIS PLAN WAS BASED ON A TOPOGRAPHIC SURVEY PERFORMED BY FUSS & O'NEILL, INC.: "DATA ACCUMULATION/TOPOGRAPHIC SURVEY", FUSS & O'NEILL, MAY 3, 2012.
2. APPROXIMATE WETLAND BOUNDARIES FLAGGED BY FUSS & O'NEILL ON NOVEMBER 17, 2017.
3. TOPOGRAPHIC ELEVATIONS BASED ON NAVD88 DATUM
4. APPROXIMATE LOCATION OF 6" DUCTILE IRON WATER MAIN PROVIDED BY AQUARION WATER COMPANY VIA GIS ON 2/21/2025

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SEAL

COMMONWEALTH OF MASSACHUSETTS
MICHAEL V. NELSON
CIVIL
No. 49576
REGISTERED PROFESSIONAL ENGINEER

4/16/2025

SEAL

SCALE:
HORZ.: 1" = 10'
VERT.: -
DATUM:
HORZ.: -
VERT.: -
0 5' 10' 20'
GRAPHIC SCALE

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QUINCY, MA 02171
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TOWN OF OXFORD

EXISTING SITE PLAN

MCKINSTRY POND DAM REPAIRS

OXFORD MASSACHUSETTS

PROJ. No.: 20080026.A53
DATE: APRIL 2025

EX-101

File: J:\DWG\P20080026\A53\Civil\Plan\20080026.A53_EX01.dwg Layout: EX-101 Plotted: 2025-04-14 11:16 AM Saved: 2025-04-14 11:03 AM User: abigail.meyers
PC3: AUTOCAD PDF (GENERAL DOCUMENTATION).PC3 STB/CTB: FO.STB
LAYER STATE:
MS VIEW:

5-5673

8" TREE
EDGE OF POND
16" TREE
WOOD SPLIT RAIL FENCE
N73°06'48"W 24.63'
16" TREE
N16°36'25"E 244.00'
3.86'
IP FD UP 0.3' OFF S75°06'E 1.64'
WOOD PLANKS
GRANITE BLOCK WALL
MCKINSTRY POND
TOWN OF OXFORD
BK. 5483 PG. 157
PARCEL 1
PL. BK. 396 PL. 71
ASSESSOR MAP 29D LOT A07
N5°36'25"E 233.05'
236.91'
EDGE OF POND
12" CMP
UP 7
CB
EP
2'x2' STONE CULVERT
FOREST STREET
(PL. BK. 188 PL. 116
PUBLIC – 40' WIDE)
N73°05'36"W 140.74'
NAD 83
PL. BK. 768 PL. 119
(TIE COURSE)
N5°36'25"E 40.79'
SB W/ DH FD FLUSH
4.49'
2x2 IB X-CUT FD
107.81'
N5°36'25"E 112.30'
A) HELD FOR LINE
B) HELD

WAITE STREET
(1931 TOWN LAYOUT BK. 2538 PG. 292
PUBLIC – 41 WIDE)

EP
GRAVEL DRIVE
STONE WALL
PE B
375± S.F.
0.009± ACRES
N16°36'25"E 238.50'
IP BASE FD DN 0.5'
A) HELD BASE
25.57'
N5°36'25"E
6'±
25.84'±
27.11'±
166.16'
25'±
11'±
PE A
484± S.F.
0.011± ACRES
16.00'
N84°15'33"W
23.00'
S78°29'07"E
S84°23'55"E 9.00'
S2°35'52"E 21.00'
25'±
S66°47'48"E 13.00'
37'±
S21°54'44"W 24.50'±
S23°12'12"W 5.00'±
28'±
TE B-2
247± S.F.
TE B-1
408± S.F.
TE A
710± S.F.
16"STUMP
12"TREE
21'±
16'±
28'±
10'±
EDGE OF WATER
57.38'
EP
PAVED DRIVE
MD
L=27.46'
R=20.00'
N5°36'25"E (TIE COURSE) 81.59'
IP FD DN 0.1' OFF N53°36'E 0.80'
N5°36'25"E 156.24'
L=35.38'
R=20.00'
IP FD DN 0.1' OFF N53°54'W 0.53'
PL. BK. 662 PL. 24
FOR REGISTRY USE

O'KEEFE REALTY TRUST
BK. 56647 PG. 38
P/O PARCEL 1 PL. BK. 240 PL. 96
PARCEL II PL. BK. 394 PL 115, LOT B
SEE ALSO PL. BK. 974 PL. 101
PARCEL B-R
ASSESSOR MAP 29C LOT B0801

ROBERT W. GREGSON
SANDRA E. GREGSON
BK. 6672 PG. 181
PL. BK. 362 PL. 6
LOT 9
ASSESSOR MAP 29C LOT B06

BALLARD STREET
(PL. BK. 662 PL. 24
PL. BK. 362 PG. 6
40' WIDE)
N84°15'51"E 60.88'
N84°15'51"E 218.89'
80.00'
S84°15'51"W 76.93'
IP BASE FD OFF N18°07'W 0.45'
IP FD DN 0.6' OFF S39°08'W 0.35'
75.00'
CB W/ DH FD UP 0.3'
B) HELD FOR LINE

LEGEND

UP	UTILITY POLE
CB	CATCH BASIN
SB	STONE BOUND
CB	CONCRETE BOUND
IP	IRON PIPE
IB	IRON BAR
MD	METAL DETECTION
DH	DRILL HOLE
EP	EDGE OF PAVEMENT
FD	FOUND
EASEMENT LINE	
ABUTTER LINE	

GRAPHIC SCALE
10 0 5 10 20 40
(IN FEET)
1 INCH = TEN FEET

THE PROPERTY LINES SHOWN ARE THE LINES DIVIDING EXISTING OWNERSHIPS AND THE LINES OF STREETS AND WAYS SHOWN ARE THOSE OF PUBLIC OR PRIVATE STREETS OR WAYS ALREADY ESTABLISHED. NO NEW LINES FOR DIVISION OF EXISTING OWNERSHIP OR FOR NEW WAYS ARE SHOWN.

ALSO, I CERTIFY THAT THIS PLAN HAS BEEN PREPARED IN CONFORMITY WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS.

_____ DATE: _____

NOTES:

1. PERMANENT EASEMENTS (PE) ARE IN THE FAVOR OF THE TOWN OF OXFORD.
2. TEMPORARY EASEMENTS (TE) SHOWN ARE FOR CONSTRUCTION PURPOSES AND ARE IN FAVOR IN THE TOWN OF OXFORD.
3. PROPERTY LINE INFORMATION SHOWN ON THIS PLAN IS BASED ON RECORD INFORMATION AND NOT A FULL PROPERTY LINE SURVEY BY THIS OFFICE.
4. DETAIL SHOWN HEREON WAS PROVIDED BY THE CLIENT.
5. WAITE STREET LAYOUT DEED BOOK 2538 PAGE 292 41' WIDE BASED ON THE NORTH END OF LAYOUT HAS BEEN ROTATED ONTO MONUMENTS AS SHOWN AS "A)". BALLARD STREET HELD PLAN BOOK 662 PLAN 24 ROTATED ONTO MONUMENTS SHOWN AS "B", ADJUSTMENTS MADE AT INTERSECTION OF WAITE AND BALLARD STREETS BY INTERSECTING WITH A 20' RADIUS CURVE BETWEEN THE TWO STREETS. SUBJECT TO A CONFIRMATORY LAYOUT, MAY BE REVISED AMENDED OR CONFIRMED.
6. HORIZONTAL DATUM REFERS TO THE MASSACHUSETTS COORDINATE SYSTEM, NAD83, MAINLAND ZONE. DATUM WAS ESTABLISHED AT THIS SITE BY LOCAL GPS OBSERVATIONS ON THE MASSCORS NETWORK.

NO.	DATE	BY	REVISIONS

SHERMAN & FRYDRYK
Land Surveying, Engineering & Scientists
A DIVISION OF HANCOCK SURVEY ASSOCIATES, INC.
3 Converse Street, Suite 203
Palmer, MA 01069

FIELD WORK: TJC/ESJ
COMPS: KJM/TRF
DRAFTING: AMT
CHECKED: TRF
APPROVED: GGG

SCALE:
HORZ: 1"=10'
VERT: N/A
DATE: 04/02/2025

EASEMENT PLAN

WAITE STREET

PLAN OF LAND IN
OXFORD, MA
PREPARED FOR
TOWN OF OXFORD

PROJECT NUMBER
24208

SHEET NUMBER
1 OF 1

24208-E.DWG
5-5673

LIMIT OF DISTURBANCE (TYP.)

REMOVE AND DISPOSE EXISTING SPILLWAY INTAKE STRUCTURE

INSTALL TEMPORARY COFFERDAMS (TYP.)

TEMPORARY CONVEYANCE STRUCTURE

PROTECT WOOD SPLIT RAIL FENCE ADJACENT TO CONSTRUCTION SITE

PROTECT OR RELOCATE UTILITY POLE AND OVERHEAD WIRES AS REQUIRED FOR PROPOSED IMPROVEMENTS

REMOVE AND STOCKPILE EXISTING GRANITE BLOCK WALL

INSTALL TEMPORARY MATTING (TIMBER, HDPE, OR APPROVED EQUIVALENT) WITHIN WETLAND AREA FOR CONSTRUCTION OF UPSTREAM FEATURES (TYP.)

INSTALL CONSTRUCTION ENTRANCE TO WORK AREA FROM WAITE STREET (TYP.)

TO STAGING AREA #3 (SEE INSET)

PROTECT TREES ADJACENT TO CONSTRUCTION SITE (TYP.)

STAGING AND STOCKPILE AREA #1

STAGING AND STOCKPILE AREA #2

REMOVE AND DISPOSE EXISTING 2'X'2' STONE CULVERT

STRAWBALES BACKED BY SILT FENCE (TYP.)

ALLOW UNIMPEDED ACCESS TO ABUTTER DRIVEWAY AT ALL TIMES DURING CONSTRUCTION PERIOD

FULL DEPTH SAWCUT (TYP.)

REMOVE AND DISPOSE EXISTING CATCH BASIN AND 12" CMP DRAIN PIPE

STRAWBALES BACKED BY SILT FENCE (TYP.)

CATCH BASIN INLET PROTECTION (USE UNTIL CATCH BASIN IS REMOVED)

ALLOW UNIMPEDED ACCESS TO ABUTTER DRIVEWAY AT ALL TIMES DURING CONSTRUCTION PERIOD

REMOVE AND DISPOSE HEADWALL

REMOVE AND DISPOSE EXISTING GUARDRAIL

INSTALL TEMPORARY HYDROCARBON ABSORPTION BOOM (TYP.)

INSTALL STONE CHECKDAM WITHIN DOWNSTREAM CHANNEL (TYP.)

INSTALL PUMP AND SETTLING BASIN FOR MAINTAINING DRY WORK AREA ALONG HEEL OF DAM (TYP.). BASIN LOCATION VARIES. DISCHARGE WATER TO DOWNSTREAM CHANNEL.

NOTE:

- THE IMPOUNDMENT (MCKINSTRY POND) SHALL BE DRAWN DOWN TO 4.4 FEET TO APPROXIMATELY ELEVATION 489 FEET.

EROSION CONTROL NOTE:

CATCH BASIN INLET PROTECTION DEVICE SHALL BE INSTALLED IN EXISTING CATCH BASIN STRUCTURE UNTIL REMOVED. ALTHOUGH NOT SHOWN ON THIS PLAN, CATCH BASIN INLET PROTECTION DEVICES SHALL ALSO BE TEMPORARILY INSTALLED IN ALL NEW CATCH BASINS FOLLOWING INSTALLATION UNTIL ALL DISTURBED AREAS ARE ADEQUATELY STABILIZED.

