

PROJECT MANUAL

FOR

**REPLACEMENT OF BRIDGE NO. 105003
BEAVER DAM TRAIL OVER FISHING BROOK**

TOWN OF



**OLD SAYBROOK
CONNECTICUT**

BOARD OF SELECTMEN

Carl P. Fortuna, First Selectman

Scott Giegerich

Matthew Pugliese

NLJA #0747-0045

OCTOBER 1, 2024

NATHAN L. JACOBSON & ASSOCIATES, INC.
CONSULTING CIVIL & ENVIRONMENTAL ENGINEERS SINCE 1972
CHESTER, CONNECTICUT

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**TOWN OF OLD SAYBROOK, CONNECTICUT
REPLACEMENT OF BRIDGE NO. 105003, BEAVER DAM TRAIL OVER FISHING BROOK**

INVITATION TO BID

Sealed Bids for **Replacement of Bridge No. 105003, Beaver Dam Trail over Fishing Brook** will be received by the **Town of Old Saybrook** electronically via the internet bidding service or by hard copy via mail or drop box at the Issuing Office until **10:00 AM** local time on **November 20, 2024** at which time the Bids received will be opened online.

The Project primarily consists of removal of an existing metal pipe culvert and replacement with a precast concrete rigid frame. Bids will be received for a single prime Contract. Bids shall be on a lump sum and unit price basis as indicated in the Bid Form.

Bidding Documents are available for free download from the Project's bidding service webpage. To download Bidding Documents: go to the bidding service homepage listed below; select this project's solicitation; sign in and/or register as directed; and select the Bidding Documents for download. A non-refundable \$40 fee to the bidding service is required to submit an electronic Bid. Notify the Issuing Office with questions in this regard. Digital ID is not required for this online bid.

Bidding service homepage: <http://www.bidexpress.com/businesses/27674/home>.

The Issuing Office is the **Office of the First Selectman, Old Saybrook Town Hall, 302 Main Street, Old Saybrook, Connecticut (860-395-3123)**. Prospective Bidders may examine the Bidding Documents at the Issuing Office during normal business hours.

Printing Bidding Documents is the responsibility of the prospective Bidder. Printed copies will not be issued by the Town. Neither Owner nor Engineer will be responsible for Bidding Documents that differ from documents available from the Project's bidding service webpage.

A pre-bid conference will be held at **10:00 AM** local time on **November 7, 2024** in the **basement meeting room (cafeteria) at the Old Saybrook Town Hall, 302 Main Street Old Saybrook, Connecticut**. Attendance at the pre-bid conference is encouraged but is not mandatory.

Bids must be accompanied by a Bid Bond in the amount of five percent of the Bid.

The successful Bidder will be required to provide Performance and Payment Bonds each in the amount of one hundred percent of the Contract Price.

The successful Bidder shall comply with the requirements of Prevailing Wage Rate Laws in accordance with Section 31-51 of the Connecticut General Statutes.

The contractor who is selected to perform this State funded project must comply with CONN. GEN. STAT. §§ 4a-60, 4a-60a, 4a-60g, and 46a-68b through 46a-68f, inclusive, as amended by June 2015 Special Session Public Act 15-5.

State law requires a minimum of twenty-five (25%) percent of the state-funded portion of the contract be set aside for award to subcontractors holding current certification from the Connecticut Department of Administrative Services ("DAS") under the provisions of CONN. GEN. STAT. § 4a-60g. (25% of the total state-funded value with DAS-certified Small Businesses and 6.25% of the total state-funded value with DAS-certified Minority-, Women-, and/or Disabled-owned Businesses.) The contractor must demonstrate good faith effort to meet the 25% set-aside goals.

The Contract Documents require affirmative action of the Contractor and any subcontractors to ensure equal employment opportunity as noted in Governor's Executive Orders 3 and 17.

The Owner is exempt from payment of Sales and Use Taxes on all materials and equipment to be permanently incorporated in the Work. These taxes shall not be included in the Bid.

Bid preference for local vendors under Section 5.4 of the Code of the Town of Old Saybrook (Ordinances) does not apply to this project because of the conflict with State Guidelines which is the source of funding for this project.

The bidder agrees that its bid shall be good, capable of being accepted, and may not be withdrawn for a period of ninety [90] days after the opening of bids.

The Town reserves the right to waive any technical defects in the bids; to reject bids which do not conform to the terms and conditions described in the specifications; to reject any, any part of, or all bids; to waive informalities or irregularities in the bidding process; and to accept that bid which the Town deems to be in its best interest, whether or not it is the lowest dollar proposed.

All work to be performed in connection with the proposed project will be subject to all applicable federal, state, and local laws, ordinances, and regulations.

If the Town determines, in its sole discretion, to proceed with the work, the successful bidder must execute and deliver an Agreement, and furnish valid Certificates of Insurance and Payments and Performance Bonds to the Town prior to the start of any work.

It is the responsibility of the bidder to ensure that it has received any and all addendums to this Invitation to Bid prior to submitting a bid.

This Invitation to Bid is not binding on the Town.

This Invitation to Bid has been prepared solely to solicit bids and does not constitute a contract offer.

The Town reserves the right to amend, cancel, postpone, withdraw, or resubmit this Invitation to Bid at any time if it is in the best interest of the Town to do so.

The Town is an Affirmative Action/Equal Opportunity Employer. Minority/Women Business Enterprises are encouraged to apply.

Owner: Town of Old Saybrook, Connecticut

By: Carl Fortuna, First Selectman

Date: October 21, 2024

+ + END OF INVITATION TO BID + +

INSTRUCTIONS TO BIDDERS FOR CONSTRUCTION CONTRACT

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ARTICLE 1—DEFINED TERMS

- 1.01 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:
- A. *Issuing Office*—The office from which the Bidding Documents are to be issued, and which registers plan holders.

ARTICLE 2—BIDDING DOCUMENTS

- 2.01 Bidder shall obtain a complete set of Bidding Requirements and proposed Contract Documents (together, the Bidding Documents). See the Agreement for a list of the Contract Documents. It is Bidder's responsibility to determine that it is using a complete set of documents in the preparation of a Bid. Bidder assumes sole responsibility for errors or misinterpretations resulting from the use of incomplete documents, by Bidder itself or by its prospective Subcontractors and Suppliers.
- 2.02 Bidding Documents are made available for the sole purpose of obtaining Bids for completion of the Project and permission to download or distribution of the Bidding Documents does not confer a license or grant permission or authorization for any other use. Authorization to download documents, or other distribution, includes the right for plan holders to print documents solely for their use, and the use of their prospective Subcontractors and Suppliers, provided the plan holder pays all costs associated with printing or reproduction. Printed documents may not be re-sold under any circumstances.
- 2.03 Owner has established a Bidding Documents Website as indicated in the Advertisement or invitation to bid. Owner recommends that Bidder register as a plan holder with the Issuing Office at such website, and obtain a complete set of the Bidding Documents from such website. Bidders may rely that sets of Bidding Documents obtained from the Bidding Documents Website are complete unless an omission is blatant. Registered plan holders will receive Addenda issued by Owner.
- 2.04 *Electronic Documents*
- A. When the Bidding Requirements indicate that electronic (digital) copies of the Bidding Documents are available, such documents will be made available to the Bidders as Electronic Documents in the manner specified.
1. Bidding Documents will be provided in Adobe PDF (Portable Document Format) (.pdf) that is readable by Adobe Acrobat Reader Version 2019 or later. It is the intent of the Engineer and Owner that such Electronic Documents are to be exactly representative of the paper copies of the documents. However, because the Owner and Engineer cannot totally control the transmission and receipt of Electronic Documents nor the Contractor's means of reproduction of such documents, the Owner and Engineer cannot and do not guarantee that Electronic Documents and reproductions prepared from those versions are identical in every manner to the paper copies.
- B. Unless otherwise stated in the Bidding Documents, the Bidder may use and rely upon complete sets of Electronic Documents of the Bidding Documents, described in Paragraph 2.04.A above. However, Bidder assumes all risks associated with differences arising from transmission/receipt of Electronic Documents versions of Bidding Documents

and reproductions prepared from those versions and, further, assumes all risks, costs, and responsibility associated with use of the Electronic Documents versions to derive information that is not explicitly contained in printed paper versions of the documents, and for Bidder's reliance upon such derived information.

ARTICLE 3—QUALIFICATIONS OF BIDDERS

- 3.01 Bidder is to submit the following information with its Bid *on the Statement of Bidder's Qualifications Form* to demonstrate Bidder's qualifications to perform the Work:
- A. Written evidence establishing its qualifications such as financial data, previous experience, and present commitments.
 - B. A written statement that Bidder is authorized to do business in the state where the Project is located, or a written certification that Bidder will obtain such authority prior to the Effective Date of the Contract.
 - C. Bidder's state or other contractor license number, if applicable.
 - D. Other required information regarding qualifications.
- 3.02 A Bidder's failure to submit required qualification information within the times indicated may disqualify Bidder from receiving an award of the Contract.
- 3.03 No requirement in this Article 3 to submit information will prejudice the right of Owner to seek additional pertinent information regarding Bidder's qualifications.

ARTICLE 4—PRE-BID CONFERENCE

- 4.01 A non-mandatory pre-bid conference will be held at the time and location indicated in the Advertisement or invitation to bid. Representatives of Owner and Engineer will be present to discuss the Project. Bidders are encouraged to attend and participate in the conference; however, attendance at this conference is not required to submit a Bid.
- 4.02 Information presented at the pre-Bid conference does not alter the Contract Documents. Owner will issue Addenda to make any changes to the Contract Documents that result from discussions at the pre-Bid conference. Information presented, and statements made at the pre-bid conference will not be binding or legally effective unless incorporated in an Addendum.

ARTICLE 5—SITE AND OTHER AREAS; EXISTING SITE CONDITIONS; EXAMINATION OF SITE; OWNER'S SAFETY PROGRAM; OTHER WORK AT THE SITE

- 5.01 *Site and Other Areas*
- A. The Site is identified in the Bidding Documents. By definition, the Site includes rights-of-way, easements, and other lands furnished by Owner for the use of the Contractor. Any additional lands required for temporary construction facilities, construction equipment, or storage of materials and equipment, and any access needed for such additional lands, are to be obtained and paid for by Contractor.
- 5.02 *Existing Site Conditions*
- A. *Subsurface and Physical Conditions; Hazardous Environmental Conditions*

1. The Supplementary Conditions identify the following regarding existing conditions at or adjacent to the Site:
 - a. Those reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data.
 - b. Those drawings known to Owner of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data.
 - c. Reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site.
 - d. Technical Data contained in such reports and drawings.
 2. Owner will make copies of reports and drawings referenced above available to any Bidder on request. These reports and drawings are not part of the Contract Documents, but the Technical Data contained therein upon whose accuracy Bidder is entitled to rely, as provided in the General Conditions, has been identified and established in the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any Technical Data or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings. **Bidders may obtain copies of the reports and drawings referenced by sending an email request to hpfrommer@nlja.com. The reports and drawings will be provided as a PDF file by return email.**
 3. If the Supplementary Conditions do not identify Technical Data, the default definition of Technical Data set forth in Article 1 of the General Conditions will apply.
- B. *Underground Facilities:* Underground Facilities are shown or indicated on the Drawings, pursuant to Paragraph 5.05 of the General Conditions, and not in the drawings referred to in Paragraph 5.02.A of these Instructions to Bidders. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.

5.03 *Other Site-related Documents*

- A. No other Site-related documents are available.

5.04 *Site Visit and Testing by Bidders*

- A. Bidder is required to visit the Site and conduct a thorough visual examination of the Site and adjacent areas. During the visit the Bidder must not disturb any ongoing operations at the Site.
- B. Bidder is not required to conduct any subsurface testing, or exhaustive investigations of Site conditions.
- C. On request, and to the extent Owner has control over the Site, and schedule permitting, the Owner will provide Bidder general access to the Site to conduct such additional examinations, investigations, explorations, tests, and studies as Bidder deems necessary for preparing and submitting a successful Bid. Owner will not have any obligation to grant such access if doing so is not practical because of existing operations, security or safety concerns,

or restraints on Owner's authority regarding the Site. Bidder is responsible for establishing access needed to reach specific selected test sites.

- D. Bidder must comply with all applicable Laws and Regulations regarding excavation and location of utilities, obtain all permits, and comply with all terms and conditions established by Owner or by property owners or other entities controlling the Site with respect to schedule, access, existing operations, security, liability insurance, and applicable safety programs.
- E. Bidder must fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies.

5.05 *Owner's Safety Program*

- A. Site visits and work at the Site may be governed by an Owner safety program. If an Owner safety program exists, it will be noted in the Supplementary Conditions.

5.06 *Other Work at the Site*

- A. Reference is made to Article 8 of the Supplementary Conditions for the identification of the general nature of other work of which Owner is aware (if any) that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) and relates to the Work contemplated by these Bidding Documents. If Owner is party to a written contract for such other work, then on request, Owner will provide to each Bidder access to examine such contracts (other than portions thereof related to price and other confidential matters), if any.

ARTICLE 6—BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

6.01 *Express Representations and Certifications in Bid Form, Agreement*

- A. The Bid Form that each Bidder will submit contains express representations regarding the Bidder's examination of Project documentation, Site visit, and preparation of the Bid, and certifications regarding lack of collusion or fraud in connection with the Bid. Bidder should review these representations and certifications, and assure that Bidder can make the representations and certifications in good faith, before executing and submitting its Bid.
- B. If Bidder is awarded the Contract, Bidder (as Contractor) will make similar express representations and certifications when it executes the Agreement.

ARTICLE 7—INTERPRETATIONS AND ADDENDA

7.01 Owner on its own initiative may issue Addenda to clarify, correct, supplement, or change the Bidding Documents.

7.02 Bidder shall submit all questions about the meaning or intent of the Bidding Documents to Engineer in writing. Contact information and submittal procedures for such questions are as follows:

- A. ***Submit questions via the Question and Answer section of the Project's bidding service webpage.***

- 7.03 Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda delivered to all registered plan holders. Questions received less than seven days prior to the date for opening of Bids may not be answered.
- 7.04 Only responses set forth in an Addendum will be binding. Oral and other interpretations or clarifications will be without legal effect. Responses to questions are not part of the Contract Documents unless set forth in an Addendum that expressly modifies or supplements the Contract Documents.

ARTICLE 8—BID SECURITY

- 8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of **five** percent of Bidder's maximum Bid price (determined by adding the base bid and all alternates) and in the form of a Bid bond issued by a surety meeting the requirements of Paragraph 6.01 of the General Conditions. Such Bid bond will be issued in the form included in the Bidding Documents.
- 8.02 The Bid security of the apparent Successful Bidder will be retained until Owner awards the contract to such Bidder, and such Bidder has executed the Contract, furnished the required Contract security, and met the other conditions of the Notice of Award, whereupon the Bid security will be released. If the Successful Bidder fails to execute and deliver the Contract and furnish the required Contract security within 15 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited, in whole in the case of a penal sum bid bond, and to the extent of Owner's damages in the case of a damages-form bond. Such forfeiture will be Owner's exclusive remedy if Bidder defaults.
- 8.03 The Bid security of other Bidders that Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of 7 days after the Effective Date of the Contract or 90 days after the Bid opening, whereupon Bid security furnished by such Bidders will be released.
- 8.04 Bid security of other Bidders that Owner believes do not have a reasonable chance of receiving the award will be released within 7 days after the Bid opening.

ARTICLE 9—CONTRACT TIMES

- 9.01 The number of days within which, or the dates by which, the Work is to be (a) substantially completed and (b) ready for final payment, and (c) Milestones (if any) are to be achieved, are set forth in the Agreement.
- 9.02 Provisions for liquidated damages, if any, for failure to timely attain a Milestone, Substantial Completion, or completion of the Work in readiness for final payment, are set forth in the Agreement.

ARTICLE 10—SUBSTITUTE AND "OR EQUAL" ITEMS

- 10.01 The Contract for the Work, as awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration during the bidding and Contract award process of possible substitute or "or-equal" items. In cases in which the Contract allows the Contractor to request that Engineer authorize the use of a substitute or "or-equal" item of

material or equipment, application for such acceptance may not be made to and will not be considered by Engineer until after the Effective Date of the Contract.

- 10.02 All prices that Bidder sets forth in its Bid will be based on the presumption that the Contractor will furnish the materials and equipment specified or described in the Bidding Documents, as supplemented by Addenda. Any assumptions regarding the possibility of post-Bid approvals of “or-equal” or substitution requests are made at Bidder’s sole risk.

ARTICLE 11—SUBCONTRACTORS, SUPPLIERS, AND OTHERS

- 11.01 *Refer to the Supplementary Conditions for limitations on subcontracting Work included in the original Contract Price.*

ARTICLE 12—PREPARATION OF BID

- 12.01 *The project is being bid online through an internet bidding service.* The Bid Form is included with the Bidding Documents. *An online Bid Form is also available on the Project’s bidding service webpage.*
- A. *Bid Forms should be completed online via the Project’s bidding service webpage from the prospective bidder’s account. Hard copy Bid Forms may also be completed. For hard copy Bid submissions: all*~~A#~~ *blanks on the Bid Form must be completed in ink and the Bid Form signed in ink. Erasures or alterations must be initialed in ink by the person signing the Bid Form. A Bid price must be indicated for each section, Bid item, alternate, adjustment unit price item, and unit price item listed therein.*
- B. If the Bid Form expressly indicates that submitting pricing on a specific alternate item is optional, and Bidder elects to not furnish pricing for such optional alternate item, then Bidder may enter the words “No Bid” or “Not Applicable.”
- C. *Other documents required with the bid submittal are listed in Article 2 of the Bid Form and, if bid online, are available for download from the Project’s bidding service website.*
- 12.02 If Bidder has obtained the Bidding Documents as Electronic Documents, *and the Bidder plans to submit a hard copy bid*, then Bidder shall prepare its Bid on a paper copy of the Bid Form printed from the Electronic Documents version of the Bidding Documents. The printed copy of the Bid Form must be clearly legible, printed on 8½ inch by 11-inch paper and as closely identical in appearance to the Electronic Document version of the Bid Form as may be practical. The Owner reserves the right to accept Bid Forms which nominally vary in appearance from the original paper version of the Bid Form, providing that all required information and submittals are included with the Bid.
- 12.03 A Bid by a corporation must be executed in the corporate name by a corporate officer (whose title must appear under the signature), accompanied by evidence of authority to sign. The corporate address and state of incorporation must be shown. *The corporate seal shall be affixed and attested by the secretary or an assistant secretary when submitting a hard copy bid.*
- 12.04 A Bid by a partnership must be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership must be shown.

- 12.05 A Bid by a limited liability company must be executed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm must be shown.
- 12.06 A Bid by an individual must show the Bidder's name and official address.
- 12.07 A Bid by a joint venture must be executed by an authorized representative of each joint venturer in the manner indicated on the Bid Form. The joint venture must have been formally established prior to submittal of a Bid, and the official address of the joint venture must be shown.
- 12.08 All names must be **entered in the Bid Form**.
- 12.09 The Bid must contain an acknowledgment of receipt of all Addenda, the numbers of which must be filled in on the Bid Form.
- 12.10 Postal and e-mail addresses and telephone number for communications regarding the Bid must be ~~shown~~ **included**.
- 12.11 The Bid must contain evidence of Bidder's authority to do business in the state where the Project is located, or Bidder must certify in writing that it will obtain such authority within the time for acceptance of Bids and attach such certification to the Bid.
- 12.12 If Bidder is required to be licensed to submit a Bid or perform the Work in the state where the Project is located, the Bid must contain evidence of Bidder's licensure, or Bidder must certify in writing that it will obtain such licensure within the time for acceptance of Bids and attach such certification to the Bid. Bidder's state contractor license number, if any, must also be shown on the Bid Form.

ARTICLE 13—BASIS OF BID

13.01 *Unit Price*

- A. Bidders must submit a Bid on a **lump sum and** unit price basis for each item of Work listed in the unit price section of the Bid Form.
- B. The "Bid Price" (sometimes referred to as the extended price) for each **lump sum and** unit price Bid item will be the product of the "Estimated Quantity", which Owner or its representative has set forth in the Bid Form, for the item and the corresponding "Bid Unit Price" offered by the Bidder. The total of all unit price Bid items will be the sum of these "Bid Prices"; such total will be used by Owner for Bid comparison purposes. The final quantities and Contract Price will be determined in accordance with Paragraph 13.03 of the General Conditions.
- C. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

13.02 *Base Bid with Alternates*

- A. Bidders must submit a Bid on a lump sum **and unit price** basis for the base Bid and include a separate price for each alternate described in the Bidding Documents and as provided for in the Bid Form. The price for each alternate will be the amount added to or deleted from the base Bid if Owner selects the alternate.

- B. In the comparison of Bids, alternates will be applied in the same order of priority as listed in the Bid Form.

13.03 Allowances

- A. For cash allowances the Bid price must include such amounts as the Bidder deems proper for Contractor's overhead, costs, profit, and other expenses on account of cash allowances, if any, named in the Contract Documents, in accordance with Paragraph 13.02.B of the General Conditions.

ARTICLE 14—SUBMITTAL OF BID

14.01 ***Bids shall be submitted via the Project's bidding service website from the Bidder's account and all documents listed on the Project's bidding service Required Documents List shall be completed and uploaded unless omission terms are met.*** ~~The Bidding Documents include one separate unbound copy of the Bid Form, and, if required, the Bid Bond Form. The unbound copy of the~~ ***If submitting a hard copy bid, the Bid Form from the project manual*** is to be completed and submitted with the Bid security and the other documents required to be submitted under the terms of Article 2 of the Bid Form.

14.02 A Bid must be received no later than the date and time prescribed and at the place indicated in the Advertisement or invitation to bid. ***Hard copy bids*** must be enclosed in a plainly marked package with the Project title, and, if applicable, the designated portion of the Project for which the Bid is submitted, the name and address of Bidder, and must be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid must be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED." A mailed Bid must be addressed to the location designated in the Advertisement.

14.03 Bids received after the date and time prescribed for the opening of bids, or not submitted at the correct location or in the designated manner, will not be accepted and will be returned to the Bidder unopened.

ARTICLE 15—MODIFICATION AND WITHDRAWAL OF BID

15.01 ***Bids may be withdrawn prior to the opening of bids by clicking the 'Withdraw Bid' button on the bidding service website. After the Bid is withdrawn, the bidding service sends a notification email to the bidder's address on file. It is the Bidder's responsibility to review and confirm that the Bid has been withdrawn successfully. For hard copy bids, an*** ~~unopened Bid~~ may be withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids. Upon receipt of such notice, the unopened Bid will be returned to the Bidder.

15.02 ***Bids may be modified and resubmitted prior to the Bid opening through the Project's bidding service website. For hard copy bids, if*** ~~if~~ a Bidder wishes to modify its Bid prior to Bid opening, Bidder must withdraw its initial Bid in the manner specified in Paragraph 15.01 and submit a new Bid prior to the date and time for the opening of Bids.

15.03 If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a

material and substantial mistake in the preparation of its Bid, the Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Work is rebid, the Bidder will be disqualified from further bidding on the Work.

ARTICLE 16—OPENING OF BIDS

16.01 Bids will be opened at the time and place indicated in the advertisement or invitation to bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids.

ARTICLE 17—BIDS TO REMAIN SUBJECT TO ACCEPTANCE

17.01 All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

ARTICLE 18—EVALUATION OF BIDS AND AWARD OF CONTRACT

18.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner also reserves the right to waive all minor Bid informalities not involving price, time, or changes in the Work.

18.02 Owner will reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible.

18.03 If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes of the Bid, whether in the Bid itself or in a separate communication to Owner or Engineer, then Owner will reject the Bid as nonresponsive.

18.04 If Owner awards the contract for the Work, such award will be to the responsible Bidder submitting the lowest responsive Bid.

18.05 *Evaluation of Bids*

A. In evaluating Bids, Owner will consider whether the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.

B. In the comparison of Bids, alternates will be applied in the same order of priority as listed in the Bid Form. To determine the Bid prices for purposes of comparison, Owner will announce to all bidders a "Base Bid plus alternates" budget after receiving all Bids, but prior to opening them. For comparison purposes alternates will be accepted, following the order of priority established in the Bid Form, until doing so would cause the budget to be exceeded. After determination of the Successful Bidder based on this comparative process and on the responsiveness, responsibility, and other factors set forth in these Instructions, the award may be made to said Successful Bidder on its base Bid and any combination of its additive alternate Bids for which Owner determines funds will be available at the time of award.

C. For the determination of the apparent low Bidder when unit price bids are submitted, Bids will be compared on the basis of the total of the products of the estimated quantity of each

item and unit price Bid for that item, together with any lump sum items.

- 18.06 In evaluating whether a Bidder is responsible, Owner will consider the qualifications of the Bidder and may consider the qualifications and experience of Subcontractors and Suppliers proposed for those portions of the Work for which the identity of Subcontractors and Suppliers must be submitted as provided in the Bidding Documents.
- 18.07 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders and any proposed Subcontractors or Suppliers.
- 18.08 ***Before award is made to a Bidder not a resident of the State in which the Project is located, such Bidder shall designate in said State a person on whom service of process can be made in the event of litigation.***
- 18.09 ***The Owner reserves the right to reject any Bid in which the prices appear, in the judgment of the Engineer, to constitute an unbalanced Bid for the Work. Unbalanced prices shall be interpreted to mean that the unit price for any item is such that it is unreasonable for that item when considered in connection with the Bid submitted on any other item or items.***
- 18.10 ***The lowest responsible responsive Bid will be determined by the Owner based on the gross sum for which the entire Work will be performed, arrived at by a correct computation of all of the items specified in the Bid therefore at the prices stated in the Bid. Where the Bid form does not provide for alternates, the gross sum for which the entire Work will be performed will be the total Bid price.***

ARTICLE 19—BONDS AND INSURANCE

- 19.01 Article 6 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner's requirements as to performance and payment bonds, other required bonds (if any), and insurance. When the Successful Bidder delivers the executed Agreement to Owner, it must be accompanied by required bonds and insurance documentation.
- 19.02 Article 8, Bid Security, of these Instructions, addresses any requirements for providing bid bonds as part of the bidding process.

ARTICLE 20—SIGNING OF AGREEMENT

- 20.01 When Owner issues a Notice of Award to the Successful Bidder, it will be accompanied by the unexecuted counterparts of the Agreement along with the other Contract Documents as identified in the Agreement. Within 15 days thereafter, Successful Bidder must execute and deliver the required number of counterparts of the Agreement and any bonds and insurance documentation required to be delivered by the Contract Documents to Owner. Within 10 days thereafter, Owner will deliver one fully executed counterpart of the Agreement to Successful Bidder, together with printed and electronic copies of the Contract Documents as stated in Paragraph 2.02 of the General Conditions.

ARTICLE 21—SALES AND USE TAXES

- 21.01 Owner is exempt from ***State of Connecticut*** state sales and use taxes on materials and equipment to be ***permanently*** incorporated in the Work. (~~Exemption No. [number]~~) Said taxes must not be

included in the Bid. Refer to Paragraph SC-7.10 of the Supplementary Conditions for additional information.

ARTICLE 22—NON-DISCRIMINATION AND EQUAL EMPLOYMENT OPPORTUNITY

22.01 *The Contract Documents provide that the Contractor and his Subcontractors shall not discriminate against any employee or applicant for employment because of race, creed, color, national origin, age, sex, sexual orientation, marital status or physical disability. The successful Bidder must be prepared to comply in all respects with the provisions regarding non-discrimination as set forth in the Contract Documents and all applicable Federal and State laws.*

ARTICLE 23—COMPLIANCE WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND CODES

23.01 *All applicable Federal, State and Municipal laws, ordinances, rules, regulations and codes of all authorities having jurisdiction over construction work in the locality of the Project shall apply to the Contract throughout and they are deemed to be included in the Contract Documents the same as though written therein.*

23.02 *Attention is directed to laws and regulations of the State Labor Department with respect to employment conditions and minimum wages.*

ARTICLE 24—FUNDING AGENCY REQUIREMENTS

24.01 *Any contract or Contracts awarded under this invitation for Bids are expected to be funded in part by the State of Connecticut. Neither the State of Connecticut nor any of its departments , agencies, or employees is or will be a party to this invitation for Bids or any resulting contract. This procurement will be subject to the requirements contained in SECTION 00 73 40 FUNDING AGENCY REQUIREMENTS*

ARTICLE 25—COMMISSION ON HUMAN RIGHTS AND OPPORTUNITIES

25.01 *The contractor who is selected to perform this State project must comply with CONN. GEN. STAT. §§ 4a-60, 4a-60a, 4a-60g, and 46a-68b through 46a-68f, inclusive, as amended by June 2015 Special Session Public Act 15-5.*

25.02 *State law requires a minimum of twenty-five (25%) percent of the state-funded portion of the contract for award to subcontractors holding current certification from the Connecticut Department of Administrative Services (“DAS”) under the provisions of CONN. GEN. STAT. § 4a-60g. (25% of the work with DAS certified Small and Minority owned businesses and 25% of that work with DAS certified Minority, Women and/or Disabled owned businesses.) The contractor must demonstrate good faith effort to meet the 25% set-aside goals.*

PERMITS



10/11/2024

William Eydman

Nathan L. Jacobson & Associates, Inc.

86 Main St

Chester, CT 06412

weydman@nlja.com

Subject: Beaver Dam Trail over Fishing Brook

Filing #: 118528

NDDDB - New Determination Number: 202409663

Expiration Date: 10/11/2026

Location Description: Beaver Dam Trail of Fishing Brook, Old Saybrook, CT

I have reviewed Natural Diversity Data Base (NDDDB) maps and files regarding this project. According to our records, there are State-listed species (RCSA Sec. 26-306) documented nearby the proposed project area.

- **Coppery Emerald (*Somatochlora georgiana*)- State Threatened**
- **Spotted Turtle (*Clemmys guttata*) - State Special Concern**
- **Eastern ribbon snake (*Thamnophis sauritus*)- State Special Concern**
- **Northern long-eared bat (*Myotis septentrionalis*)- State, Federally Endangered**

Coppery Emerald

This species is generally associated with low-gradient streams in forested to partly forested terrain. The emergence and flight period for this species is primarily between July 15-August 31. Your project activities that will restore stream flow should benefit this species.

The following general considerations will benefit this species:

- Adhere strictly to water quality standards at your project site.
- Avoid changing water level fluctuations of streams and ponds outside of natural conditions and patterns.
- Disturbance and traffic through shorelines should be minimized. Species sensitive areas should be delineated and protected from disturbance.

Spotted Turtle

Individuals of this species are associated with wetlands and vernal pools. Over the course of a season and lifetime, individuals will travel large distances (up to 1km) over upland forest and fields between multiple wetlands. They overwinter burrowed into the mud in wetlands between Nov 1- March 15. They do not begin to reproduce until 7-10 years old and adults can live at least 30 years. This species is threatened most by

any activities that reduce adult survivorship including road kills, commercial and casual collection, increased predation in areas around commercial and residential development, mortality and injury from agricultural equipment or other mechanical equipment.

Eastern ribbon snake

Eastern ribbon snakes inhabit areas with shallow water, grassy or shrubby areas bordering streams and wooded swamps. They also prefer sunny areas with low dense vegetation near shallow water areas. Their diet consists of insects, fish, frogs, salamanders and toads. They are dormant between Oct 15- March 31.

When working between March 15- November 1:

- All construction personnel working must be apprised of the species description and the possible presence of a listed species.
- Any turtles or snakes encountered within the immediate work area shall be carefully moved to an adjacent area outside of the excluded area and fencing should be inspected to identify and remove access point. These animals are protected by law and no turtles should be relocated from the site.
- In areas where silt fence is used for exclusion, it shall be removed as soon as the area is stable to allow for reptile and amphibian passage to resume.

Northern long-eared bat (*Myotis septentrionalis*)- State, Federally Endangered

The Northern long-eared bat is one of the species most impacted by White Nose Syndrome. Populations in Connecticut have declined by over 90%, and it has been Federally listed as Endangered. During the summer northern long-eared bats roost singly or in maternal colonies underneath bark, in cavities or in crevices of both live trees and snags (dead trees). Males and non-reproductive females may also roost in cooler places, like caves and mines. Northern long-eared bats seem to be flexible in selecting roosts, choosing roost trees based on suitability to retain bark or provide cavities or crevices. This bat has also been found rarely roosting in structures, like barns and sheds. Northern long-eared bats spend winter hibernating in caves and mines, called hibernacula.

- I do not anticipate impacts from this project.
- The presence of a federally endangered and state endangered species, may require consultation with the US Fish and Wildlife Service Ecological Field Office in order to be in compliance with the Federal Endangered Species Act if the proposed project requires federal permits or uses federal funds. For more information on federal requirements visit:
<http://www.fws.gov/midwest/endangered/mammals/nleb/>

Your submission information indicates that your project requires a state permit, license, registration, or authorization, or utilizes state funding or involves state agency action. This NDDB - New determination may be utilized to fulfill the Endangered and Threatened Species requirements for state-issued permit applications, licenses, registration submissions, and authorizations.

Please be aware of the following limitations and conditions:

Natural Diversity Database information includes all information regarding listed species available to us at the time of the request. This information is a compilation of data collected over the years by the Department of Energy and Environmental Protection's Natural History Survey and cooperating units of DEEP, land owners, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as enhance existing

data. Such new information is incorporated into the Database and accessed through the ezFile portal as it becomes available. New information may result in additional review, and new or modified restrictions or conditions may be necessary to remain in compliance with certain state permits.

- During your work listed species may be encountered on site. A report must be submitted by the observer to the Natural Diversity Database promptly and additional review and restrictions or conditions may be necessary to remain in compliance with certain state permits. Please fill out the [appropriate survey form](#) and follow the instructions for submittal.
- Your project involves the state permit application process or other state involvement, including state funding or state agency actions; please note that consultations with your permit analyst or the agency may result in additional requirements. In this situation, additional evaluation of the proposal by the DEEP Wildlife Division may be necessary and additional information, including but not limited to species-specific site surveys, may be required. Any additional review may result in specific restrictions or conditions relating to listed species that may be found at or in the vicinity of the site.
- If your project involves preparing an Environmental Impact Assessment, this NDDDB consultation and determination should not be substituted for biological field surveys assessing on-site habitat and species presence.
- The NDDDB - New determination for the Beaver Dam Trail over Fishing Brook as described in the submitted information and summarized at the end of this document is valid until 10/11/2026. This determination applies only to the project as described in the submission and summarized at the end of this letter. Please re-submit an updated Request for Review if the project's scope of work and/or timeframe changes, including if work has not begun by 10/11/2026.

If you have further questions, please contact me at the following:

Shannon Kearney
CT DEEP Bureau of Natural Resources
Wildlife Division
Natural Diversity Database
79 Elm Street
Hartford, CT 06106-5127
(860) 424-3170
Shannon.Kearney@ct.gov

Please reference the Determination Number 202409663 when you e-mail or write. Thank you for consulting the Natural Diversity Data Base.

Shannon Kearney
Wildlife Division- Natural Diversity Data Base
79 Elm Street
Hartford, CT 06106-5127
(860) 424-3170
Shannon.Kearney@ct.gov

Application Details:

Project involves federal funds or federal permit:	Yes
Project involves state funds, state agency action, or relates to CEPA request:	Yes
Project requires state permit, license, registration, or authorization:	Yes
DEEP enforcement action related to project:	
Project Type:	Bridge and Culvert Work
Project Sub-type:	New Bridge Including Upland and In-water work
Project Name:	Beaver Dam Trail over Fishing Brook
Project Description:	The current site is a culvert located approximately 215 feet north of Beaver Dam Trail- Kitteridge Hill Road intersection and carries two lanes of bi-directiona



Outlook

07470045 PZC CGS 8-24

From J. Howard Pfrommer, P.E. <hpfrommer@nlja.com>

Date Mon 9/19/2022 12:01 PM

To J. Howard Pfrommer <hpfrommer@nlja.com>

I spoke with Town Planner Christine Costa this morning. She noted that a CGS 8-24 submission was not needed for the project because the project is a “repair” of an existing structure.

J. Howard Pfrommer, P.E.



Nathan L. Jacobson & Associates

Consulting Civil and Environmental Engineers

Celebrating our 50th Anniversary 1972-2022

86 Main Street, P.O. Box 337, Chester, Connecticut 06412-0337

860.526.9591 • hpfrommer@nlja.com • www.nlja.com



TOWN OF OLD SAYBROOK
Inland Wetlands & Watercourses Commission

302 Main Street • Old Saybrook, Connecticut 06475-1741
Telephone (860) 395-3131 • FAX (860) 395-3125

PERMIT

APPLICANT Town of Old Saybrook
ASSESSOR'S MAP # 50 & 63 LOT #4, #6 & road right-of-way
ADDRESS Between 7 & 9 Kitteridge Hill Road, Old Saybrook, CT
PERMIT # 22-008
DATE GRANTED: 11/17/2022
PERMIT EXTENSION: 11/17/2029

EFFECTIVE DATE:

The effective date of this permit is the approval date of any subsequently approved zoning or subdivision permits. If no zoning or subdivision permits are required for the project, the effective date is the date of the approval of the Application to Conduct A Regulated Activity approval by the Inland Wetlands and Watercourses Commission or their Duly Authorized Agent.

EXPIRATION DATE:

The expiration of the zoning or subdivision permit associated with the approved Application to Conduct A Regulated Activity. If no zoning or subdivision permits are required for the project, the expiration date is **two years** from the date of approval of the Application to Conduct a Regulated Activity.

This authorization refers to your application to conduct a regulated activity within those areas regulated by the Inland Wetlands and Watercourses Commission at the following location: Between 7 & 9 Kitteridge Hill Road

The Inland Wetland Commission has considered your application with due regard for the criteria enumerated in Section 10 of the Agency's Regulations and has found that the proposed work, as specified and conditioned below, is in conformance with the purposes and provisions of said sections.

The authorized activity consists of replacement of an existing failing culvert barrel within wetlands.

This Permit is issued subject to the following conditions and/or modifications:

- 1. The permittee shall notify the Wetland Officer immediately upon the commencement of work and upon its completion.**

2. **All work and all regulated activities conducted pursuant to this authorization shall be consistent with the terms and conditions of this Permit. Any structures, excavation, fill, obstructions, encroachments or regulated activities not specifically identified and authorized herein shall constitute a violation of this Permit and may result in its modification, suspension, or revocation. Upon initiation of the activities authorized herein, the permittee thereby accepts and agrees to comply with the terms and conditions of this Permit.**
3. **This authorization is not transferable without the written consent of the Chairman of the Inland Wetland Commission.**
4. **In evaluating this application, the Commission has relied on information provided by the Applicant and, if such information subsequently proves to be false, deceptive, incomplete and/or inaccurate, this Permit may be modified, suspended or revoked.**
5. **The permittee shall employ best management practices, consistent with the terms and conditions of this Permit, to control storm water discharges, to prevent erosion and sedimentation, and to otherwise prevent pollution of wetlands. The permittee shall immediately inform the Wetlands Officer of any problems involving wetlands which have developed in the course of, or which are caused by, the authorized work.**
6. **No equipment or material including, without limitation, fills, construction materials, or debris shall be deposited, placed or stored in any wetland on or off site unless specifically authorized by this Permit. This Permit is subject to and does not derogate any present or future property rights or other rights or powers of the State of Connecticut, and conveys no property rights in real estate or material nor any exclusive privileges, and is further subject to any and all public and private rights and to any federal, state or local laws or regulations pertinent to the property or activity affected hereby.**

Old Saybrook Inland Wetlands & Watercourses Commission



**Lynette Wacker
Assistant Town Planner/Inland Wetlands Agent**

Copy to: Christina Costa, Zoning Enforcement Officer



Outlook

FW: ACOE Self-Verification Form Submission

From cenae-r-ct <cenae-r-ct@usace.army.mil>**Date** Fri 2/16/2024 11:49 AM**To** William J. Eydman <weydman@nlja.com>; carl.fortuna@oldsaybrookct.gov <carl.fortuna@oldsaybrookct.gov>

1 attachments (10 MB)

0. Self-Verification Form Submission.pdf;

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.

We received your Self-Verification Notification Form (SVNF) for the General Permits for Connecticut (GPs for CT) indicating that you plan to conduct work in our jurisdiction. We have logged this into our database and assigned it file number NAE-2024-00461. Please reference this number in any future correspondence with us.

By submitting the SVNF, you are self-verifying that your project is authorized under, and meets the terms and conditions of, the applicable GPs with no review by the Corps of Engineers. Activities that do not qualify for SV require a PCN to the Corps.

Please contact me with any questions,

Bettina Chaisson
Permits & Enforcement Branch
978-318-8058

From: William J. Eydman <weydman@nlja.com>**Sent:** Wednesday, February 14, 2024 4:02 PM**To:** cenae-r-ct <cenae-r-ct@usace.army.mil>; DEEP LWRD Regulatory Submittals <DEEP.LWRDRegulatorySubmittals@ct.gov>; darcy.winther@ct.gov**Cc:** J. Howard Pfrommer <hpfrommer@nlja.com>; carl.fortuna@oldsaybrookct.gov**Subject:** [Non-DoD Source] ACOE Self-Verification Form Submission

Hello,

This is William Eydman from Nathan L. Jacobson & Associates. Our firm has been authorized by the Town of Old Saybrook, CT to prepare plans for the Replacement of Bridge No. 105003, Beaver Dam Trail over Fishing Brook. Proposed work includes replacing the current corrugated metal pipe arch (CMPA) with a precast concrete box culvert. I am attaching an executed Self-Verification Notification Form along with the necessary supporting attachments for review and approval. A written response would be very much appreciated.

Regards,
10/9/2024

25

William J. Eydman, EIT



Nathan L. Jacobson & Associates

Consulting Civil and Environmental Engineers Since 1972

86 Main Street, P.O. Box 337, Chester, Connecticut 06412-0337

Office: 860.526.9591 • Cell: 860.304.5900

weydman@nlja.com • www.nlja.com



**US Army Corps
of Engineers**[®]
New England District

Appendix E: Self-Verification Notification Form

This form is required for all inland projects in Connecticut, but it is not required if work is done within boundaries of Mashantucket Pequot or Mohegan Tribal Lands. At least two weeks before work commences, complete all fields (write "none" if applicable) below, send this form, Official Species List (see GC 12), documentation of THPO and SHPO notifications if applicable, site location map, project plans (not required for projects involving the installation of construction mats only) and any State or local approval(s) to:

Regulatory Division, Branch B
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751
or cenae-r-ct@usace.army.mil

and

CT DEEP
79 Elm Street
Hartford, CT 06106-5127
or DEEP.LWRDRegulatorySubmittals@ct.gov

State Permit Number: _____ Date of State Permit: _____

Permittee: Town of Old Saybrook, Carl P. Fortuna Jr., First Selectman
Address, City, State & Zip: 302 Main Street, Old Saybrook, CT, 06475
Phone(s) and Email: (860) 395-3123 Carl.Fortuna@OldSaybrookCT.gov

Agent: Nathan L. Jacobson & Associates, Inc.; William Eydman, EIT
Address, City, State & Zip: 86 Main Street, Chester, CT, 06412
Phone(s) and Email: (860) 526-9591 weydman@njja.com

Contractor: To be determined.
Address, City, State & Zip: _____
Phone(s) and Email: _____

Project Name: Replacement of Bridge No. 105003; Beaver Dam Trail over Fishing Brook
Project Location (provide detailed description & locus map):
Address, City, State & Zip: 200 feet from intersection of Beaver Dam Trail / Kitteridge Hill Rd, Old Saybrook, CT, 06475
Lat. ° N, Long ° (Decimal Degrees): 41.30434, -72.41707
Waterway Name: Fishing Brook

Proposed Work Dates: Start: May 2025 Finish: October 2025

Work will be done under the following GPs (circle all that apply):

2 5 6 9 10 11 12 13 14 15 17 18 **(19)** 21

Area of Wetland Impacts (SF): Permanent: 308 Temporary: 1269

Area of Waterway Impacts (SF): Permanent: 395 Temporary: 185

TOTAL Project Impact (SF): Permanent: 703 Temporary: 1454

Describe the specific work that will be undertaken in waters and wetlands: _____
The proposed plan is to replace the existing culvert with a precast concrete rigid frame. Cofferdams will be used to
maintain flow between frame footings. A 1 foot depth of natural brook bottom material and a low flow fish channel will
be provided per Fisheries request. Riprap will be placed at the inlet and outlet above the plane of OHW.

Have the THPOs and the CT SHPO been notified of the proposed work per the procedures in GC 11? If so, attach any responses received to this form.

Yes date contacted 10/6 & 10/7/2021 No _____

Are there Federally listed endangered/threatened species, other than the northern long-eared bat, present? (see GC 12) Yes _____ No

Confirm no SAVs are present or will be impacted: Yes No _____

Applicable to GPs:

2	5	6	9	10	11	12	13	14	15	17	18	19	21
---	---	---	---	----	----	----	----	----	----	----	----	----	----

Confirm no unconfined work with impact to diadromous fish (see App. H): Yes No _____

Applicable to GPs:

2	5	6	9	10	19
---	---	---	---	----	----

Confirm work complies with Stream Crossing BMPs (see App. G): Yes No _____

Applicable to GPs:

2	6	17	19
---	---	----	----

If GP 19 and work does not comply with Appendix G, identify date of Interagency Meeting where waiver was granted: Date of Meeting: _____

Identify interagency participants: CT DEEP: _____ USACE: _____

Will your project include any secondary effects? (Secondary effects include, but are not limited to, non-tidal waters or wetlands drained, flooded, fragmented, or mechanically cleared resulting from a single and complete project. See Appendix F - Definitions.) If YES, describe here:

No.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms, eligibility criteria, and general conditions for Self-Verification under the Connecticut GPs.

Permittee Signature: _____

Date: February 14, 2024



United States Department of the Interior



FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104

In Reply Refer To:
Project Code: 2024-0042173
Project Name: Beaver Dam Trail over Fish ng Brook

January 29, 2024

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

Updated 4/12/2023 - Please review this letter each time you request an Official Species List, we will continue to update it with additional information and links to websites may change.

About Official Species Lists

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Federal and non-Federal project proponents have responsibilities under the Act to consider effects on listed species.

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested by returning to an existing project's page in IPaC.

Endangered Species Act Project Review

Please visit the “**New England Field Office Endangered Species Project Review and Consultation**” website for step-by-step instructions on how to consider effects on listed

species and prepare and submit a project review package if necessary:

<https://www.fws.gov/office/new-england-ecological-services/endangered-species-project-review>

NOTE Please do not use the **Consultation Package Builder** tool in IPaC except in specific situations following coordination with our office. Please follow the project review guidance on our website instead and reference your **Project Code** in all correspondence.

Northern Long-eared Bat - (Updated 4/12/2023) The Service published a final rule to reclassify the northern long-eared bat (NLEB) as endangered on November 30, 2022. The final rule went into effect on March 31, 2023. You may utilize the **Northern Long-eared Bat Rangewide Determination Key** available in IPaC. More information about this Determination Key and the Interim Consultation Framework are available on the northern long-eared bat species page:

<https://www.fws.gov/species/northern-long-eared-bat-myotis-septentrionalis>

For projects that previously utilized the 4(d) Determination Key, the change in the species' status may trigger the need to re-initiate consultation for any actions that are not completed and for which the Federal action agency retains discretion once the new listing determination becomes effective. If your project was not completed by March 31, 2023, and may result in incidental take of NLEB, please reach out to our office at newengland@fws.gov to see if reinitiation is necessary.

Additional Info About Section 7 of the Act

Under section 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to determine whether projects may affect threatened and endangered species and/or designated critical habitat. If a Federal agency, or its non-Federal representative, determines that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Federal agency also may need to consider proposed species and proposed critical habitat in the consultation. 50 CFR 402.14(c)(1) specifies the information required for consultation under the Act regardless of the format of the evaluation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<https://www.fws.gov/service/section-7-consultations>

In addition to consultation requirements under Section 7(a)(2) of the ESA, please note that under sections 7(a)(1) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species. Please contact NEFO if you would like more information.

Candidate species that appear on the enclosed species list have no current protections under the ESA. The species' occurrence on an official species list does not convey a requirement to

consider impacts to this species as you would a proposed, threatened, or endangered species. The ESA does not provide for interagency consultations on candidate species under section 7, however, the Service recommends that all project proponents incorporate measures into projects to benefit candidate species and their habitats wherever possible.

Migratory Birds

In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see:

<https://www.fws.gov/program/migratory-bird-permit>

<https://www.fws.gov/library/collections/bald-and-golden-eagle-management>

Please feel free to contact us at **newengland@fws.gov** with your **Project Code** in the subject line if you need more information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat.

Attachment(s): Official Species List

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office

70 Commercial Street, Suite 300
 Concord, NH 03301-5094
 (603) 223-2541

PROJECT SUMMARY

Project Code: 2024-0042173
Project Name: Beaver Dam Trail over Fishing Brook
Project Type: Bridge - Replacement
Project Description: culvert replacement
Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@41.30644475,-72.41640376929777,14z>



Counties: Middlesex County, Connecticut

ENDANGERED SPECIES ACT SPECIES

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMAL

NAME	STATUS
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered

INSECT

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency: Old Saybrook town
Name: William Eydman
Address: 86 Main Street
City: Chester
State: CT
Zip: 06412
Email: weydman@nlja.com
Phone: 8605269591



October 6, 2021

Ms. Marissa Turnbull, Tribal Historic Preservation Officer
Mashantucket Western Pequot Tribal Nation
110 Pequot Trail
Mashantucket, CT 06338

Mr. James Quinn, Tribal Historic Preservation Officer
Mohegan Tribe of Indians of Connecticut
13 Crow Hill Road
Uncasville, CT 06382

RE: Repairs to Bridge No. -
Beaver Dam Trail over Fishing Brook
Old Saybrook, CT
NLJA #0747-0045

Dear Ms. Turnbull and Mr. Quinn:

Our firm has been retained by the Town of Old Saybrook to provide engineering services for the subject project. Proposed work includes replacing the existing corrugated metal pipe arch with a precast concrete box culvert. In order to do this, one or more cofferdams will be used along with a bypass pipe to maintain brook flow while enabling the barrel stays dry during construction. The box culvert will have a floor covered with 1 foot depth of natural brook bottom material and a low flow fish channel through the barrel if Fisheries requires. Riprap will be placed at the inlet and outlet, but not below the plain of Ordinary High Water. The work will comply with U.S. Army Corps of Engineers time of year restrictions and other BMPs. Construction is anticipated to occur in 2023. The project is anticipated to be eligible for the U.S. Army Corps of Engineers, CT General Permit #19.

Would you please review the project and provide any tribal related comments, so that we can properly address them in the design?

Please contact us with any questions.

Very truly yours,
NATHAN L. JACOBSON & ASSOCIATES, INC.

A handwritten signature in blue ink, appearing to read 'Danielle L. Marzitelli', is written over the typed name.

Danielle L. Marzitelli

Enclosures:

1. Location Map, scale 1" = 2,000', dated September 2021, prepared by this office.
2. Proposed Plan Sketch, 1" = 20', dated October 2021, prepared by this office.
3. Existing Condition Photos, prepared by this office.

Cc: Carl P. Fortuna, First Selectman, w/ encl.
J. Howard Pfrommer, P.E., w/o encl.
Geoffrey L. Jacobson, P.E., w/o encl.
Larry Bonin, w/ encl.

L:\07470045 Beaver Dam Trail over Fishing Brook\Permits\THPO\1. Letter.docx

Nathan L. Jacobson & Associates, Inc.
Nathan L. Jacobson & Associates, P.C. (NY)
86 Main Street P.O. Box 337 Chester, Connecticut 06412-0337
Tel 860.526.9591 Fax 860.526.5416

Consulting Civil and Environmental Engineers Since 1972
10/2024



BEAVER DAM TRAIL
OVER FISHING BROOK

REFERENCE: U.S.G.S. ESSEX CONNECTICUT QUADRANGLE

Date: SEPTEMBER 2021

Contract No. 07470045

Scale: 1"=2000'

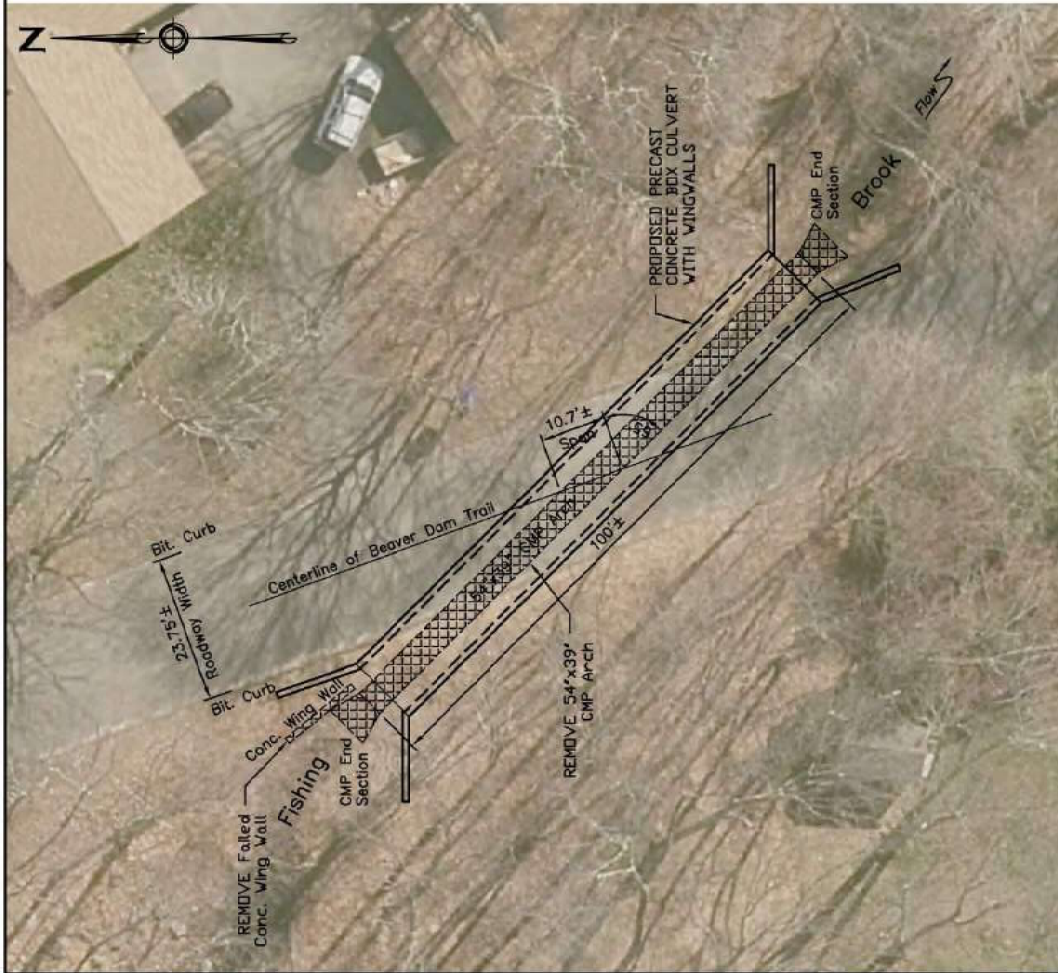
BEAVER DAM TRAIL OVER FISHING BROOK
OLD SAYBROOK, CONNECTICUT

SITE LOCATION MAP



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Failed Concrete Wing Wall
Crushed 54"x39" CMP Arch (Approx. 48"x12" At Inlet)

NORTHWEST ELEVATION 2021
N.T.S.



Concrete Wing Wall
54"x39" CMP Arch (48"x36" At Inlet)

NORTHWEST ELEVATION 2018
N.T.S.

PROPOSED PROJECT PLAN
SCALE: 1"=20'

REFERENCE:
1. CTECO 2016 ORTHOIMAGERY.

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**BEAVER DAM TRAIL
OVER FISHING BROOK
OLD SAYBROOK, CONNECTICUT**

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DATE:	SEPTEMBER 2021	DESIGNED:	MDC
SCALE:	AS NOTED	DRAWN:	AUG., June 2018
PROJECT No.:	07470045	EDITED:	DJM, Sept. 2021
CADD FILE:	07470045SP.dwg	SHEET No.:	1 OF 1

**Existing Condition Photos
for
Beaver Dam Trail over Fishing Brook
Old Saybrook, Connecticut**



Photo 1: Previous Southbound approach, 05/18/2018



Photo 2: Previous upstream elevation, 05/18/2018



Photo 2: Current upstream elevation. Culvert barrel has been crushed at inlet leaving only about 12" of available vertical clearance for flow. 09/17/2021



Photo 2: View from top of barrel looking down. 09/17/2021



Photo 3: Wingwall collapsed and was originally found on top of crushed barrel. The Town pulled the wingwall back and placed it to help stabilize eroded embankment. 09/17/2021



Photo 4: Approach roadway has been compromised due to failed culvert. Erosion has exposed underground utilities and undermined roadway pavement. Temporary riprap has been placed on embankment to help prevent further erosion. 09/17/2021



Nathan L. Jacobson & Associates, Inc.

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Jacobson Consulting Civil and Environmental Engineers Since 1972

LETTER OF TRANSMITTAL

To: State Historic Preservation Office
Attn: Environmental Review
450 Columbus Blvd., Suite 5
Hartford, CT 06103

Date: October 7, 2021

NLJA #: 0747-0045

Subject: Repairs to Bridge No. -, Beaver Dam Trail over
Fishing Brook
Old Saybrook, Connecticut

We are sending you the following:

Attached Under separate cover via: _____

- | | | |
|---|--|---|
| <input type="checkbox"/> Prints | <input type="checkbox"/> Letter | <input type="checkbox"/> Catalogue Cuts |
| <input type="checkbox"/> Specifications | <input type="checkbox"/> Shop Drawings | <input type="checkbox"/> Samples |
| <input type="checkbox"/> Reports | <input type="checkbox"/> Booklets | <input checked="" type="checkbox"/> See description below |

Sent for the following reason:

- | | | |
|--|--|--|
| <input type="checkbox"/> As requested | <input type="checkbox"/> For approval | <input type="checkbox"/> Revise and resubmit |
| <input type="checkbox"/> For your use | <input type="checkbox"/> Approved | <input type="checkbox"/> Returned after loan to us |
| <input checked="" type="checkbox"/> For review and comment | <input type="checkbox"/> Approved as noted | <input type="checkbox"/> _____ |

Copies	Drawing #	Date	Description
1		10-07-21	SHPO Project Notification Form w/ attachments

Remarks: Please review and comment from the State Historic Preservation Office's perspective. Thank you.

cc: Carl P. Fortuna Jr., First Selectman, w/encl.
J. Howard Pfrommer, P.E., w/o encl.
Geoffrey L. Jacobson, P.E., w/o encl.
Larry Bonin, w/ encl.

Signed: 
Danielle L. Marzitelli, E.I.T
dmarzitelli@nlja.com

If enclosures are not as described, please notify our office.



PROJECT REVIEW COVER FORM

This is: a new submittal supplemental information other Date Submitted: _____

PROJECT INFORMATION

Project Name: Repairs to Bridge No. -, Beaver Dam Trail over Fishing Brook

Project Proponent: Town of Old Saybrook
The individual or group sponsoring, organizing, or proposing the project.

Project Street Address: Approximately 215 feet north of Beaver Dam Trail and Kitteridge Hill Road intersection.
Include street number, street name, and or Route Number. If no street address exists give closest intersection.

City or Town: Old Saybrook County: Middlesex
Please use the municipality name and not the village or hamlet.

PROJECT DESCRIPTION (REQUIRED)

Please summarize the project below. In a separate attachment, describe the project in detail. As applicable, provide any information regarding past land use, project area size, renovation plans, demolitions, and/or new construction.
The proposed project includes replacing the current corrugated metal pipe arch (CMPA) with a precast concrete box culvert.

List all state and federal agencies involved in the project and indicate the funding, permit, license or approval program pertaining to the proposed project:

Table with 3 columns: Agency Type, Agency Name, Program Name. Rows include CTDEEP (DEEP Fisheries Consultation), CTDEEP (Request for Natural Diversity Data Base), Army Corps of Engineers (CT General Permit), and CTDEEP (401 WQC).

If there is no state or federal agency involvement, please state the reason for your review request:

FOR SHPO USE ONLY
Based on the information submitted to our office for the above named property and project, it is the opinion of the Connecticut State Historic Preservation Office that no historic properties will be affected by the proposed activities.*
Jonathan Kinney Deputy State Historic Preservation Officer Date
*All other determinations of effect will result in a formal letter from this office

PROJECT REVIEW COVER FORM

CULTURAL RESOURCES IDENTIFICATION

Background research for previously identified historic properties within a project area may be undertaken at the SHPO's office. To schedule an appointment, please contact Catherine Labadia, 860-500-2329 or Catherine.labadia@ct.gov. Some applicants may find it advantageous to hire a qualified historic preservation professional to complete the identification and evaluation of historic properties.

Are there any historic properties listed on the State or National Register of Historic Places within the project area? (Select one)

Yes No Do Not Know **If yes, please identify:** _____

Architecture

Are there any buildings, structures, or objects within the Area of Potential Effects (houses, bridges, barns, walls, etc.)? The area of potential effects means the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties. If you're not sure, check "I don't know."

- Yes (attach clearly labeled photographs of each resource and applicable property cards from the municipality assessor)
- No (proceed to next section)
- I don't know (proceed to next section)

Date the existing building/structures/objects were constructed: _____

If the project involves rehabilitation, demolition, or alterations to existing buildings older than 50 years, provide a work plan (If window replacements are proposed, provide representative photographs of existing windows).

Archeology

Does the proposed project involve ground disturbing activities?

- Yes (provide below or attach a description of current and prior land use and disturbances. Attach an excerpt of the soil survey map for the project area. These can be created for free at: <https://websoilsurvey.nrcs.usda.gov>

No

CHECKLIST (Did you attach the following information?)

<p style="text-align: center;">Required for all Projects</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Completed Form <input checked="" type="checkbox"/> Map clearly labeled depicting project area <input checked="" type="checkbox"/> Photograph of current site conditions <input checked="" type="checkbox"/> Site or project plans for new construction 	<p style="text-align: center;">Required for Projects with architectural resource</p> <ul style="list-style-type: none"> <input type="checkbox"/> Work plans for rehabilitation or renovation <input type="checkbox"/> Assessor's Property Card <p style="text-align: center;">Required for Projects with ground disturbing activities</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Soil survey map
<p>Suggested Attachments, as needed</p> <ul style="list-style-type: none"> <input type="checkbox"/> Supporting documents needed to explain project <input type="checkbox"/> Supporting documents identifying historic properties <input type="checkbox"/> Historic maps or aerials (available at http://magic.lib.uconn.edu or https://www.historicaerials.com/) 	

PROJECT CONTACT

Name: Danielle Marzitelli Firm/Agency: Nathan L. Jacobson & Associates, Inc.

Address: 86 Main Street

City: Chester State: CT Zip: 06412

Phone: 860.526.9591 Email: dmarzitelli@nlja.com

Federal and state laws exist to ensure that agencies, or their designated applicants, consider the impacts of their projects on historic resources. At a minimum, submission of this completed form with its attachments constitutes a request for review by the Connecticut SHPO. The responsibility for preparing documentation, including the identification of historic properties and the assessment of potential effects resulting from the project, rests with the federal or state agency, or its designated applicant. The role of SHPO is to review, comment, and consult. SHPO's ability to complete a timely project review largely depends on the quality of the materials submitted. Please mail the completed form with all attachments to the attention of: Environmental Review, State Historic Preservation Office, 450 Columbus Boulevard, Suite 5, Hartford, CT. **Electronic submissions are not accepted at this time.**



BEAVER DAM TRAIL
OVER FISHING BROOK

REFERENCE: U.S.G.S. ESSEX CONNECTICUT QUADRANGLE

Date: SEPTEMBER 2021

Contract No. 07470045

Scale: 1"=2000'

BEAVER DAM TRAIL OVER FISHING BROOK
OLD SAYBROOK, CONNECTICUT

SITE LOCATION MAP



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**Existing Condition Photos
for
Beaver Dam Trail over Fishing Brook
Old Saybrook, Connecticut**



Photo 1: Previous Southbound approach, 05/18/2018



Photo 2: Previous upstream elevation, 05/18/2018



Photo 2: Current upstream elevation. Culvert barrel has been crushed at inlet leaving only about 12" of available vertical clearance for flow. 09/17/2021



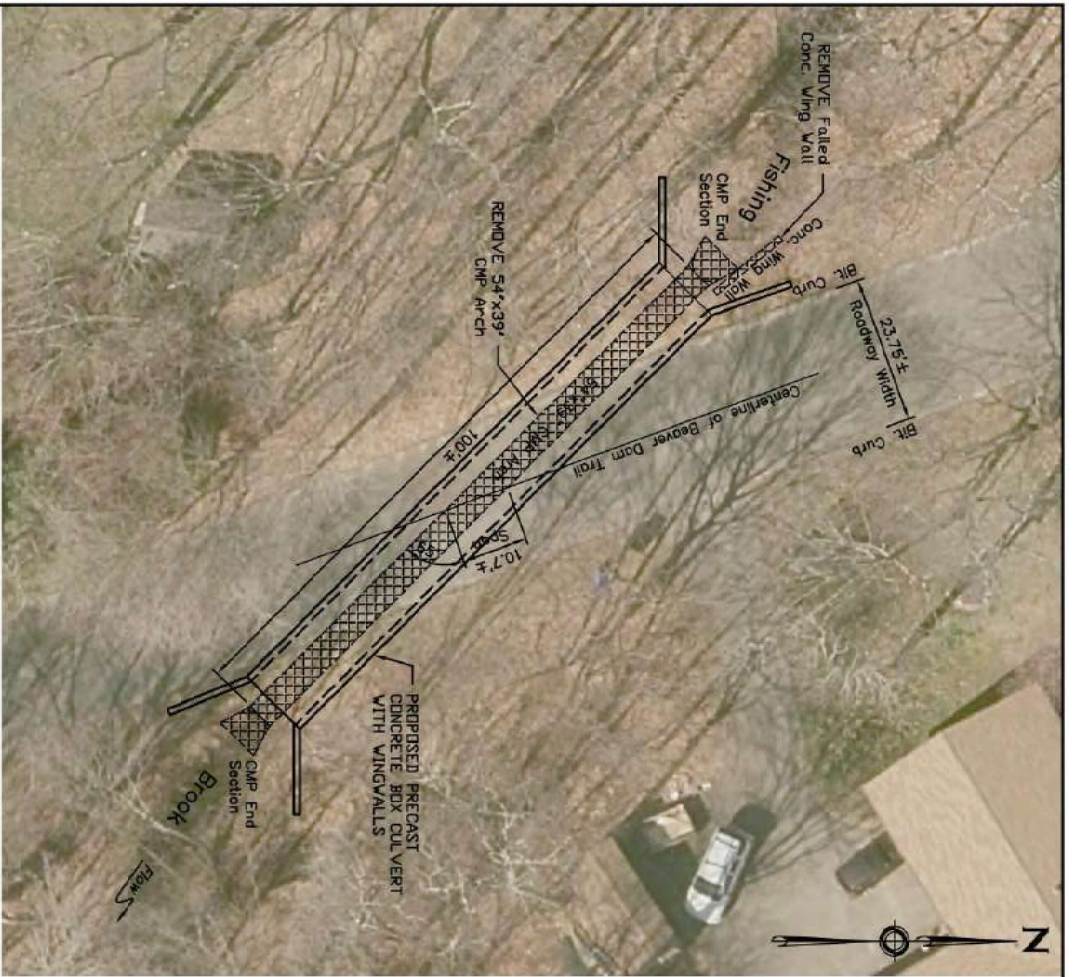
Photo 2: View from top of barrel looking down. 09/17/2021



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REFERENCE:
1. CTECO 2016 ORTHOMAGERY.

PROPOSED PROJECT PLAN

SCALE: 1"=20'

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**BEAVER DAM TRAIL
OVER FISHING BROOK
OLD SAYBROOK, CONNECTICUT**

Failed Concrete Wing Wall

Crushed 54"x39" CMP Arch (Approx. 48"x12" At Inlet)



NORTHWEST ELEVATION 2021
N.T.S.

Concrete Wing Wall

54"x39" CMP Arch (48"x36" At Inlet)



NORTHWEST ELEVATION 2018
N.T.S.

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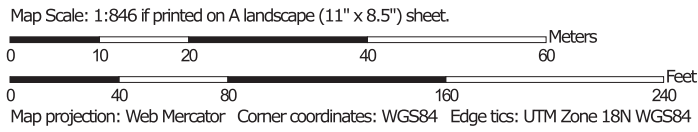
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DATE:	SEPTEMBER 2021	DESIGNED:	MDC
SCALE:	AS NOTED	DRAWN:	AJC, June 2018
PROJECT No.:	07470045	EDITED:	DJM, Sept. 2021
CADD FILE:	07470045SP.dwg	SHEET No.:	1 OF 1

oil Map—State of Connecticut
(5. Soil Map)




Soil Map may not be valid at this scale.



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)




















Soils







 Soil Map Unit Polygons

 Soil Map Unit Lines


 Soil Map Unit Points

Special Point Features



-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features

Water Features

 Streams and Canals

Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: State of Connecticut
Survey Area Data: Version 21, Sep 7, 2021

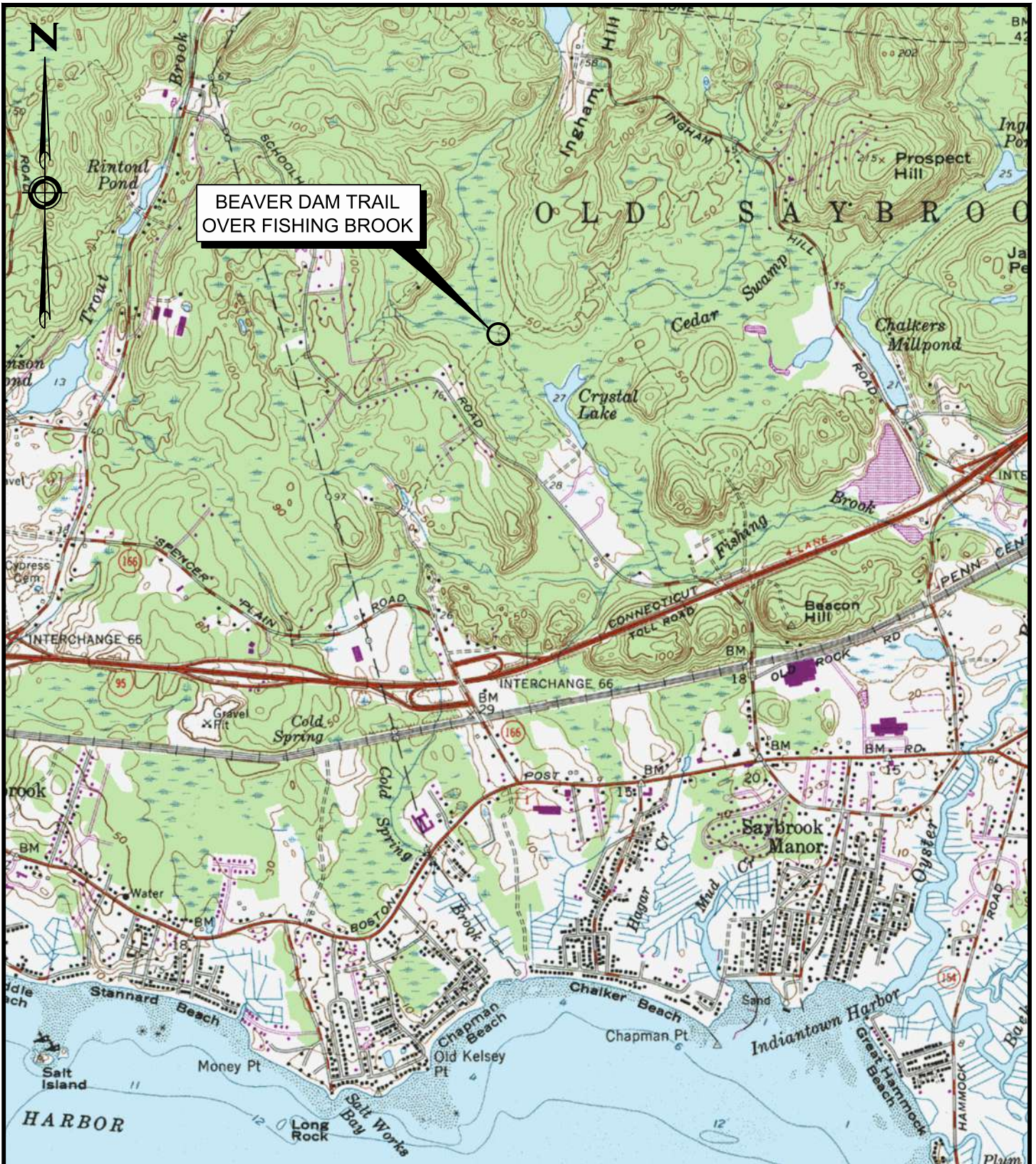
Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 31, 2009—Sep 6, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
13	Walpole sandy loam, 0 to 3 percent slopes	1.8	70.3%
61C	Canton and Charlton fine sandy loams, 8 to 15 percent slopes, very stony	0.4	14.8%
701A	Ninigret fine sandy loam, 0 to 3 percent slopes	0.4	14.8%
Totals for Area of Interest		2.6	100.0%



BEAVER DAM TRAIL
OVER FISHING BROOK

REFERENCE: U.S.G.S. ESSEX CONNECTICUT QUADRANGLE

Date: SEPTEMBER 2021

Contract No. 07470045

Scale: 1"=2000'

BEAVER DAM TRAIL OVER FISHING BROOK
OLD SAYBROOK, CONNECTICUT

SITE LOCATION MAP



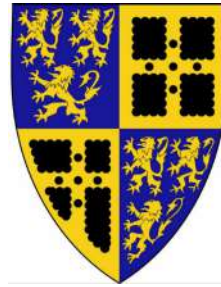
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ABBREVIATIONS	
BR	STIRRAKUS
B.O.F.	BOTTOM OF FOOTING
CONC.	CONCRETE
CF	CUBIC FEET
CMP	CORRUGATED METAL PIPE
CMFE	CORRUGATED METAL FLARED END
CMFA	CORRUGATED METAL PIPE ANDH
DN	DIAMETER
EL.	ELEVATION
HMA	HOT MIX ASPHALT
INV.	INVERT
MFL	MINIMUM
NF	NOW OR FORMERLY
DHW	ORDINARY HIGH WATER
PVC	POLYVINYLCHLORIDE
R	RADIUS
RCP	REINFORCED CONCRETE PIPE
S.F.	SQUARE FEET
STA.	STATION
T.O.W.	TOP OF WALL
(TYP.)	TYPICAL
WSEL.	WATER SURFACE ELEVATION
WF	WETLAND FLAG

LEGEND	
	EXISTING INDEX CONTOUR
	PROPOSED INDEX CONTOUR
	INTERMEDIATE CONTOUR
	SPOT ELEVATION
	CONIFEROUS TREE
	DECIDUOUS TREE
	EDGE OF WATER
	WETLAND FLAG
	PROPERTY LINE
	STREET LINE
	SURVEY CONTROL
	PERMANENT EASEMENT
	TEMPORARY EASEMENT
	EDGE OF GRAVEL
	EDGE OF PAVEMENT
	STIRRAKUS CONCRETE CLASS
	SIGN
	GUTTER
	CABLE TELEVISION
	ELECTRIC LINE
	TELEPHONE LINE
	CATCH BASIN
	FLARED END SECTION
	STORM DRAINAGE PIPE
	CLEARING
	SPURCUT
	REMOVE PAVEMENT
	EROSION CONTROL

PRELIMINARY DESIGN
OCTOBER 2022



TOWN OF
OLD SAYBROOK, CONNECTICUT

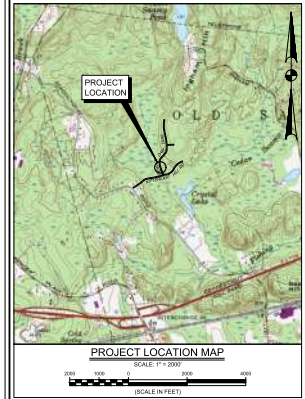
REPLACEMENT OF
BRIDGE NO. 105003
BEAVER DAM TRAIL
OVER FISHING BROOK

BOARD OF SELECTMEN

CARL P. FORTUNA, JR. FIRST SELECTMAN
SCOTT GIEGERICH
MATTHEW PUGLIESE

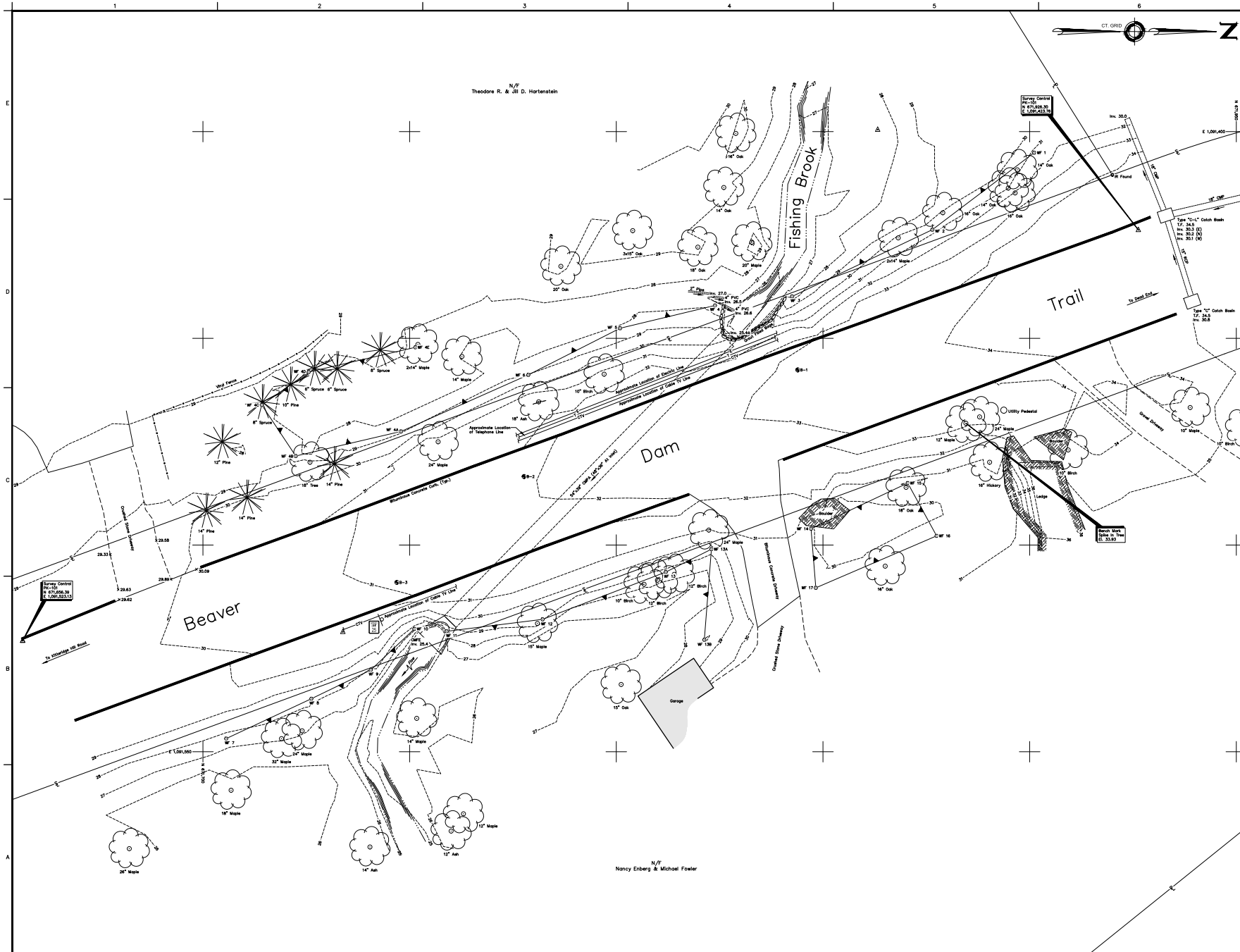
SCHEDULE OF DRAWINGS	
SHEET No.	TITLE
1 OF 17	COVER SHEET
2 OF 17	TOPOGRAPHIC SURVEY
3 OF 17	DEMOLITION PLAN
4 OF 17	ROADWAY PLAN
5 OF 17	ROADWAY PROFILE
6 OF 17	EROSION AND SEDIMENT CONTROL AND PLANTING PLAN
7 OF 17	EROSION AND SEDIMENT CONTROL NOTES
8 OF 17	EROSION AND SEDIMENT CONTROL DETAILS
9 OF 17	MAINTENANCE AND PROTECTION OF TRAFFIC PLAN
10 OF 17	STAGING PLAN
11 OF 17	ENVIRONMENTAL IMPACT PLAN
12 OF 17	GENERAL PLAN
13 OF 17	RIGID FRAME AND FOOTING DETAILS
14 OF 17	WINGWALL DETAILS
15 OF 17	PARAPET DETAILS
16 OF 17	SITE DETAILS AND NOTES
17 OF 17	FIGURES FOR DATES ON BRIDGE PARAPETS

CTDOT STANDARD DRAWINGS	
SHEET No.	TITLE
HW-822.01	TEMPORARY PRECAST CONCRETE BARRIER CURB
HW-910.20	MASH W-BEAM HARDWARE
HW-910.21	MASH BEAM RAIL (R-B MASH) GUIDERAIL
HW-910.23	METAL BEAM RAIL (R-B MASH) HALF AND QUARTER POST SPACING GUIDERAIL
HW-911.01	R-B END ANCHORAGE TYPE I AND II
TR-1208.02	METAL SIGN POSTS AND SIGN MOUNTING DETAILS
TR-1220.01	SIGNS FOR CONSTRUCTION AND PERMIT OPERATIONS
TR-1220.02	CONSTRUCTION SIGN SUPPORTS AND CHANNELIZED DEVICES



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J. HOWARD PERKINS, P.E.
CT REGISTRATION No. 15871



- NOTES**
- This survey was prepared pursuant to the Regulations of Connecticut State Agencies Sections 20-200a through 20-200c-20 as a Class T2 Topographic Survey (Vertical Accuracy Class 1/2 inch = 1 Foot) of the Survey Boundary Determination Category is Dependent Recovery. See maps referenced below.
 - Underground or overhead encroachments, structures, and systems were not investigated as a part of this survey, except as shown or noted herein.
 - Stone walls and/or fences may deviate slightly from principal corners shown.
 - Adjacent property lines of adjacent owners are shown for general informational purposes only and are not to be construed as being accurately located or shown herein.
 - Horizontal datum is NAD83. Vertical datum is NAVD83.
 - Parcels are shown on Tax Map 50.
 - Parcels may be subject to such rights and encumbrances as appear of record or as apparent by usage. This survey reflects encumbrances noted and discovered by the surveyor in the normal course of work and does not necessarily show every possible condition affecting the property. Easements, easements, local ordinances, zoning and other legal encumbrances may exist which are not reflected herein. Consult a title attorney to discover all legal encumbrances, if any, attached to this property.
 - Reference is made to the following map:
 A. "FINAL PLAN KITTERIDGE HILL, SUBDIVISION OF LAND OF GEORGE J. HERRON, SCHOOLHOUSE ROAD OLD SAYBROOK, CONNECTICUT DATE NOV. 7, 1973 SCALE: 1" = 100', by James L. McDonald, L.S., G.S.L.S., Map No. 1,028

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GRAPHIC SCALE
 1" = 100'
 SCALE: 1" = 100'

TOWN OF
 OLD SAYBROOK, CONNECTICUT

**REPLACEMENT OF
 BRIDGE NO. 105003
 BEAVER DAM TRAIL
 OVER FISHING
 BROOK**

**TOPOGRAPHIC
 SURVEY**

PRELIMINARY DESIGN

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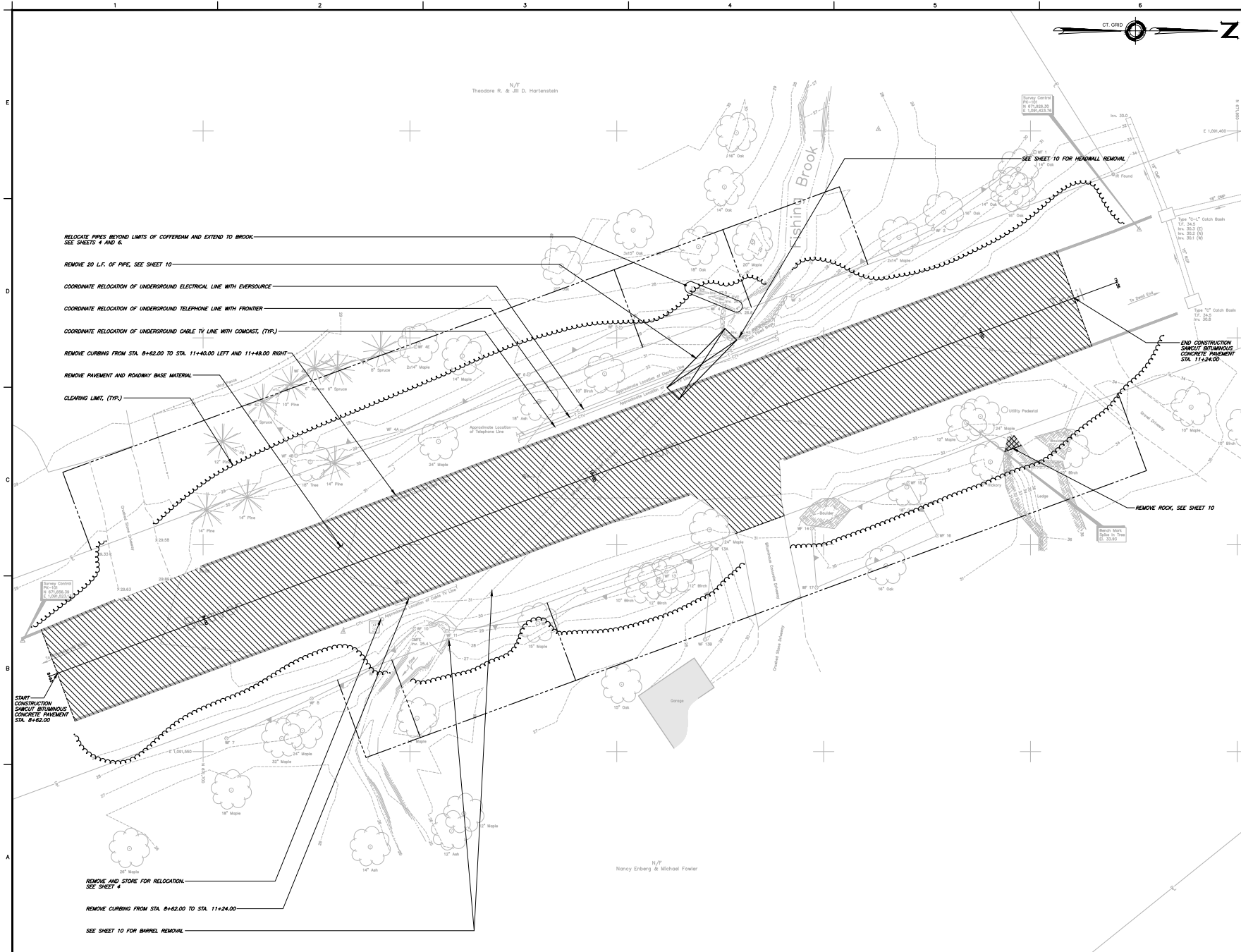
TO MY KNOWLEDGE AND BELIEF, THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

JEFFREY A. SANBORN, L.S.
 CT REGISTRATION NO. 1083

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REVISIONS		
NO.	DESCRIPTION	DATE

DATE: OCTOBER 2022 SHEET NO.:
 SCALE: 1"=10' 2 OF 17
 PROJECT NO.: 07470045
 CAD FILE: 07470045P
 FIELD BOOK: -
 DRAWING: -
 CHECKED: AUG



NOTES
 1. SEE SHEET 10 FOR PROJECT NOTES.

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TOWN OF
 OLD SAYBROOK, CONNECTICUT

**REPLACEMENT OF
 BRIDGE NO. 105003
 BEAVER DAM TRAIL
 OVER FISHING
 BROOK**

DEMOLITION PLAN

PRELIMINARY DESIGN

WE warrant all information in this drawing was prepared by the engineer or architect under the direct supervision and written approval of a professional engineer or architect. We will be held liable for the work of the person or persons named in this drawing. We will not be held liable for any work done by any other person or persons who are not named in this drawing.