EROSION AND SEDIMENTATION CONTROL PLAN INSET

NOT TO SCALE

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
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SEAL

COMMONWEALTH OF MASSACHUSETTS
MICHAEL V. NELSON
CIVIL
No. 49576
REGISTERED PROFESSIONAL ENGINEER

4/16/2025

SEAL

SCALE:
HORZ.: 1" = 10'
VERT.: -
DATUM:
HORZ.: -
VERT.: -
0 5' 10' 20'
GRAPHIC SCALE

FUSS & O'NEILL
108 MYRTLE STREET, SUITE 502
QUINCY, MA 02171
617.282.4675
www.fando.com

TOWN OF OXFORD

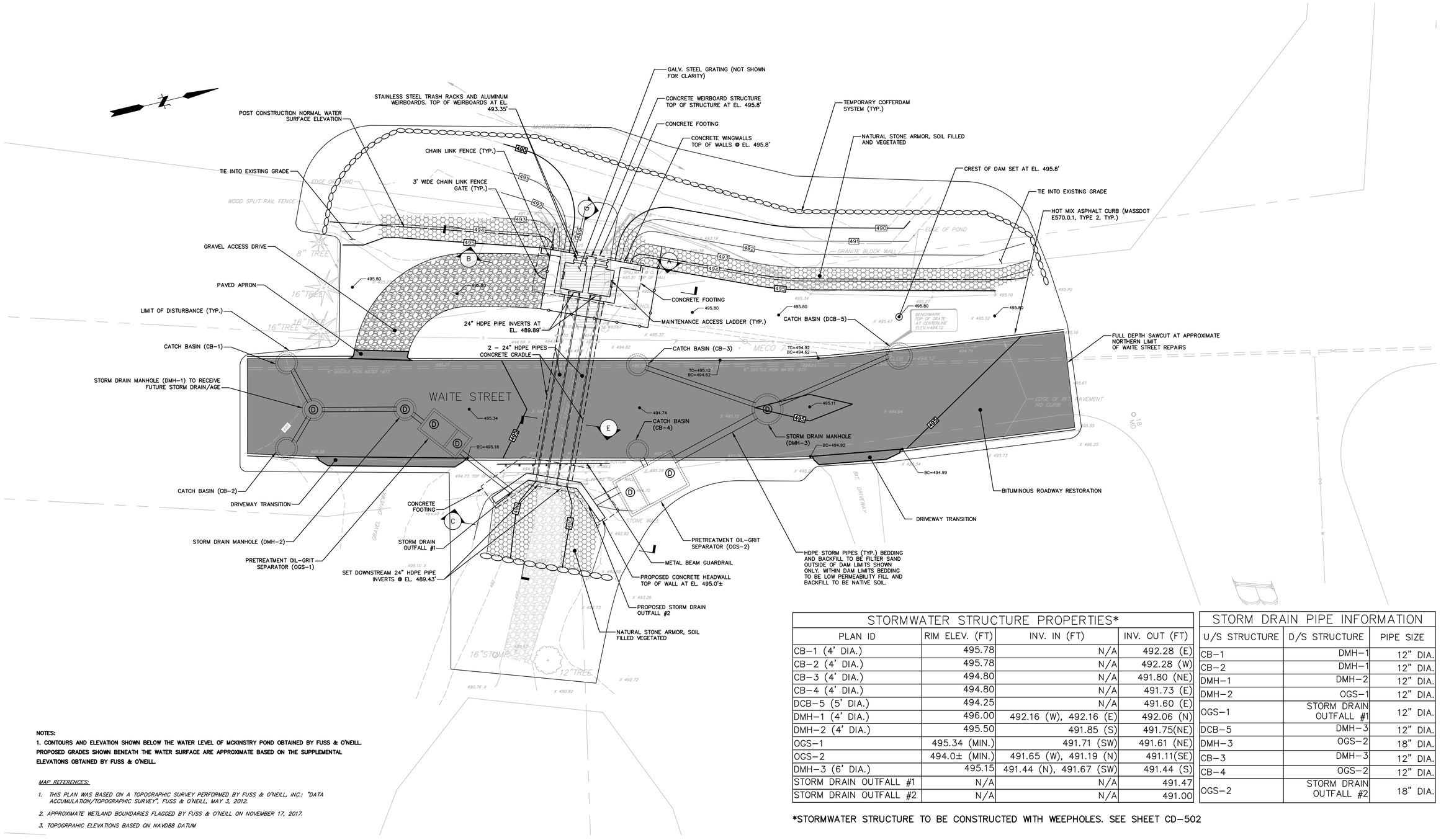
SITE PREPARATION, EROSION CONTROL, AND WATER CONTROL PLAN

MCKINSTRY POND DAM REPAIRS

OXFORD MASSACHUSETTS

PROJ. No.: 20080026.A53
DATE: APRIL 2025

CE-101



NOTES:

1. CONTOURS AND ELEVATION SHOWN BELOW THE WATER LEVEL OF MCKINSTRY POND OBTAINED BY FUSS & O'NEILL. PROPOSED GRADES SHOWN BENEATH THE WATER SURFACE ARE APPROXIMATE BASED ON THE SUPPLEMENTAL ELEVATIONS OBTAINED BY FUSS & O'NEILL.

MAP REFERENCES:

1. *THIS PLAN WAS BASED ON A TOPOGRAPHIC SURVEY PERFORMED BY FUSS & O'NEILL, INC.: "DATA ACCUMULATION/TOPOGRAPHIC SURVEY", FUSS & O'NEILL, MAY 3, 2012.*
2. *APPROXIMATE WETLAND BOUNDARIES FLAGGED BY FUSS & O'NEILL ON NOVEMBER 17, 2017.*
3. *TOPOGRPAHIC ELEVATIONS BASED ON NAVD88 DATUM*

STORMWATER STRUCTURE PROPERTIES*			
PLAN ID	RIM ELEV. (FT)	INV. IN (FT)	INV. OUT (FT)
CB-1 (4' DIA.)	495.78	N/A	492.28 (E)
CB-2 (4' DIA.)	495.78	N/A	492.28 (W)
CB-3 (4' DIA.)	494.80	N/A	491.80 (NE)
CB-4 (4' DIA.)	494.80	N/A	491.73 (E)
DCB-5 (5' DIA.)	494.25	N/A	491.60 (E)
DMH-1 (4' DIA.)	496.00	492.16 (W), 492.16 (E)	492.06 (N)
DMH-2 (4' DIA.)	495.50	491.85 (S)	491.75(NE)
OGS-1	495.34 (MIN.)	491.71 (SW)	491.61 (NE)
OGS-2	494.0± (MIN.)	491.65 (W), 491.19 (N)	491.11(SE)
DMH-3 (6' DIA.)	495.15	491.44 (N), 491.67 (SW)	491.44 (S)
STORM DRAIN OUTFALL #1	N/A	N/A	491.47
STORM DRAIN OUTFALL #2	N/A	N/A	491.00

STORM DRAIN PIPE INFORMATION		
U/S STRUCTURE	D/S STRUCTURE	PIPE SIZE
CB-1	DMH-1	12" DIA.
CB-2	DMH-1	12" DIA.
DMH-1	DMH-2	12" DIA.
DMH-2	OGS-1	12" DIA.
OGS-1	STORM DRAIN OUTFALL #1	12" DIA.
DCB-5	DMH-3	12" DIA.
DMH-3	OGS-2	18" DIA.
CB-3	DMH-3	12" DIA.
CB-4	OGS-2	12" DIA.
OGS-2	STORM DRAIN OUTFALL #2	18" DIA.

*STORMWATER STRUCTURE TO BE CONSTRUCTED WITH WEEPHOLES. SEE SHEET CD-502

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
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SEAL

COMMONWEALTH OF MASSACHUSETTS MICHAEL V. NELSON CIVIL No. 49076 REGISTERED PROFESSIONAL ENGINEER

4/16/2025

SEAL

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VERT.: -
DATUM:
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VERT.: -
0 5' 10' 20'
GRAPHIC SCALE

FUSS & O'NEILL
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www.fando.com

TOWN OF OXFORD

PROPOSED SITE PLAN

MCKINSTRY POND DAM REPAIRS

OXFORD MASSACHUSETTS

PROJ. No.: 20080026.A53
DATE: APRIL 2025

CS-101

File: J:\DWG\P20080026\A53\Civil\Plan\20080026.A53_STP01.dwg Layout: CS-101 Plotted: 2025-04-14 11:17 AM Saved: 2025-04-07 12:22 PM User: abigail.meyers
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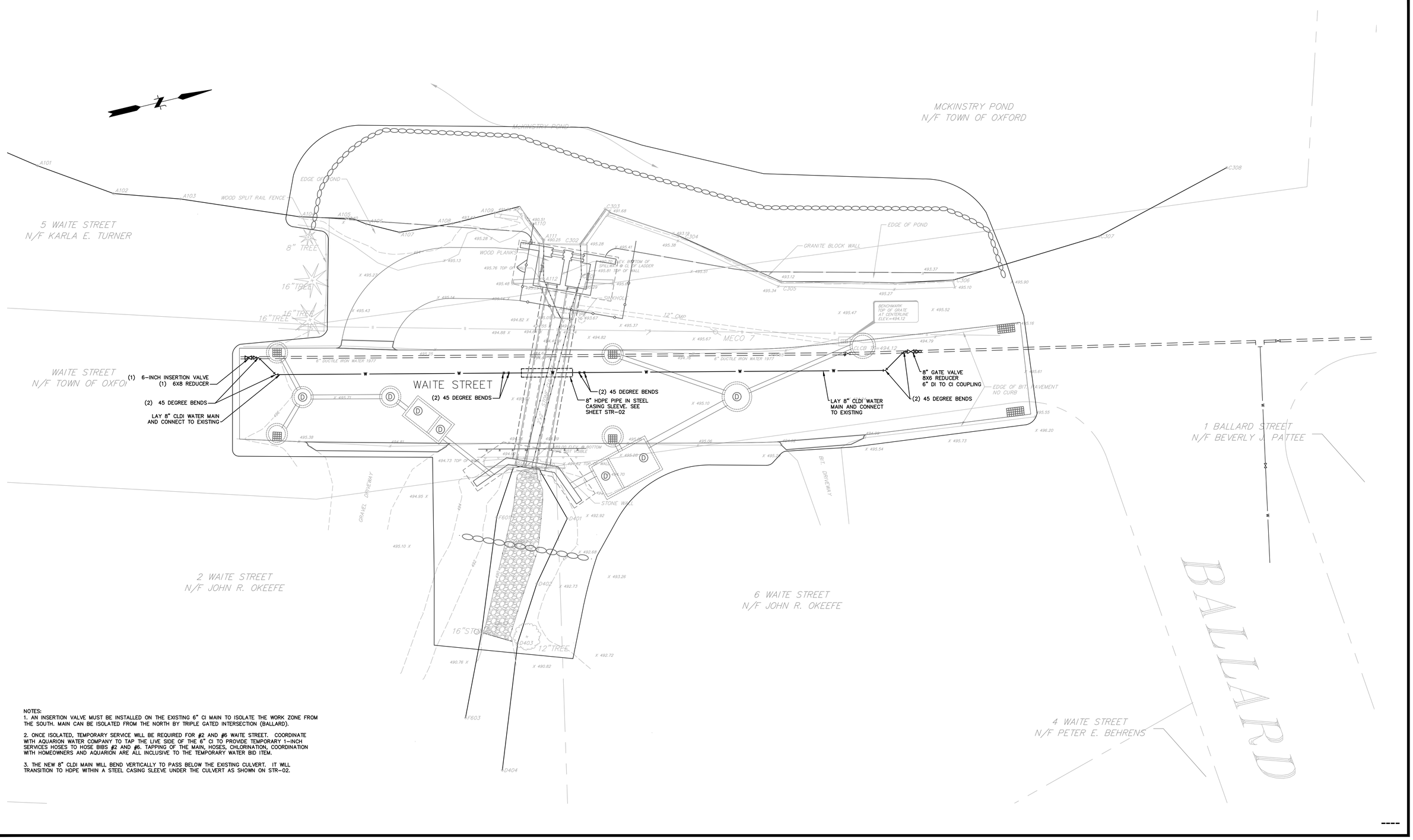
MS VIEW:



NOTES:
1. AN INSERTION VALVE MUST BE INSTALLED ON THE EXISTING 6" CI MAIN TO ISOLATE THE WORK ZONE FROM THE SOUTH. MAIN CAN BE ISOLATED FROM THE NORTH BY TRIPLE GATED INTERSECTION (BALLARD).