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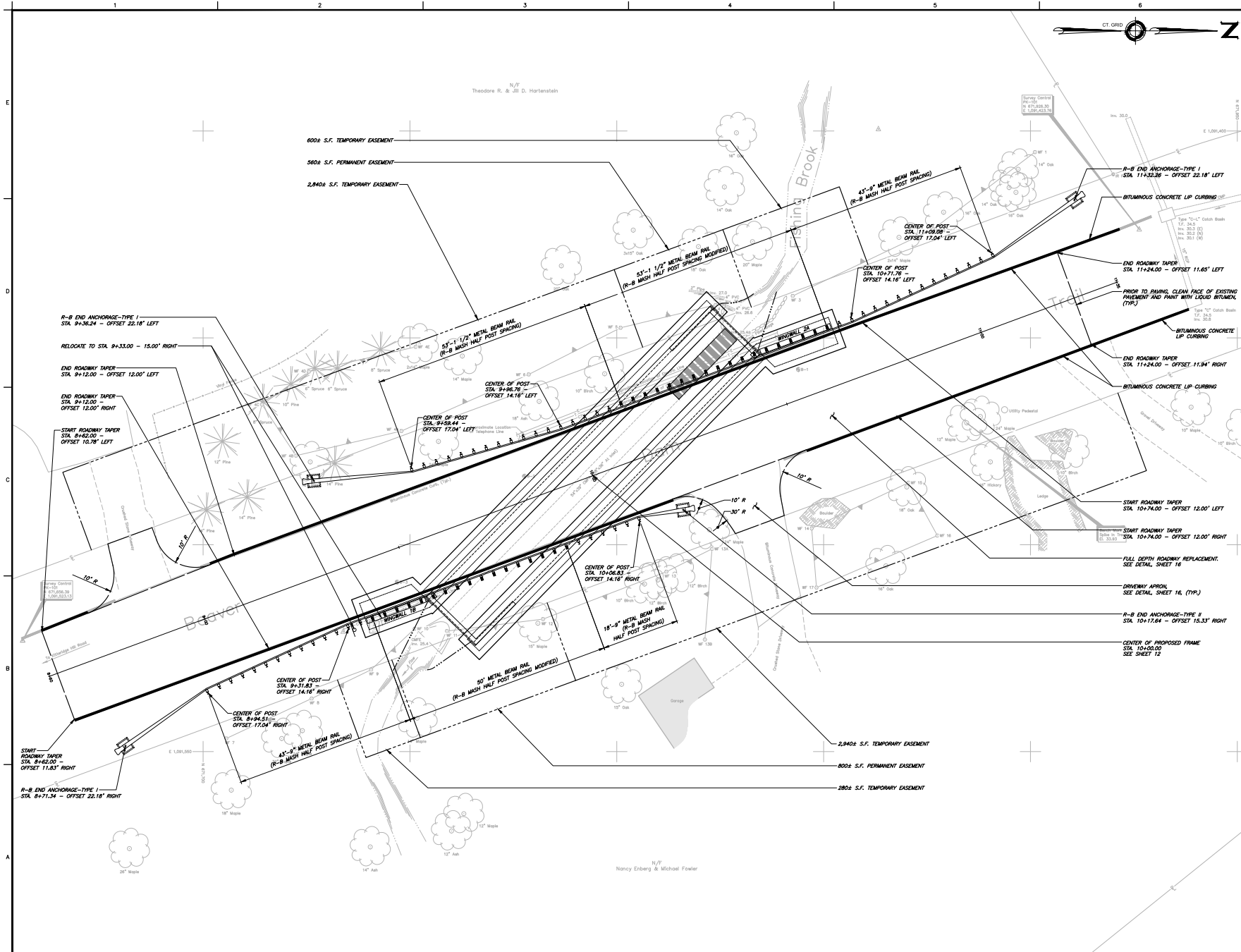
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REVISIONS		
NO.	DESCRIPTION	DATE

DATE: OCTOBER 2024 SHEET NO.:
 SCALE: 1"=10'
 PROJECT NO.: 07470405
 CADD FILE: 07470405P
 DESIGNED: JHP
 DRAWN: AJG
 CHECKED: AJG



NOTES
 1. SEE SHEET 16 FOR PROJECT NOTES.

THE DRAWING IS INTENDED TO BE USED FOR INFORMATION AND REVIEW PURPOSES ONLY AND IS NOT INTENDED TO BE USED FOR CONSTRUCTION.

GRAPHIC SCALE
 1" = 20'

TOWN OF
 OLD SAYBROOK, CONNECTICUT

REPLACEMENT OF
 BRIDGE NO. 105003
 BEAVER DAM TRAIL
 OVER FISHING
 BROOK

ROADWAY PLAN

PRELIMINARY DESIGN

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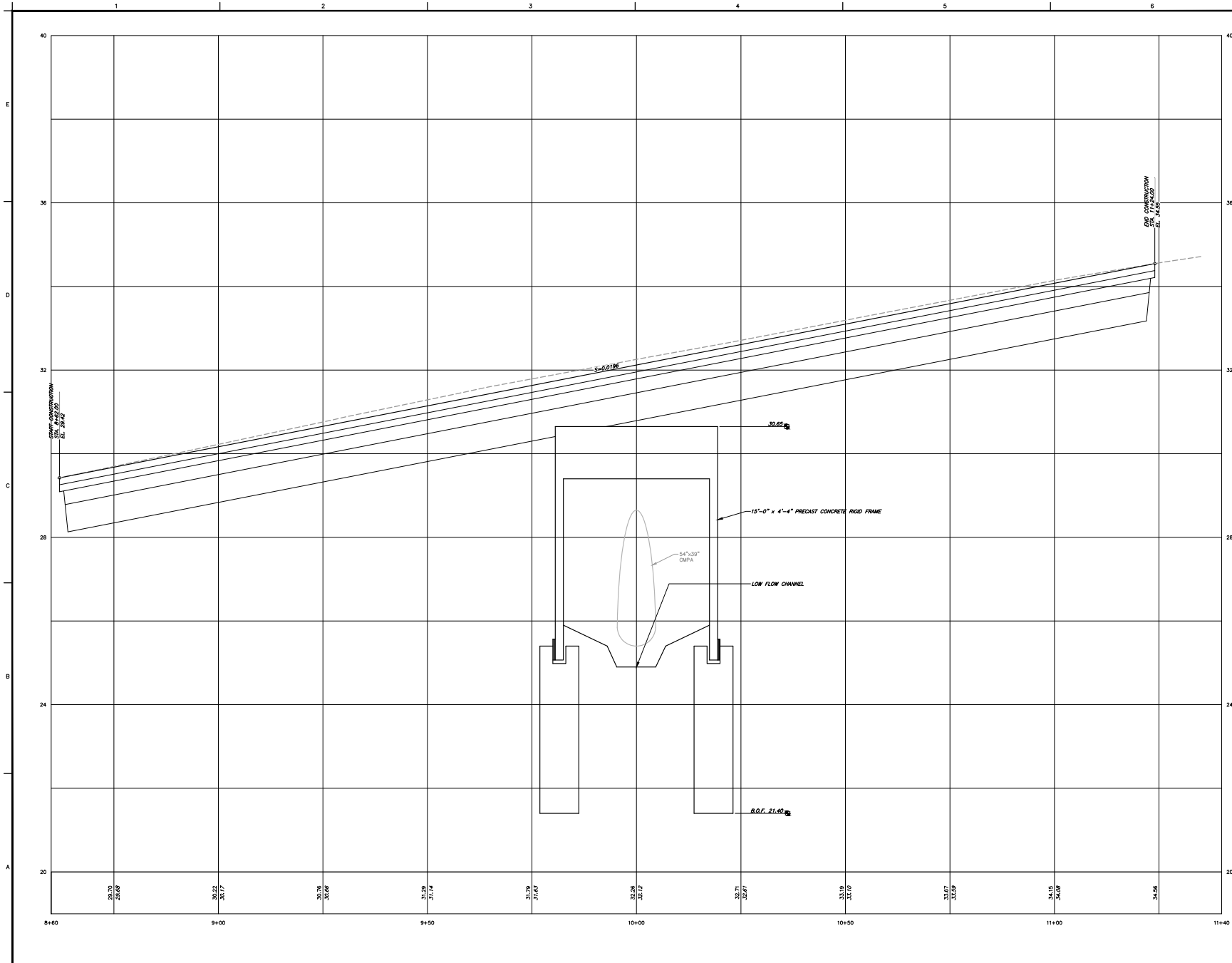
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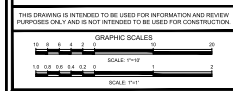
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REVISIONS	
NO.	DESCRIPTION

DATE:	OCTOBER 2012	SHEET NO.:	4 OF 17
SCALE:	1"=10'		
DESIGNED:	JPF		
DRAWN:	AJC		
CHECKED:			



- NOTES**
- SEE SHEET 16 FOR PROJECT NOTES.
 - PROFILE IS SHOWN ALONG THE ROADWAY BASELINE. ONLY KNOWN UNDERGROUND UTILITIES LOCATED DIRECTLY BELOW THE ROADWAY BASELINE ARE SHOWN. UNKNOWN UTILITIES OR UTILITIES OUTSIDE THIS LIMIT ARE NOT SHOWN ON THE PROFILE.
 - UTILITIES SHOWN ON THE PROFILE ARE FOR INFORMATION ONLY. REFER TO OTHER DRAWINGS FOR CONSTRUCTION.
 - INFORMATION OR DATA SHOWN ON OR INDICATED IN THE CONTRACT DOCUMENTS WITH RESPECT TO EXISTING UNDERGROUND PIPES, CABLES, STRUCTURES OR OTHER UNDERGROUND FACILITIES IS BELIEVED TO BE REASONABLY CORRECT BUT IS NOT GUARANTEED TO BE EXACT OR COMPLETE. SUCH INFORMATION SHALL BE CONSIDERED TO HAVE BEEN PROVIDED FOR THE CONVIENIENCE OF THE CONTRACTOR AND TO ALLEVIATE THE CONTRACTOR TO THE EXISTENCE OF SUCH UNDERGROUND FACILITIES WITHIN OR CONTIGUOUS TO THE PROJECT SITE. THE TOWN, ENGINEER AND THE CONSULTANTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ANY SUCH INFORMATION OR DATA.



TOWN OF
OLD SAYBROOK, CONNECTICUT

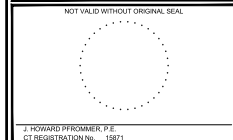
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BRIDGE NO. 105003
BEAVER DAM TRAIL
OVER FISHING
BROOK

ROADWAY PROFILE

PRELIMINARY DESIGN

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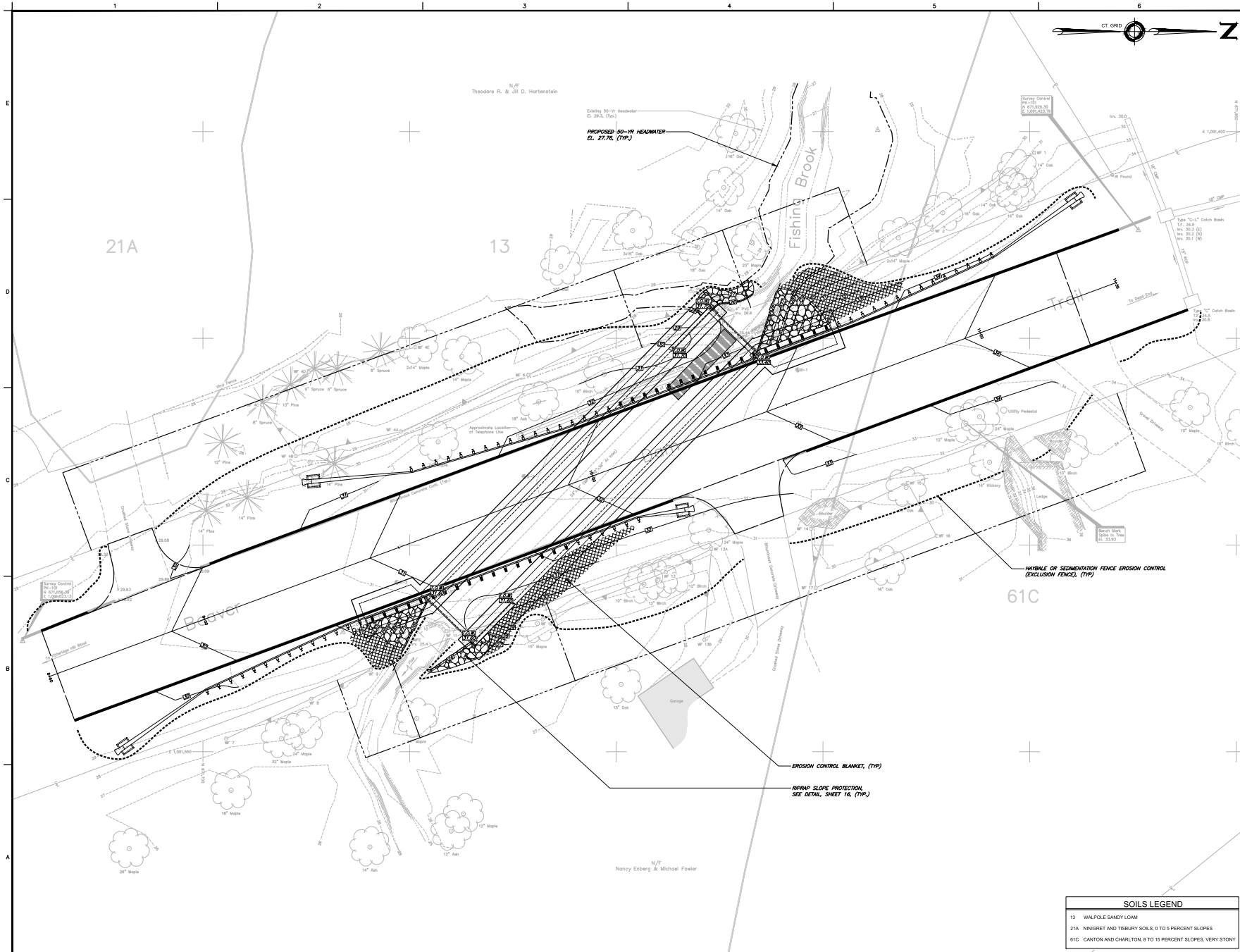
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REVISIONS	
NO.	DESCRIPTION

DATE: OCTOBER 2022	SHEET NO.:
SCALE: 1"=10' H, 1"=1' V	5 OF 17
PROJECT NO.: 0747046	
CADD FILE: 0747046SSP	
DESIGNED: JHP	
DRAWN: AJG	
CHECKED:	



- NOTES**
- SEE SHEET 16 FOR PROJECT NOTES.
 - SEE SHEET 10 FOR PUMP DISCHARGE LOCATION.

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GRAPHIC SCALE
 0 10 20
 FEET

TOWN OF
 OLD SAYBROOK, CONNECTICUT

**REPLACEMENT OF
 BRIDGE NO. 105003
 BEAVER DAM TRAIL
 OVER FISHING
 BROOK**

**EROSION AND
 SEDIMENT CONTROL
 AND PLANTING PLAN**

PRELIMINARY DESIGN

WE warrant that the drawings were prepared by the engineer or architect who is a duly licensed professional engineer or architect in the State of Connecticut. We warrant that the drawings were prepared by the engineer or architect who is a duly licensed professional engineer or architect in the State of Connecticut. We warrant that the drawings were prepared by the engineer or architect who is a duly licensed professional engineer or architect in the State of Connecticut.

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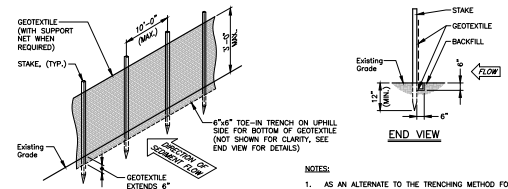


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NO.	DESCRIPTION	DATE

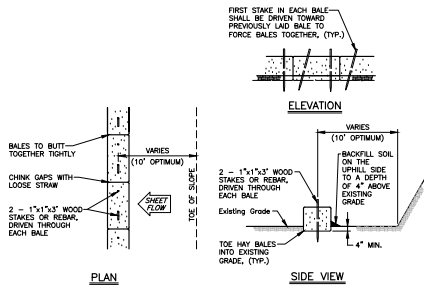
SOILS LEGEND		
13	WALPOLE SANDY LOAM	1:1-10'
21A	MINGNET AND TISSURY SOILS, 0 TO 5 PERCENT SLOPES	07/20/05
61C	CANTON AND CHARLTON, 0 TO 15 PERCENT SLOPES, VERY STONY	07/20/05

DATE:	OCTOBER 2022	SHEET NO.:	6 OF 17
SCALE:	1"=10'	PROJECT NO.:	07/20/05
DESIGNED:	JHP	CADD FILE:	07/20/05
DRAWN:	AJC	DRAWING:	
CHECKED:			

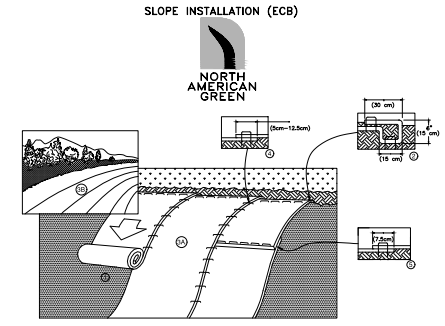


SEDIMENTATION FENCE (GSF)
N.T.S.

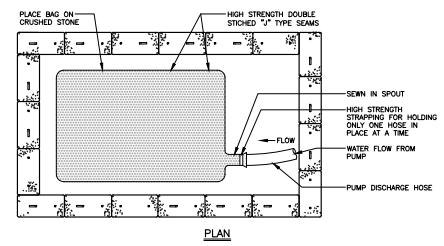
NOTES:
1. AS AN ALTERNATE TO THE TRENCHING METHOD FOR BURYING THE BOTTOM 6" PLAP OF GEOTEXTILE, IT MAY BE LAID HORIZONTALLY ON THE GROUND AND BURIED BY SPREADING SOIL UP TO THE SEDIMENTATION FENCE AS SPECIFIED IN SECTION 2.19.03 OF THE STATE OF CT DEPT. OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROADS, BRIDGES, AND INFRASTRUCTURE CONSTRUCTION, FORM 616, 2020, AS AMENDED TO DATE.



BALED HAY OR STRAW EROSION CHECKS (HB)
(SHEET FLOW APPLICATIONS)
N.T.S.



SLOPE INSTALLATION (ECB)



FILTER BAG FOR PUMP DISCHARGE
N.T.S.

- PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING GULL-O-SEED DO NOT SEED PROPOSED AREA. GULL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
- BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 4" (15cm) DEEP x 6" (15cm) WIDE TRENCH WITH APPROXIMATELY 12" (30cm) OF BLANKET EXTENDING BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30cm) APART IN THE BOTTOM OF THE TRENCH. REPEAT AT THE TOP OF THE TRENCH AT THE TOE OF THE SLOPE. MUST SEED TO COMPACTED SOIL AND/OR SEAM WITH 12" (30cm) PORTION OF BLANKET AND ONE SEED PER COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30cm) APART ACROSS THE WIDTH OF THE BLANKET.
- ROLL THE BLANKETS (A) DOWN OR (B) HORIZONTALLY ACROSS THE SLOPE. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING OPTIONAL GOLF SYSTEM STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
- THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2" (5cm-12.5cm) OVERLAP SEPARATED OR BLANKET TYPE. TO ENSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) DOWN WITH THE COLORED SEAM STRIP ON THE PREVIOUSLY INSTALLED BLANKET.
- CONSECUTIVE BLANKETS SPICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHOULDER STYLE) WITH AN APPROXIMATE 3" (7.5cm) OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" (30cm) APART ACROSS ENTIRE BLANKET WIDTH.

NOTE: *IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 4" (15cm) MAY BE NECESSARY TO PROPERLY SECURE THE BLANKETS.

14649 HIGHWAY 41 NORTH, EVANSVILLE, INDIANA 47715
USA 1-800-772-2246 CANADA 1-800-446-2240
www.hogreen.com

EROSION CONTROL MATTING
N.T.S.

NOTES:
1. SEE SHEET 16 FOR PROJECT NOTES.

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TOWN OF
OLD SAYBROOK, CONNECTICUT
REPLACEMENT OF BRIDGE NO. 105003 BEAVER DAM TRAIL OVER FISHING BROOK

EROSION AND SEDIMENT CONTROL DETAILS

PRELIMINARY DESIGN

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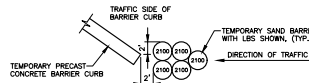
REVISIONS		
NO.	DESCRIPTION	DATE

DATE:	OCTOBER 2022	SHEET NO.:	
SCALE:	AS NOTED	PROJECT NO.:	0747040
DESIGNED:	J.P.P.	DESIGNED:	0747040/SS
DRAWN:	A.J.G.	DRAWN:	
CHECKED:		CHECKED:	

MAINTENANCE AND PROTECTION OF TRAFFIC NOTES:

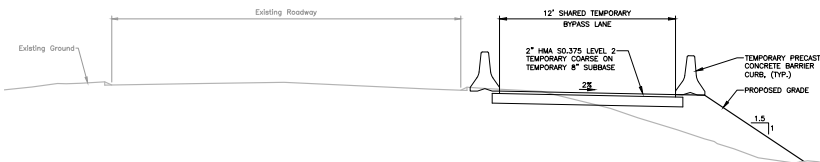
- WORK SHALL BE PERFORMED IN ACCORDANCE WITH ANY SPECIAL PROVISIONS FOR "MAINTENANCE AND PROTECTION OF TRAFFIC" AND "SECTION 1.08 - PROSECUTION AND PROGRESS"
- BE SOLELY RESPONSIBLE FOR MAINTENANCE AND PROTECTION OF TRAFFIC, INCLUDING FURNISHING ALL NECESSARY TRAFFIC CONTROL AND SAFETY SIGNS, DEVICES, FLAGMAN, ETC.
- NOTIFY THE TOWN AT LEAST FOURTEEN (14) DAYS IN ADVANCE OF ANTICIPATED WORK IN A ROADWAY.
- FOR SIGN FACE MATERIAL DETAILS, SEE CTDOT STANDARD SHEET TR-1200, 01.
- FOR SIGN INSTALLATION DETAILS, SEE CTDOT STANDARD SHEET TR-1200, 02 AND SHEET TR-1200, 02.
- THE PLACEMENT OF SIGNS SHALL NOT OBSCURE ANY PRESENT SIGNINGS OR SIGHTLINES FROM DRIVEWAYS OR INTERSECTING ROUTES. COORDINATE EXACT PLACEMENT OF SIGNS WITH THE ENGINEER.
- SIGNS SHALL BE PLACED ON THE SPECIFIC METAL SIGN POSTS. THEY SHALL NOT BE PLACED ON EXISTING POSTS, UTILITY POLES OR TREES.
- LOCATION AND DISTANCE BETWEEN CONSTRUCTION SIGNS MAY BE REVISED BY THE ENGINEER TO MEET FIELD CONDITIONS.
- EXISTING AND PROPOSED TRAFFIC SIGNS SHALL BE REMOVED OR COVERED WITH AN OPAQUE COVER IF IN CONFLICT WITH THE MAINTENANCE AND PROTECTION OF TRAFFIC PLAN.
- PROVIDE TYPE "B" BARRICADE WARNING LIGHTS HIGH INTENSITY ON SIGN D AND SIGN A.
- THE "TEMPORARY MAINTENANCE AND PROTECTION OF TRAFFIC PLAN" IS A MINIMUM GUIDELINE ONLY FOR THE MAINTENANCE AND PROTECTION OF TRAFFIC. A SPECIFIC MAINTENANCE AND PROTECTION OF TRAFFIC PLAN SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.

CONSTRUCTION SIGN LEGEND			
SIGN DESIGNATION	CTDOT SIGN NUMBER	DIMENSION	SIGN FACE
A	31-1906	48"x42"	ROAD WORK AHEAD FINES DOUBLED
B	80-9834	36"	ONE LANE ROAD AHEAD
C	80-9050	36"	↑
D	31-0552	30"	STOP



TEMPORARY IMPACT ATTENUATION SYSTEM
N.T.S.

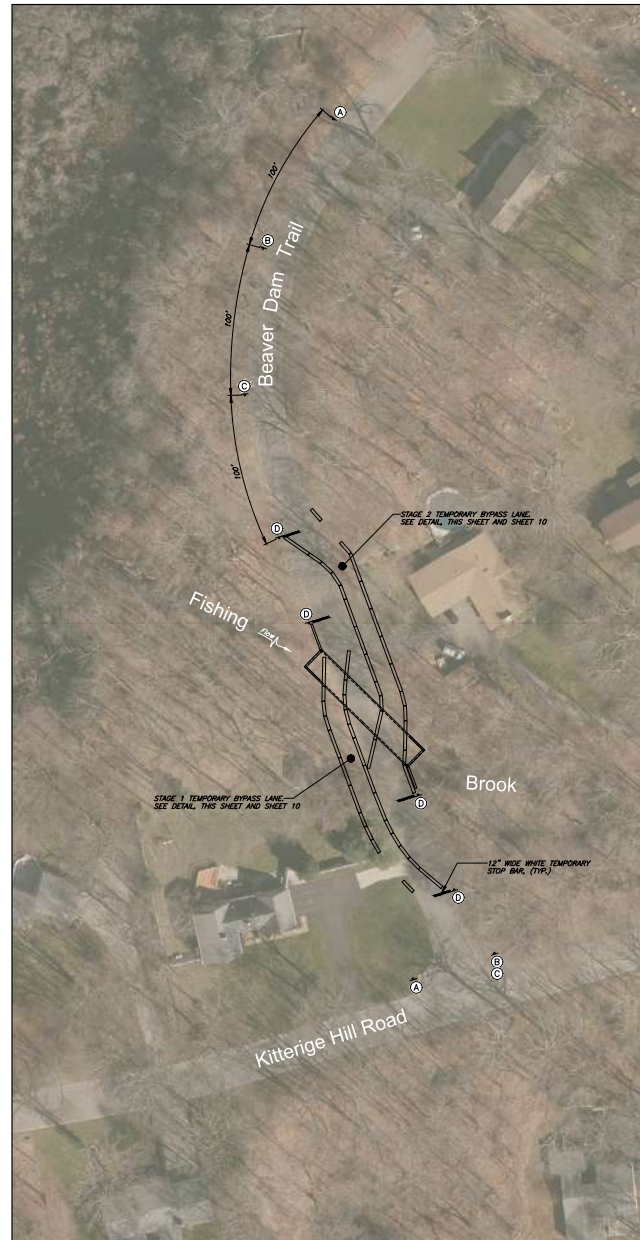
- NOTES:**
- IMPACT ATTENUATION SYSTEM DESIGNED FOR INITIAL SPEED FOR 1,800 LB. AND 4,400 LB. VEHICLE OF 25 MPH. SUBSEQUENT DECELERATION $4.15s^{-2}$ PASSENGER STRIKE SPEED, AND VELOCITY AFTER LAST BARRIER ROW 210 mph.
 - INSTALL IN ORIENTATION AS SHOWN ON PLAN.



**TYPICAL SECTION
TEMPORARY BYPASS LANE**

SCALE: 1/4"=1'-0"

- NOTES:**
- TEMPORARY BYPASS LANE MAY BE ON OPPOSITE SIDE OF ROAD FROM THAT SHOWN. SEE SHEET 10.



TEMPORARY MAINTENANCE AND PROTECTION OF TRAFFIC PLAN

SCALE: 1"=40'



- NOTES:**
- SEE SHEET 10 FOR PROJECT NOTES.

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TOWN OF
OLD SAYBROOK, CONNECTICUT
**REPLACEMENT OF
BRIDGE NO. 105003
BEAVER DAM TRAIL
OVER FISHING
BROOK**

**MAINTENANCE AND
PROTECTION OF
TRAFFIC PLAN**

PRELIMINARY DESIGN

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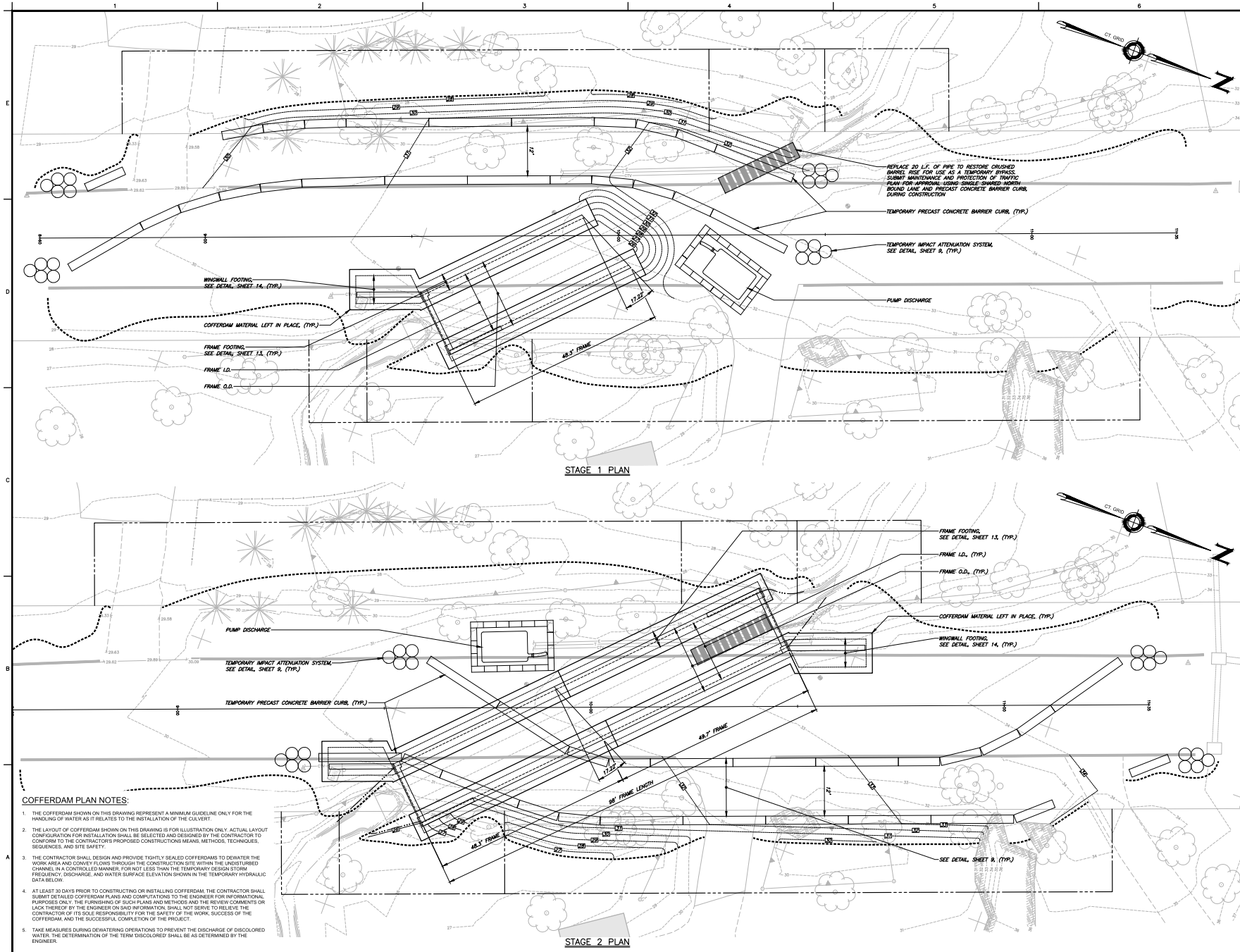


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P.E. REGISTRATION NO. 11871

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REVISIONS		
NO.	DESCRIPTION	DATE

DATE: OCTOBER 2022	SHEET NO.:
SCALE: AS NOTED	9 OF 17
PROJECT NO.: 07470405	
CADD FILE: 07470405RPT	
DESIGNED: J-P	
DRAWN: A-J	
CHECKED:	



- NOTES**
- SEE SHEET 16 FOR PROJECT NOTES.
 - REMOVE EXISTING BARREL WITHIN LIMITS OF STAGE 1 FIRST PRIOR TO SETTING STAGE 1 FRAME. REMOVE REMAINDER OF EXISTING BARREL JUST PRIOR TO SETTING STAGE 2 FRAME.
 - VERIFY LAYOUT OF PRECAST CONCRETE BARRIER CURB WITH THE OLD BRIDGE ON THE SHEET BY REQUESTING A DRIVE THROUGH OF EACH STAGE. ADJUST LAYOUT AS NEEDED.

TEMPORARY HYDRAULIC DATA

AVERAGE DAILY FLOW	1.2 CFS
AVERAGE SPRING FLOW	2.4 CFS
TEMPORARY DESIGN FREQUENCY	2 YEAR
TEMPORARY DESIGN DISCHARGE	31 CFS
TEMPORARY UPSTREAM DESIGN WATER SURFACE ELEVATION	26.5

THIS DRAWING IS INTENDED TO BE USED FOR INFORMATION AND REVIEW PURPOSES ONLY AND IS NOT INTENDED TO BE USED FOR CONSTRUCTION.

GRAPHIC SCALE
1" = 20'

TOWN OF
OLD SAYBROOK, CONNECTICUT

**REPLACEMENT OF
BRIDGE NO. 105003
BEAVER DAM TRAIL
OVER FISHING
BROOK**

STAGING PLAN

PRELIMINARY DESIGN

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Cheshire, Connecticut 06412-0337
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P.E. REGISTRATION NO. 18871

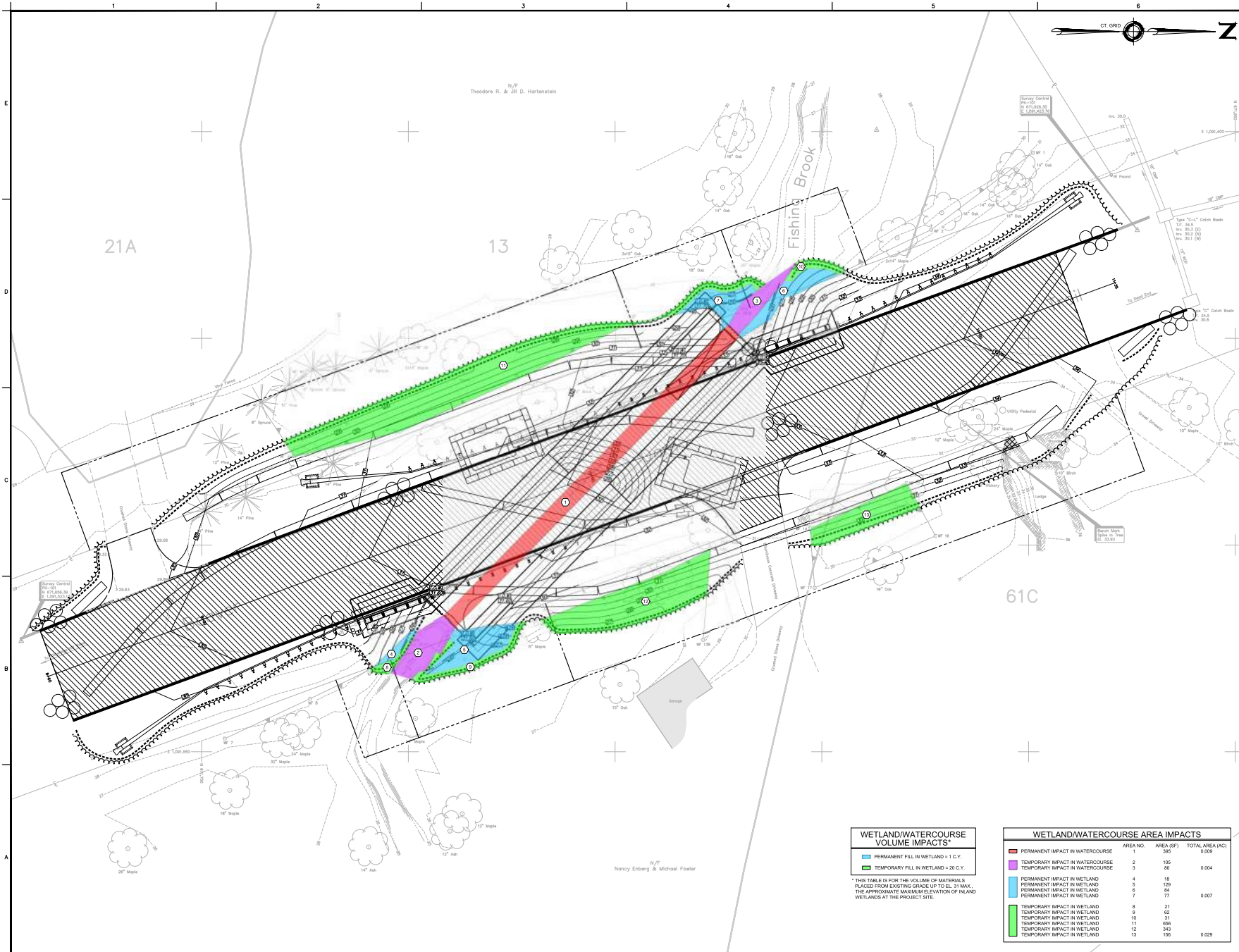
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REVISIONS

NO.	DESCRIPTION	DATE

DATE:	OCTOBER 2024	SHEET NO.:	10 OF 17
SCALE:	1"=10'		
PROJECT NO.:	07470405		
CADD FILE:	07470405P		
DESIGNED:	JHP		
DRAWN:	AUG		
CHECKED:			

- COFFERDAM PLAN NOTES:**
- THE COFFERDAM SHOWN ON THIS DRAWING REPRESENT A MINIMUM GUIDELINE ONLY FOR THE HANDLING OF WATER AS IT RELATES TO THE INSTALLATION OF THE CULVERT.
 - THE LAYOUT OF COFFERDAM SHOWN ON THIS DRAWING IS FOR ILLUSTRATION ONLY. ACTUAL LAYOUT CONFIGURATION FOR INSTALLATION SHALL BE SELECTED AND DESIGNED BY THE CONTRACTOR TO CONFORM TO THE CONTRACTOR'S PROPOSED CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND SITE SAFETY.
 - THE CONTRACTOR SHALL DESIGN AND PROVIDE TIGHTLY SEALED COFFERDAMS TO DEWATER THE WORK AREA AND CONVEY FLOWS THROUGH THE CONSTRUCTION SITE WITHIN THE UNDISTURBED CHANNELS IN A CONTROLLED MANNER, FOR NOT LESS THAN THE TEMPORARY DESIGN STORM FREQUENCY, DISCHARGE, AND WATER SURFACE ELEVATION SHOWN IN THE TEMPORARY HYDRAULIC DATA BELOW.
 - AT LEAST 30 DAYS PRIOR TO CONSTRUCTING OR INSTALLING COFFERDAM, THE CONTRACTOR SHALL SUBMIT DETAILED COFFERDAM PLANS AND COMPUTATIONS TO THE ENGINEER FOR INFORMATIONAL PURPOSES ONLY. THE FURNISHING OF SUCH PLANS AND METHODS AND THE REVIEW COMMENTS OR LACK THEREOF BY THE ENGINEER ON SAID INFORMATION SHALL NOT SERVE TO RELIEVE THE CONTRACTOR OF ITS SOLE RESPONSIBILITY FOR THE SAFETY OF THE WORK, SUCCESS OF THE COFFERDAM, AND THE SUCCESSFUL COMPLETION OF THE PROJECT.
 - TAKE PRECAUTIONS DURING DEWATERING OPERATIONS TO PREVENT THE DISCHARGE OF DISCOLORED WATER. THE DETERMINATION OF THE TERM DISCOLORED SHALL BE AS DETERMINED BY THE ENGINEER.



NOTES
1. SEE SHEET 10 FOR PROJECT NOTES.

THIS DRAWING IS INTENDED TO BE USED FOR INFORMATION AND REVIEW PURPOSES ONLY AND IS NOT INTENDED TO BE USED FOR CONSTRUCTION.

GRAPHIC SCALE
0 10 20
FOOT

TOWN OF
OLD SAYBROOK, CONNECTICUT

**REPLACEMENT OF
BRIDGE NO. 105003
BEAVER DAM TRAIL
OVER FISHING
BROOK**

**ENVIRONMENTAL
IMPACT PLAN**

PRELIMINARY DESIGN

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REVISIONS		DATE
NO.	DESCRIPTION	

DATE: OCTOBER 2024
SCALE: 1"=10'
PROJECT NO.: 07470405
CAD FILE: 07470405.RVT
DESIGNED: JJP
DRAWN: AJG
CHECKED: AJG

SHEET NO.:
11 OF 17

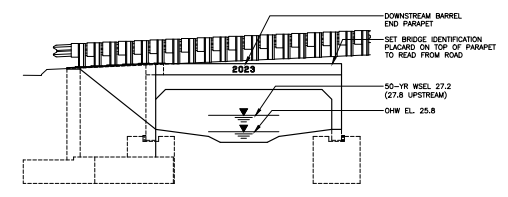
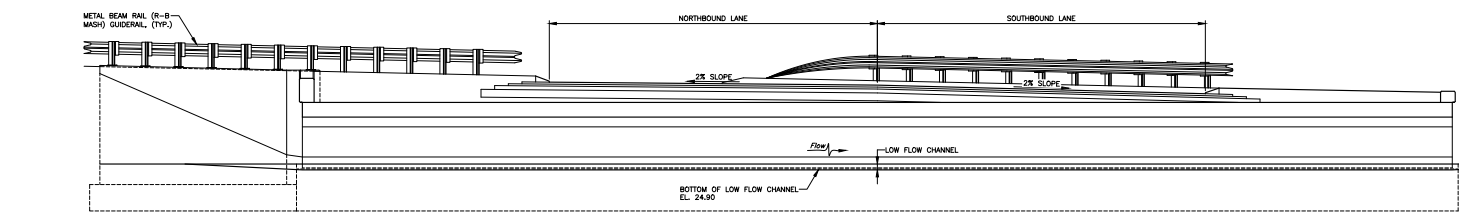
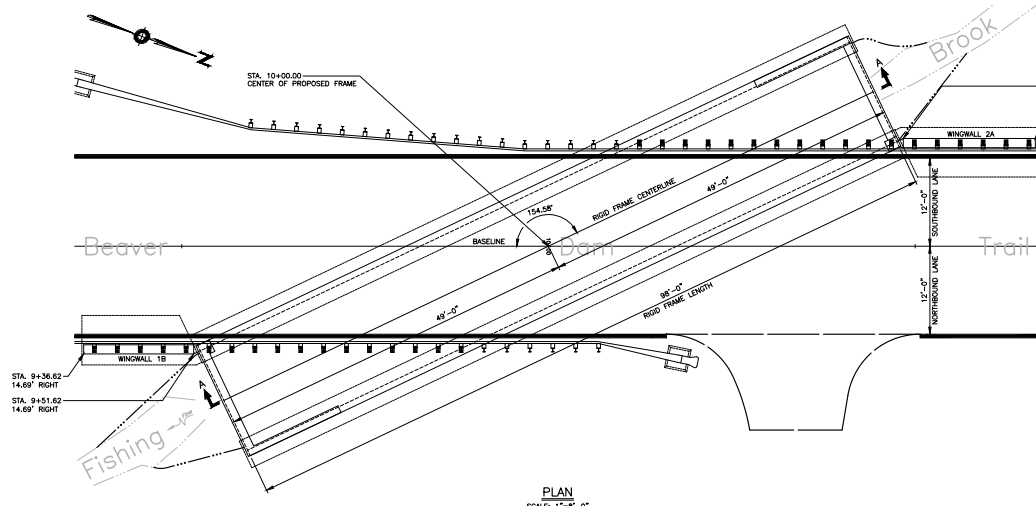
WETLAND/WATERCOURSE VOLUME IMPACTS*

PERMANENT FILL IN WETLAND + 1 C.Y.	1	396
TEMPORARY FILL IN WETLAND + 20 C.Y.	2	165
TEMPORARY FILL IN WETLAND + 20 C.Y.	3	80

* THIS TABLE IS FOR THE VOLUME OF MATERIALS PLACED FROM EXISTING GRADE UP TO EL. 31 MAX. THE APPROXIMATE MEANING ELEVATION OF INLAND WETLANDS AT THE PROJECT SITE.

WETLAND/WATERCOURSE AREA IMPACTS

	AREA NO.	AREA (SF)	TOTAL AREA (AC)
PERMANENT IMPACT IN WATERCOURSE	1	396	0.009
TEMPORARY IMPACT IN WATERCOURSE	2	165	
TEMPORARY IMPACT IN WATERCOURSE	3	80	0.004
PERMANENT IMPACT IN WETLAND	4	18	
PERMANENT IMPACT IN WETLAND	5	128	
PERMANENT IMPACT IN WETLAND	6	64	
PERMANENT IMPACT IN WETLAND	7	77	0.007
TEMPORARY IMPACT IN WETLAND	8	21	
TEMPORARY IMPACT IN WETLAND	9	62	
TEMPORARY IMPACT IN WETLAND	10	31	
TEMPORARY IMPACT IN WETLAND	11	666	
TEMPORARY IMPACT IN WETLAND	12	343	
TEMPORARY IMPACT IN WETLAND	13	196	0.029



DOWNSTREAM ELEVATION
SCALE: 1"=5'-0"

NOTES:
1. DATE OF COMPLETION AND BRIDGE IDENTIFICATION PLACARD SHALL ALSO APPEAR ON UPSTREAM BARREL END PARAPET.