2. ONCE ISOLATED, TEMPORARY SERVICE WILL BE REQUIRED FOR #2 AND #6 WAITE STREET. COORDINATE WITH AQUARION WATER COMPANY TO TAP THE LIVE SIDE OF THE 6" CI TO PROVIDE TEMPORARY 1-INCH SERVICES HOSES TO HOSE BIBS #2 AND #6. TAPPING OF THE MAIN, HOSES, CHLORINATION, COORDINATION WITH HOMEOWNERS AND AQUARION ARE ALL INCLUSIVE TO THE TEMPORARY WATER BID ITEM.

3. THE NEW 8" CLDI MAIN WILL BEND VERTICALLY TO PASS BELOW THE EXISTING CULVERT. IT WILL TRANSITION TO HDPE WITHIN A STEEL CASING SLEEVE UNDER THE CULVERT AS SHOWN ON STR-02.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
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SEAL

COMMONWEALTH OF MASSACHUSETTS
MICHAEL V. NELSON
CIVIL
No. 49576
REGISTERED PROFESSIONAL ENGINEER

4/16/2025

SEAL

SCALE:
HORZ.: 1" = 10'
VERT.: -
DATUM:
HORZ.: -
VERT.: -
0 5' 10' 20'
GRAPHIC SCALE

FUSS & O'NEILL
108 MYRTLE STREET, SUITE 502
QUINCY, MA 02171
617.282.4675
www.fando.com

TOWN OF OXFORD

UTILITY PLAN

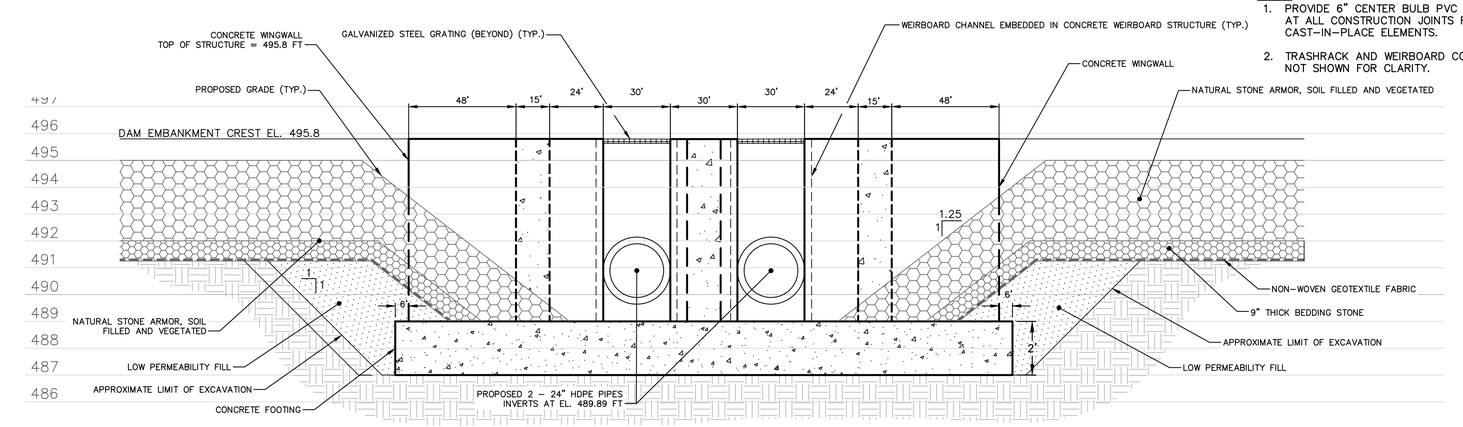
MCKINSTRY POND DAM REPAIRS

OXFORD MASSACHUSETTS

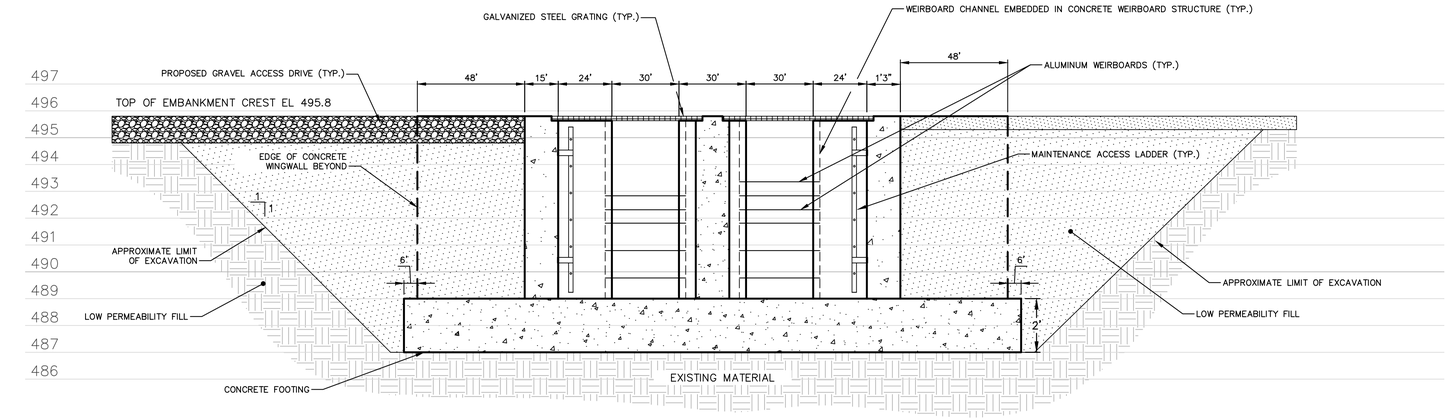
PROJ. No.: 20080026.A53
DATE: APRIL 2025

CU-101

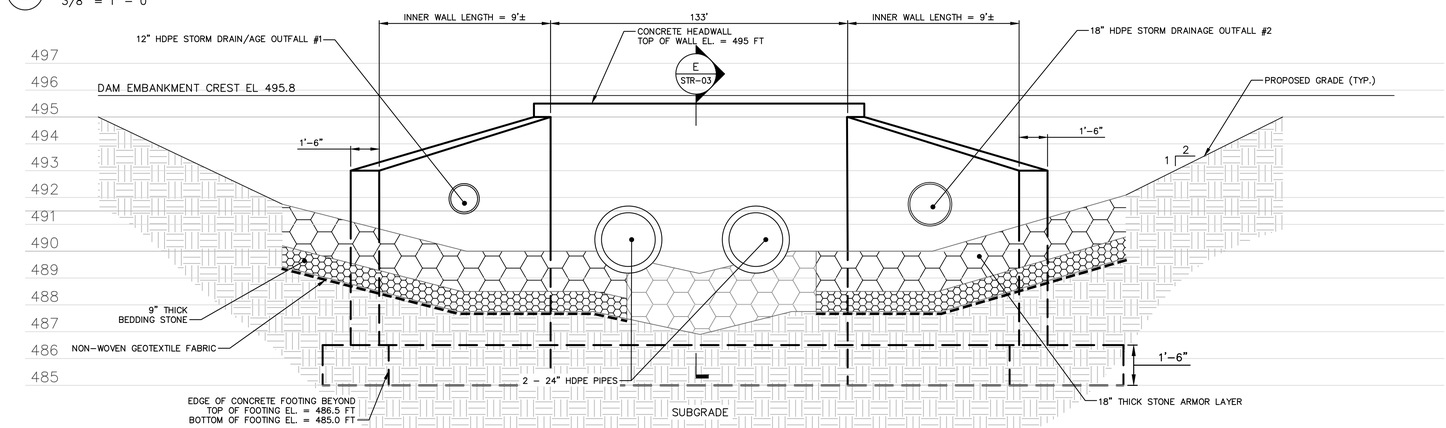
NOTES:
1. PROVIDE 6" CENTER BULB PVC WATERSTOP AT ALL CONSTRUCTION JOINTS FOR CAST-IN-PLACE ELEMENTS.
2. TRASHRACK AND WEIRBOARD CONFIGURATION NOT SHOWN FOR CLARITY.



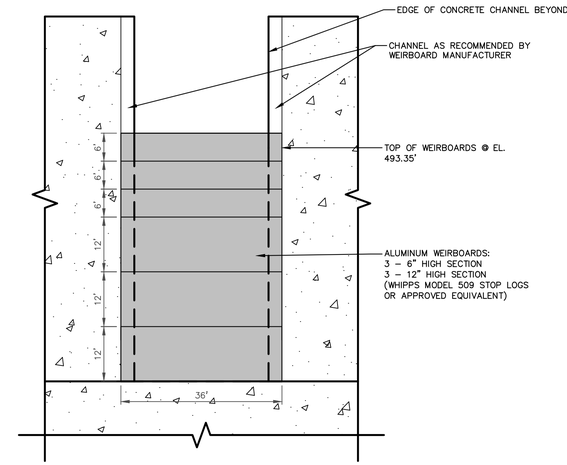
A UPSTREAM ELEVATION VIEW OF CONCRETE WEIRBOARD STRUCTURE
3/8" = 1' - 0"



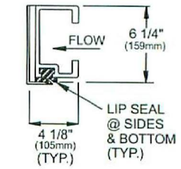
B SECTION VIEW OF CONCRETE WEIRBOARD STRUCTURE
3/8" = 1' - 0"



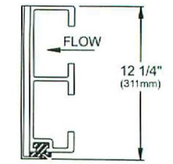
C DOWNSTREAM ELEVATION VIEW OF OUTFALL STRUCTURE
3/8" = 1' - 0"



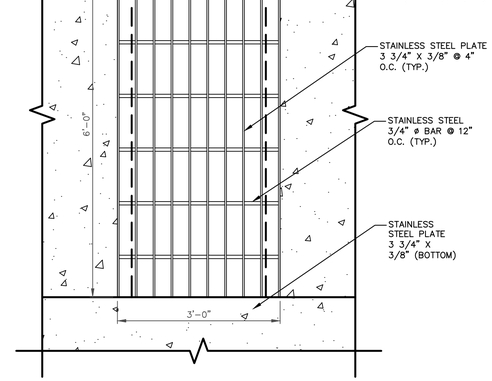
WEIRBOARD CONFIGURATION
3/4" = 1' - 0"



6" WEIRBOARD SECTION



12" WEIRBOARD SECTION



TRASHRACK CONFIGURATION
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SEAL
COMMONWEALTH OF MASSACHUSETTS
MICHAEL V. NELSON
CIVIL
No. 49576
REGISTERED PROFESSIONAL ENGINEER
4/16/2025

SEAL

SCALE:
HORZ.: AS NOTED
VERT.:
DATUM:
HORZ.: -
VERT.: -

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TOWN OF OXFORD

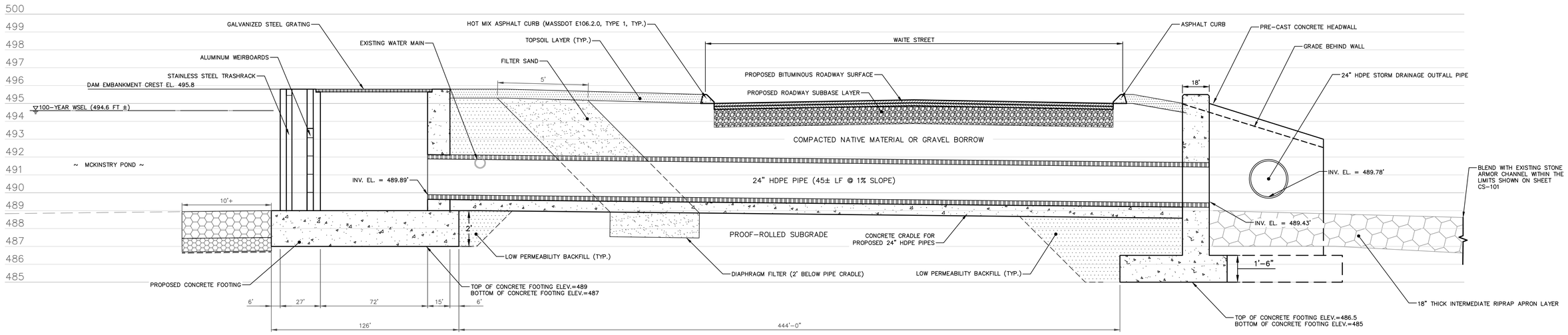
STRUCTURAL DETAILS

MCKINSTRY POND DAM REPAIRS

OXFORD MASSACHUSETTS

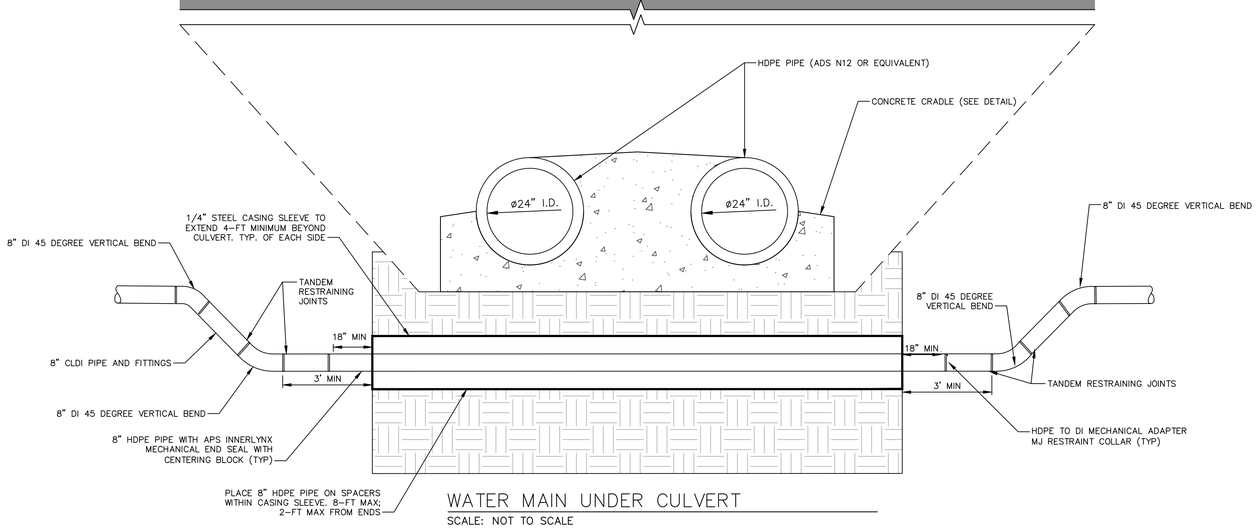
PROJ. No.: 20080026.A53
DATE: APRIL 2025

STR-01



(D) PROPOSED SPILLWAY PROFILE

3/8" = 1' - 0"



WATER MAIN UNDER CULVERT

SCALE: NOT TO SCALE

File: J:\DWG\P2008\0026\A53\Civil\Plan\20080026.A53_STP01.dwg Layout: STR-02 Plotted: 2025-04-14 11:17 AM Saved: 2025-04-07 12:22 PM User: abigail.meyers
PC3: AUTOCAD PDF (GENERAL DOCUMENTATION).PC3 STB/CTB: FO.STB
LAYER STATE:
MS VIEW:

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
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SEAL

COMMONWEALTH OF MASSACHUSETTS
MICHAEL V. NELSON
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REGISTERED PROFESSIONAL ENGINEER

4/16/2025

SEAL

SCALE:
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VERT.: -

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TOWN OF OXFORD

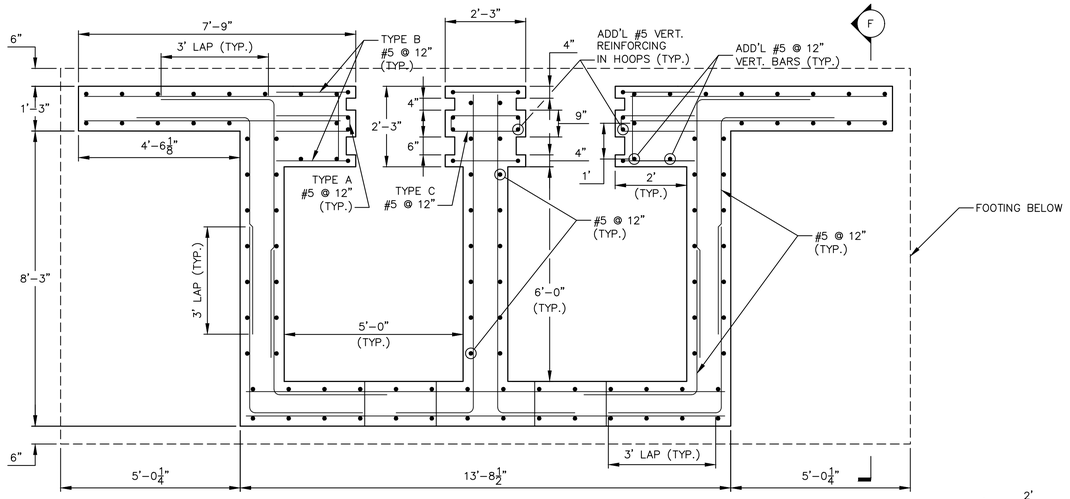
STRUCTURAL DETAILS

MCKINSTRY POND DAM REPAIRS

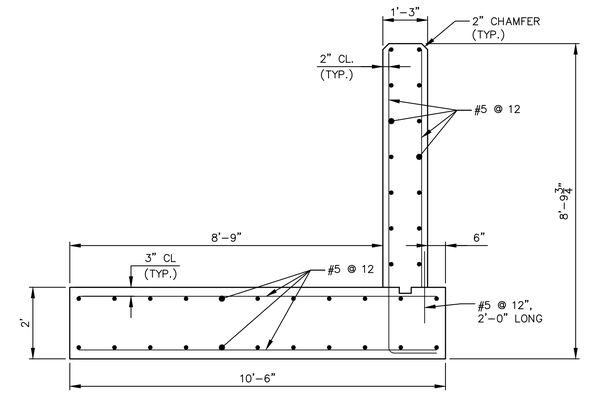
OXFORD MASSACHUSETTS

PROJ. No.: 20080026.A53
DATE: APRIL 2025

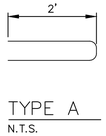
STR-02



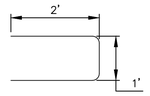
CONCRETE WEIRBOARD STEM REINFORCEMENT PLAN
1/2" = 1'-0"



F TYPICAL INLET WEIRBOARD STRUCTURE SECTION
1/2" = 1'-0"

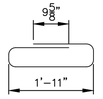


TYPE A
N.T.S.



TYPE B
N.T.S.

NOTE:
TYPE B REBAR SHOWN AS ELEVATION VIEW.



TYPE C
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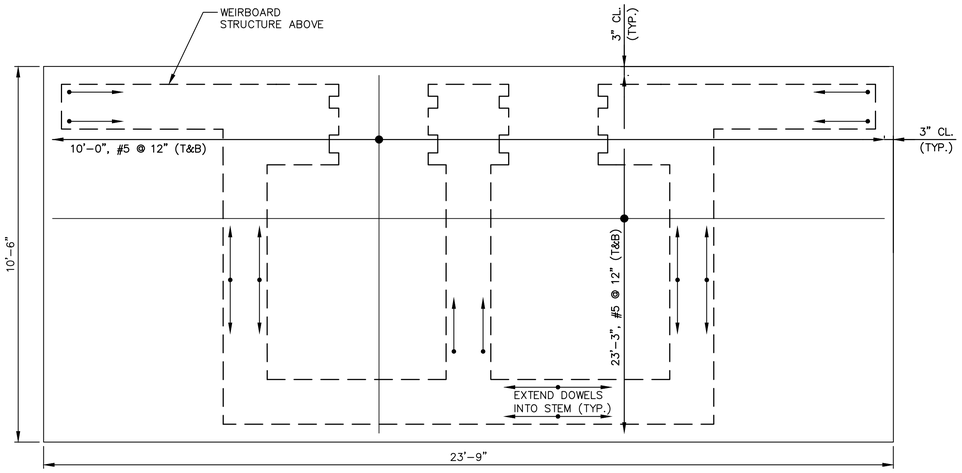
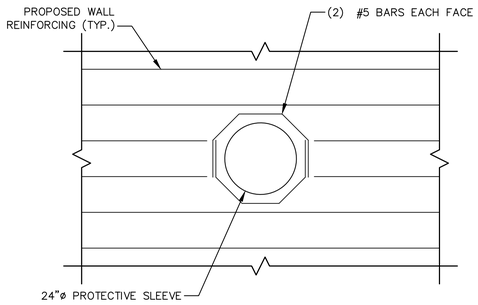
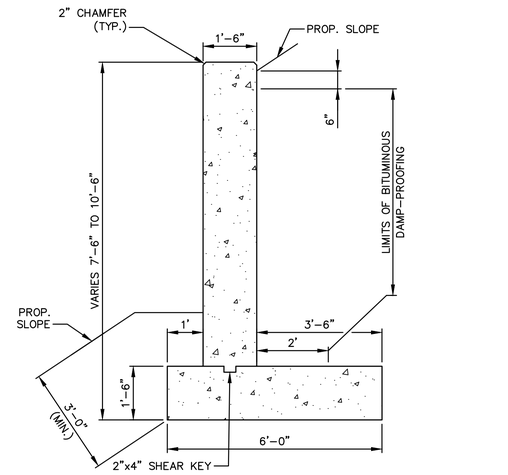


FOOTING REINFORCEMENT PLAN
1/2" = 1'-0"



PIPE PASSTHROUGH DETAIL
1/2" = 1'-0"



E TYPICAL OUTLET PRECAST HEADWALL SECTION
1/2" = 1'-0"

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
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SEAL

COMMONWEALTH OF MASSACHUSETTS
MICHAEL V. NELSON
CIVIL
No. 49576
REGISTERED
PROFESSIONAL ENGINEER

4/16/2025

SEAL

SCALE:
HORZ.: AS NOTED
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DATUM:
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VERT.: -