CULVERT GENERAL NOTES:

1. SPECIFICATIONS: PREPARED BY NATHAN L. JACOBSON & ASSOCIATES, INC. TECHNICAL PORTION IS BASED ESSENTIALLY ON CONNECTICUT DEPARTMENT OF TRANSPORTATION FORM 814 (2020) AND SUPPLEMENTAL SPECIFICATIONS DATED JULY 2022, AND SPECIAL PROVISIONS.
2. FRAME DESIGN SPECIFICATIONS: ASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH EDITION, 2017, AS SUPPLEMENTED BY THE CONNECTICUT DEPARTMENT OF TRANSPORTATION BRIDGE DESIGN MANUAL, C003, REVISED THROUGH DECEMBER 2019.
3. ALLOWABLE DESIGN STRESSES:
CLASS PCC00340 CONCRETE BASED ON $f_c = 3,000$ psi
CLASS PCC0442 CONCRETE BASED ON $f_c = 4,000$ psi
THE CONCRETE STRENGTH, f_c , USED IN DESIGN OF THE CONCRETE COMPONENTS IS NOTED ABOVE. THE COMPRESSIVE STRENGTH OF THE CONCRETE IN THE CONSTRUCTED COMPONENTS SHALL CONFORM TO THE REQUIREMENTS OF 6.01 - CONCRETE FOR STRUCTURES, AND 6.03 - PORTLAND CEMENT CONCRETE.
REINFORCEMENT (ASTM A 615 GRADE 60) $f_y = 60,000$ psi
4. LIVE LOAD: HL-93, LEGAL AND PERMIT VEHICLES.
5. FUTURE PAVING ALLOWANCE: NONE.
6. FOUNDATION PRESSURES: THE VARIOUS GROUP LOADINGS NOTED ON THE SUBSTRUCTURE PLAN SHEETS REFER TO THE GROUP LOADS AS GIVEN IN THE ASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
7. DIMENSIONS: WHEN DECIMAL DIMENSIONS ARE GIVEN TO LESS THAN THREE DECIMAL PLACES, THE OMITTED DIGITS SHALL BE ASSUMED TO BE ZEROS.
8. EXISTING DIMENSIONS: DIMENSIONS OF THE EXISTING STRUCTURE SHOWN ON THESE DRAWINGS ARE FOR GENERAL REFERENCE ONLY. THEY ARE NOT GUARANTEED. THE CONTRACTOR SHALL TAKE ALL FIELD MEASUREMENTS NECESSARY TO ASSURE PROPER FIT OF THE FINISHED WORK AND SHALL ASSUME FULL RESPONSIBILITY FOR THEIR ACCURACY. WHEN SHOP DRAWINGS BASED ON FIELD MEASUREMENTS ARE SUBMITTED FOR APPROVAL, THE FIELD MEASUREMENTS SHALL ALSO BE SUBMITTED FOR REFERENCE BY THE REVIEWER.
9. CLASS PCC00340 CONCRETE: CLASS PCC00340 CONCRETE SHALL BE USED FOR WINGWALL FOOTINGS AND WINGWALL STONE.
10. CLASS PCC0442 CONCRETE: CLASS PCC0442 CONCRETE SHALL BE USED FOR PARAPETS.
11. JOINT SEAL: SEE SPECIFICATIONS.
12. EXPOSED EDGES: EXPOSED EDGES OF CONCRETE SHALL BE BEVELED 1" x 1" UNLESS DIMENSIONED OTHERWISE.

HYDRAULIC DATA	
DRAINAGE AREA	0.66 SQ
DESIGN FREQUENCY	50 YEAR
DESIGN DISCHARGE	123 CFS
AVERAGE DAILY FLOW ELEVATION (OHW)	25.6 FT
CULVERT UPSTREAM DESIGN WATER SURFACE ELEVATION	27.6 FT
CULVERT DOWNSTREAM DESIGN WATER SURFACE ELEVATION	27.2 FT

NOTICE TO BRIDGE INSPECTORS

THE TOWN'S PROCEDURES REQUIRE THIS BRIDGE TO BE INSPECTED FOR, BUT NOT LIMITED TO, ALL APPROPRIATE COMPONENTS INDICATED IN THE GOVERNING MANUALS FOR BRIDGE INSPECTION. ATTENTION MUST BE GIVEN TO INSPECTING THE FOLLOWING SPECIAL COMPONENTS AND DETAILS. THE LISTING FOR COMPONENTS FOR SPECIFIC ATTENTION SHALL NOT BE CONSTRUED TO REDUCE THE IMPORTANCE OF INSPECTION OF ANY OTHER COMPONENT OF THE STRUCTURE. THE FREQUENCY OF INSPECTION OF THIS STRUCTURE SHALL BE IN ACCORDANCE WITH THE GOVERNING MANUALS FOR BRIDGE INSPECTION, UNLESS OTHERWISE DIRECTED BY THE TOWN.

COMPONENTS AND DETAIL	DRAWING NUMBER REFERENCE
NONE	NONE

BRIDGE IDENTIFICATION PLACARDS

PROVIDE AND INSTALL NEW BRIDGE IDENTIFICATION SIGNS AT THE LEADING END OF EACH BRIDGE END WALL ON THE TRAFFIC SIDE. THE SIGNS SHALL BE FABRICATED WITH 40 GAUGE ALUMINUM SHEET METAL. THE SIGNS SHALL BE 4'x12' WITH 7" WHITE RETROREFLECTIVE BLOCK LETTERS ON GREEN RETROREFLECTIVE SHEETING. EACH SIGN SHALL READ: 105003, THE BRIDGE SIGNS SHALL BE SIGN SHEET ALUMINUM (TYPE R) RETROREFLECTIVE SHEETING. THE FINAL LOCATION AND ATTACHMENT METHOD FOR THE SIGNS SHALL BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.

CONCRETE DISTRIBUTION		
ITEM	UNIT	QUANTITY
SUPERSTRUCTURE	C.Y.	3
SUBSTRUCTURE	C.Y.	119
FOOTINGS	C.Y.	130

TRANSPORTATION DIMENSIONS AND WEIGHT				
MEMBER	SHIPPING LENGTH	SHIPPING HEIGHT	SHIPPING WIDTH	SHIPPING WEIGHT
PRECAST FRAME	16'-8"	5'-7"	TBD	TBD

NOTES:
1. SEE SHEET 16 FOR PROJECT NOTES.

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GRAPHIC SCALE
1" = 10'

TOWN OF
OLD SAYBROOK, CONNECTICUT

REPLACEMENT OF
BRIDGE NO. 105003
BEAVER DAM TRAIL
OVER FISHING
BROOK

GENERAL PLAN

PRELIMINARY DESIGN

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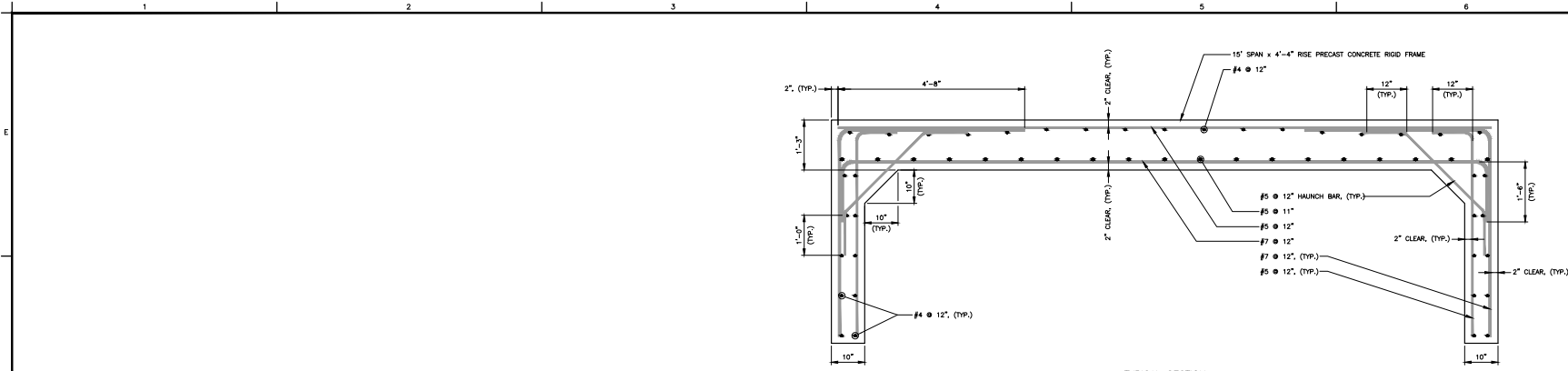
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REVISIONS		
NO.	DESCRIPTION	DATE

DATE: OCTOBER 2024
PROJECT NO.: 0747046
CAD FILE: 0747046.dwg
DESIGNED: JJP
DRAWN: AJG
CHECKED: AJG

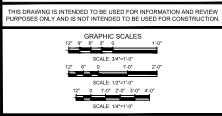
SHEET NO.:
12 OF 17



**TYPICAL SECTION
PRECAST CONCRETE RIGID FRAME REINFORCEMENT**
SCALE: 3/4"=1'-0"

- NOTES:**
1. ALL REINFORCEMENT IN THE RIGID FRAME SHALL BE HOT-DIPPED GALVANIZED.
 2. MANUFACTURER TO ESTABLISH SECTION LENGTHS COORDINATED WITH PEDESTAL POST LOCATIONS FOR R-B MASH HALF POST SPACING MODIFIED.
 3. MANUFACTURER SHALL PROVIDE A KEVED JOINT BETWEEN ADJACENT SECTIONS OF RIGID FRAME CONTAINING A CONTINUOUS GASKET MADE OF PLASTIC, RUBBER OR NEOPRENE THAT SHALL FORM AND MAINTAIN A WATERPROOF AND FLEXIBLE JOINT, UNLESS OTHERWISE APPROVED.
 4. THE MINIMUM COVER FOR RIGID FRAME REINFORCEMENT SHALL BE 2".
 5. WEEPHOLES NOT SHOWN, ADJUST REINFORCING STEEL LOCATIONS TO AVOID WEEPHOLES.
 6. OTHER THAN WHAT IS SHOWN IN THIS DRAWING SET, NO OTHER RIGID FRAME DESIGN WORK IS PROVIDED. CONTRACTOR TO PROVIDE ANY OTHER RIGID FRAME DESIGN WORK HE DEEMS NECESSARY FOR FABRICATION, HANDLING AND INSTALLATION.

NOTES
1. SEE SHEET 16 FOR PROJECT NOTES.



TOWN OF
OLD SAYBROOK, CONNECTICUT

REPLACEMENT OF
BRIDGE NO. 105003
BEAVER DAM TRAIL
OVER FISHING
BROOK

RIGID FRAME AND
FOOTING DETAILS

PRELIMINARY DESIGN

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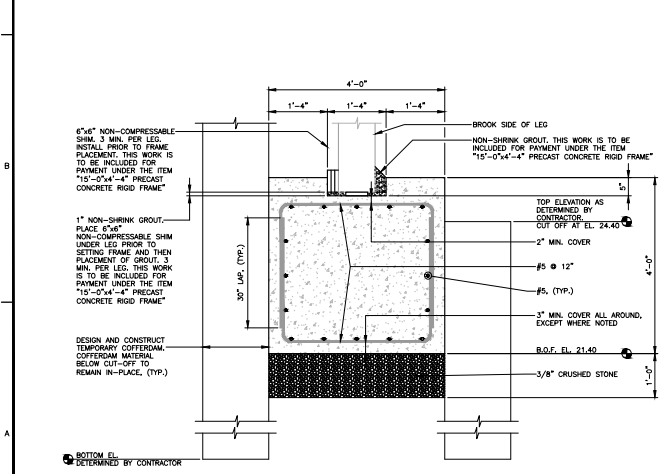
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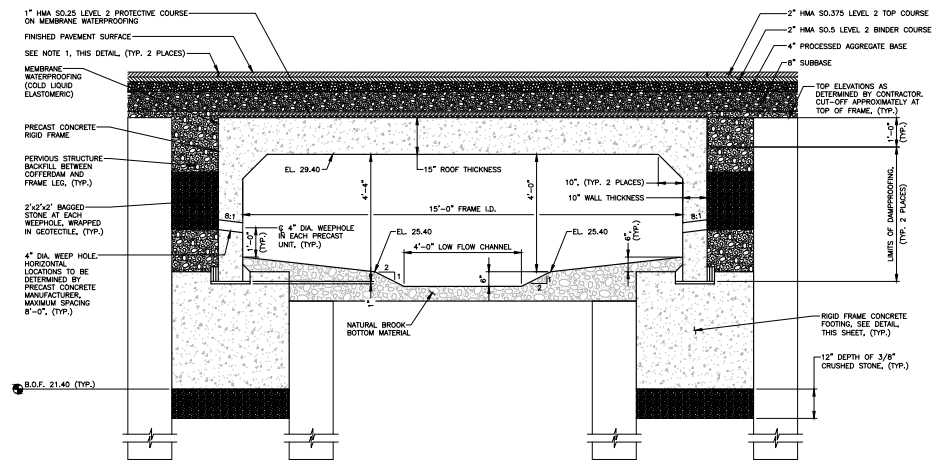
REVISIONS	
NO.	DESCRIPTION

DATE: OCTOBER 2024	SHEET NO.:
SCALE: AS NOTED	13 OF 17
PROJECT NO.: 0747046	
CSOID FILE: 0747046SSP	
DESIGNED: JLF	
DRAWN: AJG	
CHECKED:	



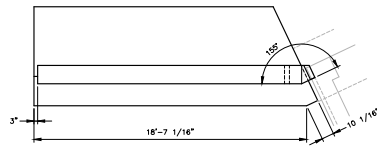
**TYPICAL SECTION
RIGID FRAME CONCRETE FOOTING**
SCALE: 3/4"=1'-0"

- NOTES:**
1. MAXIMUM ALLOWABLE DESIGN FOUNDATION PRESSURE = 4,000 psf.

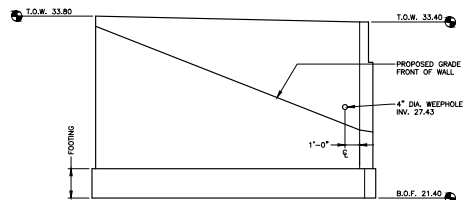


**TYPICAL SECTION
PRECAST CONCRETE RIGID FRAME**
SCALE: 1/2"=1'-0"

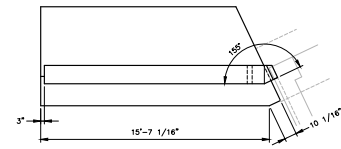
- NOTES:**
1. CUT OVERLAY WITH A 3/8"x1 3/4" DEEP KEYS CUT AND FILL WITH POURABLE BITUMINOUS SEALANT.



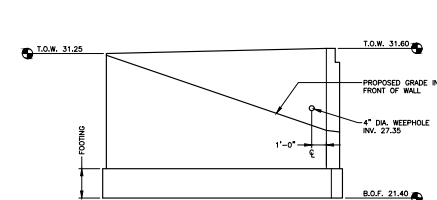
WINGWALL 2A PLAN



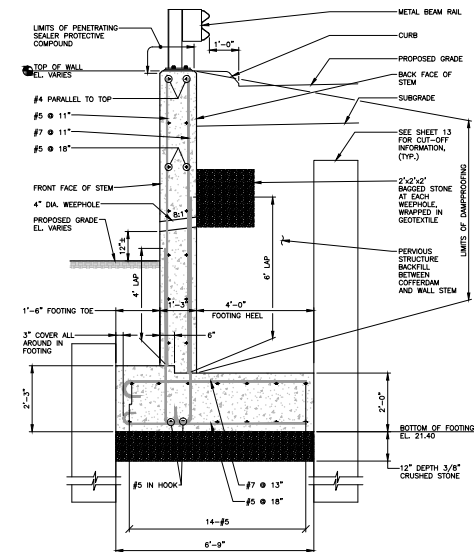
WINGWALL 2A ELEVATION
UPSTREAM WINGWALL
SCALE: 1/4"=1'-0"



WINGWALL 1B PLAN



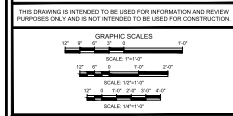
WINGWALL 1B ELEVATION
DOWNSTREAM WINGWALL
SCALE: 1/4"=1'-0"



TYPICAL SECTION
CONCRETE WINGWALL
SCALE: 1/2"=1'-0"

NOTES:
1. MAXIMUM DESIGN FOUNDATION PRESSURE = 3,020 psf.

NOTES
1. SEE SHEET 16 FOR PROJECT NOTES.



TOWN OF
OLD SAYBROOK, CONNECTICUT

REPLACEMENT OF
BRIDGE NO. 105003
BEAVER DAM TRAIL
OVER FISHING
BROOK

WINGWALL DETAILS

PRELIMINARY DESIGN

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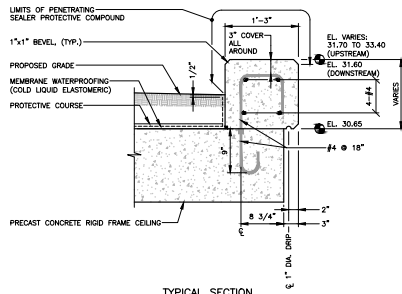
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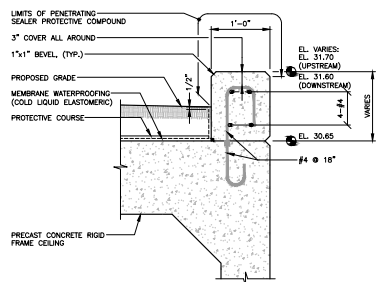
REVISIONS	
NO.	DESCRIPTION

DATE:	OCTOBER 2022	SHEET NO.:
SCALE:	AS NOTED	
PROJECT NO.:	0747049	14 OF 17
CADD FILE:	0747049SSP	
DESIGNED:	J-P	
DRAWN:	A-JG	
CHECKED:		



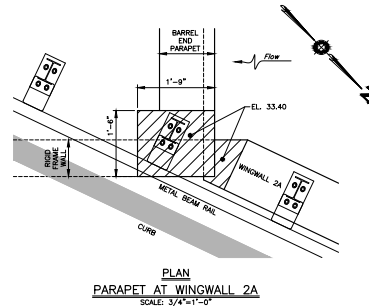
TYPICAL SECTION
BARREL END PARAPET
SCALE: 1"=1'-0"

- NOTES:
1. REINFORCEMENT NOT SHOWN IN FRAME.
 2. PARAPET CAN BE PRECAST AT THE CONTRACTOR'S DISCRETION, AND IN ACCORDANCE WITH APPLICABLE SECTIONS OF THE PROJECT MANUAL.

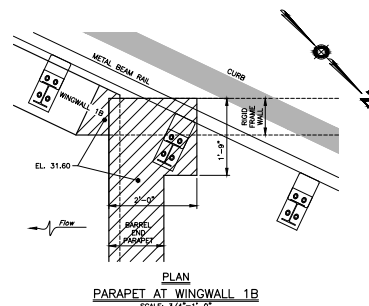


TYPICAL SECTION
BARREL SIDE PARAPET
SCALE: 1"=1'-0"

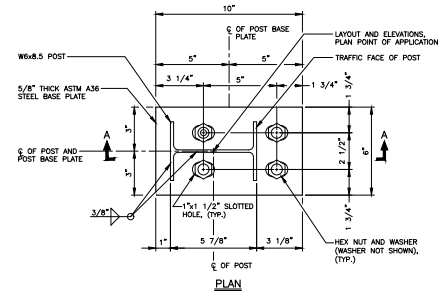
- NOTES:
1. REINFORCEMENT NOT SHOWN IN FRAME.
 2. PARAPET CAN BE PRECAST AT THE CONTRACTOR'S DISCRETION, AND IN ACCORDANCE WITH APPLICABLE SECTIONS OF THE PROJECT MANUAL.



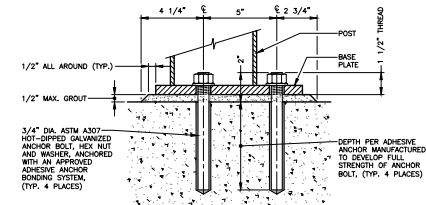
PLAN
PARAPET AT WINGWALL 2A
SCALE: 3/4"=1'-0"



PLAN
PARAPET AT WINGWALL 1B
SCALE: 3/4"=1'-0"



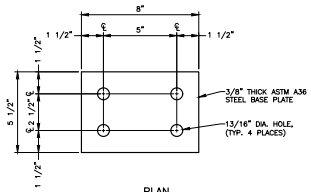
PLAN



SECTION "A-A"

POST BASE PLATE FOR METAL BEAM RAIL
(R-B MASH) HALF POST SPACING (MODIFIED)
SCALE: 3"=1'-0"

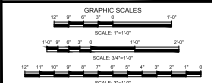
- NOTES:
1. THIS WORK IS TO BE INCLUDED FOR PAYMENT UNDER THE ITEM "METAL BEAM RAIL (R-B) MASH HALF POST SPACING (MODIFIED)".



PLAN
ANCHOR PLATE
SCALE: 3"=1'-0"

NOTES:
1. SEE SHEET 16 FOR PROJECT NOTES.

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TOWN OF
OLD SAYBROOK, CONNECTICUT

REPLACEMENT OF
BRIDGE NO. 105003
BEAVER DAM TRAIL
OVER FISHING
BROOK

PARAPET DETAILS

PRELIMINARY DESIGN

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REVISIONS	
NO.	DESCRIPTION

DATE	SCALE	SHEET NO.
OCTOBER 2024	AS NOTED	15 OF 17
PROJECT NO.:	07470405	
CDWG FILE:	07470405P	
DESIGNED:	J-P	
DRAWN:	A-JG	
CHECKED:		

PROJECT NOTES:

1. **UNFINISHED CONSTRUCTION WINDOW:** THE UNFINISHED CONSTRUCTION WINDOW FOR UNFINISHED CONSTRUCTION ACTIVITIES SHALL BE JULY 1 TO MARCH 31, INCLUSIVE. THE INSTALLATION AND REMOVAL OF CONFORMERS ARE NOT PERMITTED FROM APRIL 1 TO MARCH 31, INCLUSIVE. UNFINISHED CONSTRUCTION ACTIVITIES SHALL NOT OCCUR AT ANY OTHER TIME OF THE YEAR EXCEPT DURING THE UNFINISHED CONSTRUCTION ACTIVITIES WINDOW PERIOD.
2. **CONFORMER:** SHALL BE DEFINED AS BEHIND A CONFORMER AND FOR THE PURPOSES OF CONFORMER INSTALLATION AND REMOVAL SHALL BE SUBJECT TO CONSTRUCTION CONTROL CURTAINS OR CONFORMER BOARDS.
3. **DEWATERING:** THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONTROL OF WATER TO ENABLE CONSTRUCTION IN THE DRY, INCLUDING BUT NOT LIMITED TO TRENCHES, EXCAVATIONS, WATER CONTROL STRUCTURES AND CONFORMERS. THAT MAY BE NECESSARY TO PROPERLY COMPLETE THE WORK. PARTICULAR ATTENTION IS CALLED TO FLUCTUATIONS IN WATER FLOWS AND LEVELS THAT MAY OCCUR DUE TO EXCESSIVE RAINFALL EVENTS. NO EXTRA MONETARY COMPENSATION WILL BE ALLOWED DUE TO WATER FLOW OR LEVEL FLUCTUATIONS, WHETHER PUMPING OR SPRINGING FOR CEMENTATION IS USED OR NOT. IN ALL CASES, THE DISCHARGE SHALL BE DESIGNED TO AVOID EROSION AND SEDIMENTATION AS APPROVED BY THE ENGINEER. TAKE ALL NECESSARY PRECAUTIONS AND FURNISH EQUIPMENT TO HANDLE ALL WATER EXCESSES AND EXCESSIVE FLOOD FLOWS WHICH MAY BE ENCOUNTERED AT ANY TIME DURING CONSTRUCTION.
4. **TEMPORARY HYDRAULIC FACILITIES:** PROVIDE TEMPORARY HYDRAULIC FACILITIES TO CARRY THE WATERCOURSE THROUGH THE CONSTRUCTION SITE IN A CONTROLLED MANNER. TEMPORARY HYDRAULIC FACILITIES SHALL BE DESIGNED FOR THE TEMPORARY CRITERIA SHOWN ON SHEET TO THE CONTRACTOR SHALL INCLUDE THESE CRITERIA IN HIS CONSTRUCTION SUBMISSION.
5. **CONSTRUCTION FLOOD CONTINGENCY OPERATION PLAN:** ALL TEMPORARY STRUCTURES, MATERIAL AND EQUIPMENT SHALL BE REMOVED FROM THE FLOODPLAIN UPON A FLOOD WARNING NOTIFICATION FOR THE PROJECT AREA ISSUED BY THE U.S. WEATHER SERVICE.
6. **EROSION CONTROLS:** INSTALL EROSION CONTROLS TO THE MAXIMUM EXTENT POSSIBLE AND OBTAIN APPROVAL OF THE INSTALLATION (NOT THE DESIGN) FROM THE ENGINEER PRIOR TO THE START OF CONSTRUCTION.
7. **MAINTENANCE OF EROSION CONTROLS:** INSPECT EROSION CONTROLS REGULARLY AND IMMEDIATELY AFTER RAINFALL EVENTS AND MAINTAIN AND MODIFY AS NECESSARY OR AS DIRECTED BY THE TOWN TO ENSURE OPTIMAL PERFORMANCE.
8. **PERMITS:** ALL ACTIVITIES SHALL COMPLY WITH LOCAL, STATE AND FEDERAL AUTHORITIES, SEE PROJECT MANUAL.
9. **SWEEPING:** SWEEP OFF OPEN SECTIONS OF ROADWAY DAILY FROM DIRT AND DEBRIS TRACKED FROM CONSTRUCTION ACTIVITIES.
10. **STOCKPILES:** INSTALL EROSION CONTROLS AROUND THE BASE OF ALL SOIL MATERIAL STOCKPILES, AND TEMPORARILY SEED OR COVER THE PILES WITH AN IMPERVIOUS COVER THAT WILL REMAIN ON THE SITE LONGER THAN ONE MONTH.
11. **CONSTRUCTION VEHICLES:** NO CONSTRUCTION VEHICLES WILL BE STORED, SERVICED, REFUELED, WASHED OR FLEETED OUT IN A LOCATION WHERE LEAKS, SPILLAGE, WASTE MATERIALS, CLEANERS, OR WATERS WILL BE INTRODUCED OR FLOW INTO WETLANDS OR WATERCOURSES.
12. **SPILL KIT:** PROVIDE AND MAINTAIN A SUPPLY OF ABSORBENT SPILL RESPONSE BOOMS AND BLANKETS ON-SITE FOR THE ENTIRE CONSTRUCTION PERIOD.
13. **CONTAMINANT SPILLS:** NO EQUIPMENT STORAGE, CLEANING, REPAIRING, OR REFUELING SHALL BE CONDUCTED WITHIN 10 FEET OF A WETLAND BOUNDARY. SHOULD ANY CONTAMINANT SPILL OCCUR, IMMEDIATELY NOTIFY THE CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION, OIL AND CHEMICAL SPILL RESPONSE DIVISION AT 864-8233 AND THE ENGINEER.
14. **EQUIPMENT MAINTENANCE AND SERVICING:** DURING CONSTRUCTION, ROUTINE EQUIPMENT MAINTENANCE AND SERVICING SHALL BE CONDUCTED AT A LOCATION WITH A DRAIN CATCH BASIN ON AN IMPERVIOUS SURFACE WITH AN ABSORBENT SPILL RESPONSE MATERIALS IN PLACE. NON-ROUTINE MAINTENANCE OF EQUIPMENT SHALL BE CONDUCTED OFF-SITE. SHOULD ANY CONTAMINANT SPILL OCCUR, IMMEDIATELY NOTIFY THE CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION, OIL AND CHEMICAL SPILL RESPONSE DIVISION AT 864-8233 AND THE ENGINEER.
15. **FUEL STORAGE:** FUEL FOR CONSTRUCTION PURPOSES SHALL NOT BE STORED ON-SITE.
16. **HARMFUL MATERIALS STORAGE:** DURING CONSTRUCTION, ALL HAZARDOUS OR OTHER HARMFUL MATERIALS SHALL BE STORED OFF-SITE OR ON-SITE, THEN WITH A SECONDARY CONTAMINANT PROTECTION STRUCTURE WITH AN IMPERVIOUS COVER THAT WILL BE SECURED DURING NON-HOURS OF WORK.
17. **TREES:** TREES AND VEGETATION TO BE REMOVED MAY NOT ALL BE SEEN, BUT SHALL BE INCLUDED IN THE WORK. IN ALL CASES, CLEARING SHALL BE LIMITED TO THE MINIMUM NECESSARY TO PERFORM THE CONSTRUCTION. TREE REMOVAL SHALL BE INDIVIDUALLY VERIFIED IN THE FIELD WITH THE ENGINEER PRIOR TO THEIR REMOVAL.
18. **MATERIAL DISPOSAL:** SURPLUS OR UNSUITABLE MATERIALS SHALL BE DISPOSED OF OFF-SITE IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL ORDINANCES, RULES, REGULATIONS AND CODES.
19. **CURB AND PAVEMENT:** PAVEMENTS TO BE CUT SHALL BE SAW CUT PRIOR TO PAVING, CLEAN FACE OF EXISTING PAVEMENT AND PAINT WITH LIQUID BITUMEN. MATCH EXISTING GRADES WITH NEW PAVEMENT.
20. **UNDERGROUND UTILITIES:** FOR LOCATION OF UNDERGROUND ELECTRIC, TELEPHONE, GAS, CABLE TV AND OTHER FACILITIES OF PUBLIC UTILITY COMPANIES, INQUIRE OF "CALL BEFORE YOU DIG, INC." AT 1-800-922-4455.
21. **UTILITIES:** THERE ARE UNDERGROUND UTILITIES, BUT NO OVERHEAD UTILITIES AT THE PROJECT SITE.
22. **ELECTRIC:** EVERSOURCE ENERGY TELEPHONE: FRONTIER COMMUNICATIONS OF CONNECTICUT CABLE TELEVISION: COMCAST OF CONNECTICUT, INC.
23. **EXISTING INFORMATION OR DATA SHOWN OR INDICATED IN THE CONTRACT DOCUMENTS WITH RESPECT TO EXISTING UNDERGROUND PIPES, CABLES, CONDUITS, STRUCTURES OR OTHER UNDERGROUND FACILITIES IS BELIEVED TO BE REASONABLY CORRECT BUT NOT GUARANTEED TO BE EXACT. COMPLETE SUCH INFORMATION SHALL BE CONSIDERED TO HAVE BEEN PROVIDED FOR THE CONVENIENCE OF THE CONTRACTOR AND TO ALERT THE CONTRACTOR TO THE EXISTENCE OF SUCH UNDERGROUND FACILITIES WITHIN OR CONTIGUOUS TO THE PROJECT SITE AND THE TOWN, ENGINEER AND THEIR CONSULTANTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ANY SUCH INFORMATION OR DATA.**
24. **THE CONTRACTOR SHALL HAVE FULL RESPONSIBILITY FOR REVIEWING AND CHECKING ALL INFORMATION AND DATA DESCRIBED ABOVE, FOR LOCATING ALL SUCH UNDERGROUND FACILITIES SHOWN OR INDICATED IN THE CONTRACT DOCUMENTS. FOR COORDINATION OF THE WORK WITH THE OWNERS OF SUCH UNDERGROUND FACILITIES DURING CONSTRUCTION, FOR THE SAFETY AND PROTECTION THEREOF, AND FOR PREPARING ANY DAMAGE THEREBY RESULTING FROM THE WORK. THE COST OF ALL WHICH WILL BE CONSIDERED AS HAVING BEEN INCLUDED IN THE CONTRACT PRICE.**
25. **THE CONTRACTOR SHALL BE LIABLE FOR ALL DAMAGES AND CLAIMS RECEIVED OR SUSTAINED BY ANY PERSONS, CORPORATIONS OR PROPERTY IN CONSEQUENCE OF THE DAMAGE TO EXISTING UTILITIES, ROADWAYS, THEIR APPURTENANCES, OR OTHER FACILITIES CAUSED DIRECTLY OR INDIRECTLY BY THE OPERATIONS OF THE CONTRACTOR.**
26. **CONTRACTOR LIMIT LINE:** SHALL BE EASEMENT AND RIGHT OF WAY LINES BETWEEN START AND END CONSTRUCTION STATIONS SHOWN ON THE DRAWINGS.
27. **SITE DISTURBANCE:** SITE DISTURBANCE SHALL BE KEPT TO A MINIMUM.
28. **SITE FEATURES:** NEARLY REMOVE, STORE AND PROTECT AS APPLICABLE, AND REINSTALL OR REPLACE AS APPLICABLE, EXISTING SITE FEATURES DISTURBED BY CONSTRUCTION, REQUIRED FOR FINISHED CONSTRUCTION.
29. **SALVAGE ITEMS:** NONE.
30. **NOISE:** PROPERLY CONTROL MUFFLERS AND NOISE CONTROL DEVICES. REPLACE DEFECTIVE DEVICES AS NECESSARY AND LOCATE DEWATERING PUMPS AS FAR AS POSSIBLE FROM RESIDENTIAL STRUCTURES, SO AS TO MINIMIZE THE AMOUNT OF NOISE GENERATED AT THE SITE THAT WILL REACH RESIDENTIAL STRUCTURES.
31. **REMOVAL OF EXISTING TREES:** BEFORE INITIATING CONSTRUCTION, CONTRACTOR SHALL SUBMIT A PLAN FOR APPROVAL LIFTING METHOD FOR CONSTRUCTION AND PROTECTION OF DEBRIS FROM FALLING INTO THE BROOK DURING REMOVAL OF THE EXISTING SUPERSTRUCTURE.
32. **REMOVAL OF EXISTING MATERIALS:** EXCEPT AS NOTED OTHERWISE, SURPLUS MATERIALS SHALL BE DISPOSED OF OFF-SITE IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL LAWS, ORDINANCES, RULES, REGULATIONS AND CODES.
33. **CONTRACTOR SHALL BE:**
 - A. SOLELY RESPONSIBLE FOR PROTECTION OF PERSONS AND THE PUBLIC IN GENERAL, THE WORK TO BE PERFORMED UNDER THE CONTRACT, PUBLIC AND PRIVATE PROPERTY, AND EASEMENTS AND RIGHTS OF WAY DURING THE COURSE OF THE WORK OF THE CONTRACTOR AND HIS SUBCONTRACTORS.
 - B. LIABLE FOR ALL DAMAGES AND CLAIMS RECEIVED OR SUSTAINED BY ANY PERSONS, CORPORATIONS OR PROPERTY IN CONSEQUENCE OF THE DAMAGE TO EXISTING UTILITIES, ROADWAYS, THEIR APPURTENANCES, OR OTHER FACILITIES CAUSED DIRECTLY OR INDIRECTLY BY THE OPERATIONS OF THE CONTRACTOR, AND.
 - C. SOLELY RESPONSIBLE FOR CONSTRUCTION METHODS, MEANS, TECHNIQUES AND FOR INITIATING, MAINTAINING AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK.
34. **IN GENERAL, Lower Case Text Identifies Existing Features/Conditions**
35. **IN GENERAL, UPPER CASE TEXT IDENTIFIES PROPOSED FEATURES/CONDITIONS UNLESS OTHERWISE SPECIFIED.**

REFERENCES:

1. VERTICAL DATUM IS NAVD83 AND HORIZONTAL DATUM IS NAD83.
2. GROUND BASED TOPOGRAPHIC SURVEY WAS PERFORMED BY LAM SURVEY & TECHNICAL SERVICES, INC., 86 MAIN STREET, CHESTER, CT 06412 ON 11-15-2021, 11-16-2021, 12-09-2021, 01-14-2022, 01-19-2022 AND 01-27-2022.
3. INLAND WETLAND BOUNDARY HAS FLAGGED IN THE FIELD BY R. RICHARD SHARUK, CESS, ON 12-02-2021 AND 01-18-2022. FLAGS WERE LOCATED IN THE FIELD BY LAND SURVEY & TECHNICAL SERVICES, INC.
4. UNDERGROUND UTILITY LOCATIONS SHOWN WERE DETERMINED AS FOLLOWS:
 - A. EMAIL FROM FRONTIER DATED 11-30-2021 NOTIFYING THAT THEIR UNDERGROUND LINES ARE BELOW THE WEST VEGETATED SHOULDER OF THE ROAD.
 - B. MAP SHOWING UNDERGROUND COMCAST INFRASTRUCTURE BELOW THE EAST VEGETATED SHOULDER OF THE ROAD ENTITLED "TOWN, OLD SAYBROOK, STATE, CT, LOCATION: BEAVER DAM TRAIL", UNDATED, NO SCALE, AND EMAIL VERIFICATION FROM COMCAST DATED 11-30-2021.
 - C. MAP SHOWING UNDERGROUND EVERSOURCE INFRASTRUCTURE BELOW THE WEST VEGETATED SHOULDER OF THE ROAD, ENTITLED "TOWN, OLD SAYBROOK, STATE, CT, LOCATION: BEAVER DAM TRAIL", UNDATED, NO SCALE, AND EMAIL VERIFICATION FROM COMCAST DATED 11-30-2021.



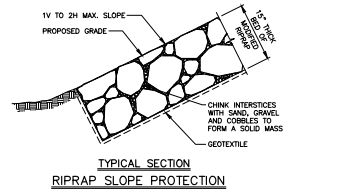
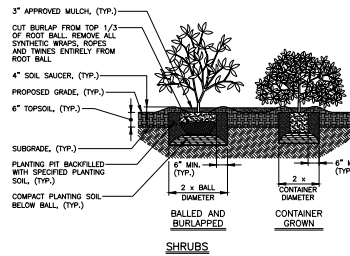
SPOTTED TURTLE



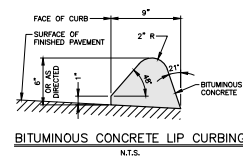
EASTERN RIBBON SNAKE

TURTLE AND SNAKE PROTECTION NOTES:

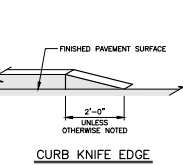
1. CONSTRUCTION PERSONNEL SHALL BE APPRISED OF THE SPECIES DESCRIPTION AND THE POSSIBLE PRESENCE OF A LISTED SPECIES.
2. TURTLES AND SNAKES ENCOUNTERED WITHIN THE IMMEDIATE WORK AREA SHALL BE CAREFULLY MOVED TO AN ADJACENT AREA OUTSIDE OF THE EXCLUDED AREA AND FENCING SHALL BE INSPECTED TO IDENTIFY AND REMOVE ANY ACCESS POINTS.
3. THESE TURTLES AND SNAKES ARE PROTECTED BY LAW AND SHALL NOT BE HARMS OR REMOVED FROM THE SITE.
4. WHEREVER MAYBE OR SEDIMENTATION FENCE IS USED FOR EXCLUSION, IT SHALL BE SHOWN AS SOON AS THE AREA IS STABLE TO ALLOW FOR REPTILE AND AMPHIBIAN PASSAGE TO RESUME.



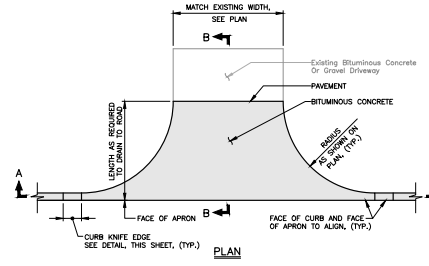
TYPICAL SECTION RIPRAP SLOPE PROTECTION



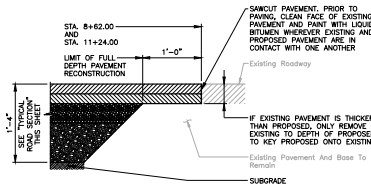
BITUMINOUS CONCRETE LIP CURBING



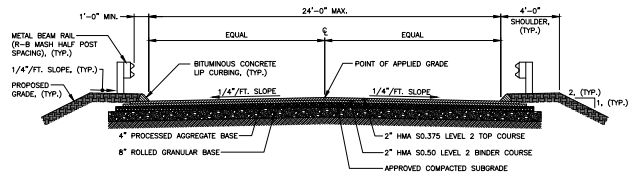
CURB KNIFE EDGE



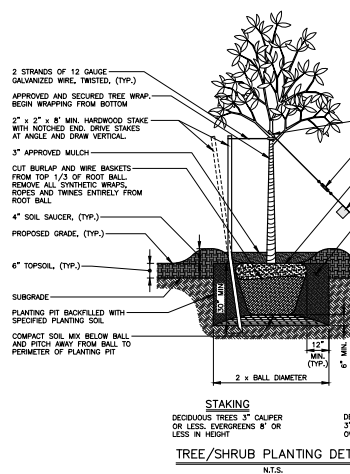
DRIVEWAY APRON



ROADWAY PAVEMENT TRANSITION



TYPICAL ROAD SECTION BEAVER DAM TRAIL



TREE/SHRUB PLANTING DETAIL

- NOTES:**
1. FOR TREES 3" - 4" CALIPER: PROVIDE 3 GUYS AND ANCHORS. GUYS SHALL CONSIST OF 3 STRANDS OF 11 GAUGE WIRE, TWISTED. ANCHORS SHALL BE 3/4" X 30" STAKES, NOTED, AND DRIVEN AT A 45 DEGREE ANGLE.
 2. FOR TREES 6" - 12" CALIPER: PROVIDE 4 GUYS AND ANCHORS. GUYS SHALL BE 1/2", 7 STRAND CABLE. PROVIDE EACH GUY WITH A TURNBUCKLE. ANCHORS SHALL BE 8" DIA. X 45" DEAMEN, BURIED 48" DEEP.
 3. FOR TREES OVER 12" CALIPER: PROVIDE 6 GUYS AND ANCHORS. GUYS SHALL BE 5/8", 7 STRAND CABLE. PROVIDE EACH GUY WITH A TURNBUCKLE. ANCHORS SHALL BE 8" DIA. X 45" DEAMEN, BURIED 48" DEEP.
- THE ABOVE GUYING REQUIREMENTS ARE MINIMUMS. THE CONTRACTOR SHALL PROVIDE ADDITIONAL GUYS AND STAKES AS REQUIRED TO SECURE THE TREE. THE GUYS SHALL BE CONTINUOUSLY INSPECTED, AND TIGHTENED AS NEEDED, ASSURE THAT THE TREE GUYS ARE ADEQUATELY MARKED TO CLEARLY FOREWARN PEDESTRIANS. MARKING SHALL BE CONTINUOUSLY INSPECTED AND REPAIRED AS NEEDED.
- PERMITS SHALL BE IN ACCORDANCE WITH APPLICABLE REGULATIONS AND STANDARDS IN ORDER TO PRESERVE THE NATURAL FORM OF THE SPECIFIC PLANT. IF APPLICABLE AND APPROVED BY THE ENGINEER, ONE FOURTH TO ONE THIRD OF THE WOOD SHALL BE REMOVED BY THINNING OUT TO BALANCE ROOT LOSS DUE TO TRANSPILATING.

TOWN OF
OLD SAYBROOK, CONNECTICUT

**REPLACEMENT OF
BRIDGE NO. 105003
BEAVER DAM TRAIL
OVER FISHING
BROOK**

**SITE DETAILS
AND NOTES**

PRELIMINARY DESIGN

THIS DRAWING IS INTENDED TO BE USED FOR INFORMATION AND REVIEW PURPOSES ONLY AND IS NOT INTENDED TO BE USED FOR CONSTRUCTION.

GRAPHIC SCALE
0" 10' 20'

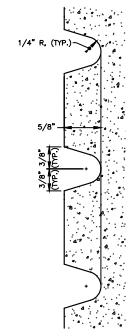
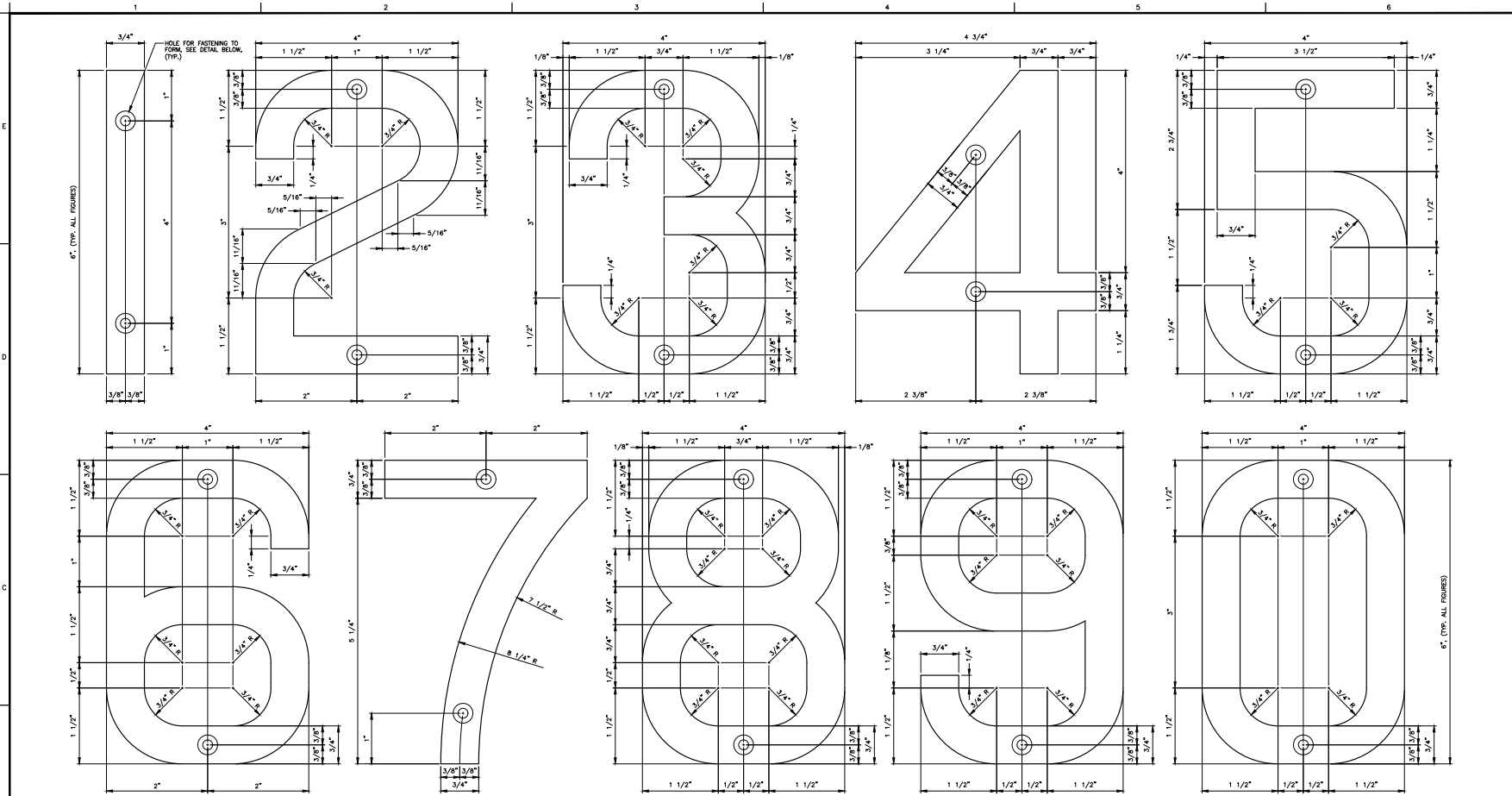
Nathan L. Jacobson & Associates, Inc.
86 Main Street P.O. Box 337
Chester, Connecticut 06412-0337
Tel: (860) 526-9591 Fax: (860) 526-5416
www.nliac.com

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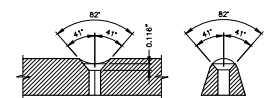
NO.	DESCRIPTION	DATE

DATE: OCTOBER 2022 SHEET NO:
SCALE: AS NOTED
PROJECT NO.: 0747049
CADD FILE: 0747049.dwg
DESIGNED: JJP
DRAWN: JJP
CHECKED: AUG

16 OF 17



TYPICAL SECTION THROUGH FIGURES
N.T.S.



HOLE FOR FASTENING TO FORM
N.T.S.

- NOTES:
1. DRILL HOLE WITH NO.9 DRILL AND COUNTERSINK FOR STANDARD 3/16\"/>

NOTES:
1. SEE SHEET 16 FOR PROJECT NOTES.

THIS DRAWING IS INTENDED TO BE USED FOR INFORMATION AND REVIEW PURPOSES ONLY AND IS NOT INTENDED TO BE USED FOR CONSTRUCTION.



TOWN OF
OLD SAYBROOK, CONNECTICUT

REPLACEMENT OF
BRIDGE NO. 105003
BEAVER DAM TRAIL
OVER FISHING
BROOK

FIGURES FOR
DATES ON BRIDGE
PARAPETS

PRELIMINARY DESIGN

WEAK ALL RIGHTS IN THE DRAWING ARE RESERVED BY THE ENGINEER. WRITTEN APPROVAL OF NATHAN L. JACOBSON & ASSOCIATES, INC. WILL BE AT THE SOLE RISK OF THE PERSON OR FIRM MAKING SUCH UNAUTHORIZED ALTERATIONS AND NATHAN L. JACOBSON & ASSOCIATES, INC. WILL NEITHER BEAR NOR ACCEPT ANY LIABILITY OR LEGAL EXPENSE ARISING FROM SUCH UNAUTHORIZED ALTERATIONS.

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Cheshire, Connecticut 06412-0337
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www.nliib.com
Jacobson Consulting Civil and Environmental Engineers Since 1972

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J. HOWARD PFROMMER, P.E.
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REVISIONS		DATE
NO.	DESCRIPTION	

DATE:	OCTOBER 2022	SHEET NO.:	17 OF 17
SCALE:	AS NOTED		
PROJECT NO.:	0747045		
CADD FILE:	074704501		
DESIGNED:	JHP		
DRAWN:	AUG		
CHECKED:			

November 5, 2021

Ms. Danielle Marzitelli
Nathan L. Jacobson & Associates, Inc.
86 Main Street, P.O. Box 337
Chester, CT 06412
(sent only via email to dmarzitelli@nlja.com)

Subject: Culvert Replacement
Beaver Dam Trail over Fishing Brook
Old Saybrook, Connecticut

Dear Ms. Marzitelli:

The Connecticut State Historic Preservation Office (SHPO) is in receipt of your request for our comments concerning the referenced project. The proposed project is subject to permitting by the United States Army Corps of Engineers. As a result, the proposed undertaking is subject to Section 106, the implementing regulations of the National Historic Preservation Act. SHPO understands that the Town of Old Saybrook plans to replace the existing corrugated metal pipe arch carrying Beaver Dam Trail over Fishing Brook with a precast concrete box culvert.

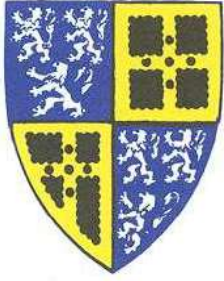
There are no archeological sites or properties listed on the National Register of Historic Places (NRHP) recorded within or immediately adjacent to the Area of Potential Effect (APE) for this project. It is SHPO's opinion that this common type of culvert, constructed during the late 20th century, is not eligible for listing on the NRHP. The area surrounding the APE is considered archeologically sensitive, but project plans indicate that all of the work will be confined to existing disturbed contexts related to the building of Beaver Dam Trail. Therefore, it is unlikely that significant archeological resources would be affected by the proposed replacement. However, should project plans include more substantial ground disturbing activities in undisturbed areas, SHPO would appreciate further consultation. Based on the information provided to our office, it is SHPO's opinion that no historic properties will be affected by this undertaking.

This office appreciates the opportunity to review and comment upon this project. Do not hesitate to contact Catherine Labadia, Staff Archaeologist and Environmental Reviewer, for additional information at (860) 500-2329 or catherine.labadia@ct.gov.

Sincerely,



Jonathan Kinney
Deputy State Historic Preservation Officer



TOWN OF OLD SAYBROOK
**Inland Wetlands & Watercourses
Commission**

*J. Colin Heffernan, Chairman
Chuck Savage, Vice Chairman
Laura Parker Gray
Peter DeLisa (Conservation)
Mark Caldarella (Zoning)
Paula Kay (Planning)
Sandra Roberts (Economic Development)*

www.oldsaybrookct.gov

Alternate Members
*Elizabeth D. Steffen, Secretary
Janis Esty*

MINUTES
REGULAR MEETING
Thursday, November 17, 2022
Via Hybrid Meeting
Town Hall 1st floor conference room
302 Main Street, Old Saybrook

I. CALL TO ORDER

Acting Chairman C. Savage called the meeting to order at 7:00 pm.

II. ROLL CALL

Members Present: C. Savage, L. Gray, P. DeLisa, M. Caldarella, P. Kay, S. Roberts, J. Esty (seated); E. Steffen (not seated)

Members Absent: C. Heffernan

Staff Present: L. Wacker, Assistant Town Planner; C. Maharbiz, Recording Clerk

Audience Present: 4 present in person

III. OLD BUSINESS



22-008 “Town of Old Saybrook” Application to Conduct a Regulated Activity

Replacement of an existing failing culvert barrel within wetlands.

Between 7 & 9 Kitteridge Hill Road (on Beaver Dam Trail) Map 50/Lots 63-4 and 63-6 and road right-of way.

Applicant: Town of Old Saybrook Agent: Howard Pfrommer, P.E. NLJA & Assoc.

ACTION: Receive application, Review for completeness, Determine if regulated activities are significant

Mr. Pfrommer presented on the Beaver Dam culvert replacement project and provided answers to previous questions raised by Commission members. With respect to the amount of proposed fill in the wetlands, Mr. Pfrommer stated that there will be 20 cubic yards of fill in the temporary impact areas and 1 cubic yard in the permanent impact areas.

C. Savage asked how the utility lines will be dealt with. Mr. Pfrommer explained that there have been two utility coordination meetings and the utility companies are currently looking for an

underground solution rather than aerial solution to deal with the underground lines located on the west side.

MOTION to approve application 22-008 “Town of Old Saybrook” as proposed; **MADE:** by C. Savage; **SECONDED:** by S. Roberts; **VOTING IN FAVOR:** C. Savage, L. Gray, P. DeLisa, M. Caldarella, P. Kay, S. Roberts; J. Esty; **OPPOSED:** None; **ABSTAINING:** None; **APPROVED:** 7-0-0.

22-009 “The Lee Company” Application to Conduct a Regulated Activity

Construction of an access driveway including removing and depositing material, grading and vegetation removal within the 100’ upland review area.

281 Schoolhouse Road, Map50/Lot 013

Applicant: Angus McDonald Gary Sharpe & Associates Owner: The Lee Company

ACTION: Receive application, Review for completeness, Determine if regulated activities are significant

Engineer Fern Tremblay presented. He briefly reviewed the application and answered questions previously posed by Commission members. First, with respect to the number of trees to be removed within the upland review area, he stated that 38 trees will be removed, 3 of which are dead. Second, with respect to the question about whether the driveway can be narrowed, Mr. Tremblay stated that due to having to meet regulations for both Westbrook and Old Saybrook, Westbrook regulations require a minimum of 18 feet for two-way traffic. Finally, regarding vernal pools, Richard Snarsky identified an area with potential for a vernal pool. Mr. Tremblay explained that to accommodate that, the applicant will stagger the silt fence and provide overlap. This will prevent sediment from coming down but provide a corridor for amphibians.

M. Caldarella asked about encroachment into the wetlands by the silt fence overlap and Mr. Tremblay explained that there will be none and that the silt fence will be removed upon completion of the work. The proposed vegetative soil will remain and will have ferns. He also asked if the road at the exit will be locked, which Mr. Tremblay confirmed. L. Gray asked if there are old stone walls along the road. Mr. Tremblay showed the location of a wall but stated that it will not be disturbed. She also asked about the diameter of the trees being removed, which Mr. Tremblay stated are mostly 6-8 inches in diameter with 1-2 about 24 inches. In answer to a question about the age of the facility, Mr. Tremblay stated that the earliest building is from 1961 and the most recent from 2015. L. Wacker asked if road salt will be used and Mr. Tremblay stated he did not think it would be necessary.

L. Wacker reported that she met with the tree warden who said that this is not an old growth forest, and he is not concerned with the trees being removed. Additionally, soil scientist Rich Snarsky was not concerned about the timing of the project with the vernal pool. L. Wacker suggested that the limits of disturbance be marked in the field to prevent accidental encroachment into the wetlands during construction.

MOTION to approve application 22-009 “The Lee Company” as proposed; **MADE:** by C. Savage; **SECONDED:** by L. Gray; **VOTING IN FAVOR:** C. Savage, L. Gray, P. DeLisa, M. Caldarella, P. Kay, S. Roberts; J. Esty; **OPPOSED:** None; **ABSTAINING:** None; **APPROVED:**

7-0-0.

22-010 “Pelczar” Application to Conduct a Regulated Activity

Construction of a garage, covered landing, deck with roof, greenhouse, mulch walkway and gangway bridge within the 100’ upland review area.

140 Ingham Hill Road, Map 48/Lot 1

Applicant/Owner: Steven Pelczar

ACTION: Receive application, Review for completeness, Determine if regulated activities are significant

Mr. Pelczar provided a review of the application. He stated that he found a gangway that can be carried in and put in place with no footings required. Eight trees will be cut to build the garage, which will be chipped and used for the pathway from the garage. He will use a silt fence at the edge of the wetlands and only the over dig for the footings will encroach on the wetlands.

C. Savage asked how much the footings will encroach on the wetlands and Mr. Pelczar stated roughly 4 square feet. P. Kay asked if the applicant considered the option of applying for a variance and Mr. Pelczar stated he was discouraged from doing that. M. Caldarella questioned whether the garage could be shifted closer to the road to eliminate the disturbance into the wetlands and Mr. Pelczar stated that he cannot do that due to setbacks. Commission members then discussed the possibility of reducing the size of the garage bump out by 2 feet, and Mr. Pelczar agreed to the size reduction. J. Esty asked if holes will be made in the wetlands for electrical wire and Mr. Pelczar stated he will be taking electricity from the street.

MOTION to determine that the garage, mulch path, and gangway portions of 22-010 “Pelczar” application are complete, that the activities will not have a significant impact and that Ordinance 71 fees will not be required; **MADE:** by C. Savage; **SECONDED:** by P. Kay; **VOTING IN FAVOR:** C. Savage, L. Gray, P. DeLisa, M. Caldarella, P. Kay, S. Roberts; J. Esty; **OPPOSED:** None; **ABSTAINING:** None; **APPROVED:** 7-0-0.

MOTION to approve application 22-010 “Pelczar” as proposed with the condition that the applicant will modify the bump out on the garage from 5 ft to 3 ft and will draw electricity from the street; **MADE:** by C. Savage; **SECONDED:** by M. Caldarella; **VOTING IN FAVOR:** C. Savage, L. Gray, P. DeLisa, M. Caldarella, P. Kay, S. Roberts; J. Esty; **OPPOSED:** None; **ABSTAINING:** None; **APPROVED:** 7-0-0.

IV. PUBLIC HEARINGS

22-007 “SPR Oasis, LLC” Application to Conduct a Regulated Activity

Construction of a retail center within inland wetlands and 100’ upland review area.

52 Spencer Plain Road (Map 25/Lot 27)

Applicant: SPR Oasis, LLC Owner: Ortho Saybrook LLC Agent: Joseph Wren, P.E.L.S.

ACTION: Continue or close by 11/17/2022 (NLT 12/21/2022)

Attorney Edward Cassella, Joe Wren, and Bob Russo presented. Commission member E. Steffen recused herself. Mr. Cassella gave an overview of the project, which is for a retail grocery store

and two fast food restaurant pads. He also discussed the submission of a feasible alternative, specifically a proposal with three restaurant pads instead of a larger grocery pad. Soil scientist Bob Russo discussed his findings with respect to the three wetland areas on the site, and discussed drainage, hydrology, stormwater runoff, vernal pools, soil type, vegetation, and wetland impacts. Joe Wren provided details of the project and showed site plans. He described the alternative plan submitted with the application. Then he explained in more detail a new proposed alternative plan, which would have 1 restaurant pad and 1 retail space instead of 3 restaurant pads. He showed the new proposed alternative plan superimposed over the prior alternative site plan. He stated that this new plan incorporates most, if not all, the comments from the reviewing engineer and soil scientist as well as from the Commission.

P. Kay asked if the comments set forth in the Jacobson and Davidson letters were addressed in the new plan. Mr. Cassella confirmed that the new alternative plan addresses their comments, regarding pushing the structure to the west and use of the wetlands for stormwater runoff. M. Caldarella asked if the submission was final, which Mr. Cassella stated it is not and the applicant will be submitting final plans as soon as possible.

Chairman Savage opened the public hearings to public comment. Geoffrey Jacobson asked about the stormwater basins on the new alternative plan. Mr. Wren stated that they are considering having 2 stormwater basins. Mr. Jacobson also confirmed the addition of retaining walls in the NE corner. Eric Davidson asked if the 10,000 square foot of additional buffer in the alternative plan will be in the new plan. Mr. Wren stated that with the retaining walls, the buffer areas will be greater than 10,000 square feet. Mr. Davidson also suggested doing a water quality swale that runs along the edge of the retaining wall instead of a single basin.

MOTION to continue the public hearing for applicant 22-007 to the December 15, 2022 meeting at 7 p.m. Town Hall, Old Saybrook; **MADE:** by C. Savage; **SECONDED:** M. Caldarella; **VOTING IN FAVOR:** C. Savage, L. Gray, P. DeLisa, M. Caldarella, P. Kay, S. Roberts; J. Esty; **OPPOSED:** None; **ABSTAINING:** None; **APPROVED:** 7-0-0.

V. NEW BUSINESS

22-012 “Foster” Application to Conduct a Regulated Activity

Construction of a 288 s.f. 3 season room, construction of a den, screened porch and new covered entry within the 100’ upland review area.

110 Sheffield Street, Map 31/Lot 3

Applicant/Owner: Nicholas V. Foster Agent: Denise Von Dassel, Architect

ACTION: Receive application, review for completeness, accept application and determine if regulated activities are significant.

Mr. Foster presented. He explained that the house is completely within the 100-foot review area. He described the three areas to be rebuilt: (1) a 3-season porch with proper foundation; (2) a den and existing screened porch to be rebuilt into a 18 x 18-foot room with a screened porch rebuilt where it is currently located; and (3) a new covered entryway over the front door. The house will increase in size by 348 square feet. A silt fence will be installed surrounding the water side

and native grasses have been planted. No dirt will be removed or brought in. No trees will be removed and there will be no effects on the wetlands.

C. Savage asked when the work is proposed and Mr. Foster stated that he is hoping to begin in the spring, but still needs to receive approval from other commission. L. Gray asked about the age of the house, which Mr. Foster stated is at least 150 years old.

MOTION to accept the application 22-012 “Foster” Application to Conduct a Regulated Activity as complete, that the regulated activities are not significant and that no Ordinance 71 fees are required; **MADE:** by C. Savage; **SECONDED:** by P. Kay; **VOTING IN FAVOR:** C. Savage, L. Gray, P. DeLisa, M. Caldarella, P. Kay, S. Roberts; J. Esty; **OPPOSED:** None; **ABSTAINING:** None; **APPROVED:** 7-0-0.

22-013 “EconoLodge” Application to Conduct a Regulated Activity

Construction of a 4680 s.f. building addition with covered porches within 100’ upland review area.

1750 Boston Post Road, Map 25/Lot 4

Applicant: RR SAI, LLC

Agent: Attorney Edward M. Cassella

ACTION: Receive application, review for completeness, accept application and determine if regulated activities are significant.

Mr. Cassella presented. He explained that the owners previously received a permit in June for an owner’s apartment addition with a condition that the area below the addition be limited to a 4-foot crawl space. The owners have presented the current application to request a modification to the size of the building with a new configuration, which is 511 square feet larger than initially approved. Additionally, the owners are requesting approval to have a split basement where the western size remains a 4-ft. crawl space but the eastern size is a full 7-ft. basement space. They did soil testing to determine the water level and found that the first floor is 3 ft. 10 inches above grade. There is a proposed sump pump, which will be directed to the pond and not to the south where the wetlands are located.

M. Caldarella asked if the sump pump is being placed for back-up, which was confirmed by Mr. Cassella. One sump pump will be added. C. Savage asked if it would tie into the existing line and Mr. Cassella explained that there will be a line for the sump pump and another for the roof. L. Wacker asked if the parking lot will be dug up to put in the new line. Mr. Cassella was unsure and stated that he would find out. She also stated that the applicant would need to provide that information along with erosion and sediment control measures on the site plan.

MOTION to accept the application 22-013 “EconoLodge” Application to Conduct a Regulated Activity as complete, that the regulated activities are not significant and that no Ordinance 71 fees will be required with further details on the discharge pipe to be provided; **MADE:** by C. Savage; **SECONDED:** by P. Kay; **VOTING IN FAVOR:** C. Savage, L. Gray, P. DeLisa, M. Caldarella, P. Kay, S. Roberts; J. Esty; **OPPOSED:** None; **ABSTAINING:** None; **APPROVED:** 7-0-0.

VI. REGULAR BUSINESS

A. 2023 Meeting Calendar

MOTION to approve the 2023 Meeting Calendar as presented; **MADE:** by C. Savage; **SECONDED:** M. Caldarella; **VOTING IN FAVOR:** C. Savage, L. Gray, P. DeLisa, M. Caldarella, P. Kay, S. Roberts; J. Esty; **OPPOSED:** None; **ABSTAINING:** None; **APPROVED:** 7-0-0.

B. Meeting Minutes

On page 4, L. Gray corrected “18-inch” to “18-foot” gravel road.

MOTION to approve the regular meeting minutes of October 20, 2022, as corrected; **MADE:** by C. Savage; **SECONDED:** M. Caldarella; **VOTING IN FAVOR:** C. Savage, L. Gray, P. DeLisa, M. Caldarella, P. Kay, S. Roberts; J. Esty; **OPPOSED:** None; **ABSTAINING:** None; **APPROVED:** 7-0-0.

C. Correspondence & Announcements – None.

D. Committee, Representative & Staff Reports – L. Wacker issued an administrative permit for a garage addition 75 feet from the wetlands on 129 Old Boston Post Road. She also noted that during the Feb. 16 meeting a representative from DEEP will be providing training to commission members and reported that she and E. Steffen attended the CACIWC meeting. M. Caldarella mentioned that at the most recent Zoning Commission meeting, a motion was approved for a 6-month moratorium on drive-thrus.

VII. ADJOURNMENT

MOTION to adjourn the meeting at 9:18 p.m. to the next regular meeting on December 15, 2022, Old Saybrook Town Hall, 302 Main Street, 1st Floor Conference Room and via Zoom; **MADE:** by C. Savage; **SECONDED:** by M. Caldarella; **VOTING IN FAVOR:** C. Savage, L. Gray, P. DeLisa, M. Caldarella, P. Kay, S. Roberts; J. Esty; **OPPOSED:** None; **ABSTAINING:** None; **APPROVED:** 7-0-0.

Respectfully Submitted,
Carolina Maharbiz, Recording Clerk

From: J. Howard Pfrommer, P.E.
Sent: Monday, September 19, 2022 12:02 PM
To: J. Howard Pfrommer, P.E.
Subject: 07470045 PZC CGS 8-24

I spoke with Town Planner Christine Costa this morning. She noted that a CGS 8-24 submission was not needed for the project because the project is a "repair" of an existing structure.

J. Howard Pfrommer, P.E.

 **Nathan L. Jacobson & Associates**
Consulting Civil and Environmental Engineers

Celebrating our 50th Anniversary 1972-2022

86 Main Street, P.O. Box 337, Chester, Connecticut 06412-0337

860.526.9591 • hfrommer@nlja.com • www.nlja.com

BID FORM FOR CONSTRUCTION CONTRACT

The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

ARTICLE 1—OWNER AND BIDDER

1.01 This Bid is submitted to:

***Town of Old Saybrook, Connecticut
Office of the First Selectman
302 Main Street
Old Saybrook, CT 06475***

1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner 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—ATTACHMENTS TO THIS BID

2.01 The following documents are submitted with and made a condition of this Bid:

- A. Required Bid security;
- B. Evidence of authority to do business in the state of the Project; or a written covenant to obtain such authority within the time for acceptance of Bids;
- C. Statement of Bidders Qualifications Form;
- D. Non Collusion Affidavit Form;
- E. CHRO Bidder Contract Compliance Monitoring Report;
- F. State of Connecticut Certificate of Compliance with Connecticut General Statute 31-57b.

ARTICLE 3—BASIS OF BID—LUMP SUM BID AND UNIT PRICES

3.01 *Unit Price Bids*

A. Bidder will perform the following Work at the indicated unit prices:

BASE BID SCHEDULE

Item No.	Description	Unit	Estimated Quantity	Bid Unit Price	Bid Amount
1	All WORK included in the Contract Documents except for WORK included under Item Nos. 2 through 6 below	L.S.	1		
2	Rock Excavation	C.Y.	5		
3	Additional Excavation (A.O.B.E.)	C.Y.	10		
4	Additional Granular Fill (A.O.B.E.)	C.Y.	10		
5	Additional 3/8" Crushed Stone (A.O.B.E.)	C.Y.	10		
6	Additional Geotextile (A.O.B.E.)	S.Y.	100		
Total Bid Price (Total of All Lump Sum and Unit Price Bid Items)					\$

B. Bidder acknowledges that:

1. **All Work in the Contract Documents shall be included in Bid Item Nos. 1 through 6;**
2. each Bid Unit Price includes an amount considered by Bidder to be adequate to cover **all described Work, including** Contractor’s overhead and profit for each separately identified item, and
3. estimated quantities are not guaranteed and are solely for the purpose of comparison of Bids, and final payment for all Unit Price Work will be based on actual quantities, determined as provided in the Contract Documents.

ARTICLE 4—TIME OF COMPLETION

4.01 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.

4.02 Bidder accepts the provisions of the Agreement as to liquidated damages.

ARTICLE 5—BIDDER’S ACKNOWLEDGEMENTS: ACCEPTANCE PERIOD, INSTRUCTIONS, AND RECEIPT OF ADDENDA

5.01 *Bid Acceptance Period*

A. This Bid will remain subject to acceptance for 90 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

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 REPLACEMENT OF BRIDGE NO. 105003, BEAVER DAM TRAIL OVER FISHING BROOK

5.02 *Instructions to Bidders*

- A. Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security.

5.03 *Receipt of Addenda*

- A. Bidder hereby acknowledges receipt of the following Addenda **and agrees to be bound by all addenda whether or not listed herein:**

Addendum Number	Addendum Date

ARTICLE 6—BIDDER’S REPRESENTATIONS AND CERTIFICATIONS

6.01 *Bidder’s Representations*

- A. In submitting this Bid, Bidder represents the following:
 1. Bidder has examined and carefully studied the Bidding Documents, including Addenda.
 2. Bidder has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
 3. Bidder is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work.
 4. Bidder has carefully studied the reports of explorations and tests of subsurface conditions at or adjacent to the Site and the drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, with respect to the Technical Data in such reports and drawings.
 5. Bidder has carefully studied the reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, with respect to Technical Data in such reports and drawings.
 6. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Technical Data identified in the Supplementary Conditions or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, if selected as Contractor; and (c) Bidder’s (Contractor’s) safety precautions and programs.
 7. Based on the information and observations referred to in the preceding paragraph, Bidder agrees that no further examinations, investigations, explorations, tests, studies, or data

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REPLACEMENT OF BRIDGE NO. 105003, BEAVER DAM TRAIL OVER FISHING BROOK

are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.

8. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.
9. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and of discrepancies between Site conditions and the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
10. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
11. The submission of this Bid constitutes an incontrovertible representation by Bidder that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

6.02 *Bidder's Certifications*

A. The Bidder certifies the following:

1. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation.
2. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid.
3. Bidder has not solicited or induced any individual or entity to refrain from bidding.
4. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 6.02.A:
 - a. Corrupt practice means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process.
 - b. Fraudulent practice means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition.
 - c. Collusive practice means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels.
 - d. Coercive practice means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

TOWN OF OLD SAYBROOK, CONNECTICUT
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BIDDER hereby submits this Bid as set forth above:

Bidder:

(typed or printed name of organization)

By: _____
(individual's signature)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Date: _____
(typed or printed)

If Bidder is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.

Attest: _____
(individual's signature)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Date: _____
(typed or printed)

Address for giving notices:

Bidder's Contact:

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Phone: _____

Email: _____

Address: _____

Bidder's Contractor License No.: (if applicable) _____

BID BOND

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

BIDDER (*Name and Address*):

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

OWNER (*Name and Address*):

*Town of Old Saybrook, Connecticut
Office of the First Selectman
302 Main Street
Old Saybrook, CT 06475*

BID

Bid Due Date:

Description (*Project Name - Include Location*):

Town of Old Saybrook, Connecticut, Replacement of Bridge No. 105003, Beaver Dam Trail over Fishing Brook

BOND

Bond Number:

Date:

Penal sum: _____ \$ _____
(Words) (Figures)

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

BIDDER

SURETY

Bidder's Name and Corporate Seal (Seal)

Surety's Name and Corporate Seal (Seal)

By: _____

Signature

Print Name

Title

By: _____

Signature (Attach Power of Attorney)

Print Name

Title

Attest: _____

Signature

Title

Attest: _____

Signature

Title

Note: Addresses are to be used for giving any required notice.

Provide execution by any additional parties, such as joint venturers, if necessary.

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond shall be Owner's sole and exclusive remedy upon default of Bidder.
2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation shall be null and void if:
 - 3.1 Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or
 - 3.2 All Bids are rejected by Owner, or
 - 3.3 Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from the Bid due date without Surety's written consent.
6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety and in no case later than one year after the Bid due date.
7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

COMMISSION ON HUMAN RIGHTS AND OPPORTUNITIES
CONTRACT COMPLIANCE REGULATIONS
NOTIFICATION TO BIDDERS

(Revised 09/3/15)

The contract to be awarded is subject to contract compliance requirements mandated by Sections 4a-60 and 4a-60a of the Connecticut General Statutes; and, when the awarding agency is the State, Sections 46a-71(d) and 46a-81i(d) of the Connecticut General Statutes. There are Contract Compliance Regulations codified at Section 46a-68j-21 through 43 of the Regulations of Connecticut State Agencies, which establish a procedure for awarding all contracts covered by Sections 4a-60 and 46a-71(d) of the Connecticut General Statutes.

According to Section 46a-68j-30(9) of the Contract Compliance Regulations, every agency awarding a contract subject to the contract compliance requirements has an obligation to “aggressively solicit the participation of legitimate minority business enterprises as bidders, contractors, subcontractors and suppliers of materials.” “Minority business enterprise” is defined in Section 4a-60 of the Connecticut General Statutes as a business wherein fifty-one percent or more of the capital stock, or assets belong to a person or persons: “(1) Who are active in daily affairs of the enterprise; (2) who have the power to direct the management and policies of the enterprise; and (3) who are members of a minority, as such term is defined in subsection (a) of Section 32-9n.” “Minority” groups are defined in Section 32-9n of the Connecticut General Statutes as “(1) Black Americans . . . (2) Hispanic Americans . . . (3) persons who have origins in the Iberian Peninsula . . . (4) Women . . . (5) Asian Pacific Americans and Pacific Islanders; (6) American Indians . . .” An individual with a disability is also a minority business enterprise as provided by Section 4a-60g of the Connecticut General Statutes. The above definitions apply to the contract compliance requirements by virtue of Section 46a-68j-21(11) of the Contract Compliance Regulations.

The awarding agency will consider the following factors when reviewing the bidder’s qualifications under the contract compliance requirements:

- (a) the bidder’s success in implementing an affirmative action plan;
- (b) the bidder’s success in developing an apprenticeship program complying with Sections 46a-68-1 to 46a-68-17 of the Administrative Regulations of Connecticut State Agencies, inclusive;
- (c) the bidder’s promise to develop and implement a successful affirmative action plan;
- (d) the bidder’s submission of employment statistics contained in the “Employment Information Form”, indicating that the composition of its workforce is at or near parity when compared to the racial and sexual composition of the workforce in the relevant labor market area; and
- (e) the bidder’s promise to set aside a portion of the contract for legitimate minority business enterprises. See Section 46a-68j-30(10)(E) of the Contract Compliance Regulations.

INSTRUCTIONS AND OTHER INFORMATION

The following BIDDER CONTRACT COMPLIANCE MONITORING REPORT must be completed in full, signed, and submitted with the bid for this contract. The contract awarding agency and the Commission on Human Rights and Opportunities will use the information contained thereon to determine the bidders compliance to Sections 4a-60 and 4a-60a CONN. GEN. STAT., and Sections 46a-68j-23 of the Regulations of Connecticut State Agencies regarding equal employment opportunity, and the bidder’s good faith efforts to include minority business enterprises as subcontractors and suppliers for the work of the contract.

1) **Definition of Small Contractor**

Section 4a-60g CONN. GEN. STAT. defines a small contractor as a company that has been doing business under the same management and control and has maintained its principal place of business in Connecticut for a one year period immediately prior to its application for certification under this section, had gross revenues not exceeding fifteen million dollars in the most recently completed fiscal year, and at least fifty-one percent of the ownership of which is held by a person or persons who are active in the daily affairs of the company, and have the power to direct the management and policies of the company, except that a nonprofit corporation shall be construed to be a small contractor if such nonprofit corporation meets the requirements of subparagraphs (A) and (B) of subdivision 4a-60g CONN. GEN. STAT.

00 43 39

MANAGEMENT: Managers plan, organize, direct, and control the major functions of an organization through subordinates who are at the managerial or supervisory level. They make policy decisions and set objectives for the company or departments. They are not usually directly involved in production or providing services. Examples include top executives, public relations managers, managers of operations specialties (such as financial, human resources, or purchasing managers), and construction and engineering managers.

BUSINESS AND FINANCIAL OPERATIONS: These occupations include managers and professionals who work with the financial aspects of the business. These occupations include accountants and auditors, purchasing agents, management analysts, labor relations specialists, and budget, credit, and financial analysts.

MARKETING AND SALES: Occupations related to the act or process of buying and selling products and/or services such as sales engineer, retail sales workers and sales representatives including wholesale.

LEGAL OCCUPATIONS: In-House Counsel who is charged with providing legal advice and services in regards to legal issues that may arise during the course of standard business practices. This category also includes assistive legal occupations such as paralegals, legal assistants.

COMPUTER SPECIALISTS: Professionals responsible for the computer operations within a company are grouped in this category. Examples of job titles in this category include computer programmers, software engineers, database administrators, computer scientists, systems analysts, and computer support specialists

ARCHITECTURE AND ENGINEERING: Occupations related to architecture, surveying, engineering, and drafting are included in this category. Some of the job titles in this category include electrical and electronic engineers, surveyors, architects, drafters, mechanical engineers, materials engineers, mapping technicians, and civil engineers.

OFFICE AND ADMINISTRATIVE SUPPORT: All clerical-type work is included in this category. These jobs involve the preparing, transcribing, and preserving of written communications and records; collecting accounts; gathering and distributing information; operating office machines and electronic data processing equipment; and distributing mail. Job titles listed in this category include telephone operators, bill and account collectors, customer service representatives, dispatchers, secretaries and administrative assistants, computer operators and clerks (such as payroll, shipping, stock, mail and file).

BUILDING AND GROUNDS CLEANING AND MAINTENANCE: This category includes occupations involving landscaping, housekeeping, and janitorial services. Job titles found in this category include supervisors of landscaping or housekeeping, janitors, maids, grounds maintenance workers, and pest control workers.

CONSTRUCTION AND EXTRACTION: This category includes construction trades and related occupations. Job titles found in this category include boilermakers, masons (all types), carpenters, construction laborers, electricians, plumbers (and related trades), roofers, sheet metal workers, elevator installers, hazardous materials removal workers, paperhangers, and painters. Paving, surfacing, and tamping equipment operators; drywall and ceiling tile installers; and carpet, floor and tile installers and finishers are also included in this category. First line supervisors, foremen, and helpers in these trades are also grouped in this category..

INSTALLATION, MAINTENANCE AND REPAIR: Occupations involving the installation, maintenance, and repair of equipment are included in this group. Examples of job titles found here are heating, ac, and refrigeration mechanics and installers; telecommunication line installers and repairers; heavy vehicle and mobile equipment service technicians and mechanics; small engine mechanics; security and fire alarm systems installers; electric/electronic repair, industrial, utility and transportation equipment; millwrights; riggers; and manufactured building and mobile home installers. First line supervisors, foremen, and helpers for these jobs are also included in the category.

MATERIAL MOVING WORKERS: The job titles included in this group are Crane and tower operators; dredge, excavating, and lading machine operators; hoist and winch operators; industrial truck and tractor operators; cleaners of vehicles and equipment; laborers and freight, stock, and material movers, hand; machine feeders and offbearers; packers and packagers, hand; pumping station operators; refuse and recyclable material collectors; and miscellaneous material moving workers.

PRODUCTION WORKERS: The job titles included in this category are chemical production machine setters, operators and tenders; crushing/grinding workers; cutting workers; inspectors, testers sorters, samplers, weighers; precious stone/metal workers; painting workers; cementing/gluing machine operators and tenders; etchers/engravers; molders, shapers and casters except for metal and plastic; and production workers.

<p><u>White</u> (not of Hispanic Origin)- All persons having origins in any of the original peoples of Europe, North Africa, or the Middle East.</p> <p><u>Black</u>(not of Hispanic Origin)- All persons having origins in any of the Black racial groups of Africa.</p> <p><u>Hispanic</u>- All persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race.</p>	<p><u>Asian or Pacific Islander</u>- All persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands. This area includes China, India, Japan, Korea, the Philippine Islands, and Samoa.</p> <p><u>American Indian or Alaskan Native</u>- All persons having origins in any of the original peoples of North America, and who maintain cultural identification through tribal affiliation or community recognition.</p>
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BIDDER CONTRACT COMPLIANCE MONITORING REPORT

PART I - Bidder Information

Company Name Street Address City & State Chief Executive	Bidder Federal Employer Identification Number _____ Or Social Security Number _____
Major Business Activity (brief description)	Bidder Identification (response optional/definitions on page 1) -Bidder is a small contractor. Yes ___ No ___ -Bidder is a minority business enterprise Yes ___ No ___ (If yes, check ownership category) Black ___ Hispanic ___ Asian American ___ American Indian/Alaskan Native ___ Iberian Peninsula ___ Individual(s) with a Physical Disability ___ Female ___
Bidder Parent Company (If any)	- Bidder is certified as above by State of CT Yes___ No___
Other Locations in Ct. (If any)	

PART II - Bidder Nondiscrimination Policies and Procedures

1. Does your company have a written Affirmative Action/Equal Employment Opportunity statement posted on company bulletin boards? Yes___ No___	7. Do all of your company contracts and purchase orders contain non-discrimination statements as required by Sections 4a-60 & 4a-60a Conn. Gen. Stat.? Yes___ No___
2. Does your company have the state-mandated sexual harassment prevention in the workplace policy posted on company bulletin boards? Yes___ No___	8. Do you, upon request, provide reasonable accommodation to employees, or applicants for employment, who have physical or mental disability? Yes___ No___
3. Do you notify all recruitment sources in writing of your company's Affirmative Action/Equal Employment Opportunity employment policy? Yes___ No___	9. Does your company have a mandatory retirement age for all employees? Yes___ No___
4. Do your company advertisements contain a written statement that you are an Affirmative Action/Equal Opportunity Employer? Yes ___ No ___	10. If your company has 50 or more employees, have you provided at least two (2) hours of sexual harassment training to all of your supervisors? Yes ___ No ___ NA ___
5. Do you notify the Ct. State Employment Service of all employment openings with your company? Yes ___ No ___	11. If your company has apprenticeship programs, do they meet the Affirmative Action/Equal Employment Opportunity requirements of the apprenticeship standards of the Ct. Dept. of Labor? Yes ___ No ___ NA ___
6. Does your company have a collective bargaining agreement with workers? Yes___ No___ 6a. If yes, do the collective bargaining agreements contain non-discrimination clauses covering all workers? Yes___ No___ 6b. Have you notified each union in writing of your commitments under the nondiscrimination requirements of contracts with the state of Ct? Yes___ No___	12. Does your company have a written affirmative action Plan? Yes ___ No ___ If no, please explain. 13. Is there a person in your company who is responsible for equal employment opportunity? Yes ___ No ___ If yes, give name and phone number. _____

1. Will the work of this contract include subcontractors or suppliers? Yes__ No__

1a. If yes, please list all subcontractors and suppliers and report if they are a small contractor and/or a minority business enterprise. (defined on page 1 / use additional sheet if necessary)

1b. Will the work of this contract require additional subcontractors or suppliers other than those identified in 1a. above?

Yes__ No__

PART IV - Bidder Employment Information

Date:

JOB CATEGORY *	OVERALL TOTALS	WHITE (not of Hispanic origin)		BLACK (not of Hispanic origin)		HISPANIC		ASIAN or PACIFIC ISLANDER		AMERICAN INDIAN or ALASKAN NATIVE	
		Male	Female	Male	Female	Male	Female	Male	Female	male	female
Management											
Business & Financial Ops											
Marketing & Sales											
Legal Occupations											
Computer Specialists											
Architecture/Engineering											
Office & Admin Support											
Bldg/ Grounds Cleaning/Maintenance											
Construction & Extraction											
Installation , Maintenance & Repair											
Material Moving Workers											
Production Occupations											
TOTALS ABOVE											
Total One Year Ago											
FORMAL ON THE JOB TRAINEES (ENTER FIGURES FOR THE SAME CATEGORIES AS ARE SHOWN ABOVE)											
Apprentices											
Trainees											

*NOTE: JOB CATEGORIES CAN BE CHANGED OR ADDED TO (EX. SALES CAN BE ADDED OR REPLACE A CATEGORY NOT USED IN YOUR COMPANY)

1. Which of the following recruitment sources are used by you? (Check yes or no, and report percent used)				2. Check (X) any of the below listed requirements that you use as a hiring qualification (X)	3. Describe below any other practices or actions that you take which show that you hire, train, and promote employees without discrimination
SOURCE	YES	NO	% of applicants provided by source		
State Employment Service				Work Experience	
Private Employment Agencies				Ability to Speak or Write English	
Schools and Colleges				Written Tests	
Newspaper Advertisement				High School Diploma	
Walk Ins				College Degree	
Present Employees				Union Membership	
Labor Organizations				Personal Recommendation	
Minority/Community Organizations				Height or Weight	
Others (please identify)				Car Ownership	
				Arrest Record	
				Wage Garnishments	

Certification (Read this form and check your statements on it CAREFULLY before signing). I certify that the statements made by me on this BIDDER CONTRACT COMPLIANCE MONITORING REPORT are complete and true to the best of my knowledge and belief, and are made in good faith. I understand that if I knowingly make any misstatements of facts, I am subject to be declared in non-compliance with Section 4a-60, 4a-60a, and related sections of the CONN. GEN. STAT.

(Signature)	(Title)	(Date Signed)	(Telephone)
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STATEMENT OF BIDDER'S QUALIFICATIONS

Bidder _____

To: Town of Old Saybrook

All questions must be answered and the data given must be clear and comprehensive. This statement must be notarized. The Bidder may submit any additional information as desired (attach additional sheets if needed). The information requested herein is material and will be relied upon by the Owner in the award of this Contract.

1. Name of Bidder: _____

2. Permanent main office address: _____

3. When organized: _____

4. If a corporation, where incorporated: _____

5. How many years have you been engaged in contracting under your present firm or trade name?

6. List applicable contracting licenses with identification numbers issued by the authority having jurisdiction in the area of the Work:

7. Average annual billing for the last five (5) years: \$ _____

8. Total work in progress and under contract: \$ _____

9. List and describe all uncompleted contracts on hand. Schedule list showing gross amount of each contract and the appropriate anticipated dates of completion:

STATEMENT OF BIDDER'S QUALIFICATIONS

10. Describe general character of work performed by you:

11. Have you ever failed to complete any work awarded to you? ___ (Yes)___ (No). If yes, explain where and why:

12. Have you ever defaulted on a contract? ___(Yes) ___(No). If yes, explain where and why:

13. Are there any judgments, claims or suits pending or outstanding against you? ___(Yes) ___(No). If yes, describe:

14. Have you ever been denied the award of a Contract on which you submitted the low bid? ___(Yes) ___(No). If yes, explain where and why:

STATEMENT OF BIDDER'S QUALIFICATIONS

15. List all lawsuits your firm has filed due to construction contracts in the last five (5) years.

16. List all lawsuits that have been filed against your firm due to construction contracts in the last five (5) years:

17. List all of the contracts completed by you in the past five (5) years, stating approximate gross cost for each, the month and year completed, and project contacts with phone numbers:

18. List your major equipment available for this Contract:

19. List experience in work similar in importance to this Project:

STATEMENT OF BIDDER'S QUALIFICATIONS

20. List and provide background and experience of the principal members and supervisory personnel of your organization, including the officers:

21. List all subsidiary or affiliated companies in which the principals of your organization have any financial interest:

22. List bank references: _____

23. List occupational safety and health violations in the last three (3) years:

STATEMENT OF BIDDER'S QUALIFICATIONS

The undersigned certifies that the Bidder is not disqualified from bidding municipal or state projects for occupational safety and health violations under Sec. 31-57b of the Connecticut State Statutes.

The undersigned hereby authorizes and requests any person, firm, or corporation to furnish any information requested by the Owner in verification of this Statement of Bidder's Qualifications and agrees, if determined to be the apparent lowest Bidder, to submit a current detailed financial statement, showing assets, liabilities, and net worth, and to furnish any other information in verification of this Statement of Bidder's Qualifications within five (5) working days of the request.

An apparent low Bidder who, upon request of the Owner, fails to submit a current detailed financial statement or to furnish any other information in verification of this Statement of Bidder's Qualifications, will be considered non-responsive to the Bid requirements, in which case the Owner will rescind the determination of the apparent low Bid, reject said Bid, and the Bid security accompanying the Bid shall become the property of the Owner.