FUSS & O'NEILL
108 MYRTLE STREET, SUITE 502
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TOWN OF OXFORD

STRUCTURAL DETAILS

MCKINSTRY POND DAM REPAIRS

OXFORD MASSACHUSETTS

PROJ. No.: 20080026.A53
DATE: APRIL 2025

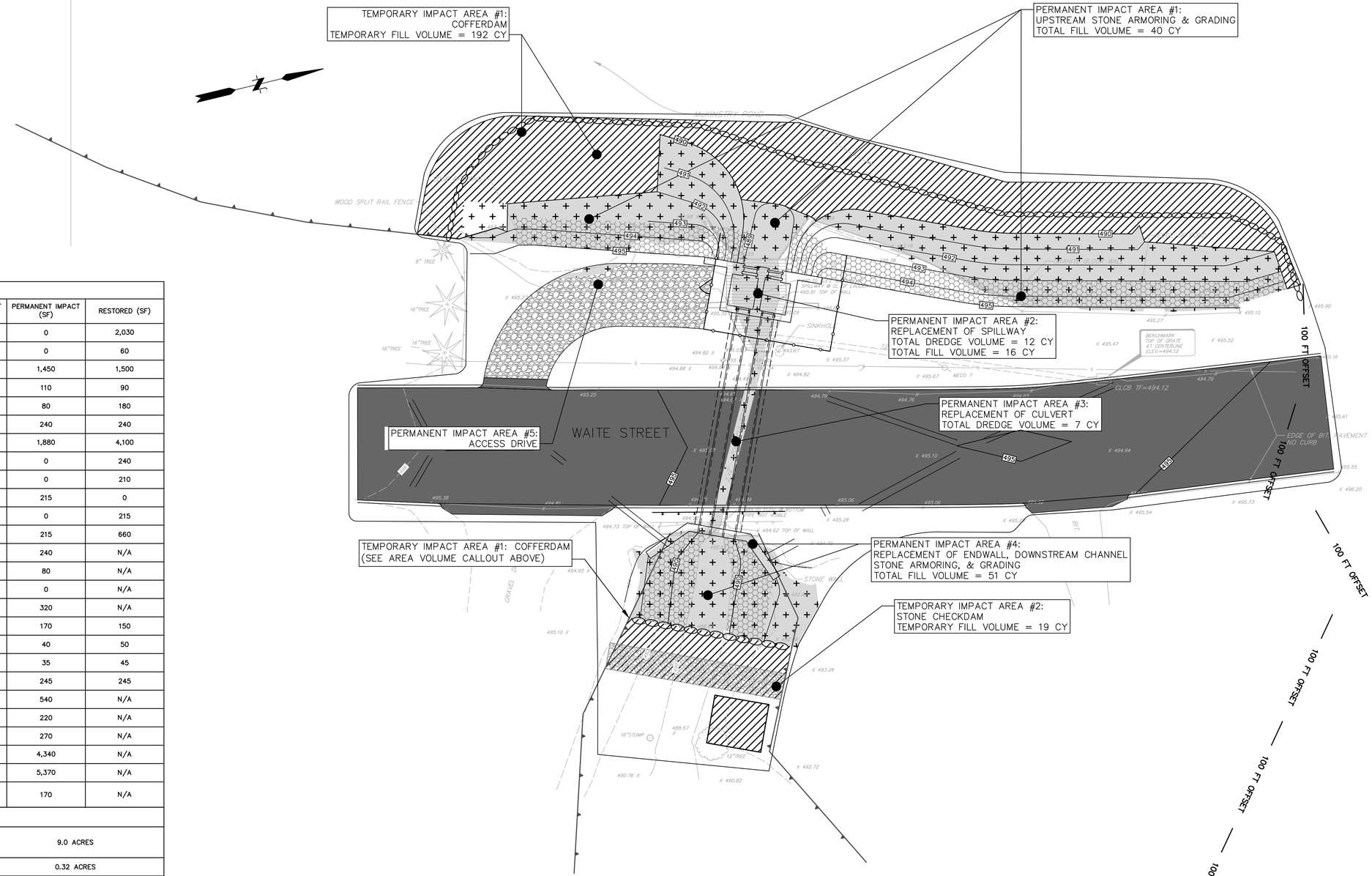
STR-03

WETLAND RESOURCE AREA SUMMARY				
RESOURCE AREA	PROJECT AREA	TEMPORARY IMPACT (SF)	PERMANENT IMPACT (SF)	RESTORED (SF)
ORDINARY HIGH WATER/LAND UNDER WATER	COFFERDAM	2,030	0	2,030
	STONE CHECK DAM	60	0	60
	UPSTREAM STONE ARMORING & GRADING	0	1,450	1,500
	REPLACEMENT OF SPILLWAY	0	110	90
	CULVERT REPLACEMENT	0	80	180
	DOWNSTREAM CHANNEL & ENDWALL	0	240	240
	TOTAL	2,090	1,880	4,100
BORDERING VEGETATED WETLANDS (BVW)	COFFERDAM	240	0	240
	STONE CHECK DAM	210	0	210
	DOWNSTREAM CHANNEL & ENDWALL	0	215	0
	WETLAND REPLICATION AREA (SHEET WET-02)	0	0	215
	TOTAL	450	215	660
BORDERING LAND SUBJECT TO FLOODING (BLSF)	UPSTREAM STONE ARMOR AND GRADING	0	240	N/A
	DOWNSTREAM CHANNEL & ENDWALL	0	80	N/A
	ACCESS DRIVE	20	0	N/A
	TOTAL	20	320	N/A
BANK ALTERATION	UPSTREAM STONE ARMOR AND GRADING	0	170	150
	DOWNSTREAM CHANNEL & ENDWALL	0	40	50
	WETLAND REPLICATION AREA (SHEET WET-02)	0	35	45
	TOTAL	0	245	245
RIVER FRONT AREA (0-100 FT OFFSET)	SPILLWAY REPLACEMENT	0	540	N/A
	CULVERT REPLACEMENT	0	220	N/A
	ACCESS DRIVE	0	270	N/A
	PAVEMENT RESTORATION AND DRAINAGE	0	4,340	N/A
	TOTAL	0	5,370	N/A
RIVER FRONT AREA (100-200 FT OFFSET)	PAVEMENT RESTORATION AND DRAINAGE	0	170	N/A

ADDITIONAL REGULATORY IMPACTS		
LUWW IMPACTED BY THE TEMPORARY DRAWDOWN	APPROXIMATE AREA WITHIN THE IMPOUNDMENT	9.0 ACRES
LIMIT OF DISTURBANCE	APPROXIMATE TOTAL PROJECT AREA	0.32 ACRES
TOTAL RIVERFRONT AREA	WITHIN PARCELS IMPACTED	.21 ACRES

NOTE:

1. NO FEMA BASE FLOOD ELEVATION (FEMA FLOOD ZONE X), BLSF WAS ESTIMATED FROM HYDRAULIC MODELING.
2. HATCHING FOR THE RIVER FRONT AREA IMPACTS IS NOT SHOWN FOR CLARITY.



No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
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SEAL

MICHAEL V. NELSON CIVIL No. 49576 REGISTERED PROFESSIONAL ENGINEER COMMONWEALTH OF MASSACHUSETTS

4/16/2025

SEAL

SCALE:
HORZ.: 1" = 10'
VERT.: -
DATUM:
HORZ.: -
VERT.: -
0 5' 10' 20'
GRAPHIC SCALE

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TOWN OF OXFORD

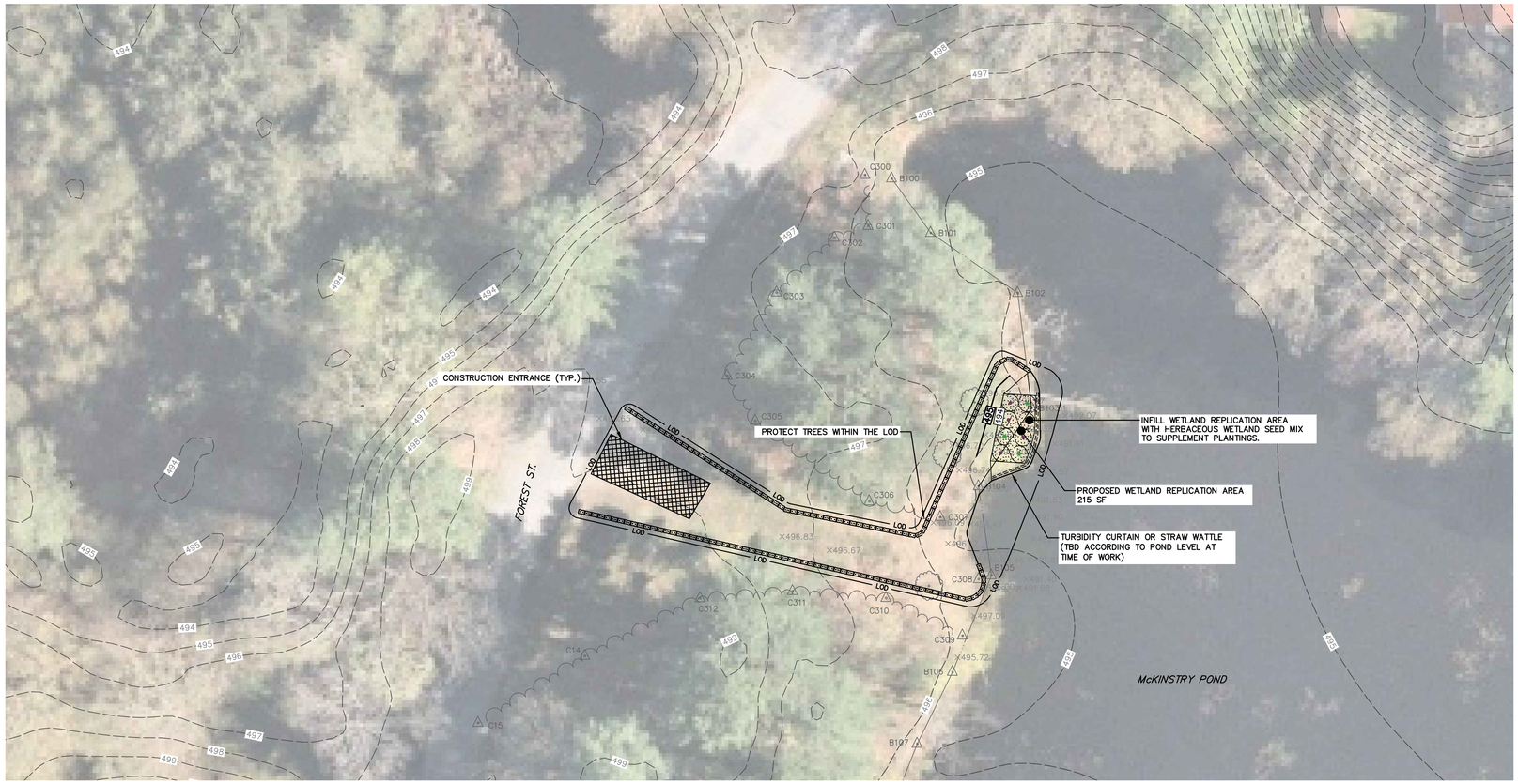
RESOURCE AREA IMPACT PLAN

MCKINSTRY POND DAM REPAIRS

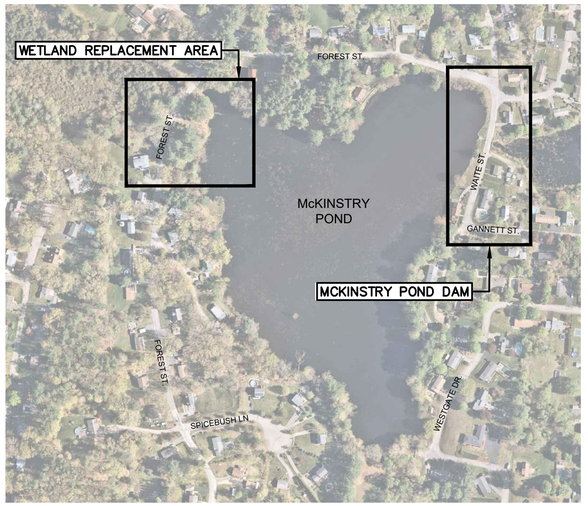
OXFORD MASSACHUSETTS

PROJ. No.: 20080026.A53
DATE: APRIL 2025

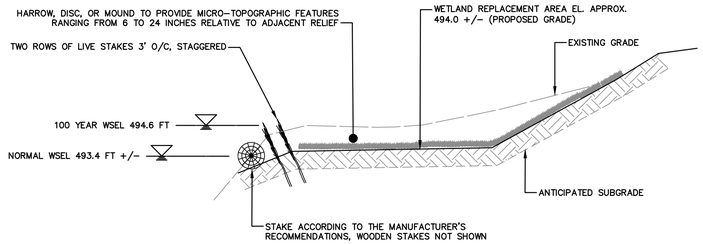
WET-01



WETLAND REPLACEMENT PLAN
SCALE: 1"= 20'



INDEX PLAN
SCALE: 1"= 250'



WETLAND REPLICATION AREA – TYPICAL SECTION
NOT TO SCALE

NOTES

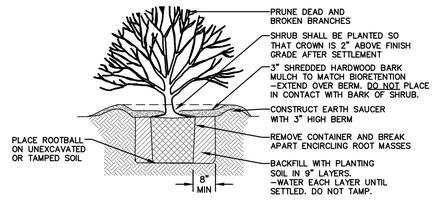
1. SUPPLEMENT EXISTING, STRIPPED, AND STOCKPILED LOAM WITH IMPORTED LOAM AS REQUIRED TO PROVIDE 6" OF LOAM FOR VEGETATIVE SUPPORT ON DISTURBED AREAS.
2. THE COIR ROLL SHALL BE FIELD ADJUSTED SO THAT THE ROLL IS SITUATED WHERE THE NORMAL WATER LEVEL IS ½ OF THE COIR ROLL HEIGHT.
3. SCATTER COARSE WOODY DEBRIS SPARINGLY BETWEEN PLANTINGS.
4. WOODY DEBRIS SHALL BE OBTAINED FROM BRUSH CLEARING OPERATIONS AT THE PROPOSED WETLAND REPLACEMENT AREA. THE DEBRIS SHALL CONSIST OF NATIVE STICKS AND SMALL LOGS (LESS THAN 4" IN DIAMETER). SCATTERED DEBRIS SHALL BE SPREAD IN ONE LAYER AND COMPRISE AN ESTIMATED 15% OF THE GROUND COVER BETWEEN PLANTS.
5. THE WETLAND REPLICATION AREA IS ANTICIPATED TO REQUIRE BETWEEN 6 AND 24 INCHES OF EXCAVATION TO REACH SUITABLE SUBGRADE. 6–12 INCHES OF A HORIZON OR O HORIZON SOIL MATERIAL WILL BE PLACED TO ENABLE SUITABLE ROOTING MEDIUM (WETLAND REPLICATION BACKFILL SOIL).
6. INFILL THE WETLAND REPLICATION AREA WITH HERBACEOUS WETLAND SEED MIX TO SUPPLEMENT PLANTINGS/WOODY DEBRIS IN ACCORDANCE WITH THE MASSACHUSETTS INLAND WETLAND REPLICATION GUIDELINES.