Dated at _____ this _____ day of _____ 20_____

(Name of Bidder)

By _____

Title _____

State of _____ }

County of _____ }

_____ being duly sworn, deposes and says that he is

_____ of _____

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

Subscribed and sworn before me this _____ day of _____ 20_____.

(Notary Public)

(SEAL)

My Commission expires: _____

STATE OF CONNECTICUT
Certificate of Compliance with
Connecticut General Statute Section 31 - 57b

I hereby certify that all of the statements herein contained below have been examined by me, and to the best of my knowledge and belief are true and correct.

The _____ **HAS / HAS NOT**
Company Name (Cross out Non-applicable)

been cited for three (3) or more willful or serious or serious violations of any Occupational Safety and Health Act (OSHA) or of any standard, order or regulation promulgated pursuant to such act, during the three year period preceding the bid, provided such violations were cited in accordance with the provisions of any State Occupational Safety and Health Act of 1970, and not abated within the time fixed by the citation and such citation has not been set aside following appeal to the appropriate agency of court having jurisdiction or **HAS / HAS NOT** (Cross out Non-applicable) received one or more criminal convictions related to the injury or death of any employee in the three-year period preceding the bid.

The list of violations (if applicable) is attached.

(Name of Firm, Organization or Corporation)

Signed:

Written Signature:

Name Typed: (Corporation Seal)

Title:

(Title of Above Person, typed)

Dated:

State of _____)
County of _____) *ss:* *A.D., 20* _____)

Sworn to and personally appeared before me for the above, _____,
(Name of Firm, Organization, Corporation)

Signer and Sealer of the foregoing instrument of and acknowledged the same to be the free act and deed of

_____, and his/her free act and deed as
(Name of Person appearing in front of Notary or Clerk)

(Title of Person appearing in front of Notary or Clerk)

My Commission Expires: _____
(Notary Public) *(Seal)*

NOTICE OF AWARD

Date of Issuance:

Owner: Town of Old Saybrook, Connecticut

Owner's Contract No.:

Engineer: Nathan L. Jacobson & Associates, Inc.

Engineer's Project No.: 0747-0045

Project: Replacement of Bridge No. 105003, Beaver Dam Trail
over Fishing Brook

Contract Name: (See Project)

Bidder:

Bidder's Address:

TO BIDDER:

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:

[describe Work, alternates, or sections of Work awarded]

The Contract Price of the awarded Contract is: \$ _____ *[note if subject to unit prices, or cost-plus].*

[] 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 [] counterparts of the Agreement, fully executed by Bidder.
2. Deliver with the executed Agreement(s) the Contract security *[e.g., performance and payment bonds]* and insurance documentation as specified in the Instructions to Bidders and General Conditions, Articles 2 and 6.
3. Other conditions precedent (if any):

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

Owner:

Authorized Signature

By:

Title:

Copy: Engineer

AGREEMENT BETWEEN OWNER AND CONTRACTOR FOR CONSTRUCTION CONTRACT (STIPULATED PRICE)

This Agreement is by and between **Town of Old Saybrook, Connecticut** (“Owner”) and **TBD** (“Contractor”).

Terms used in this Agreement have the meanings stated in the General Conditions and the Supplementary Conditions.

Owner and Contractor hereby agree as follows:

ARTICLE 1—WORK

1.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows: **Removal of a metal pipe culvert and replacement with a precast concrete rigid frame.**

ARTICLE 2—THE PROJECT

2.01 The Project, of which the Work under the Contract Documents is a part, is generally described as follows: **Removal of a metal pipe culvert and replacement with a precast concrete rigid frame.**

ARTICLE 3—ENGINEER

3.01 The Owner has retained **Nathan L. Jacobson & Associates, Inc.** (“Engineer”) to act as Owner’s representative, assume all duties and responsibilities of Engineer, and have the rights and authority assigned to Engineer in the Contract.

3.02 The part of the Project that pertains to the Work has been designed by **Nathan L. Jacobson & Associates, Inc.**

ARTICLE 4—CONTRACT TIMES

4.01 *Time is of the Essence*

A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

4.02 *Contract Times: Days*

A. The Work will be substantially complete within **120** days after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within **150** days after the date when the Contract Times commence to run.

4.03 *Liquidated Damages*

A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial and other losses if the Work is not completed and Milestones not achieved within the Contract Times, as duly modified. The parties also recognize the delays, expense, and difficulties involved in proving, in a legal or arbitration proceeding, the actual loss suffered by Owner if the Work is not completed on time.

Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty):

1. *Substantial Completion:* Contractor shall pay Owner **\$1,000** for each day that expires after the time (as duly adjusted pursuant to the Contract) specified above for Substantial Completion, until the Work is substantially complete.
 2. *Completion of Remaining Work:* After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Times (as duly adjusted pursuant to the Contract) for completion and readiness for final payment, Contractor shall pay Owner **\$100** for each day that expires after such time until the Work is completed and ready for final payment.
 3. Liquidated damages for failing to timely attain Milestones, Substantial Completion, and final completion are not additive, and will not be imposed concurrently.
- ~~B. If Owner recovers liquidated damages for a delay in completion by Contractor, then such liquidated damages are Owner's sole and exclusive remedy for such delay, and Owner is precluded from recovering any other damages, whether actual, direct, excess, or consequential, for such delay, except for special damages (if any) specified in this Agreement.~~

ARTICLE 5—CONTRACT PRICE

- 5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents, the amounts that follow, subject to adjustment under the Contract:
- A. For all Work, at the prices stated in Contractor's Bid, attached hereto as an exhibit.

ARTICLE 6—PAYMENT PROCEDURES

- 6.01 *Submittal and Processing of Payments*
- A. Contractor shall submit Applications for Payment in accordance with Article 15 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.
- 6.02 *Progress Payments; Retainage*
- A. Owner shall make progress payments on the basis of Contractor's Applications for Payment on or about the **30th** day of each month during performance of the Work as provided in Paragraph 6.02.A.1 below, provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the requirements of the Contract. All such payments will be measured by the Schedule of Values established as provided in the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided elsewhere in the Contract.
 1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Owner may withhold, including but not limited to liquidated damages, in accordance with the Contract.
 - a. **Ninety-five (95)** percent of the value of the Work completed (with the balance being retainage).

- b. **Ninety-five (95)** percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).
 - d. **When project state funding requires compliance with the CHRO and when an Affirmative Action Plan is required by the CHRO, in addition to the 5% retainage, 2% of the state funded portion of the Contract will be retained each month until the Contractor has an Affirmative Action Plan approved by the CHRO.**
- B. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to **one hundred (100)** percent of the Work completed, less such amounts set off by Owner pursuant to Paragraph 15.01.E of the General Conditions, and less **two hundred (200)** percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the punch list of items to be completed or corrected prior to final payment.
- 1. **Where project state funding requires compliance with the CHRO, retained amounts will not be released until the Contractor has an Affirmative Action Plan or a Set-Aside Plan, as applicable, approved by the CHRO.**

6.03 *Final Payment*

- A. Upon final completion and acceptance of the Work, Owner shall pay the remainder of the Contract Price in accordance with Paragraph 15.06 of the General Conditions.

~~6.04 *Interest*~~

- A. ~~All amounts not paid **within xx days of** when due will bear interest at the rate of **none (0) percent per annum.**~~

ARTICLE 7—CONTRACT DOCUMENTS

7.01 *Contents*

- A. The Contract Documents consist of all of the following:
 - 1. This Agreement.
 - 2. Bonds:
 - a. Performance bond (together with power of attorney).
 - b. Payment bond (together with power of attorney).
 - 3. General Conditions.
 - 4. Supplementary Conditions.
 - 5. Specifications as listed in the table of contents of the project manual. ~~(copy of list attached).~~
 - 6. Drawings (not attached but incorporated by reference) consisting of **16** sheets with each sheet bearing the following general title: **Town of Old Saybrook, Connecticut, Replacement of Bridge No. 105003, Beaver Dam Trail over Fishing Brook dated October 1, 2024, and 8 CTDOT Standard Drawings.**
 - 8. Addenda (numbers **[number]** to **[number]**, inclusive).

9. Exhibits to this Agreement (enumerated as follows):
 - a. Contractor's Bid.
 10. The following which may be delivered or issued on or after the Effective Date of the Contract and are not attached hereto:
 - a. Notice to Proceed.
 - b. Work Change Directives.
 - c. Change Orders.
 - d. Field Orders.
 - e. Warranty Bond, if any.
- ~~B. The Contract Documents listed in Paragraph 7.01.A are attached to this Agreement (except as expressly noted otherwise above).~~
- C. There are no Contract Documents other than those listed above in this Article 7.
 - D. The Contract Documents may only be amended, modified, or supplemented as provided in the Contract.

ARTICLE 8—REPRESENTATIONS, CERTIFICATIONS, AND STIPULATIONS

8.01 Contractor's Representations

- A. In order to induce Owner to enter into this Contract, Contractor makes the following representations:
 1. Contractor has examined and carefully studied the Contract Documents, including Addenda.
 2. Contractor has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
 3. Contractor is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work.
 4. Contractor has carefully studied the reports of explorations and tests of subsurface conditions at or adjacent to the Site and the drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, with respect to the Technical Data in such reports and drawings.
 5. Contractor has carefully studied the reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, with respect to Technical Data in such reports and drawings.
 6. Contractor has considered the information known to Contractor itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Technical Data identified in the Supplementary Conditions or by definition, with respect to the

effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor; and (c) Contractor's safety precautions and programs.

7. Based on the information and observations referred to in the preceding paragraph, Contractor agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.
8. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.
9. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and of discrepancies between Site conditions and the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
10. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
11. Contractor's entry into this Contract constitutes an incontrovertible representation by Contractor that without exception all prices in the Agreement are premised upon performing and furnishing the Work required by the Contract Documents.

8.02 *Contractor's Certifications*

- A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 8.02:
 1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process or in the Contract execution;
 2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
 3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and
 4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

8.03 *Standard General Conditions*

- A. Owner stipulates that if the General Conditions that are made a part of this Contract are EJCDC® C-700, Standard General Conditions for the Construction Contract (2018), published by the Engineers Joint Contract Documents Committee, and if Owner is the party that has

furnished said General Conditions, then Owner has plainly shown all modifications to the standard wording of such published document to the Contractor, through a process such as highlighting or “track changes” (redline/strikeout), or in the Supplementary Conditions.

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement.

This Agreement will be effective on _____ (which is the Effective Date of the Contract).

Owner:

Contractor:

(typed or printed name of organization)

(typed or printed name of organization)

By: _____
(individual's signature)

By: _____
(individual's signature)

Date: _____
(date signed)

Date: _____
(date signed)

Name: _____
(typed or printed)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Title: _____
(typed or printed)

(If Contractor is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest: _____
(individual's signature)

Attest: _____
(individual's signature)

Title: _____
(typed or printed)

Title: _____
(typed or printed)

Address for giving notices:

Address for giving notices:

Designated Representative:

Designated Representative:

Name: _____
(typed or printed)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Title: _____
(typed or printed)

Address:

Address:

Phone: _____

Phone: _____

Email: _____

Email: _____

(If Owner is a corporation, attach evidence of authority to sign. If Owner is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)

License No.: _____
(where applicable)

State: _____

NOTICE TO PROCEED

Owner: Town of Old Saybrook, Connecticut Owner's Project No.: _____
Engineer: Nathan L. Jacobson & Associates, Inc. Engineer's Project No.: 0747-0045
Contractor: _____ Contractor's Project No.: _____
Project: Replacement of Bridge No. 105003, Beaver Dam Trail over Fishing Brook
Contract Name: (Same as Project)
Effective Date of Contract: _____

Owner hereby notifies Contractor that the Contract Times under the above Contract will commence to run on **[date Contract Times are to start]** 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 **120** from the date stated above for the commencement of the Contract Times, resulting in a date for Substantial Completion of **TBD** and the number of days to achieve readiness for final payment is **150** from the commencement date of the Contract Times, resulting in a date for readiness for final payment of **TBD**.

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

[Note any access limitations, security procedures, or other restrictions]

Owner: Town of Old Saybrook, Connecticut
By (signature): _____
Name (printed): _____
Title: _____
Date Issued: _____
Copy: Engineer

PERFORMANCE BOND

CONTRACTOR *(name and address)*:

SURETY *(name and address of principal place of business)*:

OWNER *(name and address)*:

**Town of Old Saybrook, Connecticut
Office of the First Selectman
302 Main Street
Old Saybrook, CT 06475**

CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description *(name and location)*: **Town of Old Saybrook, Connecticut, Replacement of Bridge No. 105003,
Beaver Dam Trail over Fishing Brook**

BOND

Bond Number:

Date *(not earlier than the Effective Date of the Agreement of the Construction Contract)*:

Amount:

Modifications to this Bond Form: None See Paragraph 16

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

CONTRACTOR AS PRINCIPAL

SURETY

Contractor's Name and Corporate Seal *(seal)*

Surety's Name and Corporate Seal *(seal)*

By: _____
Signature

By: _____
Signature *(attach power of attorney)*

Print Name

Print Name

Title

Title

Attest: _____
Signature

Attest: _____
Signature

Title

Title

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

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

2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Paragraph 3.

3. If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after:

3.1 The Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor, and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Paragraph 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor, and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;

3.2 The Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and

3.3 The Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

4. Failure on the part of the Owner to comply with the notice requirement in Paragraph 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

5. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for

performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owners concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:

5.4.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or

5.4.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

6. If the Surety does not proceed as provided in Paragraph 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Paragraph 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

7. If the Surety elects to act under Paragraph 5.1, 5.2, or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication for:

7.1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

7.2 additional legal, design professional, and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 5; and

7.3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

8. If the Surety elects to act under Paragraph 5.1, 5.3, or 5.4, the Surety's liability is limited to the amount of this Bond.

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

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

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

12. Notice to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

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

14. Definitions

14.1 Balance of the Contract Price: The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made including allowance for the Contractor for any amounts received or to be received by the Owner in

settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

14.2 Construction Contract: The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

14.3 Contractor Default: Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

14.4 Owner Default: Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

14.5 Contract Documents: All the documents that comprise the agreement between the Owner and Contractor.

15. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

16. Modifications to this Bond are as follows:

PAYMENT BOND

CONTRACTOR (name and address):

SURETY (name and address of principal place of business):

OWNER (name and address):

**Town of Old Saybrook, Connecticut
Office of the First Selectman
302 Main Street
Old Saybrook, CT 06475**

CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description: **Town of Old Saybrook, Connecticut, Replacement of Bridge No. 105003, Beaver Dam Trail over Fishing Brook**

Bond Number:

Date (not earlier than the Effective Date of the Agreement of the Construction Contract):

Amount:

Modifications to this Bond Form: None See Paragraph 18

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

CONTRACTOR AS PRINCIPAL

SURETY

_____ (seal)

_____ (seal)

Contractor's Name and Corporate Seal

Surety's Name and Corporate Seal

By: _____

By: _____

Signature

Signature (attach power of attorney)

Print Name

Print Name

Title

Title

Attest: _____

Attest: _____

Signature

Signature

Title

Title

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, materials, and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.
2. If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless the Owner from claims, demands, liens, or suits by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.
3. If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, and tendered defense of such claims, demands, liens, or suits to the Contractor and the Surety.
4. When the Owner has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Owner against a duly tendered claim, demand, lien, or suit.
5. The Surety's obligations to a Claimant under this Bond shall arise after the following:
 - 5.1 Claimants who do not have a direct contract with the Contractor,
 - 5.1.1 have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and
 - 5.1.2 have sent a Claim to the Surety (at the address described in Paragraph 13).
 - 5.2 Claimants who are employed by or have a direct contract with the Contractor have sent a Claim to the Surety (at the address described in Paragraph 13).
6. If a notice of non-payment required by Paragraph 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.
7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:
 - 7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and
 - 7.2 Pay or arrange for payment of any undisputed amounts.
 - 7.3 The Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.
8. The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.
9. Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.
10. The Surety shall not be liable to the Owner, Claimants, or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.
11. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.

12. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.
13. Notice and Claims to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.
14. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.
15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.
16. **Definitions**
 - 16.1 **Claim:** A written statement by the Claimant including at a minimum:
 1. The name of the Claimant;
 2. The name of the person for whom the labor was done, or materials or equipment furnished;
 3. A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Construction Contract;
 4. A brief description of the labor, materials, or equipment furnished;
 5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
 6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;
 7. The total amount of previous payments received by the Claimant; and
 - 16.2 **Claimant:** An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms of "labor, materials, or equipment" that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.
 - 16.3 **Construction Contract:** The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.
 - 16.4 **Owner Default:** Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.
 - 16.5 **Contract Documents:** All the documents that comprise the agreement between the Owner and Contractor.
8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.
17. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.
18. Modifications to this Bond are as follows:

CERTIFICATE OF SUBSTANTIAL COMPLETION

Owner:	Town of Old Saybrook, Connecticut	Owner's Contract No.:	
Contractor:		Contractor's Project No.:	
Engineer:	Nathan L. Jacobson & Associates, Inc.	Engineer's Project No.:	0747-0045
Project:	Town of Old Saybrook, Connecticut, Replacement of Bridge No. 105003, Beaver Dam Trail over Fishing Brook	Contract Name:	(Same as Project)

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.

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 shall be as provided in the Contract, except as amended as follows: *[Note: 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.]*

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: *[punch list; others]*

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.

EXECUTED BY ENGINEER:		RECEIVED:		RECEIVED:	
By: _____	By: _____	By: _____	By: _____	By: _____	By: _____
(Authorized signature)	Owner (Authorized Signature)	Owner (Authorized Signature)	Owner (Authorized Signature)	Contractor (Authorized Signature)	Contractor (Authorized Signature)
Title: _____	Title: _____	Title: _____	Title: _____	Title: _____	Title: _____
Date: _____	Date: _____	Date: _____	Date: _____	Date: _____	Date: _____

NOTICE OF ACCEPTABILITY OF WORK

Owner: Town of Old Saybrook Owner’s Project No.: N.A.
Engineer: Nathan L. Jacobson & Associates, Inc. Engineer’s Project No.: 0747-0045
Contractor: Contractor’s Project No.:
Project: Replacement of Bridge No. 105003, Beaver Dam Trail over Fishing Brook
Contract Name: Same
Notice Date: Effective Date of the Construction Contract:

The Engineer hereby gives notice to the Owner and Contractor that Engineer recommends final payment to Contractor, and that the Work furnished and performed by Contractor under the Construction Contract is acceptable, expressly subject to the provisions of the Construction Contract’s Contract Documents (“Contract Documents”) ~~and of the Agreement between Owner and Engineer for Professional Services dated [date of professional services agreement] (“Owner-Engineer Agreement”).~~ This Notice of Acceptability of Work (Notice) is made expressly subject to the following terms and conditions to which all who receive and rely on said Notice agree:

- 1. This Notice has been prepared with the skill and care ordinarily used by members of the engineering profession practicing under similar conditions at the same time and in the same locality.
- 2. This Notice reflects and is an expression of the Engineer’s professional opinion.
- 3. This Notice has been prepared to the best of Engineer’s knowledge, information, and belief as of the Notice Date.
- 4. This Notice is based entirely on and expressly limited by the scope of services Engineer has been employed by Owner to perform or furnish during construction of the Project (including observation of the Contractor’s Work) under the Owner-Engineer Agreement, and applies only to facts that are within Engineer’s knowledge or could reasonably have been ascertained by Engineer as a result of carrying out the responsibilities specifically assigned to Engineer under such Owner-Engineer Agreement.
- 5. This Notice is not a guarantee or warranty of Contractor’s performance under the Construction Contract, an acceptance of Work that is not in accordance with the Contract Documents, including but not limited to defective Work discovered after final inspection, nor an assumption of responsibility for any failure of Contractor to furnish and perform the Work thereunder in accordance with the Contract Documents, or to otherwise comply with the Contract Documents or the terms of any special guarantees specified therein.
- 6. This Notice does not relieve Contractor of any surviving obligations under the Construction Contract, and is subject to Owner’s reservations of rights with respect to completion and final payment.

Engineer

By (signature): _____
Name (printed): _____
Title: _____

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

ARTICLE 1—DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. 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, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.
 3. *Application for Payment*—The document prepared by Contractor, in a form acceptable to Engineer, to request progress or final payments, and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
 4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
 5. *Bidder*—An individual or entity that submits a Bid to Owner.
 6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.
 7. *Bidding Requirements*—The Advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.
 8. *Change Order*—A document 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, or other revision to the Contract, issued on or after the Effective Date of the Contract.
 9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.
 10. *Claim*
 - a. A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment of Contract

- Price or Contract Times; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract.
- b. A demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal, or seeking resolution of a contractual issue that Engineer has declined to address.
 - c. A demand or assertion by Owner or Contractor, duly submitted in compliance with the procedural requirements set forth herein, made pursuant to Paragraph 12.01.A.4, concerning disputes arising after Engineer has issued a recommendation of final payment.
 - d. A demand for money or services by a third party is not a Claim.
11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), lead-based paint (as defined by the HUD/EPA standard), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to Laws and Regulations regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.
12. *Contract*—The entire and integrated written contract between Owner and Contractor concerning the Work.
13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.
14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents.
15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.
16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.
17. *Cost of the Work*—See Paragraph 13.01 for definition.
18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.
19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.
20. *Electronic Document*—Any Project-related correspondence, attachments to correspondence, data, documents, drawings, information, or graphics, including but not limited to Shop Drawings and other Submittals, that are in an electronic or digital format.
21. *Electronic Means*—Electronic mail (email), upload/download from a secure Project website, or other communications methods that allow: (a) the transmission or communication of Electronic Documents; (b) the documentation of transmissions,

including sending and receipt; (c) printing of the transmitted Electronic Document by the recipient; (d) the storage and archiving of the Electronic Document by sender and recipient; and (e) the use by recipient of the Electronic Document for purposes permitted by this Contract. Electronic Means does not include the use of text messaging, or of Facebook, Twitter, Instagram, or similar social media services for transmission of Electronic Documents.

22. *Engineer*—The individual or entity named as such in the Agreement.
23. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.
24. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto.
 - a. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated into the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, is not a Hazardous Environmental Condition.
 - b. The presence of Constituents of Concern that are to be removed or remediated as part of the Work is not a Hazardous Environmental Condition.
 - c. The presence of Constituents of Concern as part of the routine, anticipated, and obvious working conditions at the Site, is not a Hazardous Environmental Condition.
25. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and binding decrees, resolutions, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
26. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.
27. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date, or by a time prior to Substantial Completion of all the Work.
28. *Notice of Award*—The written notice by Owner to a Bidder of Owner’s acceptance of the Bid.
29. *Notice to Proceed*—A written notice 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.
30. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.
31. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising Contractor’s plan to accomplish the Work within the Contract Times.

32. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.
33. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative (RPR) includes any assistants or field staff of Resident Project Representative.
34. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.
35. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer’s review of the submittals.
36. *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.
37. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.
38. *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, and such other lands or areas furnished by Owner which are designated for the use of Contractor.
39. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.
40. *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.
41. *Submittal*—A written or graphic document, prepared by or for Contractor, which the Contract Documents require Contractor to submit to Engineer, or that is indicated as a Submittal in the Schedule of Submittals accepted by Engineer. Submittals may include Shop Drawings and Samples; schedules; product data; Owner-delegated designs; sustainable design information; information on special procedures; testing plans; results of tests and evaluations, source quality-control testing and inspections, and field or Site quality-control testing and inspections; warranties and certifications; Suppliers’ instructions and reports; records of delivery of spare parts and tools; operations and maintenance data; Project photographic documentation; record documents; and other such documents required by the Contract Documents. Submittals, whether or not approved or accepted by Engineer, are not Contract Documents. Change Proposals, Change Orders, Claims, notices, Applications for Payment, and requests for interpretation or clarification are not Submittals.
42. *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 of such Work.

43. *Successful Bidder*—The Bidder to which the Owner makes an award of contract.
44. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.
45. *Supplier*—A manufacturer, fabricator, supplier, distributor, 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 a Subcontractor.
46. *Technical Data*
 - a. Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (1) existing subsurface conditions at or adjacent to the Site, or existing physical conditions at or adjacent to the Site including existing surface or subsurface structures (except Underground Facilities) or (2) Hazardous Environmental Conditions at the Site.
 - b. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then Technical Data is defined, with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06, as the data contained in boring logs, recorded measurements of subsurface water levels, assessments of the condition of subsurface facilities, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical, environmental, or other Site or facilities conditions report prepared for the Project and made available to Contractor.
 - c. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data, and instead Underground Facilities are shown or indicated on the Drawings.
47. *Underground Facilities*—All active or not-in-service underground lines, pipelines, conduits, ducts, encasements, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or systems at the Site, including but not limited to those facilities or systems that produce, transmit, distribute, or convey telephone or other communications, cable television, fiber optic transmissions, power, electricity, light, heat, gases, oil, crude oil products, liquid petroleum products, water, steam, waste, wastewater, storm water, other liquids or chemicals, or traffic or other control systems. An abandoned facility or system is not an Underground Facility.
48. *Unit Price Work*—Work to be paid for on the basis of unit prices.
49. *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; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.

50. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

1.02 Terminology

- A. The words and terms discussed in Paragraphs 1.02.B, C, D, and E are not defined terms that require initial capital letters, but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.
- B. *Intent of Certain Terms or Adjectives*: 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 Article 10 or any other provision of the Contract Documents.
- C. *Day*: The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.
- D. *Defective*: The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
1. does not conform to the Contract Documents;
 2. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
 3. 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 15.03 or Paragraph 15.04).
- E. *Furnish, Install, Perform, Provide*
1. The word “furnish,” when used in connection with services, materials, or equipment, means 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, means 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, means to furnish and install said services, materials, or equipment complete and ready for intended use.

4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words “furnish,” “install,” “perform,” or “provide,” then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.
- F. *Contract Price or Contract Times*: References to a change in “Contract Price or Contract Times” or “Contract Times or Contract Price” or similar, indicate that such change applies to (1) Contract Price, (2) Contract Times, or (3) both Contract Price and Contract Times, as warranted, even if the term “or both” is not expressed.
- G. 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 Performance and Payment Bonds; Evidence of Insurance*

- A. *Performance and Payment Bonds*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner the performance bond and payment bond (if the Contract requires Contractor to furnish such bonds).
- B. *Evidence of Contractor’s Insurance*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each additional insured (as identified in the Contract), the certificates, endorsements, and other evidence of insurance required to be provided by Contractor in accordance with Article 6, except to the extent the Supplementary Conditions expressly establish other dates for delivery of specific insurance policies.
- C. *Evidence of Owner’s Insurance*: After receipt of the signed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each additional insured (as identified in the Contract), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

2.02 *Copies of Documents*

- A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully signed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.
- B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

2.03 *Before Starting Construction*

- A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Contract (or as otherwise required by the Contract Documents), 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;
 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.

2.04 *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 2.03.A, procedures for handling Shop Drawings, Samples, and other Submittals, processing Applications for Payment, electronic or digital transmittals, 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 and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 *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 the schedules submitted in accordance with Paragraph 2.03.A. No progress payment will 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 the component parts of the Work.
 4. If a schedule is not acceptable, Contractor will have an additional 10 days to revise and resubmit the schedule.

2.06 *Electronic Transmittals*

- A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may send, and shall accept, Electronic Documents transmitted by Electronic Means.
- B. If the Contract does not establish protocols for Electronic Means, then Owner, Engineer, and Contractor shall jointly develop such protocols.
- C. Subject to any governing protocols for Electronic Means, when transmitting Electronic Documents by Electronic Means, the transmitting party makes no representations as to long-term compatibility, usability, or readability of the Electronic Documents resulting from the recipient's use of software application packages, operating systems, or computer hardware differing from those used in the drafting or transmittal of the Electronic Documents.

ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

- A. The Contract Documents are complementary; what is required by one Contract Document 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.
- C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic versions of the Contract Documents (including any printed copies derived from such electronic versions) and the printed record version, the printed record version will govern.
- D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.
- E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.
- F. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation will be deemed stricken, and all remaining provisions will continue to be valid and binding upon Owner and Contractor, which agree that the Contract Documents will be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.
- G. Nothing in the Contract Documents creates:
 - 1. any contractual relationship between Owner or Engineer and any Subcontractor, Supplier, or other individual or entity performing or furnishing any of the Work, for the benefit of such Subcontractor, Supplier, or other individual or entity; or
 - 2. any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity, except as may otherwise be required by Laws and Regulations.

3.02 *Reference Standards*

A. *Standards Specifications, Codes, Laws and Regulations*

1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, means the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract 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, reference standard, or code, and no instruction of a Supplier, will be effective to change the duties or responsibilities of Owner, Contractor, or Engineer from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner or Engineer 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 part of the Contract Documents prepared by or for Engineer.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies*

1. *Contractor's Verification of Figures and Field Measurements:* Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict, error, ambiguity, or discrepancy is resolved by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.
2. *Contractor's Review of Contract Documents:* If, before or 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) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) 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 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.
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 part of the Contract Documents prepared by or for Engineer take precedence in

resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:

- a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); 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 *Requirements of the Contract Documents*

- A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer in writing all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work.
- B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.
- C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly notify Owner and Contractor in writing that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

3.05 *Reuse of Documents*

- A. Contractor and its Subcontractors and Suppliers 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 versions, or 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; or
 2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.
- B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein precludes Contractor from retaining copies of the Contract Documents for record purposes.

ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times; Notice to Proceed*

- A. The Contract Times will commence to run on the 30th day after the Effective Date of the Contract 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 Contract. In no event will the Contract Times commence to run later than the 60th day after the day of Bid opening or the 30th day after the Effective Date of the Contract, whichever date is earlier.

4.02 *Starting the Work*

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

4.03 *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.

4.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 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 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.
 - 2. Proposed adjustments in the Progress Schedule that will change the Contract Times must be submitted in accordance with the requirements of Article 11.
- B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work will be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

4.05 *Delays in Contractor's Progress*

- A. If Owner, Engineer, 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 Contract Price or Contract Times.
- B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption,

and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.

- C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Such an adjustment will be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:
 - 1. Severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
 - 2. Abnormal weather conditions;
 - 3. Acts or failures to act of third-party utility owners or other third-party entities (other than those third-party utility owners or other third-party entities performing other work at or adjacent to the Site as arranged by or under contract with Owner, as contemplated in Article 8); and
 - 4. Acts of war or terrorism.
- D. Contractor's entitlement to an adjustment of Contract Times or Contract Price is limited as follows:
 - 1. Contractor's entitlement to an adjustment of the Contract Times is conditioned on the delay, disruption, or interference adversely affecting an activity on the critical path to completion of the Work, as of the time of the delay, disruption, or interference.
 - 2. Contractor shall not be entitled to an adjustment in Contract Price for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor. Such a concurrent delay by Contractor shall not preclude an adjustment of Contract Times to which Contractor is otherwise entitled.
 - 3. Adjustments of Contract Times or Contract Price are subject to the provisions of Article 11.
- E. Each Contractor request or Change Proposal seeking an increase in Contract Times or Contract Price must be supplemented by supporting data that sets forth in detail the following:
 - 1. The circumstances that form the basis for the requested adjustment;
 - 2. The date upon which each cause of delay, disruption, or interference began to affect the progress of the Work;
 - 3. The date upon which each cause of delay, disruption, or interference ceased to affect the progress of the Work;
 - 4. The number of days' increase in Contract Times claimed as a consequence of each such cause of delay, disruption, or interference; and
 - 5. The impact on Contract Price, in accordance with the provisions of Paragraph 11.07.

Contractor shall also furnish such additional supporting documentation as Owner or Engineer may require including, where appropriate, a revised progress schedule indicating all the activities affected by the delay, disruption, or interference, and an explanation of the effect of the delay, disruption, or interference on the critical path to completion of the Work.

- F. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5, together with the provisions of Paragraphs 4.05.D and 4.05.E.
- G. Paragraph 8.03 addresses delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.

ARTICLE 5—SITE; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 *Availability of Lands*

- A. Owner shall furnish the Site. Owner shall notify Contractor in writing 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.
- 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 permanent improvements are to be made 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.

5.02 *Use of Site and Other Areas*

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

1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas, or to improvements, structures, utilities, or similar facilities located at such adjacent lands or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.
2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.13, or otherwise; (b)

promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or in a court of competent jurisdiction; and (c) to the fullest extent permitted by Laws and Regulations, 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 any such claim, and against all 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 directly or indirectly, in whole or in part by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.

- B. *Removal of Debris During Performance of the Work:* During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris will 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 and adjacent areas 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 of 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 structures or land to stresses or pressures that will endanger them.

5.03 *Subsurface and Physical Conditions*

- A. *Reports and Drawings:* The Supplementary Conditions identify:
 - 1. Those reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data;
 - 2. Those drawings of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data; and
 - 3. Technical Data contained in such reports and drawings.
- B. *Underground Facilities:* Underground Facilities are shown or indicated on the Drawings, pursuant to Paragraph 5.05, and not in the drawings referred to in Paragraph 5.03.A. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.
- C. *Reliance by Contractor on Technical Data:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b.

- D. *Limitations of Other Data and Documents:* Except for such reliance on 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;
 2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings;
 3. the contents of other Site-related documents made available to Contractor, such as record drawings from other projects at or adjacent to the Site, or Owner's archival documents concerning the Site; or
 4. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

5.04 *Differing Subsurface or Physical Conditions*

- A. *Notice by Contractor:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site:
1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate;
 2. is of such a nature as to require a change in the Drawings or Specifications;
 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 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

- B. *Engineer's Review:* After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine whether it is necessary for Owner to obtain additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.

- C. *Owner's Statement to Contractor Regarding Site Condition:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.
- D. *Early Resumption of Work:* If at any time Engineer determines that Work in connection with the subsurface or physical condition in question may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the condition in question has been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.
- E. *Possible Price and Times Adjustments*
1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, 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 fall within any one or more of the categories described in Paragraph 5.04.A;
 - 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 Paragraph 13.03; and,
 - c. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E.
 2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:
 - a. Contractor knew of the existence of such condition at the time Contractor made a 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 otherwise;
 - b. The existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or
 - c. Contractor failed to give the written notice required by Paragraph 5.04.A.
 3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.
 4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

- F. *Underground Facilities; Hazardous Environmental Conditions*: Paragraph 5.05 governs rights and responsibilities regarding the presence or location of Underground Facilities. Paragraph 5.06 governs rights and responsibilities regarding Hazardous Environmental Conditions. The provisions of Paragraphs 5.03 and 5.04 are not applicable to the presence or location of Underground Facilities, or to Hazardous Environmental Conditions.

5.05 *Underground Facilities*

- A. *Contractor's Responsibilities*: Unless it is otherwise expressly provided in the Supplementary Conditions, the cost of all of the following are included in the Contract Price, and Contractor shall have full responsibility for:
1. reviewing and checking all information and data regarding existing Underground Facilities at the Site;
 2. complying with applicable state and local utility damage prevention Laws and Regulations;
 3. verifying the actual location of those Underground Facilities shown or indicated in the Contract Documents as being within the area affected by the Work, by exposing such Underground Facilities during the course of construction;
 4. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and
 5. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.
- B. *Notice by Contractor*: If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated on the Drawings, or was not shown or indicated on the Drawings with reasonable accuracy, then 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 7.15), notify Owner and Engineer in writing regarding such Underground Facility.
- C. *Engineer's Review*: Engineer will:
1. promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated on the Drawings, or was not shown or indicated with reasonable accuracy;
 2. identify and communicate with the owner of the Underground Facility; prepare recommendations to Owner (and if necessary issue any preliminary instructions to Contractor) regarding the Contractor's resumption of Work in connection with the Underground Facility in question;
 3. obtain any pertinent cost or schedule information from Contractor; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and
 4. advise Owner in writing of Engineer's findings, conclusions, and recommendations.

During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

- D. *Owner's Statement to Contractor Regarding Underground Facility:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.
- E. *Early Resumption of Work:* If at any time Engineer determines that Work in connection with the Underground Facility may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the Underground Facility in question and conditions affected by its presence have been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.
- F. *Possible Price and Times Adjustments*
1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, to the extent that any existing Underground Facility at the Site that was not shown or indicated on the Drawings, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
 - a. 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 Paragraph 13.03;
 - b. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E; and
 - c. Contractor gave the notice required in Paragraph 5.05.B.
 2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.
 3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.
 4. The information and data shown or indicated on the Drawings with respect to existing Underground Facilities at the Site is based on information and data (a) furnished by the owners of such Underground Facilities, or by others, (b) obtained from available records, or (c) gathered in an investigation conducted in accordance with the current edition of ASCE 38, Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data, by the American Society of Civil Engineers. If such information or data is incorrect or incomplete, Contractor's remedies are limited to those set forth in this Paragraph 5.05.F.

5.06 *Hazardous Environmental Conditions at Site*

- A. *Reports and Drawings:* The Supplementary Conditions identify:
1. those reports known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site;
 2. drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and
 3. Technical Data contained in such reports and drawings.
- B. *Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b. Except for such reliance on 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;
 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 removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.
- D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.
- E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) 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 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.

- F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.
- G. 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, as a result of such Work stoppage, such special conditions under which Work is agreed to be resumed by Contractor, or any costs or expenses incurred in response to the Hazardous Environmental Condition, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off. Entitlement to any such adjustment is subject to the provisions of Paragraphs 4.05.D, 4.05.E, 11.07, and 11.08.
- H. 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, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.
- I. 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, arbitration, or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.I obligates Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- J. 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 failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J obligates Contractor to

indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

- K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 6—BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of Contractor's obligations under the Contract. These bonds must remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the terms of a prescribed bond form, the Supplementary Conditions, or other provisions of the Contract.
- B. Contractor shall also furnish such other bonds (if any) as are required by the Supplementary Conditions or other provisions of the Contract.
- C. All bonds must be in the form included in the Bidding Documents or otherwise specified by Owner prior to execution of the Contract, except as provided otherwise by Laws or Regulations, and must be issued and signed by a surety named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Department Circular 570 (as amended and supplemented) by the Bureau of the Fiscal Service, U.S. Department of the Treasury. A bond 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 must show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.
- D. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue bonds in the required amounts.
- E. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer in writing and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which must comply with the bond and surety requirements above.
- F. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner's termination rights under Article 16.
- G. Upon request to Owner from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Owner shall provide a copy of the payment bond to such person or entity.
- H. Upon request to Contractor from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Contractor shall provide a copy of the payment bond to such person or entity.

6.02 *Insurance—General Provisions*

- A. Owner and Contractor shall obtain and maintain insurance as required in this article and in the Supplementary Conditions.
- B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized in the state or jurisdiction in which the Project is located to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.
- C. Alternative forms of insurance coverage, including but not limited to self-insurance and “Occupational Accident and Excess Employer’s Indemnity Policies,” are not sufficient to meet the insurance requirements of this Contract, unless expressly allowed in the Supplementary Conditions.
- D. Contractor shall deliver to Owner, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Contractor has obtained and is maintaining the policies and coverages required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, full disclosure of all relevant exclusions, and evidence of insurance required to be purchased and maintained by Subcontractors or Suppliers. In any documentation furnished under this provision, Contractor, Subcontractors, and Suppliers may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those applicable to this Contract.
- E. Owner shall deliver to Contractor, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Owner has obtained and is maintaining the policies and coverages required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, and full disclosure of all relevant exclusions. In any documentation furnished under this provision, Owner may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those relevant to this Contract.
- F. Failure of Owner or Contractor to demand such certificates or other evidence of the other party’s full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, will not be construed as a waiver of the other party’s obligation to obtain and maintain such insurance.
- G. In addition to the liability insurance required to be provided by Contractor, the Owner, at Owner’s option, may purchase and maintain Owner’s own liability insurance. Owner’s liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner’s liability policies for any of Contractor’s obligations to the Owner, Engineer, or third parties.

- H. Contractor shall require:
1. Subcontractors to purchase and maintain worker's compensation, commercial general liability, and other insurance that is appropriate for their participation in the Project, and to name as additional insureds Owner and Engineer (and any other individuals or entities identified in the Supplementary Conditions as additional insureds on Contractor's liability policies) on each Subcontractor's commercial general liability insurance policy; and
 2. Suppliers to purchase and maintain insurance that is appropriate for their participation in the Project.
- I. If either party does not purchase or maintain the insurance required of such party by the Contract, 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.
- J. If Contractor has failed to obtain and maintain required insurance, Contractor's entitlement to enter or remain at the Site will end immediately, and Owner may impose an appropriate set-off against payment for any associated costs (including but not limited to the cost of purchasing necessary insurance coverage), and exercise Owner's termination rights under Article 16.
- K. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect (but is in no way obligated) to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price will be adjusted accordingly.
- L. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests. Contractor is responsible for determining whether such coverage and limits are adequate to protect its interests, and for obtaining and maintaining any additional insurance that Contractor deems necessary.
- M. The insurance and insurance limits required herein will not be deemed as a limitation on Contractor's liability, or that of its Subcontractors or Suppliers, under the indemnities granted to Owner and other individuals and entities in the Contract or otherwise.
- N. All the policies of insurance required to be purchased and maintained under this Contract will contain a provision or endorsement that the coverage afforded will not be canceled, or renewal refused, until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured and Engineer.

6.03 *Contractor's Insurance*

- A. *Required Insurance:* Contractor shall purchase and maintain Worker's Compensation, Commercial General Liability, and other insurance pursuant to the specific requirements of the Supplementary Conditions.
- B. *General Provisions:* The policies of insurance required by this Paragraph 6.03 as supplemented must:
1. include at least the specific coverages required;

2. be written for not less than the limits provided, or those required by Laws or Regulations, whichever is greater;
 3. remain in effect at least until the Work is complete (as set forth in Paragraph 15.06.D), and longer if expressly required elsewhere in this Contract, and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract;
 4. apply with respect to the performance of the Work, whether such performance is 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; and
 5. include all necessary endorsements to support the stated requirements.
- C. *Additional Insureds*: The Contractor's commercial general liability, automobile liability, employer's liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies, if required by this Contract, must:
1. include and list as additional insureds Owner and Engineer, and any individuals or entities identified as additional insureds in the Supplementary Conditions;
 2. include coverage for the respective officers, directors, members, partners, employees, and consultants of all such additional insureds;
 3. afford primary coverage to these additional insureds for all claims covered thereby (including as applicable those arising from both ongoing and completed operations);
 4. not seek contribution from insurance maintained by the additional insured; and
 5. as to commercial general liability insurance, apply to additional insureds with respect to liability caused in whole or in part by Contractor's acts or omissions, or the acts and omissions of those working on Contractor's behalf, in the performance of Contractor's operations.

6.04 *Builder's Risk and Other Property Insurance*

- A. *Builder's Risk*: Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the Work's full insurable replacement cost (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). The specific requirements applicable to the builder's risk insurance are set forth in the Supplementary Conditions.
- B. *Property Insurance for Facilities of Owner Where Work Will Occur*: Owner is responsible for obtaining and maintaining property insurance covering each existing structure, building, or facility in which any part of the Work will occur, or to which any part of the Work will attach or be adjoined. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, providing coverage consistent with that required for the builder's risk insurance, and will be maintained until the Work is complete, as set forth in Paragraph 15.06.D.

- C. *Property Insurance for Substantially Complete Facilities:* Promptly after Substantial Completion, and before actual occupancy or use of the substantially completed Work, Owner will obtain property insurance for such substantially completed Work, and maintain such property insurance at least until the Work is complete, as set forth in Paragraph 15.06.D. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, and provide coverage consistent with that required for the builder's risk insurance. The builder's risk insurance may terminate upon written confirmation of Owner's procurement of such property insurance.
- D. *Partial Occupancy or Use by Owner:* If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide advance notice of such occupancy or use to the builder's risk insurer, and obtain an endorsement consenting to the continuation of coverage prior to commencing such partial occupancy or use.
- E. *Insurance of Other Property; Additional Insurance:* If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, then the entity or individual owning such property item will be responsible for insuring it. If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.04, it may do so at Contractor's expense.

6.05 *Property Losses; Subrogation*

- A. The builder's risk insurance policy purchased and maintained in accordance with Paragraph 6.04 (or an installation floater policy if authorized by the Supplementary Conditions), will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors.
 - 1. Owner and Contractor waive all rights against each other and the 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, risks, 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 Engineer, its consultants, all individuals or entities identified in the Supplementary Conditions as builder's risk or installation floater insureds, 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.
 - 2. None of the above waivers extends to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.
- B. Any property insurance policy maintained by Owner covering any loss, damage, or consequential loss to Owner's existing structures, buildings, or facilities in which any part of the Work will occur, or to which any part of the Work will attach or adjoin; to adjacent structures, buildings, or facilities of Owner; or to part or all of the completed or substantially completed Work, during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to

Paragraph 15.06, will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them, and that the insured is allowed to waive the insurer's rights of subrogation in a written contract executed prior to the loss, damage, or consequential loss.

1. 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 all losses and damages caused by, arising out of, or resulting from fire or any of the perils, risks, or causes of loss covered by such policies.
- C. The waivers in this Paragraph 6.05 include the waiver of rights 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 insured peril, risk, or cause of loss.
- D. Contractor shall be responsible for assuring that each Subcontract contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, 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 fire or other peril, risk, or cause of loss covered by builder's risk insurance, installation floater, and any other property insurance applicable to the Work.

6.06 *Receipt and Application of Property Insurance Proceeds*

- A. Any insured loss under the builder's risk and other policies of property insurance required by Paragraph 6.04 will be adjusted and settled with the named insured that purchased the policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.
- B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.04 shall maintain such proceeds in a segregated account, and distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.
- C. If no other special agreement is reached, Contractor shall repair or replace the damaged Work, using allocated insurance proceeds.

ARTICLE 7—CONTRACTOR’S RESPONSIBILITIES

7.01 *Contractor’s Means and Methods of Construction*

- A. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.
- B. If the Contract Documents note, or Contractor determines, that professional engineering or other design services are needed to carry out Contractor’s responsibilities for construction means, methods, techniques, sequences, and procedures, or for Site safety, then Contractor shall cause such services to be provided by a properly licensed design professional, at Contractor’s expense. Such services are not Owner-delegated professional design services under this Contract, and neither Owner nor Engineer has any responsibility with respect to (1) Contractor’s determination of the need for such services, (2) the qualifications or licensing of the design professionals retained or employed by Contractor, (3) the performance of such services, or (4) any errors, omissions, or defects in such services.

7.02 *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.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who will not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

7.03 *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 maintain good discipline and order at the Site.
- B. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of Contractor’s employees; of Suppliers and Subcontractors, and their employees; and of any other individuals or entities performing or furnishing any of the Work, just as Contractor is responsible for Contractor’s own acts and omissions.
- C. 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 will be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner’s written consent, which will not be unreasonably withheld.

7.04 *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, whether or not such items are specifically called for in the Contract Documents.

- B. All materials and equipment incorporated into the Work must be new and of good quality, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications will 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 must 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.

7.05 *“Or Equals”*

- A. *Contractor’s Request; Governing Criteria:* Whenever an item of equipment or material is specified or described in the Contract Documents by using the names of one or more proprietary items or specific Suppliers, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item 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 is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material, or items from other proposed Suppliers, under the circumstances described below.
 - 1. If Engineer in its sole discretion determines that an item of equipment or material proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer will deem it an “or equal” item. For the purposes of this paragraph, a proposed item of equipment or material will be considered functionally equal to an item so named if:
 - a. in the exercise of reasonable judgment Engineer determines that the proposed item:
 - 1) is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
 - 2) 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;
 - 3) has a proven record of performance and availability of responsive service; and
 - 4) is not objectionable to Owner.
 - b. Contractor certifies that, if the proposed item is approved and incorporated into the Work:
 - 1) there will be no increase in cost to the Owner or increase in Contract Times; and
 - 2) the item will conform substantially to the detailed requirements of the item named in the Contract Documents.
- B. *Contractor’s Expense:* Contractor shall provide all data in support of any proposed “or equal” item at Contractor’s expense.
- C. *Engineer’s Evaluation and Determination:* Engineer will be allowed a reasonable time to evaluate each “or-equal” request. Engineer may require Contractor to furnish additional data about the proposed “or-equal” item. Engineer will be the sole judge of acceptability. No “or-equal” item will be ordered, furnished, installed, or utilized until Engineer’s review is complete

and Engineer determines that the proposed item is an “or-equal,” which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.

- D. *Effect of Engineer’s Determination:* Neither approval nor denial of an “or-equal” request will result in any change in Contract Price. The Engineer’s denial of an “or-equal” request will be final and binding, and may not be reversed through an appeal under any provision of the Contract.
- E. *Treatment as a Substitution Request:* If Engineer determines that an item of equipment or material proposed by Contractor does not qualify as an “or-equal” item, Contractor may request that Engineer consider the item a proposed substitute pursuant to Paragraph 7.06.

7.06 *Substitutes*

- A. *Contractor’s Request; Governing Criteria:* Unless the specification or description of an item of equipment or material required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material under the circumstances described below. To the extent possible such requests must be made before commencement of related construction at the Site.
 - 1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of equipment or material from anyone other than Contractor.
 - 2. The requirements for review by Engineer will be as set forth in Paragraph 7.06.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.
 - 3. Contractor shall make written application to Engineer for review of a proposed substitute item of equipment or material that Contractor seeks to furnish or use. The application:
 - a. will certify that the proposed substitute item will:
 - 1) perform adequately the functions and achieve the results called for by the general design;
 - 2) be similar in substance to the item specified; and
 - 3) be suited to the same use as the item specified.
 - b. will state:
 - 1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times;
 - 2) 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

- 3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.
 - c. will identify:
 - 1) all variations of the proposed substitute item from the item specified; and
 - 2) available engineering, sales, maintenance, repair, and replacement services.
 - d. will contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.
- B. *Engineer's Evaluation and Determination:* Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.
- C. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- D. *Reimbursement of Engineer's Cost:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. 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.
- E. *Contractor's Expense:* Contractor shall provide all data in support of any proposed substitute at Contractor's expense.
- F. *Effect of Engineer's Determination:* If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request will be final and binding, and may not be reversed through an appeal under any provision of the Contract. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.06.D, by timely submittal of a Change Proposal.

7.07 Concerning Subcontractors and Suppliers

- A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner. The Contractor's retention of a Subcontractor or Supplier for the performance of parts of the Work will not relieve Contractor's obligation to Owner to perform and complete the Work in accordance with the Contract Documents.

- B. Contractor shall retain specific Subcontractors and Suppliers for the performance of designated parts of the Work if required by the Contract to do so.
- C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor or Supplier to furnish or perform any of the Work against which Contractor has reasonable objection.
- D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within 5 days.
- E. Owner may require the replacement of any Subcontractor or Supplier. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors or Suppliers for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor or Supplier so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor or Supplier.
- F. If Owner requires the replacement of any Subcontractor or Supplier retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.
- G. No acceptance by Owner of any such Subcontractor or Supplier, whether initially or as a replacement, will constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.
- H. On a monthly basis, Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.
- I. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors and Suppliers.
- J. The divisions and sections of the Specifications and the identifications of any Drawings do not control Contractor in dividing the Work among Subcontractors or Suppliers, or in delineating the Work to be performed by any specific trade.
- K. All Work performed for Contractor by a Subcontractor or Supplier must be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract for the benefit of Owner and Engineer.
- L. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor for Work performed for Contractor by the Subcontractor or Supplier.

- M. Contractor shall restrict all Subcontractors and Suppliers from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed in this Contract.

7.08 *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 an 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 will be disclosed 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.

7.09 *Permits*

- A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits, licenses, and certificates of occupancy. 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 the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

7.10 *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.

7.11 *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. Neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and 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 such Work or other action. It is not Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this does not relieve Contractor of its obligations under Paragraph 3.03.
- C. Owner or Contractor may give written notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such written notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.12 *Record Documents*

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

7.13 *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.
- B. Contractor shall designate a qualified and experienced safety representative whose duties and responsibilities are the prevention of Work-related accidents and the maintenance and supervision of safety precautions and programs.
- C. 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, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- D. All damage, injury, or loss to any property referred to in Paragraph 7.13.C.2 or 7.13.C.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 at its expense (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).
- E. 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.
- F. Contractor shall notify Owner; the owners of adjacent property; the owners of Underground Facilities and other utilities (if the identity of such owners is known to Contractor); and other contractors and utility owners performing work at or adjacent to the Site, in writing, when Contractor knows that prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.
- G. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. Any Owner's safety programs that are applicable to the Work are identified or included in the Supplementary Conditions or Specifications.
- H. 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.
- I. Contractor's duties and responsibilities for safety and protection will continue until all the Work is completed, Engineer has issued a written notice to Owner and Contractor in accordance with Paragraph 15.06.C that the Work is acceptable, and Contractor has left the Site (except as otherwise expressly provided in connection with Substantial Completion).
- J. Contractor's duties and responsibilities for safety and protection will resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.14 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of safety data sheets (formerly known as 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.

7.15 *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 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 by an emergency, or are required as a result of Contractor's response to an emergency. If Engineer determines that a change in the Contract Documents is required because of an emergency or Contractor's response, a Work Change Directive or Change Order will be issued.

7.16 *Submittals*

A. *Shop Drawing and Sample Requirements*

1. Before submitting a Shop Drawing or Sample, Contractor shall:
 - a. review and coordinate the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
 - b. determine and verify:
 - 1) all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect to the Submittal;
 - 2) the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
 - 3) all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto;
 - c. confirm that the Submittal is complete with respect to all related data included in the Submittal.
2. Each Shop Drawing or Sample must bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that Submittal, and that Contractor approves the Submittal.
3. With each Shop Drawing or Sample, Contractor shall give Engineer specific written notice of any variations that the Submittal may have from the requirements of the Contract Documents. This notice must be set forth in a written communication separate from the Submittal; and, in addition, in the case of a Shop Drawing by a specific notation made on the Shop Drawing itself.

- B. *Submittal Procedures for Shop Drawings and Samples:* Contractor shall label and submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals.

1. *Shop Drawings*

- a. Contractor shall submit the number of copies required in the Specifications.

- b. Data shown on the Shop Drawings must 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 7.16.C.

2. *Samples*

- a. Contractor shall submit the number of Samples required in the Specifications.
 - b. Contractor shall 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 7.16.C.
3. 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. *Engineer's Review of Shop Drawings and Samples*

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the accepted Schedule of Submittals. 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, comply with the requirements of 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, or to safety precautions or programs incident thereto.
3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
4. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.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 will document any such approved variation from the requirements of the Contract Documents in a Field Order or other appropriate Contract modification.
5. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for complying with the requirements of Paragraphs 7.16.A and B.
6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, will not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.
7. Neither Engineer's receipt, review, acceptance, or approval of a Shop Drawing or Sample will result in such item becoming a Contract Document.

8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.C.4.

D. Resubmittal Procedures for Shop Drawings and Samples

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.
2. Contractor shall furnish required Shop Drawing and Sample submittals with sufficient information and accuracy to obtain required approval of an item with no more than two resubmittals. Engineer will record Engineer's time for reviewing a third or subsequent resubmittal of a Shop Drawing or Sample, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges.
3. If Contractor requests a change of a previously approved Shop Drawing or Sample, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

E. Submittals Other than Shop Drawings, Samples, and Owner-Delegated Designs

1. The following provisions apply to all Submittals other than Shop Drawings, Samples, and Owner-delegated designs:
 - a. Contractor shall submit all such Submittals to the Engineer in accordance with the Schedule of Submittals and pursuant to the applicable terms of the Contract Documents.
 - b. Engineer will provide timely review of all such Submittals in accordance with the Schedule of Submittals and return such Submittals with a notation of either Accepted or Not Accepted. Any such Submittal that is not returned within the time established in the Schedule of Submittals will be deemed accepted.
 - c. Engineer's review will be only to determine if the Submittal is acceptable under the requirements of the Contract Documents as to general form and content of the Submittal.
 - d. If any such Submittal is not accepted, Contractor shall confer with Engineer regarding the reason for the non-acceptance, and resubmit an acceptable document.
 2. Procedures for the submittal and acceptance of the Progress Schedule, the Schedule of Submittals, and the Schedule of Values are set forth in Paragraphs 2.03, 2.04, and 2.05.
- F. Owner-delegated Designs: Submittals pursuant to Owner-delegated designs are governed by the provisions of Paragraph 7.19.

7.17 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 is entitled to rely on Contractor's warranty and guarantee.

- B. Owner's rights under this warranty and guarantee are in addition to, and are not limited by, Owner's rights under the correction period provisions of Paragraph 15.08. The time in which Owner may enforce its warranty and guarantee rights under this Paragraph 7.17 is limited only by applicable Laws and Regulations restricting actions to enforce such rights; provided, however, that after the end of the correction period under Paragraph 15.08:
 - 1. Owner shall give Contractor written notice of any defective Work within 60 days of the discovery that such Work is defective; and
 - 2. Such notice will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the notice.
- C. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
 - 1. abuse, or improper modification, 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.
- D. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents is absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents, a release of Contractor's obligation to perform the Work in accordance with the Contract Documents, or a release of Owner's warranty and guarantee rights under this Paragraph 7.17:
 - 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;
 - 6. The issuance of a notice of acceptability by Engineer;
 - 7. The end of the correction period established in Paragraph 15.08;
 - 8. Any inspection, test, or approval by others; or
 - 9. Any correction of defective Work by Owner.
- E. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract will govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

7.18 Indemnification

- A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, 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 losses,

damages, costs, and judgments (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 from third-party claims or actions relating to or resulting from the performance or furnishing of the Work, provided that any such claim, action, loss, cost, judgment or damage is attributable to bodily injury, sickness, disease, or death, or to damage 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 7.18.A will 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.

7.19 *Delegation of Professional Design Services*

- A. Owner may require Contractor to provide professional design services for a portion of the Work by express delegation in the Contract Documents. Such delegation will specify the performance and design criteria that such services must satisfy, and the Submittals that Contractor must furnish to Engineer with respect to the Owner-delegated design.
- B. Contractor shall cause such Owner-delegated professional design services to be provided pursuant to the professional standard of care by a properly licensed design professional, whose signature and seal must appear on all drawings, calculations, specifications, certifications, and Submittals prepared by such design professional. Such design professional must issue all certifications of design required by Laws and Regulations.
- C. If a Shop Drawing or other Submittal related to the Owner-delegated design is prepared by Contractor, a Subcontractor, or others for submittal to Engineer, then such Shop Drawing or other Submittal must bear the written approval of Contractor's design professional when submitted by Contractor to Engineer.
- D. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, and approvals performed or provided by the design professionals retained or employed by Contractor under an Owner-delegated design, subject to the professional standard of care and the performance and design criteria stated in the Contract Documents.
- E. Pursuant to this Paragraph 7.19, Engineer's review, approval, and other determinations regarding design drawings, calculations, specifications, certifications, and other Submittals furnished by Contractor pursuant to an Owner-delegated design will be only for the following limited purposes:
 - 1. Checking for conformance with the requirements of this Paragraph 7.19;

2. Confirming that Contractor (through its design professionals) has used the performance and design criteria specified in the Contract Documents; and
 3. Establishing that the design furnished by Contractor is consistent with the design concept expressed in the Contract Documents.
- F. Contractor shall not be responsible for the adequacy of performance or design criteria specified by Owner or Engineer.
- G. Contractor is not required to provide professional services in violation of applicable Laws and Regulations.

ARTICLE 8—OTHER WORK AT THE SITE

8.01 *Other Work*

- A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.
- B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any third-party utility work that Owner has arranged to take place at or adjacent to the Site, Owner shall provide such information to Contractor.
- C. Contractor shall afford proper and safe access to the Site to each contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work.
- D. 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.
- E. If the proper execution or results of any part of Contractor's Work depends upon work performed by others, 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.
- F. The provisions of this article are not applicable to work that is performed by third-party utilities or other third-party entities without a contract with Owner, or that is performed without having been arranged by Owner. If such work occurs, then any related delay,

disruption, or interference incurred by Contractor is governed by the provisions of Paragraph 4.05.C.3.

8.02 *Coordination*

- A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:
 - 1. The identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;
 - 2. An itemization of the specific matters to be covered by such authority and responsibility; and
 - 3. The extent of such authority and responsibilities.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

8.03 *Legal Relationships*

- A. If, in the course of performing other work for Owner at or adjacent to the Site, the Owner's employees, any other contractor working for Owner, or any utility owner that Owner has arranged to perform work, causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment will take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract, and any remedies available to Contractor under Laws or Regulations concerning utility action or inaction. When applicable, any such equitable adjustment in Contract Price will be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times or Contract Price is subject to the provisions of Paragraphs 4.05.D and 4.05.E.
- B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site.
 - 1. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this Paragraph 8.03.B.

2. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due Contractor.
- C. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) 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 any such claims, and against all 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 damage, delay, disruption, or interference.

ARTICLE 9—OWNER'S RESPONSIBILITIES

9.01 *Communications to Contractor*

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

9.02 *Replacement of Engineer*

- A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents will be that of the former Engineer.

9.03 *Furnish Data*

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

9.04 *Pay When Due*

- A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

9.05 *Lands and Easements; Reports, Tests, and Drawings*

- A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.
- B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.
- C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

- 9.06 *Insurance*
- A. Owner’s responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.
- 9.07 *Change Orders*
- A. Owner’s responsibilities with respect to Change Orders are set forth in Article 11.
- 9.08 *Inspections, Tests, and Approvals*
- A. Owner’s responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.
- 9.09 *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.
- 9.10 *Undisclosed Hazardous Environmental Condition*
- A. Owner’s responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.
- 9.11 *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 (including obligations under proposed changes in the Work).
- 9.12 *Safety Programs*
- 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.
- B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

ARTICLE 10—ENGINEER’S STATUS DURING CONSTRUCTION

- 10.01 *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.
- 10.02 *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 10.07. 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.

10.03 *Resident Project Representative*

- A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in the Supplementary Conditions and in Paragraph 10.07.
- B. If Owner designates an individual or entity who is not Engineer's consultant, agent, or employee to represent Owner at the Site, then the responsibilities and authority of such individual or entity will be as provided in the Supplementary Conditions.

10.04 *Engineer's Authority*

- A. Engineer has the authority to reject Work in accordance with Article 14.
- B. Engineer's authority as to Submittals is set forth in Paragraph 7.16.
- C. Engineer's authority as to design drawings, calculations, specifications, certifications and other Submittals from Contractor in response to Owner's delegation (if any) to Contractor of professional design services, is set forth in Paragraph 7.19.
- D. Engineer's authority as to changes in the Work is set forth in Article 11.
- E. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.05 *Determinations for Unit Price Work*

- A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

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

- A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.07 *Limitations on Engineer's Authority and Responsibilities*

- A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, 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, will 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 Contractor under Paragraph 15.06.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 10.07 also apply to the Resident Project Representative, if any.

10.08 *Compliance with Safety Program*

- A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs of which Engineer has been informed.

ARTICLE 11—CHANGES TO THE CONTRACT

11.01 *Amending and Supplementing the Contract*

- A. The Contract may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.
- B. If an amendment or supplement to the Contract includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order.
- C. All changes to the Contract that involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, must be supported by Engineer's recommendation. Owner and Contractor may amend other terms and conditions of the Contract without the recommendation of the Engineer.

11.02 *Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders covering:
 - 1. Changes in 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;
 - 2. Changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;
 - 3. Changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.05, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters; and
 - 4. Changes that embody the substance of any final and binding results under: Paragraph 11.03.B, resolving the impact of a Work Change Directive; Paragraph 11.09, concerning Change Proposals; Article 12, Claims; Paragraph 13.02.D, final adjustments resulting from allowances; Paragraph 13.03.D, final adjustments relating to determination of quantities for Unit Price Work; and similar provisions.
- B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of Paragraph 11.02.A, it will be deemed to be of full force and effect, as if fully executed.

11.03 *Work Change Directives*

- A. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.07 regarding change of Contract Price.
- B. If Owner has issued a Work Change Directive and:
 - 1. Contractor believes that an adjustment in Contract Times or Contract Price is necessary, then Contractor shall submit any Change Proposal seeking such an adjustment no later than 30 days after the completion of the Work set out in the Work Change Directive.
 - 2. Owner believes that an adjustment in Contract Times or Contract Price is necessary, then Owner shall submit any Claim seeking such an adjustment no later than 60 days after issuance of the Work Change Directive.

11.04 *Field Orders*

- A. Engineer may authorize minor changes in the Work if the changes 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. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly.

- B. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.05 *Owner-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. Changes involving the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters will be supported by Engineer's recommendation.
- B. Such changes in the Work may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work must be performed under the applicable conditions of the Contract Documents.
- C. Nothing in this Paragraph 11.05 obligates Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

11.06 *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, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.C.2.

11.07 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment of Contract Price must comply with the provisions of Article 12.
- B. 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, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03);
 - 2. Where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.07.C.2); or
 - 3. Where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.07.C).

- C. *Contractor's Fee*: When applicable, the Contractor's fee for overhead and profit will 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 13.01.B.1 and 13.01.B.2, the Contractor's fee will be 15 percent;
 - b. For costs incurred under Paragraph 13.01.B.3, the Contractor's fee will be 5 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 11.07.C.2.a and 11.07.C.2.b is that the Contractor's fee will be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of 5 percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted Work the maximum total fee to be paid by Owner will be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the Work;
 - d. No fee will be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;
 - e. The amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in Cost of the Work will be the amount of the actual net decrease in Cost of the Work and a deduction of an additional amount equal to 5 percent of such actual net decrease in Cost of the Work; and
 - f. When both additions and credits are involved in any one change or Change Proposal, the adjustment in Contractor's fee will be computed by determining the sum of the costs in each of the cost categories in Paragraph 13.01.B (specifically, payroll costs, Paragraph 13.01.B.1; incorporated materials and equipment costs, Paragraph 13.01.B.2; Subcontract costs, Paragraph 13.01.B.3; special consultants costs, Paragraph 13.01.B.4; and other costs, Paragraph 13.01.B.5) and applying to each such cost category sum the appropriate fee from Paragraphs 11.07.C.2.a through 11.07.C.2.e, inclusive.

11.08 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment in the Contract Times must comply with the provisions of Article 12.
- B. Delay, disruption, and interference in the Work, and any related changes in Contract Times, are addressed in and governed by Paragraph 4.05.

11.09 *Change Proposals*

A. *Purpose and Content:* Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; contest an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; challenge a set-off against payment due; or seek other relief under the Contract. The Change Proposal will specify any proposed change in Contract Times or Contract Price, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents. Each Change Proposal will address only one issue, or a set of closely related issues.

B. *Change Proposal Procedures*

1. *Submittal:* Contractor shall submit each Change Proposal to Engineer within 30 days after the start of the event giving rise thereto, or after such initial decision.
2. *Supporting Data:* The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal.
 - a. Change Proposals based on or related to delay, interruption, or interference must comply with the provisions of Paragraphs 4.05.D and 4.05.E.
 - b. Change proposals related to a change of Contract Price must include full and detailed accounts of materials incorporated into the Work and labor and equipment used for the subject Work.

The supporting data must be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event.

3. *Engineer's Initial Review:* Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal. If in its discretion Engineer concludes that additional supporting data is needed before conducting a full review and making a decision regarding the Change Proposal, then Engineer may request that Contractor submit such additional supporting data by a date specified by Engineer, prior to Engineer beginning its full review of the Change Proposal.
4. *Engineer's Full Review and Action on the Change Proposal:* Upon receipt of Contractor's supporting data (including any additional data requested by Engineer), Engineer will conduct a full review of each Change Proposal and, within 30 days after such receipt of the Contractor's supporting data, either approve the Change Proposal in whole, deny it in whole, or approve it in part and deny it in part. Such actions must be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.
5. *Binding Decision:* Engineer's decision is final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.

- C. *Resolution of Certain Change Proposals*: If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties in writing that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice will be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.
- D. *Post-Completion*: Contractor shall not submit any Change Proposals after Engineer issues a written recommendation of final payment pursuant to Paragraph 15.06.B.

11.10 *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.

ARTICLE 12—CLAIMS

12.01 *Claims*

- A. *Claims Process*: The following disputes between Owner and Contractor are subject to the Claims process set forth in this article:
 1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;
 2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents;
 3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters; and
 4. Subject to the waiver provisions of Paragraph 15.07, any dispute arising after Engineer has issued a written recommendation of final payment pursuant to Paragraph 15.06.B.
- B. *Submittal of Claim*: The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim rests with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.
- C. *Review and Resolution*: The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim will be stated in writing and submitted to the other party, with a copy to Engineer.

D. *Mediation*

1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate will stay the Claim submittal and response process.
 2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process will resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim submittal and decision process will resume as of the date of the conclusion of the mediation, as determined by the mediator.
 3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.
- E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action will be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.
- F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim will be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.
- G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim will be incorporated in a Change Order or other written document to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

ARTICLE 13—COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

13.01 *Cost of the Work*

- A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:
1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or
 2. When needed to determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.
- B. *Costs Included*: Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work will be in amounts no higher than those commonly incurred in the

locality of the Project, will not include any of the costs itemized in Paragraph 13.01.C, and will 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 in advance of the subject Work. Such employees include, without limitation, superintendents, foremen, safety managers, safety representatives, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work will be apportioned on the basis of their time spent on the Work. Payroll costs include, but are not limited to, salaries and wages plus the cost of fringe benefits, which include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, sick leave, and vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, will 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 accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts will accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment will 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, which 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 will be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.
4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed or retained for services specifically related to the Work.
5. Other costs consisting of 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, 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.
 - 1) In establishing included costs for materials such as scaffolding, plating, or sheeting, consideration will be given to the actual or the estimated life of the material for use on other projects; or rental rates may be established on the basis of purchase or salvage value of such items, whichever is less. Contractor will not

be eligible for compensation for such items in an amount that exceeds the purchase cost of such item.

c. *Construction Equipment Rental*

- 1) Rentals of all construction equipment and machinery, and the parts thereof, in accordance with rental agreements approved by Owner as to price (including any surcharge or special rates applicable to overtime use of the construction equipment or machinery), and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs will be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts must cease when the use thereof is no longer necessary for the Work.
 - 2) Costs for equipment and machinery owned by Contractor or a Contractor-related entity will be paid at a rate shown for such equipment in the equipment rental rate book specified in the Supplementary Conditions. An hourly rate will be computed by dividing the monthly rates by 176. These computed rates will include all operating costs.
 - 3) With respect to Work that is the result of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price (“changed Work”), included costs will be based on the time the equipment or machinery is in use on the changed Work and the costs of transportation, loading, unloading, assembly, dismantling, and removal when directly attributable to the changed Work. The cost of any such equipment or machinery, or parts thereof, must cease to accrue when the use thereof is no longer necessary for the changed 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 builder’s risk or other property insurance established in accordance with Paragraph 6.04), 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 include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses will 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 communication 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 that Contractor is required by the Contract Documents to purchase and maintain.

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

1. Payroll costs and other compensation of Contractor's officers, executives, principals, general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.
2. The cost of purchasing, renting, or furnishing small tools and hand tools.
3. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
4. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
5. 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.
6. Expenses incurred in preparing and advancing Claims.
7. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. *Contractor's Fee*

1. When the Work as a whole is performed on the basis of cost-plus-a-fee, then:
 - a. Contractor's fee for the Work set forth in the Contract Documents as of the Effective Date of the Contract will be determined as set forth in the Agreement.
 - b. for any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work, Contractor's fee will be determined as follows:
 - 1) When the fee for the Work as a whole is a percentage of the Cost of the Work, the fee will automatically adjust as the Cost of the Work changes.
 - 2) When the fee for the Work as a whole is a fixed fee, the fee for any additions or deletions will be determined in accordance with Paragraph 11.07.C.2.
2. When the Work as a whole is performed on the basis of a stipulated sum, or any other basis other than cost-plus-a-fee, then Contractor's fee for any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work will be determined in accordance with Paragraph 11.07.C.2.

E. *Documentation and Audit*: Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor and pertinent Subcontractors will establish

and maintain records of the costs in accordance with generally accepted accounting practices. Subject to prior written notice, Owner will be afforded reasonable access, during normal business hours, to all Contractor's accounts, records, books, correspondence, instructions, drawings, receipts, vouchers, memoranda, and similar data relating to the Cost of the Work and Contractor's fee. Contractor shall preserve all such documents for a period of three years after the final payment by Owner. Pertinent Subcontractors will afford such access to Owner, and preserve such documents, to the same extent required of Contractor.

13.02 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*: Contractor agrees that:
 - 1. 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
 - 2. 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 for any of the foregoing will be valid.
- C. *Owner's Contingency Allowance*: Contractor agrees that an Owner's 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 for Work covered by allowances, and the Contract Price will be correspondingly adjusted.

13.03 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. Payments to Contractor for Unit Price Work will be based on actual quantities.
- 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. 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, and the final adjustment of Contract Price will be set forth in a Change Order, subject to the provisions of the following paragraph.

E. *Adjustments in Unit Price*

1. Contractor or Owner shall be entitled to an adjustment in the unit price with respect to an item of Unit Price Work if:
 - a. the quantity of the item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and
 - b. Contractor's unit costs to perform the item of Unit Price Work have changed materially and significantly as a result of the quantity change.
2. The adjustment in unit price will account for and be coordinated with any related changes in quantities of other items of Work, and in Contractor's costs to perform such other Work, such that the resulting overall change in Contract Price is equitable to Owner and Contractor.
3. Adjusted unit prices will apply to all units of that item.

ARTICLE 14—TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK

14.01 *Access to Work*

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction 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 with such procedures and programs as applicable.

14.02 *Tests, Inspections, and Approvals*

- A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.
- B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work will be governed by the provisions of Paragraph 14.05.
- 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, obtaining, and paying for all inspections and tests required:
 1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;

2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;
3. by manufacturers of equipment furnished under the Contract Documents;
4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and
5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests will be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

- E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.
- F. 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. Such uncovering will be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 *Defective Work*

- A. *Contractor's Obligation*: It is Contractor's obligation to assure that the Work is not defective.
- B. *Engineer's Authority*: Engineer has the authority to determine whether Work is defective, and to reject defective Work.
- C. *Notice of Defects*: Prompt written notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.
- D. *Correction, or Removal and Replacement*: Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.
- E. *Preservation of Warranties*: When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.
- F. *Costs and Damages*: In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs, losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages 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. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work will be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

14.05 *Uncovering Work*

- A. Engineer has the authority to require additional inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.
- B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.
- C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then 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, and provide all necessary labor, material, and equipment.
 - 1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages 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 pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.
 - 2. 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, 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, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 *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, then 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 will 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.

14.07 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 defective Work as required by Engineer, then Owner may, after 7 days' written notice to Contractor, correct or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 14.07, 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, 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 incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. 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 14.07.

ARTICLE 15—PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

15.01 Progress Payments

- A. *Basis for Progress Payments:* The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments for Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.
- B. *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.
 - 2. 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 must also be accompanied by: (a) a bill of sale, invoice, copies of subcontract or purchase order payments, or other documentation establishing full payment by Contractor for the materials and equipment; (b) at Owner's

request, documentation warranting that Owner has received the materials and equipment free and clear of all Liens; and (c) evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

3. Beginning with the second Application for Payment, each Application must include an affidavit of Contractor stating that all previous progress payments received by Contractor have been applied to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
4. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

C. *Review of Applications*

1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, 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 13.03, 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; 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;
 - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto;
 - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work;
 - d. to make any examination to ascertain how or for what purposes Contractor has used the money paid by Owner; 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 15.01.C.2.
6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:
 - a. the Work is defective, requiring correction or replacement;
 - b. the Contract Price has been reduced by Change Orders;
 - c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or
 - e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due*

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

E. *Reductions in Payment by Owner*

1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:
 - a. Claims have been made against Owner based on Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages resulting from Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;

- b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;
 - c. Contractor has failed to provide and maintain required bonds or insurance;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;
 - e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;
 - f. The Work is defective, requiring correction or replacement;
 - g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - h. The Contract Price has been reduced by Change Orders;
 - i. An event has occurred that would constitute a default by Contractor and therefore justify a termination for cause;
 - j. Liquidated or other damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;
 - k. 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; or
 - l. Other items entitle Owner to a set-off against the amount recommended.
2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, 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, if Contractor remedies the reasons for such action. The reduction imposed will be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.
3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld will be treated as an amount due as determined by Paragraph 15.01.D.1 and subject to interest as provided in the Agreement.

15.02 *Contractor's Warranty of Title*

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than 7 days after the time of payment by Owner.

15.03 *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 and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time

submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.

- 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 preliminary certificate of Substantial Completion which will fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have 7 days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.
- E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.
- F. 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 punch list.

15.04 *Partial Use or Occupancy*

- 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. At any time, Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be 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 15.03.A through 15.03.E for that part of the Work.
2. At any time, Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work 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 15.03 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 6.04 regarding builder's risk or other property insurance.

15.05 *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, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

15.06 *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, annotated record documents (as provided in Paragraph 7.12), and other documents, Contractor may make application for final payment.
2. The final Application for Payment must be accompanied (except as previously delivered) by:
 - a. all documentation called for in the Contract Documents;
 - b. consent of the surety, if any, to final payment;
 - c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.

- d. a list of all duly pending Change Proposals and Claims; and
 - e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) 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, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.
- B. *Engineer's Review of Final Application and Recommendation of Payment:* 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 have been fulfilled, Engineer will, within 10 days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the final Application for Payment to Owner for payment. Such recommendation will account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. 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. *Notice of Acceptability:* In support of its recommendation of payment of the final Application for Payment, Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to stated limitations in the notice and to the provisions of Paragraph 15.07.
- D. *Completion of Work:* The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment and issuance of notice of the acceptability of the Work.
- E. *Final Payment Becomes Due:* Upon receipt from Engineer of the final Application for Payment and accompanying documentation, Owner shall set off against the amount recommended by Engineer for final payment any further sum to which Owner is entitled, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions of this Contract with respect to progress payments. Owner shall pay the resulting balance due to Contractor within 30 days of Owner's receipt of the final Application for Payment from Engineer.

15.07 *Waiver of Claims*

- A. By making final payment, Owner waives its claim or right to liquidated damages or other damages for late completion by Contractor, except as set forth in an outstanding Claim,

appeal under the provisions of Article 17, set-off, or express reservation of rights by Owner. Owner reserves all other claims or rights after final payment.

- B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted as a Claim, or appealed under the provisions of Article 17.

15.08 *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 Supplementary Conditions or the terms of any applicable special guarantee required by the Contract Documents), Owner gives Contractor written notice that any Work has been found to be defective, or that Contractor's repair of any damages to the Site or adjacent areas has been found to be defective, then after receipt of such notice of defect Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
 - 1. correct the defective repairs to the Site or such adjacent areas;
 - 2. correct such defective Work;
 - 3. remove the defective Work from the Project and replace it with Work that is not defective, if the defective Work has been rejected by Owner, and
 - 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting from the corrective measures.
- B. Owner shall give any such notice of defect within 60 days of the discovery that such Work or repairs is defective. If such notice is given within such 60 days but after the end of the correction period, the notice will be deemed a notice of defective Work under Paragraph 7.17.B.
- C. If, after receipt of a notice of defect within 60 days and within the correction period, 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. Contractor shall pay all 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). Contractor's failure to pay such costs, losses, and damages within 10 days of invoice from Owner will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the failure to pay.
- D. 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.
- E. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, 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.

- F. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph are not to be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 16—SUSPENSION OF WORK AND TERMINATION

16.01 *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 written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times directly attributable to any such suspension. Any Change Proposal seeking such adjustments must be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 *Owner May Terminate for Cause*

- A. The occurrence of any one or more of the following events will constitute a default by Contractor and 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);
 - 2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;
 - 3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or
 - 4. Contractor's repeated disregard of the authority of Owner or Engineer.
- B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) 10 days' written notice that Owner is considering a declaration that Contractor is in default and termination of the Contract, Owner may proceed to:
 - 1. declare Contractor to be in default, and give Contractor (and any surety) written notice that the Contract is terminated; and
 - 2. enforce the rights available to Owner under any applicable performance bond.
- C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, 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 complete the Work as Owner may deem expedient.
- D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within 7 days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.
- E. If Owner proceeds as provided in Paragraph 16.02.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 the cost to complete the Work, including all related claims, costs,

losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses, and damages exceeds 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.

- F. 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, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.
- G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond will govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *Owner May Terminate for Convenience*

- A. Upon 7 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; and
 - 3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.
- B. Contractor shall not be paid for any loss of anticipated profits or revenue, post-termination overhead costs, or other economic loss arising out of or resulting from such termination.

16.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon 7 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 16.03.
- 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, 7 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 are not intended to preclude Contractor from submitting a Change Proposal 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 17—FINAL RESOLUTION OF DISPUTES

17.01 *Methods and Procedures*

- A. *Disputes Subject to Final Resolution:* The following disputed matters are subject to final resolution under the provisions of this article:
 - 1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full, pursuant to Article 12; and
 - 2. Disputes between Owner and Contractor concerning the Work, or obligations under the Contract Documents, that arise after final payment has been made.
- B. *Final Resolution of Disputes:* For any dispute subject to resolution under this article, Owner or Contractor may:
 - 1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions;
 - 2. agree with the other party to submit the dispute to another dispute resolution process; or
 - 3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

ARTICLE 18—MISCELLANEOUS

18.01 *Giving Notice*

- A. Whenever any provision of the Contract requires the giving of written notice to Owner, Engineer, or Contractor, it will be deemed to have been validly given only if delivered:
 - 1. in person, by a commercial courier service or otherwise, to the recipient's place of business;
 - 2. by registered or certified mail, postage prepaid, to the recipient's place of business; or
 - 3. by e-mail to the recipient, with the words "Formal Notice" or similar in the e-mail's subject line.

18.02 *Computation of Times*

- A. When any period of time is referred to in the Contract 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.

18.03 *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. 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.

18.04 *Limitation of Damages*

- A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

- A. A party's non-enforcement of any provision will not constitute a waiver of that provision, nor will it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

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

18.07 *Controlling Law*

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

18.08 *Assignment of Contract*

- A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party to this Contract of any rights under or interests in the Contract will be binding on the other party without the written consent of the party sought to be bound; and, specifically but without limitation, money that may become due and money that is due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract.

18.09 *Successors and Assigns*

- A. Owner and Contractor each binds itself, its successors, assigns, and legal representatives to the other party hereto, its successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

18.10 *Headings*

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

SUPPLEMENTARY CONDITIONS OF THE CONSTRUCTION CONTRACT

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SUPPLEMENTARY CONDITIONS OF THE CONSTRUCTION CONTRACT

These Supplementary Conditions amend or supplement EJCDC® C-700, Standard General Conditions of the Construction Contract (2018). The General Conditions remain in full force and effect except as amended.

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

The address system used in these Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix "SC" added—for example, "Paragraph SC-4.05."

ARTICLE 1—DEFINITIONS AND TERMINOLOGY

1.01 Defined Terms

SC-1.01 Add the following language at the end of Paragraph 1.01.A.33:

The Resident Project Representative may provide part-time services.

SC-1.01 Add the following Paragraph after Paragraph 1.01.A.50: 51. Inspector – See definition for Resident Project Representative.

ARTICLE 2—PRELIMINARY MATTERS

2.01 Delivery of Bonds and Evidence of Insurance

SC-2.01 Add the following language at the end of Paragraph 2.01.B:

The Contractor shall obtain all insurance required under the Contract and Owner approval of such insurance prior to commencing, or allowing a Subcontractor to commence, Work under this Contract.

2.02 Copies of Documents

SC-2.02 Amend the first sentence of Paragraph 2.02.A. to read as follows:

Owner shall furnish to Contractor two printed copies of the Contract Documents (including one fully signed counterpart of the Agreement), and one copy in electronic portable document format (PDF).

ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 Intent

SC-3.01 Add the following language at the end of Paragraph 3.01.A:

Where a conflict may occur between the various Contract Documents:

1. Amendments and Addenda shall take precedence over previously issued Contract Documents.

2. The General Requirements (Division 1) take precedence over the Supplementary Conditions
3. The Supplementary Conditions take precedence over the General Conditions.
4. The Specifications take precedence over the Drawings.
5. Stated dimensions take precedence over scaled dimensions.
6. Large-scale detail drawings take precedence over small-scale drawings.
7. The schedules contained in the Contract Documents take precedence over other data on the Drawings.

3.04 *Requirements of the Contract Documents*

SC-3.04 Delete Paragraph 3.04.B and insert the following in its place:

- B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal.

ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK

4.05 *Delays in Contractors' Progress*

SC-4.05 Amend Paragraph 4.05.A to delete the word "shall" and replace with "may".

SC-4.05 Amend Paragraph 4.05.C to delete the word "shall" and replace with "may".

ARTICLE 5—SITE, SUBSURFACE AND PHYSICAL CONDITIONS, HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 *Availability of Lands*

SC-5.01 Delete Paragraphs 5.01.A through 5.01.C and insert the following in its place:

- A. Owner shall furnish the Site. Owner shall notify Contractor in writing 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.
- B. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment, at its own cost.

5.02 *Use of Site and Other Areas*

SC-5.02 Amend Paragraph 5.02.A.2. to include the word "defend," after the words "Laws and Regulations,".

5.03 *Subsurface and Physical Conditions*

SC-5.03 Add the following new paragraphs immediately after Paragraph 5.03.D:

- E. The following table lists the reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data, and specifically identifies the Technical Data in the report upon which Contractor may rely:

Report Title	Date of Report	Technical Data
No Reports Available		

- F. The following table lists the drawings of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data, and specifically identifies the Technical Data upon which Contractor may rely:

Drawings Title	Date of Drawings	Technical Data
No Drawings Available		

- G. Contractor may request copies of reports and drawings identified in SC-5.03.E and SC-5.03.F that were not included with the Bidding Documents from Engineer.

5.04 *Differing Subsurface or Physical Conditions*

SC-5.04 Delete Paragraph 5.04.A. and insert the following in its place:

- A. Notice by Contractor: If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site:
1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate;
 2. is of such a nature as to require a change in the Drawings or Specifications;
 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, within 3 days 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 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

SC-5.04 Amend Paragraph 5.04.E. to delete the word “shall” and replace with “may”.

5.05 *Underground Facilities*

SC-5.05 Amend Paragraph 5.05.F to delete the word “shall” and replace with “may”.

5.06 Hazardous Environmental Conditions

SC-5.06 Add the following new paragraphs immediately after Paragraph 5.06.A.3:

4. The following table lists the reports known to Owner relating to Hazardous Environmental Conditions at or adjacent to the Site, and the Technical Data (if any) upon which Contractor may rely:

Report Title	Date of Report	Technical Data
No Reports Available		

5. The following table lists the drawings known to Owner relating to Hazardous Environmental Conditions at or adjacent to the Site, and Technical Data (if any) contained in such Drawings upon which Contractor may rely:

Drawings Title	Date of Drawings	Technical Data
No Drawings Available		

SC-5.06 Add the following new paragraphs immediately after Paragraph 5.06.D:

1. The Contractor’s responsibilities in the event of a hazardous materials spill or release include, but are not limited to, providing a Temporary Emergency Coordinator and an Alternate Temporary Emergency Coordinator as part of the Contractor’s crew. The Temporary Emergency Coordinator or Alternate shall always be on site that the Contractor’s crews are on site. Names and phone numbers of the Temporary Emergency Coordinator and Alternate shall be provided to the Owner prior to the start of construction.
2. The Temporary Emergency Coordinator and Alternate shall be familiar with, and shall ensure the availability on site of, materials, methods, and procedures necessary to respond to sudden or non-sudden release of contents of any tank within the contract limit.
3. If a release from any tank occurs during the construction period, the Temporary Emergency Coordinator or his Alternate shall:
 - a. Respond to the occurrence using the Contractor’s personnel, equipment and materials;
 - b. Notify the Owner, the Engineer and/or such other parties as the Owner may designate;
 - c. Notify the State of Connecticut, Department of Energy & Environmental Protection, Oil and Chemical Spill Response Division;
 - d. Notify the local fire department and request assistance, if necessary;
 - e. Stop work in the affected area, and arrange for the spill material to be removed in accordance with the appropriate regulations, and the area of work cleaned;
 - f. Notify the Owner in writing that the spilled material has been removed, the area of work cleaned, and request written authorization to proceed with the Work.

ARTICLE 6—BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

- SC-6.01 Add the following paragraph immediately after Paragraph 6.01.H:
- I. Payment Bonds shall conform to the requirements of the Connecticut General Statutes Sections 49-41a and 49-42. Other sections of the CGS and Public Acts may also apply, and the Contractor shall comply with such applicable sections, whether such sections are contained herein.

6.02 *Insurance – General Provisions*

SC-6.02 Delete Paragraph 6.02.E. and insert the following in its place:

- E. Upon request by Contractor, Owner shall also provide other evidence of insurance (if any), including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, and full disclosure of all relevant exclusions. In any documentation furnished under this provision, Owner may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those relevant to this Contract.

SC-6.02 Delete Paragraph 6.02.K. and insert the following in its place:

- K. Without prejudice to any other right or remedy, if Contractor has failed to obtain required insurance, the Owner may elect (but is in no way obligated) to obtain equivalent insurance to protect Owner's interests at the expense of the Contractor who was required to provide such coverage, and the Contract Price will be adjusted accordingly.

SC-6.02 Delete Paragraph 6.02.N. and insert the following in its place:

- N. All the policies of insurance required to be purchased and maintained under this Contract by Contractor will contain a provision or endorsement that the coverage afforded will not be canceled, or renewal refused, until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured and Engineer.

6.03 *Contractor's Insurance*

SC-6.03 Add the following paragraph immediately after Paragraph 6.03.B.5:

6. If any policy is written on a claim made basis, an extended reporting period of at least 36 months after Substantial Completion is required.