REFERENCE:

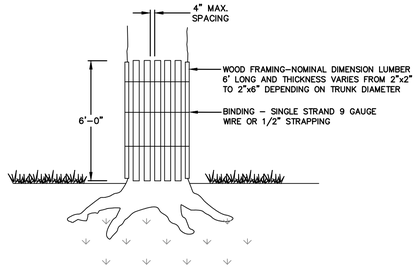
1. THIS MAP WAS PREPARED FROM USGS COLOR ORTHO IMAGERY DATED 2021. SOURCE: OFFICE OF GEOGRAPHIC AND ENVIRONMENTAL INFORMATION (MASSGIS), COMMONWEALTH OF MASSACHUSETTS EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS (MASS.GOV).
2. EXISTING CONTOURS WERE OBTAINED FROM WWW.NOAA.GOV WEBSITE, 2021 USGS LIDAR: CENTRAL EASTERN MASSACHUSETTS.
3. SPOT ELEVATIONS WERE OBTAINED BY FUSS & O'NEILL PERSONNEL USING A HANDHELD SUBMETER TRIMBLE CATALYST GPS UNIT.

SHRUB SPECIES PLANTING SCHEDULE

SYMBOL	COMMON/LATIN NAME	ESTIMATED QUANTITY	PLANTING REMARKS	TYPE
	HIGHBUSH BLUEBERRY, VACCINIUM CORYMBOSUM	5	BALLED AND BURLAPPED, 5 FT. ON CENTER SPACING, 3 FT. TALL AFTER PLANTING	1 GALLON CONTAINER
	SWEET PEPPERBUSH, CLETHRA ALNIFOLIA	3	BALLED AND BURLAPPED, 5 FT. ON CENTER SPACING, 3 FT. TALL AFTER PLANTING	1 GALLON CONTAINER
	BLACK WILLOW, SALIX NIGRA	27	N/A	LIVE STAKES



SHRUBS IN CONTAINER
NOT TO SCALE



NOTE:
1. SHALL BE IN ACCORDANCE WITH SECTION L.11 OF THE RIDOT STANDARD SPECIFICATIONS.

TREE PROTECTION
NOT TO SCALE

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
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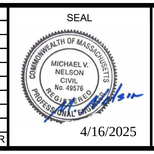
SEAL



4/16/2025

SEAL

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0 5' 10' 20'
GRAPHIC SCALE

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TOWN OF OXFORD

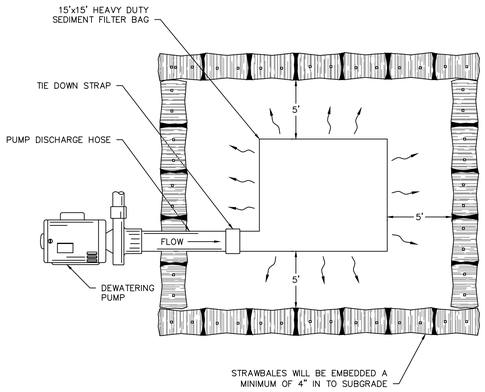
WETLAND REPLACEMENT PLAN

MCKINSTRY POND DAM REPAIRS

OXFORD MASSACHUSETTS

PROJ. No.: 20080026.A53
DATE: APRIL 2025

WET-02



DEWATERING BASIN
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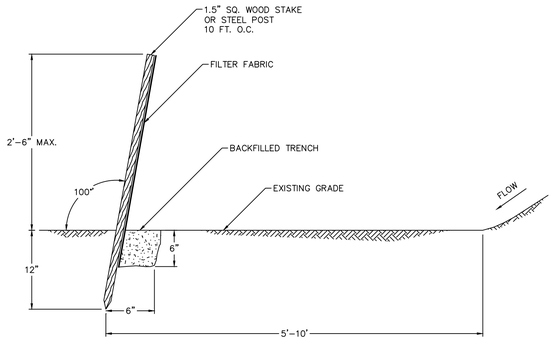

SILT FENCE
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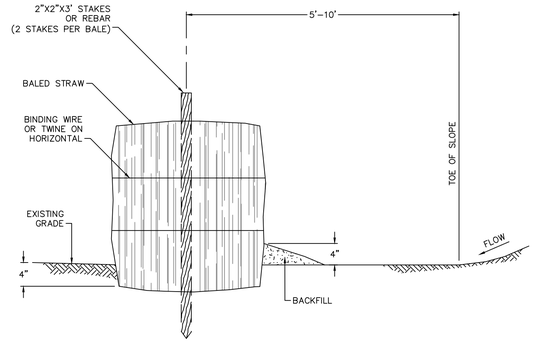
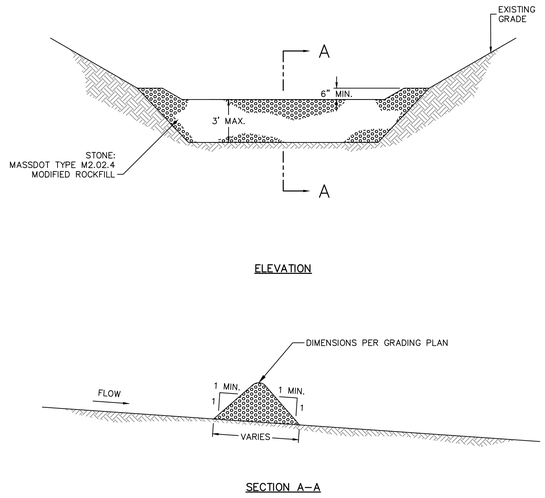
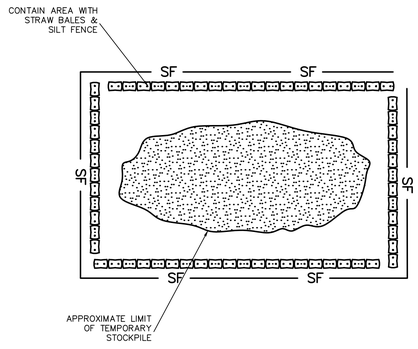


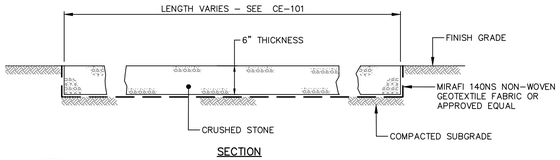
TOE OF SLOPE STRAW BALE BARRIER
NOT TO SCALE



STONE CHECK DAM
NOT TO SCALE



TEMPORARY SOIL STOCKPILE
SCALE: N.T.S.

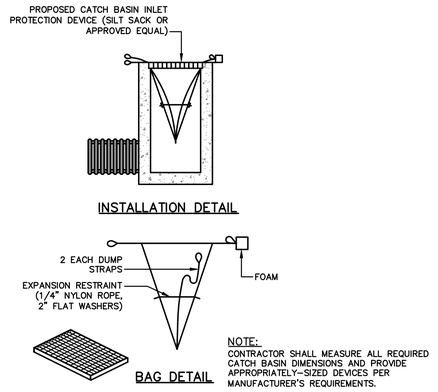


SECTION

NOTES:

1. MAINTAIN CONSTRUCTION ENTRANCE IN GOOD CONDITION THROUGHOUT CONSTRUCTION PERIOD.
2. ANY PAVED AREAS, ADJACENT TO THE CONSTRUCTION ENTRANCE SHALL BE SWEPT DAILY TO REMOVE ANY MATERIAL THAT MAY BE TRACKED ONTO PAVEMENT.
3. REMOVE STONE, FABRIC, AND TRACKED MATERIALS FOLLOWING CONSTRUCTION ACTIVITIES AND RESTORE AREA TO ORIGINAL CONDITION.
4. CRUSHED STONE SHALL CONFORM TO THE GRADATION LISTED FOR M2.01.0 OF THE MASSDOT STANDARD SPECIFICATIONS. CRUSHED STONE SHALL EXTEND A MINIMUM OF 12" BELOW THE BOTTOM OF THE STANDPIPE.

TEMPORARY CONSTRUCTION ENTRANCE
SCALE: N.T.S.



CATCH BASIN INLET PROTECTION
SCALE: N.T.S.

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SEAL

4/16/2025

SEAL

SCALE:
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DATUM:
HORZ.: -
VERT.: -

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QUINCY, MA 02171
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TOWN OF OXFORD

EROSION AND SEDIMENTATION CONTROL DETAILS

MCKINSTRY POND DAM REPAIRS

OXFORD MASSACHUSETTS

PROJ. No.: 20080026.A53
DATE: APRIL 2025

CD-501

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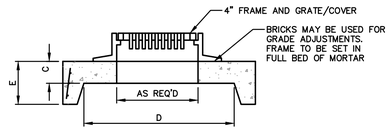
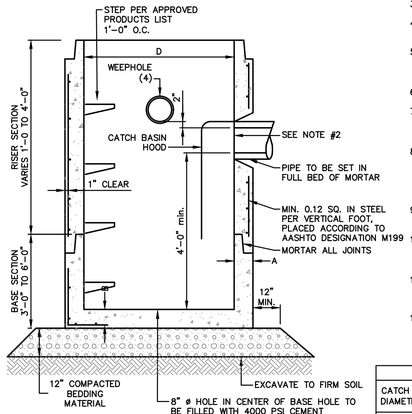


ALTERNATE TOP SLAB

(STEEL REINFORCED FOR HS–25 LOADING)



SECTION

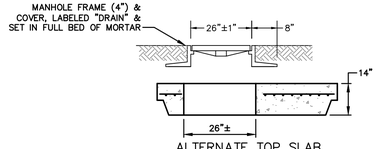
NOTES:

1. SEE TABLE 1 FOR STEEL REINFORCEMENT REQUIREMENTS.
2. FACE OF PIPE FLUSH OR NOT TO PROJECT MORE THAN 4" FROM FACE OF WALL ALONG CENTER LINE OF PIPE.
3. ALL CONCRETE TO BE AIR ENTRAINED.
4. FRAME & GRATE TO BE EJ MODEL OMA554000002 FOUR FLANGE OR APPROVED EQUAL.
5. STEEL REINFORCEMENT FOR BASE SECTION BOTTOM SHALL BE A MINIMUM OF 0.12 SQ. IN./LIN. FT. (BOTH WAYS).
6. ONE POUR MONOLITHIC BASE SECTION.
7. CONCRETE SHALL BE COMPRESSIVE STRENGTH 4000 PSI CEMENT (SEE MASSDOT SPECIFICATIONS FOR DESIGN REQUIREMENTS).
8. ANY NECESSARY ADJUSTMENTS DURING CONSTRUCTION WILL BE DONE BY SAW–CUTTING AND/OR CORING ONLY. NO JACKHAMMERS, HAMMERS AND CHISELS OR PNEUMATIC TOOLS WILL BE ALLOWED.
9. THE CENTERLINE OF OPENING MUST BE WITHIN 2'–0" FROM STEPS.
10. CATCH BASIN DESIGN SHALL CONFORM TO ASTM C–478 FOR "PRECAST REINFORCED CONCRETE MANHOLE SECTION.
11. PROVIDE "V" KNOCKOUTS FOR PIPES WITH 2" MAX. CLEARANCE TO OUTSIDE OF PIPE. MORTAR ALL PIPE CONNECTIONS.
12. FOR DESCRIPTION, MATERIALS AND CONSTRUCTION METHODS, SEE MASSDOT STANDARD SPECIFICATIONS.

TABLE 1					
CATCH BASIN DIAMETER (D)	A	B	C	E	CIRCUMFERENTIAL STEEL REINFORCEMENT REQUIRED *
4'–0"	5"	6"	8"	12.5"	0.12 SQ. IN./LIN. FT.
5'–0"	6"	8"	8"	14"	0.15 SQ. IN./LIN. FT.
6'–0"	7"	8"	8"	14"	0.18 SQ. IN./LIN. FT.

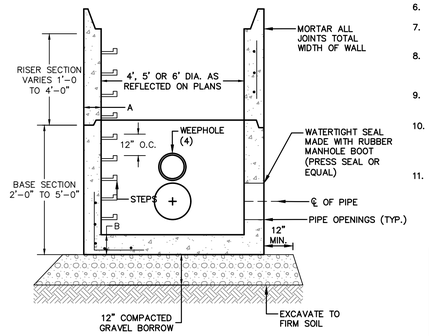
CATCH BASIN

NOT TO SCALE



ALTERNATE TOP SLAB

(REINFORCED TO MEET OR EXCEED REQUIREMENTS OF HS–20 LOADING)



SECTION (4–FOOT DIAMETER)

NOTES:

1. MANHOLE SHALL BE PRECAST AND SHALL BE IN ACCORDANCE WITH SECTION 200 OF THE MASSDOT STANDARD SPECIFICATIONS.
2. FRAME TO BE EJ MODEL NO. OMA22600001 & COVER TO BE EJ MODEL NO. OMA211000041 OR APPROVED EQUAL. FRAME HEIGHT SHALL BE 4–INCHES (MAXIMUM). LETTERING: DRAIN.
3. FRAMES SHALL BE SET IN FULL BED OF MORTAR. RED BRICKS AND MORTAR MAY BE USED TO ADJUST GRADE.
4. SEE TABLE 1 FOR STEEL REINFORCING REQUIREMENTS. STEEL REINFORCEMENT SHALL MEET OR EXCEED H–20 LOADING.
5. CONCRETE SHALL BE COMPRESSIVE STRENGTH 4000 PSI CEMENT (SEE MASSDOT SPECIFICATIONS FOR DESIGN REQUIREMENTS).
6. ONE POUR MONOLITHIC BASE SECTION.
7. PROVIDE "V" KNOCKOUTS FOR PIPES WITH 2" MAX. CLEARANCE TO OUTSIDE OF PIPE. MORTAR ALL PIPE CONNECTIONS.
8. JOINT SEALANT SHALL BE PREFORMED BUTYL RUBBER MASTIC TYPE SEAL THAT COMPLIES WITH AASHTO M198 OR SYNTHETIC RUBBER GASKET THAT COMPLIES WITH ASTM C–443 OR C–361.
9. MANHOLE DESIGN SHALL CONFORM TO ASTM C–478 FOR "PRECAST REINFORCED CONCRETE MANHOLE SECTIONS."
10. MANHOLE STEPS SHALL BE ASTM A 615/A615M, DEFORMED, 1/2–INCH STEEL REINFORCED RODS ENCASED IN ASTM D 4101, POLYPROPYLENE PLASTIC. THE CENTERLINE OF OPENING MUST BE WITHIN 2'–0" FROM STEPS.
11. ANY NECESSARY ADJUSTMENTS DURING CONSTRUCTION WILL BE DONE BY SAW–CUTTING AND/OR CORING ONLY. NO JACKHAMMERS, HAMMERS AND CHISELS OR PNEUMATIC TOOLS WILL BE ALLOWED.

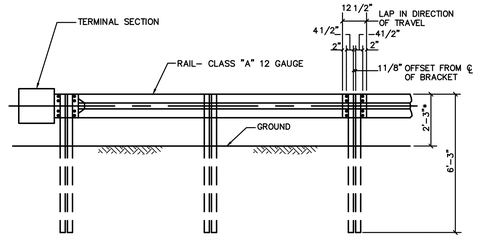
TABLE 1			
CATCH BASIN DIAMETER (D)	A	B	CIRCUMFERENTIAL STEEL REINFORCEMENT REQUIRED *
4'–0"	5"	6"	0.12 SQ. IN./LIN. FT.
5'–0"	6"	7"	0.15 SQ. IN./LIN. FT.
6'–0"	7"	8"	0.18 SQ. IN./LIN. FT.

* FOR LONGITUDINAL (VERTICAL STANDING) REINFORCEMENT REFER TO ASTM C478

NOTE: PENETRATIONS FOR FUTURE EXPANSION STORMWATER PIPES TO BE CAPPED.

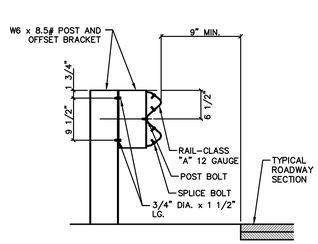
DRAIN MANHOLE

NOT TO SCALE

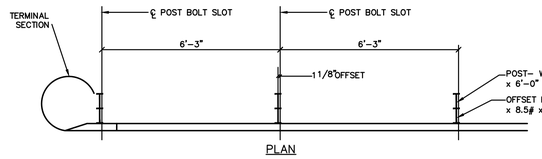


ELEVATION

NOTE: FOR DETAILS, DIMENSIONS AND MATERIALS NOT SHOWN SEE MASS HIGHWAY STEEL BEAM HIGHWAY GUARD STANDARDS AND SPECIFICATIONS



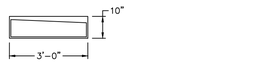
TYPICAL POST SECTION

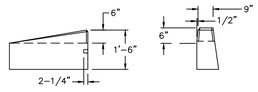


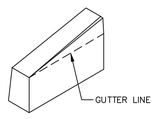
PLAN

METAL BEAM GUARDRAIL

NOT TO SCALE





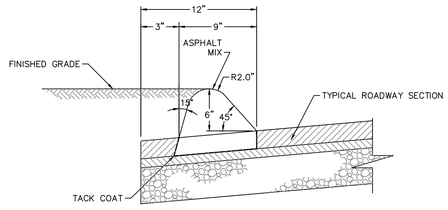


NOTE:

1. SHALL BE IN ACCORDANCE WITH SECTION 906 OF R.I. STANDARD SPECIFICATIONS.
2. DRAWING SHOWS TRANSITION CURB FOR ONE DIRECTION, FOR OTHER DIRECTION USE OPPOSITE HAND AND INCLUDE A 1/2"ø x 4" EPOXY COATED DOWEL.
3. EXPOSED SURFACES TO HAVE A SPONGE FLOAT FINISH.
4. EXPOSED EDGES TO HAVE A 3/4" CHAMFER.
5. LEFT AND RIGHT SECTIONS SHALL BE INSTALLED AS REQUIRED.

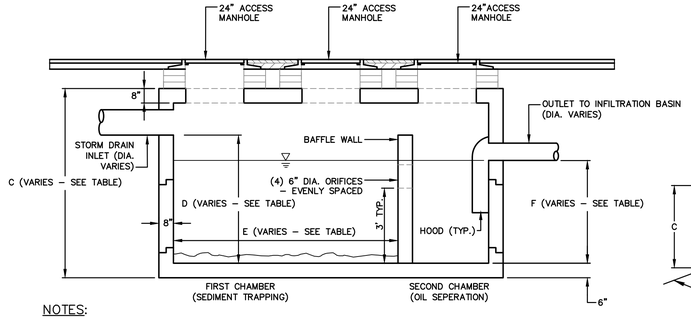
3' PRECAST CONCRETE TRANSITION CURB

NOT TO SCALE



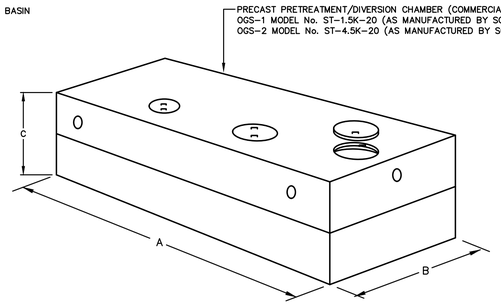
HOT MIX ASPHALT CURB

NOT TO SCALE



NOTES:

1. CONCRETE IS 5,000 P.S.I. @28 DAYS.
2. STEEL REINFORCEMENT PER ASTM A–615–79 GRADE 60 1" MIN. COVER.
3. DESIGN LOADING PER AASHO HS20–44.
4. CAST JOINT SEALED WITH FLEXIBLE BUTYL RESIN SEALANT.
5. ATTACH 6–INCH MINIMUM THICKNESS REINFORCED CONCRETE ANTI–BUOYANCY SLAB TO BOTTOM OF OGS–2 WITH REBAR OR OTHER APPROPRIATE ANCHOR SYSTEM. SLAB SHALL EXTEND ONE FOOT HORIZONTALLY FROM OGS–2 BOTTOM LENGTH AND WIDTH.
6. HOODS FOR 12" OUTLET SHALL BE BMP SNOUT 18F AS MANUFACTURED BY BMP, INC. OR APPROVED EQUAL.
7. HOODS FOR 24" OUTLET SHALL BE BMP SNOUT 30F AS MANUFACTURED BY BMP, INC. OR APPROVED EQUAL.
8. STRUCTURE SHALL BE INSTALLED ON 6" DEEP LAYER OF ¾" CRUSHED STONE BEDDING.
9. 24" DIA. ACCESS FRAME & COVERS SHALL BE EJ MODEL NO. OMA226000001 AND EJ MODEL NO. OMA211000041, RESPECTIVELY. FRAME HEIGHTS SHALL NOT EXCEED 4–INCHES IN HEIGHT.



PRETREATMENT DIVERSION CHAMBER SIZING TABLE							
CHAMBER ID	MODEL (GAL)	A	B	C	D	E	F
OGS–1	1,500	11'–0"	6'–0"	6'–8"	4'–1"	5'–6"	4'–0"
OGS–2	4,500	15'–0"	9'–0"	7'–8"	4'–7"	9'–6"	4'–6"

PRETREATMENT OIL–GRIT SEPARATOR (DUAL CHAMBER OIL/WATER SEPARATOR)

NOT TO SCALE

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
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SEAL

COMMONWEALTH OF MASSACHUSETTS
MICHAEL V. NELSON
CIVIL
No. 49578
REGISTERED PROFESSIONAL ENGINEER

4/16/2025

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TOWN OF OXFORD

CIVIL DETAILS

MCKINSTRY POND DAM REPAIRS

OXFORD MASSACHUSETTS

PROJ. No.: 20080026.A53
DATE: APRIL 2025

CD-502

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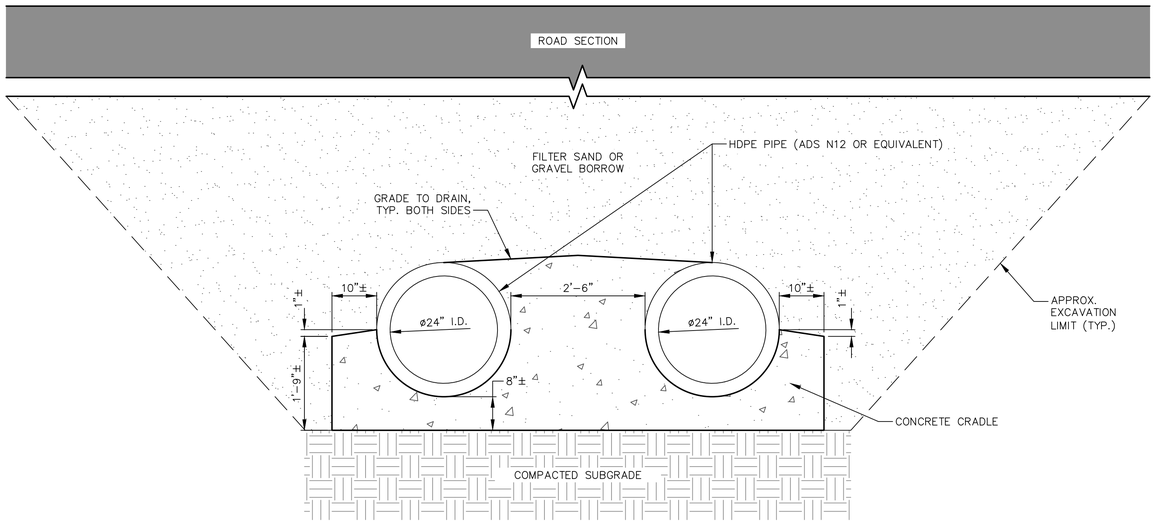
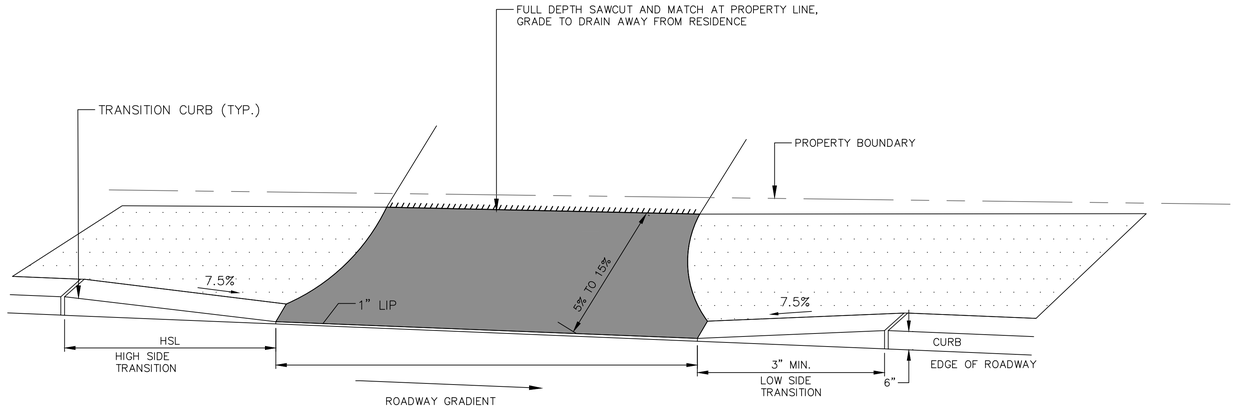


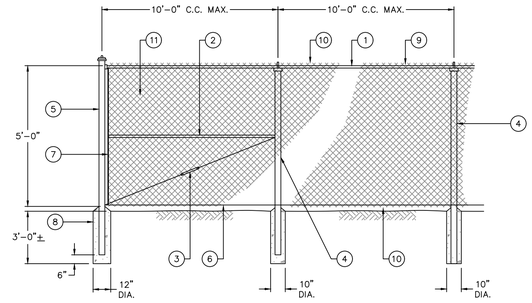
E CONCRETE CRADLE

SCALE: 3/4" = 1' – 0"



DRIVEWAY TRANSITION

SCALE: N.T.S.



ELEVATION

NOTES

1. FOOTING DESIGN TO BE CHECKED BY AN ENGINEER FOR WIND LOADS IF SLATS ARE USED OR IF POOR SOIL CONDITIONS EXIST.
2. STRAIGHT RUNS BETWEEN BRACED POSTS SHALL NOT EXCEED 500 FT.
3. FENCE DETAILS ARE INTENDED AS A GUIDE ONLY. ALL FENCE MATERIALS AND CONSTRUCTION METHODS SHALL BE APPROVED BY THE ENGINEER AND FENCE MANUFACTURER.

CHAIN LINK FENCE LEGEND

(1) 1 5/8" O.D. TOP RAIL ATTACH FABRIC WITH 9 GUAGE WIRE CLIP EVERY 24"

(2) 1 5/8" O.D. BRACE FOR RAIL FENCES OVER 6 FEET HIGH AND ALL FENCES WITHOUT TOP RAIL

(3) 5/16" TRUSS ROD AND TURNBUCKLE

(4) INTERMEDIATE POST

FENCE HEIGHT	SQUARE POST	ROUND POST
6 FEET AND LESS	1 7/8"	2"
OVER 6 FEET	2 1/4"	2 1/2"

ATTACH TO C.L. FABRIC WITH CLIPS EVERY 15"

(5) END OR CORNER POST

FENCE HEIGHT	SQUARE POST	ROUND POST
6 FEET AND LESS	2"	2 1/2"
OVER 6 FEET	2 1/2"	3"

(6) 6 GAUGE BOTTOM TENSION WIRE ATTACH TO FABRIC WITH HOG RING AT 24" C.C.

(7) TENSION ROD ATTACHED TO END OR CORNER POST

(8) CONCRETE FOOTING 36" DEEP WITH 12" DIA. AT END POST AND 10" DIA. AT INTERMEDIATE POST. HOLE CORE IN UNDISTURBED OR COMPACTED SOIL. (SEE NOTE NO. 1)

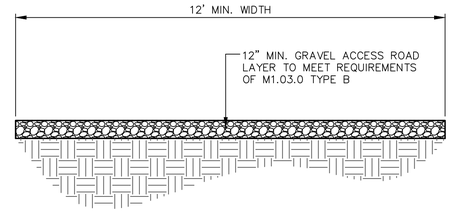
(9) 6 GAUGE TENSION WIRE WHEN TOP RAIL IS NOT USED.

(10) FABRIC SELVAGE:
UNDER 6 FEET SHALL BE KNUCKLED TOP AND BOTTOM
6 FEET AND OVER SHALL BE KNUCKLED BOTTOM AND TWISTED ON THE TOP
RECREATIONAL FENCING, REGARDLESS OF HEIGHT, SHALL BE KNUCKLED TOP AND BOTTOM

(11) 9 GAUGE 2" WIRE MESH FABRIC (COMMERCIAL) BLACK VINYL COATED.

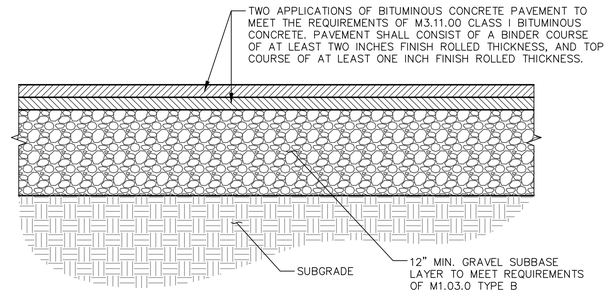
CHAIN LINK FENCE

SCALE: N.T.S.



GRAVEL ACCESS DRIVE SECTION

SCALE: N.T.S.



NOTE: ROADWAY DESIGN AND MATERIAL PLACEMENT SHALL CONFORM TO THE MASSACHUSETTS HIGHWAY DEPARTMENT "STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES" AND THE "OXFORD SUBDIVISION RULES AND REGULATIONS".

BITUMINOUS ROADWAY RESTORATION

SCALE: N.T.S.

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SEAL

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TOWN OF OXFORD

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MCKINSTRY POND DAM REPAIRS

OXFORD MASSACHUSETTS

PROJ. No.: 20080026.A53
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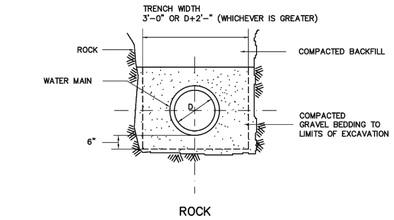
CD-503

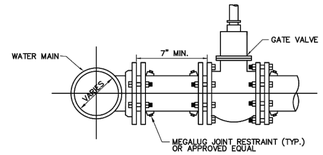


TYPICAL TRENCH SECTIONS

SCALE : NONE

NOTE : MINIMUM DEPTH OF COVER ABOVE PIPE BARREL TO BE 5'-0"

Tata & Howard, Inc. Consulting Engineers Date: April 2006 Scale: None	Typical Trench Sections Standard Details Aquarion Water Company	Figure No. 1



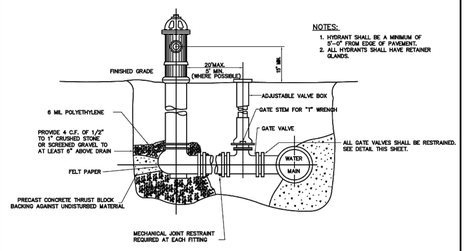
MECHANICAL JOINT RESTRAINT DETAIL

SCALE : NONE

MINIMUM LENGTH OF PIPE TO BE RESTRAINED IN THE REQUIRED DIRECTION (IN FEET) Based on Ductile Iron Pipe with a 150 psi Test Pressure with 5.0 feet of Bury in Unified Soil Classification SM.					
PIPE SIZE IN.	1/4 BEND	1/8 BEND	1/16 BEND	TEES*	PLUG/CAP
6	16.0	7.0	3.0	29.0	29.0
8	21.0	9.0	4.0	29.0	38.0
10	26.0	11.0	5.0	38.0	46.0
12	33.0	14.0	6.0	48.0	69.0
16	42.0	17.0	8.0	57.0	89.0

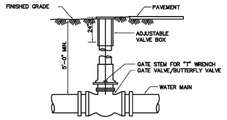
(*) Lengths shown are for the Tee Branch. The required length of restraint for the Tee Run is 18 feet.

Tata & Howard, Inc. Consulting Engineers Date: April 2006 Scale: None	Mechanical Joint Restraint Details Standard Details Aquarion Water Company	Figure No. 2



TYPICAL HYDRANT AND VALVE DETAIL

SCALE: NONE

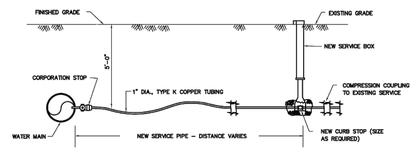


GATE VALVE DETAIL

SCALE : NONE

NOTE : ALL GATE VALVES SHALL BE RESTRAINED AS SPECIFIED

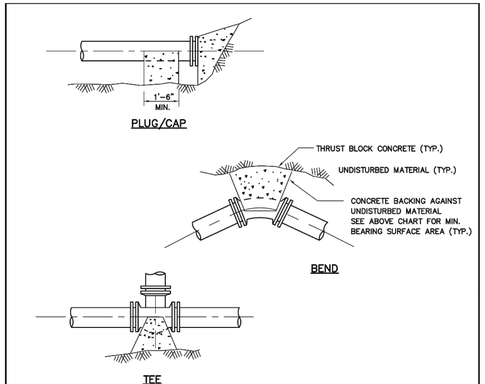
Tata & Howard, Inc. Consulting Engineers Date: April 2006 Scale: None	Typical Hydrant and Gate Valve Detail Standard Details Aquarion Water Company	Figure No. 4



TYPICAL HOUSE SERVICE CONNECTION

SCALE : NONE

Tata & Howard, Inc. Consulting Engineers Date: April 2006 Scale: None	Typical House Service Connection Standard Details Aquarion Water Company	Figure No. 5

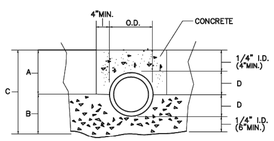


TYPICAL CONCRETE BACKING

SCALE : NONE

AREA OF BEARING FACE OF CONCRETE THRUST BLOCKS IN SQUARE FEET Based on 250 P.S.I. & 1.5 ton/s.f. allowable soil bearing capacity				
PIPE SIZE IN.	1/4 BEND	1/8 BEND	1/16 BEND	PLUG & TEES
4,6,8	6.0	11.8	2.3	4.5
10	9.8	6.7	2.3	6.7
12	13.3	5.2	3.7	9.6
16	24.0	2.9	3.7	17.0

Tata & Howard, Inc. Consulting Engineers Date: April 2006 Scale: None	Thrust Block Details Standard Details Aquarion Water Company	Figure No. 7



A – LIMITS FOR ENCASEMENT PLUS BEDDING.
B – LIMITS FOR CRADLE ENCASEMENT.
C – LIMITS FOR FULL ENCASEMENT.
D – 1/2 O.D.

CONCRETE ENCASEMENT

SCALE : NONE

Tata & Howard, Inc. Consulting Engineers Date: April 2006 Scale: None	Typical Concrete Encasement Standard Details Aquarion Water Company	Figure No. 8

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
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SEAL

COMMONWEALTH OF MASSACHUSETTS
MICHAEL V. NIELSON
CIVIL
No. 49578
REGISTERED PROFESSIONAL ENGINEER

4/16/2025

SEAL

SCALE:
HORZ.: NOT TO SCALE
VERT.:
DATUM:
HORZ.: -
VERT.: -

FUSS & O'NEILL
108 MYRTLE STREET, SUITE 502
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TOWN OF OXFORD

AQUARION WATER COMPANY DETAILS

MCKINSTRY POND DAM REPAIRS

OXFORD MASSACHUSETTS

PROJ. No.: 20080026.A53
DATE: APRIL 2025

CD-504