SC-6.03 Supplement Paragraph 6.03 with the following provisions after Paragraph 6.03.C:

- D. *Other Additional Insureds:* As a supplement to the provisions of Paragraph 6.03.C of the General Conditions, the commercial general liability, automobile liability, umbrella or excess, builder's risk, and unmanned aerial vehicle liability policies must include as additional insureds (in addition to Owner and Engineer) the following: **State of Connecticut**
- E. *Workers' Compensation and Employer's Liability:* Contractor shall purchase and maintain statutory workers' compensation and employer's liability insurance, including, as applicable, United States Longshoreman and Harbor Workers' Compensation Act, Jones Act, stop-gap employer's liability coverage for monopolistic states, and foreign voluntary workers' compensation (from available sources, notwithstanding the jurisdictional requirement of Paragraph 6.02.B of the General Conditions).

Workers' Compensation and Related Policies	Policy limits of not less than:
Workers' Compensation	
State	Statutory
Applicable Federal (e.g., Longshoreman's)	Statutory
Foreign voluntary workers' compensation	Statutory
Employer's Liability	
Bodily injury, each accident	\$100,000
Bodily injury by disease, each employee	\$100,000
Bodily injury/disease aggregate	\$500,000

- F. *Commercial General Liability—Claims Covered:* Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against claims for:
1. damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees,
 2. damages insured by reasonably available personal injury liability coverage, and
 3. damages because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.
- G. *Commercial General Liability—Form and Content:* Contractor's commercial liability policy must be written on a 1996 (or later) Insurance Services Organization, Inc. (ISO) commercial general liability form (occurrence form) and include the following coverages and endorsements:
1. Products and completed operations coverage.
 - a. Such insurance must be maintained for three years after final payment.
 - b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.
 2. Blanket contractual liability coverage, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.
 3. Severability of interests and no insured-versus-insured or cross-liability exclusions.
 4. Underground, explosion, and collapse coverage.
 5. Personal injury coverage.
 6. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together). If Contractor demonstrates to Owner that the specified ISO endorsements are not commercially available, then Contractor may satisfy this requirement by providing equivalent endorsements.
 7. For design professional additional insureds, ISO Endorsement CG 20 32 07 04 "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.

- H. *Commercial General Liability—Excluded Content:* The commercial general liability insurance policy, including its coverages, endorsements, and incorporated provisions, must not include any of the following:
1. Any modification of the standard definition of “insured contract” (except to delete the railroad protective liability exclusion if Contractor is required to indemnify a railroad or others with respect to Work within 50 feet of railroad property).
 2. Any exclusion for water intrusion or water damage.
 3. Any provisions resulting in the erosion of insurance limits by defense costs other than those already incorporated in ISO form CG 00 01.
 4. Any exclusion of coverage relating to earth subsidence or movement.
 5. Any exclusion for the insured’s vicarious liability, strict liability, or statutory liability (other than worker’s compensation).
 6. Any limitation or exclusion based on the nature of Contractor’s work.
 7. Any professional liability exclusion broader in effect than the most recent edition of ISO form CG 22 79.
- I. *Commercial General Liability—Minimum Policy Limits*

Commercial General Liability	Policy limits of not less than:
General Aggregate	\$2,000,000
Products—Completed Operations Aggregate	\$2,000,000
Personal and Advertising Injury	\$1,000,000
Bodily Injury and Property Damage—Each Occurrence	\$1,000,000

- J. *Automobile Liability:* Contractor shall purchase and maintain automobile liability insurance 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. The automobile liability policy must be written on an occurrence basis.

Automobile Liability	Policy limits of not less than:
Combined Single Limit	
Combined Single Limit (Bodily Injury and Property Damage)	\$1,000,000

- K. *Umbrella or Excess Liability:* Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer’s liability, commercial general liability, and automobile liability insurance described in the Paragraphs above. The coverage afforded must be at least as broad as that of each and every one of the underlying policies.

Excess or Umbrella Liability	Policy limits of not less than:
Each Occurrence	\$3,000,000
General Aggregate	\$3,000,000

- L. *Using Umbrella or Excess Liability Insurance to Meet CGL and Other Policy Limit Requirements:* Not applicable.
- M. *Contractor's Pollution Liability Insurance:* Contractor shall purchase and maintain a policy covering third-party injury and property damage, including cleanup costs, as a result of pollution conditions arising from Contractor's operations and completed operations. This insurance must be maintained for no less than three years after final completion.

Contractor's Pollution Liability	Policy limits of not less than:
Each Occurrence/Claim	\$1,000,000
General Aggregate	\$1,000,000

- N. *Contractor's Professional Liability Insurance:* Not applicable.
- O. *Railroad Protective Liability Insurance:* Not applicable.
- P. *Unmanned Aerial Vehicle Liability Insurance:* Not applicable.
- Q. *Owner's Protective Liability Insurance Policy:* Contractor shall purchase and maintain a policy for and in the name of the Owner. This policy shall protect the Owner, its officers, agents, employees, heirs and assigns from claims for bodily injury, personal injury, and property damage arising from the Contractor's or his Subcontractor's execution of the work.

Owner's Protective Liability Insurance	Policy limits of not less than:
Each Occurrence	\$1,000,000
General Aggregate	\$2,000,000

6.05 Property Losses; Subrogation

SC-6.05 Delete Paragraphs 6.05.A.1 through 6.05.C.

SC-6.05 Amend Paragraph 6.05.D. to add the word "solely" after the word "Contractor shall be" in the first sentence.

ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

7.02 *Supervision and Superintendence*

SC-7.02 Add the following language at the end of the last sentence of Paragraph 7.02.B:

The Contractor's resident superintendent shall be able to read and speak English in a competent manner.

SC-7.02 Add the following new paragraph immediately after Paragraph 7.02.B:

- C. The Contractor shall assign to the Project only personnel who are careful and competent to perform the work assigned to them. At the demand of the Owner, the Contractor shall remove any person employed by the Contractor on the Project who does not perform the Work, as determined by the Engineer, in conformance with the requirements of the Technical Specifications and other Contract Documents or who becomes physically or

verbally abusive to the Owner, the Engineer or any of their designated representatives or to any representative of a State or local agency having jurisdiction over the Project. Following such a demand, such person shall not work again on the Project without the prior written consent of the Owner. Should the Contractor, following such a demand for removal, continue to employ or again employ such person on the Project without the required consent of the Owner, the Owner may withhold all estimated payments that are or may become due to the Contractor for the Project, or the Owner may shut down the Project (while Contract Time continues to accrue) until the Contractor has complied with the Owner's demand concerning such person.

7.03 *Labor; Working Hours*

SC-7.03 Amend Paragraph 7.03.B. to add the words "and liable" after "fully responsible" in the first sentence.

SC-7.03 Add the following new subparagraphs immediately after Paragraph 7.03.C:

1. Regular working hours will be 7:00am to 5:00pm.
2. Legal Holidays include: New Year's Day, Martin Luther King, Jr. Day, Lincoln's Birthday, Washington's Birthday, Good Friday, Memorial Day, Independence Day, Labor Day, Columbus Day, Veteran's Day, Thanksgiving Day, Christmas Day.

7.05 *"Or Equals"*

SC-7.05 Delete Paragraph 7.05.D and insert the following in its place:

- D. Effect of Engineer's Determination: Neither approval nor denial of an "or-equal" request shall result in any change in Contract Price or Contract Time. The Engineer's denial of an "or-equal" request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents.

7.07 *Concerning Subcontractors and Suppliers*

SC-7.07 Amend Paragraph 7.07.F to delete the word "shall" and replace with "may".

SC-7.07 Add the following new paragraph immediately after Paragraph 7.07.M:

- N. The Contractor shall perform with his own organization and with the assistance of workers under his immediate superintendence Work amounting to not less than 50 percent of the original total Contract value for the Project, exclusive of specialty items not commonly found in contracts for similar work or which require highly specialized knowledge, craftsmanship or equipment, not ordinarily available in the organization of contractors performing work of the character embraced in the Contract. Specialty items, if any, shall be specified elsewhere.

7.10 *Taxes*

SC-7.10 Add the following new paragraph immediately after Paragraph 7.10.A:

- B. Owner is exempt from payment of sales and compensating use taxes of the State of **Connecticut** and of cities and counties thereof on all materials to be permanently incorporated into the Work.
1. Owner will furnish the required certificates of tax exemption to Contractor for use in the purchase of supplies and materials to be incorporated into the Work.

2. Owner's exemption does not apply to construction tools, machinery, equipment, or other property purchased by or leased by Contractor, or to supplies or materials not incorporated into the Work.
3. The Contractor may be exempt from payment of Federal Transportation Taxes in accordance with the provisions of Revenue Ruling 55-162 which exempts a state or political subdivision thereof from the Federal Transportation Tax on construction materials consigned to construction projects. Therefore, the Contractor will be authorized to consign to the Owner in care of the Contractor any materials for shipment to the site which will be incorporated in the Work.
4. The Federal Transportation Tax exemption applies only to construction materials and does not cover any transportation tax on fuel, lubricants, spare parts, and items of construction equipment belonging to the Contractor which will not be permanently incorporated in the Work. The Contractor shall pay all transportation costs and demurrage which may be incurred in connection with the furnishing of all materials to the Project.
5. The consignment authority as granted by the Owner is to the Contractor. Should the Contractor employ Subcontractors and others who furnish construction materials which are to be incorporated in the Work, it will be necessary for the Contractor to authorize the consignment of such materials to the Owner in care of the Contractor, for shipment to the site. The Contractor shall be held responsible for the extension of this consignment authority.

7.11 *Laws and Regulations*

SC-7.11 Add the new paragraphs immediately after Paragraph 7.11.C:

D. Non-Discrimination and Equal Employment Opportunity

1. The Contractor will not discriminate or permit discrimination against any person or group of persons on the grounds of race, color, religious creed, age, marital status, national origin, sex, sexual orientation, mental retardation, or physical disability, including, but not limited to, blindness, unless it is shown by such Contractor that such disability prevents performance of the work involved in any manner prohibited by the law of the United States or of the State of Connecticut, and further agrees to provide the State Commission on Human Rights and Opportunities with such information requested by the Commission concerning the employment practices and procedures of the Contractor as relate to the provisions of this Supplementary Condition.
2. The Contractor's attention is specifically directed toward the need for compliance, both by him and by each of his Subcontractors, with provisions of the following Laws, Acts, Rules and Regulations:
 - a. Chapter 814C of the Connecticut General Statutes as amended to date "Fair Employment Practices".
 - b. All other applicable Federal and State Laws, Acts, Rules and Regulations pertaining to non-discrimination and equal employment opportunity, including but not limited to Title VI of the Civil Rights Act of 1964 as amended and Executive Orders 11246 and 11375 as supplemented and amended.

3. This Contract may be canceled, terminated, or suspended by the Owner for violation or non-compliance with any applicable State or Federal law, Act, rule and Regulation, or requirement of these Contract Documents, concerning non-discrimination and equal employment opportunity.

E. Executive Orders

1. Comply with the following orders, guidelines, and rules:
 - a. State of Connecticut Executive Order No. Three.
 - b. Guidelines and Rules of State Labor Commissioner Implementing Governor's Executive Order No. Three.
 - c. State of Connecticut Executive Order No. Sixteen, Violence in the Workplace Prevention.
 - d. State of Connecticut Executive Order No. Seventeen.

F. Wage Rates

1. If the provisions of Section 31-53 of the General Statutes of Connecticut, as amended, apply to this Contract, then the Contractor shall comply with the following:
 - a. "The wages paid on an hourly basis to any mechanic, laborer or workman employed upon the work herein contracted to be done and the amount of payment or contribution paid or payable on behalf of each such employee to any employee welfare fund, as defined in subsection (h) of Section 31-53 of the General Statutes, shall be at a rate equal to the rate customary or prevailing for the same work in the same trade or occupation in the town in which such public works project is being constructed. Any contractor who is not obligated by agreement to make payment or contribution on behalf of such employees to any such employee welfare fund shall pay to each employee as part of his wages the amount of payment or contribution for his classification on each pay day."

“(g) The provisions of this section shall not apply where the total cost of all work to be performed by all contractors and subcontractors in connection with new construction of any public works project is less than four hundred thousand dollars or where the total cost of all work to be performed by all contractors and subcontractors in connection with any remodeling, refinishing, refurbishing, rehabilitation, alteration or repair of any public works project is less than one hundred thousand dollars.”
 - b. For all labor, the wages paid shall be at least the minimum rate established for the Project by the State Labor Department.
 - c. It is the Contractor's responsibility to obtain wage rate decisions for any work classifications not included in attached prevailing wage rate schedules.

G. Posting Wage Rates

1. If the provisions of Section 31-53 of the General Statutes of Connecticut, as amended, apply to this Contract, then the Contractor shall post at conspicuous points on the site of the Project a schedule showing all determined wage rates and all authorized deductions, if any, from wages to be paid.

7.18 *Indemnification*

SC-7.18 Amend Paragraph 7.18.A to delete the words “indemnify and hold harmless” and replace with “indemnify, defend, and hold harmless”.

ARTICLE 8—OTHER WORK AT THE SITE

8.03 *Legal Relationships*

SC-8.03 Amend Paragraph 8.03.A to delete the word “shall” and replace with “may” in the first sentence.

ARTICLE 9—OWNER’S RESPONSIBILITIES

No Supplementary Conditions in this Article.

ARTICLE 10—ENGINEER’S STATUS DURING CONSTRUCTION

10.03 *Resident Project Representative*

SC-10.03 Add the following new paragraphs immediately after Paragraph 10.03.B:

- C. The Resident Project Representative (RPR) will be Engineer's representative at the Site. RPR's dealings in matters pertaining to the Work in general will be with Engineer and Contractor. RPR's dealings with Subcontractors will only be through or with the full knowledge or approval of Contractor. The RPR will:
 - 1. *Conferences and Meetings:* Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences, and other Project-related meetings (but not including Contractor’s safety meetings), and as appropriate prepare and circulate copies of minutes thereof.
 - 2. *Safety Compliance:* Comply with Site safety programs, as they apply to RPR, and if required to do so by such safety programs, receive safety training specifically related to RPR’s own personal safety while at the Site.
 - 3. *Liaison*
 - a. Serve as Engineer’s liaison with Contractor. Working principally through Contractor’s authorized representative or designee, assist in providing information regarding the provisions and intent of the Contract Documents.
 - b. Assist Engineer in serving as Owner’s liaison with Contractor when Contractor’s operations affect Owner’s on-Site operations.
 - c. Assist in obtaining from Owner additional details or information, when required for Contractor’s proper execution of the Work.
 - 4. *Review of Work; Defective Work*
 - a. Conduct on-Site part-time observations of the Work to assist Engineer in determining, to the extent set forth in Paragraph 10.02, if the Work is in general proceeding in accordance with the Contract Documents.

- b. Observe whether any Work in place appears to be defective during on-Site visits.
- c. Observe whether any Work in place should be uncovered for observation, or requires special testing, inspection or approval.

5. *Inspections and Tests*

- a. Observe Contractor-arranged inspections required by Laws and Regulations, including but not limited to those performed by public or other agencies having jurisdiction over the Work.
- b. Accompany visiting inspectors representing public or other agencies having jurisdiction over the Work.

6. *Payment Requests: Review Applications for Payment with Contractor.*

7. *Completion*

- a. Participate in Engineer’s visits regarding Substantial Completion.
- b. Assist in the preparation of a punch list of items to be completed or corrected.
- c. Participate in Engineer’s visit to the Site in the company of Owner and Contractor regarding completion of the Work, and prepare a final punch list of items to be completed or corrected by Contractor.
- d. Observe whether items on the final punch list have been completed or corrected.

D. The RPR will not:

- 1. Authorize any deviation from the Contract Documents or substitution of materials or equipment (including “or-equal” items).
- 2. Exceed limitations of Engineer’s authority as set forth in the Contract Documents.
- 3. Undertake any of the responsibilities of Contractor, Subcontractors, or Suppliers.
- 4. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of construction.
- 5. Advise on, issue directions regarding, or assume control over security or safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor.
- 6. Participate in specialized field or laboratory tests or inspections conducted off-site by others except as specifically authorized by Engineer.
- 7. Authorize Owner to occupy the Project in whole or in part.

10.06 *Decisions on Requirements of Contract Documents and Acceptability of Work.*

SC-10.06 Amend Paragraph 10.06.A to delete the word “Owner” from the second sentence.

ARTICLE 11—CHANGES TO THE CONTRACT

11.02 *Change Orders*

SC-11.02 Amend Paragraph 11.02.B to delete the words “Owner or” from the first sentence.

11.04 *Field Orders*

SC-11.04 Amend Paragraph 11.04.A to delete the words “Owner and also on” from the second sentence.

11.09 *Change Proposals*

SC-11.09 Amend Paragraph 11.09.B.5 to delete the words “Owner and” and “Owner or” from the first sentence.

ARTICLE 12—CLAIMS

No suggested Supplementary Conditions in this Article.

ARTICLE 13—COST OF WORK; ALLOWANCES, UNIT PRICE WORK

13.01 *Cost of the Work*

SC-13.01 Supplement Paragraph 13.01.B.4 by adding the following to the end of the last sentence:
, which are approved in writing by Owner.

SC-13.01 Supplement Paragraph 13.01.B.5.c.(2) by adding the following sentence:

The equipment rental rate book that governs the included costs for the rental of machinery and equipment owned by Contractor (or a related entity) under the Cost of the Work provisions of this Contract is the most current edition of **Rental Rate Blue Book**.

SC-13.01 Supplement Paragraph 13.01.C.2 by adding the following definition of small tools and hand tools:

- a. For purposes of this paragraph, “small tools and hand tools” means any tool or equipment whose current price if it were purchased new at retail would be less than \$1,000.

13.03 *Unit Price Work*

SC-13.03 Delete Paragraph 13.03.E in its entirety and insert the following in its place:

E. *Adjustments in Unit Price*

1. Contractor or Owner shall be entitled to an adjustment in the unit price with respect to an item of Unit Price Work if:
 - a. the extended price of a particular item of Unit Price Work amounts to **10** percent or more of the Contract Price (based on estimated quantities at the time of Contract formation) and the variation in the quantity of that particular item of Unit Price Work actually furnished or performed by Contractor differs by more than **25** percent from the estimated quantity of such item indicated in the Agreement; and
 - b. Contractor’s unit costs to perform the item of Unit Price Work have changed materially and significantly as a result of the quantity change.
2. The adjustment in unit price will account for and be coordinated with any related changes in quantities of other items of Work, and in Contractor’s costs to perform such

other Work, such that the resulting overall change in Contract Price is equitable to Owner and Contractor.

3. Adjusted unit prices will apply to all units of that item.

ARTICLE 14—TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK

14.05 Uncovering Work

- SC-14.05 Amend Paragraph 14.05.C.2 to delete the word “shall” and replace with “may” in the first sentence.

ARTICLE 15—PAYMENTS TO CONTRACTOR, SET OFFS; COMPLETIONS; CORRECTION PERIOD

15.01 Progress Payments

- SC-15.01 Add the following language at the end of the last sentence of Paragraph 15.01.B.1:

Applications for Progress Payments shall be submitted on EJCDC form C 620 (2013 Edition) or AIA forms G702 and G703 (latest editions).

- SC-15.01 Delete Paragraph 15.01.D in its entirety and insert the following in its place:

D. Payment Becomes Due

1. Thirty days after presentation of the Application for Payment to Owner with Engineer’s recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

- SC-15.01 Delete Paragraph 15.01.E.3 in its entirety and insert the following in its place:

Upon a subsequent determination that Owner’s refusal of payment was not justified, the amount wrongfully withheld will be treated as an amount due as determined by Paragraph 15.01.D.1.

15.03 Substantial Completion

- SC-15.03 Amend Paragraph 15.03.D. to delete the last sentence in its entirety.

15.04 Partial Use or Occupancy

- SC-15.04 Delete Paragraph 15.04.A.4. in its entirety.

15.07 Waiver of Claims

- SC-15.07 Delete Paragraph 15.07.A. in its entirety and insert the following in its place:

- A. Owner reserves all claims or rights after final payment.

ARTICLE 16—SUSPENSION OF WORK AND TERMINATION

16.01 Owner May Suspend Work

SC-16.01 Delete Paragraph 16.01.A. in its entirety and insert the following in its place:

- 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 written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor may be entitled to an adjustment in the Contract Price or an extension of the Contract Times directly attributable to any such suspension. Any Change Proposal seeking such adjustments must be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 Owner May Terminate for Cause

SC-16.02 Amend Paragraph 16.02.A.1. to delete the word “persistent” in the first sentence.

SC-16.02 Amend Paragraph 16.02.A.4. to delete the word “repeated” in the first sentence.

ARTICLE 17—FINAL RESOLUTIONS OF DISPUTES

17.01 Methods and Procedures

SC-17.01 Add the following new paragraph immediately after Paragraph 17.01.A.2:

- 3. Notwithstanding any applicable statute of limitations, a party giving notice under Paragraph 18.01 shall commence an action on the Claim within one year of giving such notice. Failure to do so will not be considered timely and shall result in the Claim being time-barred.

SC-17.01 Add the following new paragraph immediately after Paragraph 17.01.

17.02 Arbitration

- A. All matters subject to final resolution under this Article will be settled by arbitration administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules (subject to the conditions and limitations of this Paragraph SC-17.02). Any controversy or claim in the amount of \$100,000 or less will be settled in accordance with the American Arbitration Association’s supplemental rules for Fixed Time and Cost Construction Arbitration. This agreement to arbitrate will be specifically enforceable under the prevailing law of any court having jurisdiction.
- B. The demand for arbitration will be filed in writing with the other party to the Contract and with the selected arbitration administrator, and a copy will be sent to Engineer for information. The demand for arbitration will be made within the specific time required in Article 17, or if no specified time is applicable within a reasonable time after the matter in question has arisen, and in no event will any such demand be made after the date when institution of legal or equitable proceedings based on such matter in question would be barred by the applicable statute of limitations.
- C. The arbitrator(s) must be licensed engineers, contractors, attorneys, or construction managers. Hearings will take place pursuant to the standard procedures of the Construction

Arbitration Rules that contemplate in-person hearings. The arbitrators will have no authority to award punitive or other damages not measured by the prevailing party's actual damages, except as may be required by statute or the Contract. Any award in an arbitration initiated under this clause will be limited to monetary damages and include no injunction or direction to any party other than the direction to pay a monetary amount.

- D. The Arbitrators will have the authority to allocate the costs of the arbitration process among the parties, but will only have the authority to allocate attorneys' fees if a specific Law or Regulation or this Contract permits them to do so.
- E. The award of the arbitrators must be accompanied by a reasoned written opinion and a concise breakdown of the award. The written opinion will cite the Contract provisions deemed applicable and relied on in making the award.
- F. The parties agree that failure or refusal of a party to pay its required share of the deposits for arbitrator compensation or administrative charges will constitute a waiver by that party to present evidence or cross-examine witness. In such event, the other party shall be required to present evidence and legal argument as the arbitrator(s) may require for the making of an award. Such waiver will not allow for a default judgment against the non-paying party in the absence of evidence presented as provided for above.
- G. No arbitration arising out of or relating to the Contract will include by consolidation, joinder, or in any other manner any other individual or entity (including Engineer, and Engineer's consultants and the officers, directors, partners, agents, employees or consultants of any of them) who is not a party to this Contract unless:
 - 1. the inclusion of such other individual or entity will allow complete relief to be afforded among those who are already parties to the arbitration;
 - 2. such other individual or entity is substantially involved in a question of law or fact which is common to those who are already parties to the arbitration, and which will arise in such proceedings;
 - 3. such other individual or entity is subject to arbitration under a contract with either Owner or Contractor, or consents to being joined in the arbitration; and
 - 4. the consolidation or joinder is in compliance with the arbitration administrator's procedural rules.
- H. The award will be final. Judgment may be entered upon it in any court having jurisdiction thereof, and it will not be subject to modification or appeal, subject to provisions of the Laws and Regulations relating to vacating or modifying an arbitral award.
- I. Except as may be required by Laws or Regulations, neither party nor an arbitrator may disclose the existence, content, or results of any arbitration hereunder without the prior written consent of both parties, with the exception of any disclosure required by Laws and Regulations or the Contract. To the extent any disclosure is allowed pursuant to the exception, the disclosure must be strictly and narrowly limited to maintain confidentiality to the extent possible.

ARTICLE 18—MISCELLANEOUS

18.04 Limitation of Damages

SC-18.04 Add the following language at the end of the last sentence of Paragraph 18.04.A:
, or any other consequential damages whatsoever.

Add the following new Article

SC-19.01 Funding Agency Requirements

19.01 *Funding Agency Bidding and Contracting Requirements*

- A. The Funding Agency Bidding and Contracting Requirements in Section 00 73 40 apply to all work to be performed under this Contract and those provisions supersede any conflicting provisions of this Contract.
- B. The Contractor shall cooperate with and allow access to the site to designated representatives of the Funding Agency.

FUNDING AGENCY REQUIREMENTS

The contractor who is selected to perform this State project must comply with C.G.S. § 4a-60, 4a-60a, 4a-60g, and 46a-68b through 46a-68f, inclusive, as amended by June 2015 Special Session Public Act 15-5.

Sec. 4a-60. (Formerly Sec. 4-114a). Nondiscrimination and affirmative action provisions in contracts of the state and political subdivisions other than municipalities.

- (a) Every contract to which an awarding agency is a party, every quasi-public agency project contract and every municipal public works contract shall contain the following provisions:
- (1) The contractor agrees and warrants that in the performance of the contract such contractor will not discriminate or permit discrimination against any person or group of persons on the grounds of race, color, religious creed, age, marital status, national origin, ancestry, sex, gender identity or expression, intellectual disability, mental disability or physical disability, including, but not limited to, blindness, unless it is shown by such contractor that such disability prevents performance of the work involved, in any manner prohibited by the laws of the United States or of the state of Connecticut; and the contractor further agrees to take affirmative action to insure that applicants with job-related qualifications are employed and that employees are treated when employed without regard to their race, color, religious creed, age, marital status, national origin, ancestry, sex, gender identity or expression, intellectual disability, mental disability or physical disability, including, but not limited to, blindness, unless it is shown by such contractor that such disability prevents performance of the work involved;
 - (2) The contractor agrees, in all solicitations or advertisements for employees placed by or on behalf of the contractor, to state that it is an "affirmative action-equal opportunity employer" in accordance with regulations adopted by the Commission on Human Rights and Opportunities;
 - (3) The contractor agrees to provide each labor union or representative of workers with which such contractor has a collective bargaining agreement or other contract or understanding and each vendor with which such contractor has a contract or understanding, a notice to be provided by the Commission on Human Rights and Opportunities advising the labor union or workers' representative of the contractor's commitments under this section, and to post copies of the notice in conspicuous places available to employees and applicants for employment;
 - (4) The contractor agrees to comply with each provision of this section and sections 46a-68e and 46a-68f and with each regulation or relevant order issued by said commission pursuant to sections 46a-56, as amended by this act, 46a-68e, 46a-68f and 46a-86; and
 - (5) The contractor agrees to provide the Commission on Human Rights and Opportunities with such information requested by the commission, and permit access to pertinent books, records and accounts, concerning the employment practices and procedures of the contractor as relate to the provisions of this section and section 46a-56, as amended by this act.

- (b) If the contract is a public works contract, municipal public works contract or contract for a quasi-public agency project, the contractor agrees and warrants that he or she will make good faith efforts to employ minority business enterprises as subcontractors and suppliers of materials on such public works or quasi-public agency project.
- (c)
- (1) Any contractor who has one or more contracts with an awarding agency or who is a party to a municipal public works contract or a contract for a quasi-public agency project, where any such contract is valued at less than fifty thousand dollars for each year of the contract, shall provide the awarding agency, or in the case of a municipal public works or quasi-public agency project contract, the Commission on Human Rights and Opportunities, with a written or electronic representation that complies with the nondiscrimination agreement and warranty under subdivision (1) of subsection (a) of this section, provided if there is any change in such representation, the contractor shall provide the updated representation to the awarding agency or commission not later than thirty days after such change.
 - (2) Any contractor who has one or more contracts with an awarding agency or who is a party to a municipal public works contract or a contract for a quasi-public agency project, where any such contract is valued at fifty thousand dollars or more for any year of the contract, shall provide the awarding agency, or in the case of a municipal public works or quasi-public agency project contract, the Commission on Human Rights and Opportunities, with any one of the following:
 - (A) Documentation in the form of a company or corporate policy adopted by resolution of the board of directors, shareholders, managers, members or other governing body of such contractor that complies with the nondiscrimination agreement and warranty under subdivision (1) of subsection (a) of this section;
 - (B) Documentation in the form of a company or corporate policy adopted by a prior resolution of the board of directors, shareholders, managers, members or other governing body of such contractor if (i) the prior resolution is certified by a duly authorized corporate officer of such contractor to be in effect on the date the documentation is submitted, and (ii) the head of the awarding agency, or a designee, or in the case of a municipal public works or quasi-public agency project contract, the executive director of the Commission on Human Rights and Opportunities or a designee, certifies that the prior resolution complies with the nondiscrimination agreement and warranty under subdivision (1) of subsection (a) of this section; or
 - (C) Documentation in the form of an affidavit signed under penalty of false statement by a chief executive officer, president, chairperson or other corporate officer duly authorized to adopt company or corporate policy that certifies that the company or corporate policy of the contractor complies with the nondiscrimination agreement and warranty under subdivision (1) of subsection (a) of this section and is in effect on the date the affidavit is signed.
 - (3) No awarding agency, or in the case of a municipal public works contract, no municipality, or in the case of a quasi-public agency project contract, no entity,

shall award a contract to a contractor who has not provided the representation or documentation required under subdivisions (1) and (2) of this subsection, as applicable. After the initial submission of such representation or documentation, the contractor shall not be required to resubmit such representation or documentation unless there is a change in the information contained in such representation or documentation. If there is any change in the information contained in the most recently filed representation or updated documentation, the contractor shall submit an updated representation or documentation, as applicable, either (A) not later than thirty days after the effective date of such change, or (B) upon the execution of a new contract with the awarding agency, municipality or entity, as applicable, whichever is earlier. Such contractor shall also certify, in accordance with subparagraph (B) or (C) of subdivision (2) of this subsection, to the awarding agency or commission, as applicable, not later than fourteen days after the twelve-month anniversary of the most recently filed representation, documentation or updated representation or documentation, that the representation on file with the awarding agency or commission, as applicable, is current and accurate.

- (d) For the purposes of this section, "contract" includes any extension or modification of the contract, "contractor" includes any successors or assigns of the contractor, "marital status" means being single, married as recognized by the state of Connecticut, widowed, separated or divorced, and "mental disability" means one or more mental disorders, as defined in the most recent edition of the American Psychiatric Association's "Diagnostic and Statistical Manual of Mental Disorders", or a record of or regarding a person as having one or more such disorders. For the purposes of this section, "contract" does not include a contract where each contractor is (1) a political subdivision of the state, including, but not limited to, a municipality, unless the contract is a municipal public works contract or quasi-public agency project contract, (2) any other state, as defined in section 1-267, (3) the federal government, (4) a foreign government, or (5) an agency of a subdivision, state or government described in subdivision (1), (2), (3) or (4) of this subsection.
- (e) For the purposes of this section, "minority business enterprise" means any small contractor or supplier of materials fifty-one per cent or more of the capital stock, if any, or assets of which is owned by a person or persons: (1) Who are active in the daily affairs of the enterprise, (2) who have the power to direct the management and policies of the enterprise, and (3) who are members of a minority, as such term is defined in subsection (a) of section 32-9n; and "good faith" means that degree of diligence which a reasonable person would exercise in the performance of legal duties and obligations. "Good faith efforts" shall include, but not be limited to, those reasonable initial efforts necessary to comply with statutory or regulatory requirements and additional or substituted efforts when it is determined that such initial efforts will not be sufficient to comply with such requirements.
- (f) Determination of the contractor's good faith efforts shall include, but shall not be limited to, the following factors: The contractor's employment and subcontracting policies, patterns and practices; affirmative advertising, recruitment and training; technical assistance activities and such other reasonable activities or efforts as the Commission on Human Rights and Opportunities may prescribe that are designed to ensure the participation of minority business enterprises in public works projects.

- (g) The contractor shall develop and maintain adequate documentation, in a manner prescribed by the Commission on Human Rights and Opportunities, of its good faith efforts.
- (h) The contractor shall include the provisions of subsections (a) and (b) of this section in every subcontract or purchase order entered into in order to fulfill any obligation of a contract with the state, and in every subcontract entered into in order to fulfill any obligation of a municipal public works contract or contract for a quasi-public agency project, and such provisions shall be binding on a subcontractor, vendor or manufacturer, unless exempted by regulations or orders of the Commission on Human Rights and Opportunities. The contractor shall take such action with respect to any such subcontract or purchase order as the commission may direct as a means of enforcing such provisions, including sanctions for noncompliance in accordance with section 46a-56; provided, if such contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the commission regarding a state contract, the contractor may request the state of Connecticut to enter into any such litigation or negotiation prior thereto to protect the interests of the state and the state may so enter.

Sec. 4a-60a. Contracts of the state and political subdivisions, other than municipalities, to contain provisions re nondiscrimination on the basis of sexual orientation.

- (a) Every contract to which an awarding agency is a party, every contract for a quasi-public agency project and every municipal public works contract shall contain the following provisions:
 - (1) The contractor agrees and warrants that in the performance of the contract such contractor will not discriminate or permit discrimination against any person or group of persons on the grounds of sexual orientation, in any manner prohibited by the laws of the United States or of the state of Connecticut, and that employees are treated when employed without regard to their sexual orientation;
 - (2) The contractor agrees to provide each labor union or representative of workers with which such contractor has a collective bargaining agreement or other contract or understanding and each vendor with which such contractor has a contract or understanding, a notice to be provided by the Commission on Human Rights and Opportunities advising the labor union or workers' representative of the contractor's commitments under this section, and to post copies of the notice in conspicuous places available to employees and applicants for employment;
 - (3) The contractor agrees to comply with each provision of this section and with each regulation or relevant order issued by said commission pursuant to section 46a-56; and
 - (4) The contractor agrees to provide the Commission on Human Rights and Opportunities with such information requested by the commission, and permit access to pertinent books, records and accounts, concerning the employment practices and procedures of the contractor which relate to the provisions of this section and section 46a-56.
- (b)

- (1) Any contractor who has one or more contracts with an awarding agency or who is a party to a municipal public works contract or a contract for a quasi-public agency project, where any such contract is valued at less than fifty thousand dollars for each year of the contract, shall provide the awarding agency, or in the case of a municipal public works or quasi-public agency project contract, the Commission on Human Rights and Opportunities, with a written representation that complies with the nondiscrimination agreement and warranty under subdivision (1) of subsection (a) of this section.
- (2) Any contractor who has one or more contracts with an awarding agency or who is a party to a municipal public works contract or a contract for a quasi-public agency project, where any such contract is valued at fifty thousand dollars or more for any year of the contract, shall provide such awarding agency, or in the case of a municipal public works or quasi-public agency project contract, the Commission on Human Rights and Opportunities, with any of the following:
 - (A) Documentation in the form of a company or corporate policy adopted by resolution of the board of directors, shareholders, managers, members or other governing body of such contractor that complies with the nondiscrimination agreement and warranty under subdivision (1) of subsection (a) of this section;
 - (B) Documentation in the form of a company or corporate policy adopted by a prior resolution of the board of directors, shareholders, managers, members or other governing body of such contractor if (i) the prior resolution is certified by a duly authorized corporate officer of such contractor to be in effect on the date the documentation is submitted, and (ii) the head of the awarding agency, or a designee, or in the case of a municipal public works or quasi-public agency project contract, the executive director of the Commission on Human Rights and Opportunities or a designee, certifies that the prior resolution complies with the nondiscrimination agreement and warranty under subdivision (1) of subsection (a) of this section; or
 - (C) Documentation in the form of an affidavit signed under penalty of false statement by a chief executive officer, president, chairperson or other corporate officer duly authorized to adopt company or corporate policy that certifies that the company or corporate policy of the contractor complies with the nondiscrimination agreement and warranty under subdivision (1) of subsection (a) of this section and is in effect on the date the affidavit is signed.
- (3) No awarding agency, or in the case of a municipal public works contract, no municipality, or in the case of a quasi-public agency project contract, no entity, shall award a contract to a contractor who has not provided the representation or documentation required under subdivisions (1) and (2) of this subsection, as applicable. After the initial submission of such representation or documentation, the contractor shall not be required to resubmit such representation or documentation unless there is a change in the information contained in such representation or documentation. If there is any change in the information contained in the most recently filed representation or updated documentation, the contractor shall submit an updated representation or documentation, as

applicable, either (A) not later than thirty days after the effective date of such change, or (B) upon the execution of a new contract with the awarding agency, municipality, or entity, as applicable, whichever is earlier. Such contractor shall also certify, in accordance with subparagraph (B) or (C) of subdivision (2) of this subsection, to the awarding agency or commission, as applicable, not later than fourteen days after the twelve-month anniversary of the most recently filed representation, documentation or updated representation or documentation, that the representation on file with the awarding agency or commission, as applicable, is current and accurate.

- (4) For the purposes of this section, "contract" includes any extension or modification of the contract, and "contractor" includes any successors or assigns of the contractor. For the purposes of this section, "contract" does not include a contract where each contractor is (A) a political subdivision of the state, including, but not limited to, a municipality, unless the contract is a municipal public works contract or quasi-public agency project contract, (B) any other state, as defined in section 1-267, (C) the federal government, (D) a foreign government, or (E) an agency of a subdivision, state or government described in subparagraph (A), (B), (C) or (D) of this subdivision.
- (c) The contractor shall include the provisions of subsection (a) of this section in every subcontract or purchase order entered into in order to fulfill any obligation of a contract with the state, and in every subcontract entered into in order to fulfill any obligation of a municipal public works contractor contract for a quasi-public agency project, and such provisions shall be binding on a subcontractor, vendor or manufacturer unless exempted by regulations or orders of the Commission on Human Rights and Opportunities. The contractor shall take such action with respect to any such subcontract or purchase order as the commission may direct as a means of enforcing such provisions, including sanctions for noncompliance in accordance with section 46a-56, as amended by this act; provided, if such contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the commission regarding a state contract, the contractor may request the state of Connecticut to enter into any such litigation or negotiation prior thereto to protect the interests of the state and the state may so enter.

Sec. 4a-60g. (Formerly Sec. 32-9e). Set-aside program for small contractors and minority business enterprises.

- (a) As used in this section and sections 4a-60h to 4a-60j, inclusive, the following terms have the following meanings:
 - (1) "Small contractor" means any contractor, subcontractor, manufacturer, service company or nonprofit corporation (A) that maintains its principal place of business in the state, (B) that had gross revenues not exceeding fifteen million dollars in the most recently completed fiscal year prior to such application, and (C) that is independent. "Small contractor" does not include any person who is affiliated with another person if both persons considered together have a gross revenue exceeding fifteen million dollars.
 - (2) "Independent" means the viability of the enterprise of the small contractor does not depend upon another person, as determined by an analysis of the small

contractor's relationship with any other person in regards to the provision of personnel, facilities, equipment, other resources and financial support, including bonding.

- (3) "State agency" means each state board, commission, department, office, institution, council or other agency with the power to contract for goods or services itself or through its head.
- (4) "Minority business enterprise" means any small contractor (A) fifty-one per cent or more of the capital stock, if any, or assets of which are owned by a person or persons who (i) exercise operational authority over the daily affairs of the enterprise, (ii) have the power to direct the management and policies and receive the beneficial interest of the enterprise, (iii) possess managerial and technical competence and experience directly related to the principal business activities of the enterprise, and (iv) are members of a minority, as such term is defined in subsection (a) of section 32-9n, or are individuals with a disability, or (B) which is a nonprofit corporation in which fifty-one per cent or more of the persons who (i) exercise operational authority over the enterprise, (ii) possess managerial and technical competence and experience directly related to the principal business activities of the enterprise, (iii) have the power to direct the management and policies of the enterprise, and (iv) are members of a minority, as defined in this subsection, or are individuals with a disability.
- (5) "Affiliated" means the relationship in which a person directly, or indirectly through one or more intermediaries, controls, is controlled by or is under common control with another person.
- (6) "Control" means the power to direct or cause the direction of the management and policies of any person, whether through the ownership of voting securities, by contract or through any other direct or indirect means. Control shall be presumed to exist if any person, directly or indirectly, owns, controls, holds with the power to vote, or holds proxies representing, twenty per cent or more of any voting securities of another person.
- (7) "Person" means any individual, corporation, limited liability company, partnership, association, joint stock company, business trust, unincorporated organization or other entity.
- (8) "Individual with a disability" means an individual (A) having a physical or mental impairment that substantially limits one or more of the major life activities of the individual, which mental impairment may include, but is not limited to, having one or more mental disorders, as defined in the most recent edition of the American Psychiatric Association's "Diagnostic and Statistical Manual of Mental Disorders", or (B) having a record of such an impairment.
- (9) "Nonprofit corporation" means a nonprofit corporation incorporated pursuant to chapter 602 or any predecessor statutes thereto.
- (10) "Municipality" means any town, city, borough, consolidated town and city or consolidated town and borough.
- (11) "Quasi-public agency" means the Connecticut Health and Educational Facilities Authority, the Connecticut Higher Education Supplemental Loan Authority, the Connecticut Student Loan Foundation, the Connecticut Housing Finance Authority, the Connecticut Housing Authority, the Materials Innovation and Recycling Authority, the Connecticut Lottery Corporation, the Connecticut

Airport Authority, the Connecticut Health Insurance Exchange, the Connecticut Green Bank, the Connecticut Port Authority and the State Education Resource Center.

- (12) "Awarding agency" means a state agency or political subdivision of the state other than a municipality.
 - (13) "Public works contract" has the same meaning as provided in section 46a-68b, as amended by this act.
 - (14) "Municipal public works contract" means that portion of an agreement entered into on or after October 1, 2015, between any individual, firm or corporation and a municipality for the construction, rehabilitation, conversion, extension, demolition or repair of a public building, highway or other changes or improvements in real property, which is financed in whole or in part by the state, including, but not limited to, matching expenditures, grants, loans, insurance or guarantees but excluding any project of an alliance district, as defined in section 10-262u, as amended by this act, financed by state funding in an amount equal to fifty thousand dollars or less.
 - (15) "Quasi-public agency project" means the construction, rehabilitation, conversion, extension, demolition or repair of a building or other changes or improvements in real property pursuant to a contract entered into on or after October 1, 2015, which is financed in whole or in part by a quasi-public agency using state funds, including, but not limited to, matching expenditures, grants, loans, insurance or guarantees.
- (b)
- (1) It is found and determined that there is a serious need to help small contractors, minority business enterprises, nonprofit organizations and individuals with disabilities to be considered for and awarded state contracts for the purchase of goods and services, public works contracts, municipal public works contracts and contracts for quasi-public agency projects. Accordingly, the necessity of awarding such contracts in compliance with the provisions of this section, sections 4a-60h to 4a-60j, inclusive, and sections 32-9i to 32-9p, inclusive, for advancement of the public benefit and good, is declared as a matter of legislative determination.
 - (2) Notwithstanding any provisions of the general statutes, and except as set forth in this section, the head of each awarding agency shall set aside in each fiscal year, for award to small contractors, on the basis of competitive bidding procedures, contracts or portions of contracts for the construction, reconstruction or rehabilitation of public buildings, the construction and maintenance of highways and the purchase of goods and services. The total value of such contracts or portions thereof to be set aside by each such agency shall be at least twenty-five per cent of the total value of all contracts let by the head of such agency in each fiscal year, provided a contract for any goods or services which have been determined by the Commissioner of Administrative Services to be not customarily available from or supplied by small contractors shall not be included. Contracts or portions thereof having a value of not less than twenty-five per cent of the total value of all contracts or portions thereof to be set aside shall be reserved for awards to minority business enterprises.

- (3) Notwithstanding any provision of the general statutes, and except as provided in this section, on and after October 1, 2015, each municipality when awarding a municipal public works contract shall state in its notice of solicitation for competitive bids or request for proposals or qualifications for such contract that the general or trade contractor shall be required to comply with the provisions of this section and the requirements concerning nondiscrimination and affirmative action under sections 4a-60 and 4a-60a, as amended by this act. Any such contractor awarded a municipal public works contract shall, on the basis of competitive bidding procedures, (A) set aside at least twenty-five per cent of the total value of the state's financial assistance for such contract for award to subcontractors who are small contractors, and (B) of that portion to be set aside in accordance with subparagraph (A) of this subdivision, reserve a portion equivalent to twenty-five per cent of the total value of the contract or portion thereof to be set aside for awards to subcontractors who are minority business enterprises. The provisions of this section shall not apply to any municipality that has established a set-aside program pursuant to section 7-148u where the percentage of contracts set aside for minority business enterprises is equivalent to or exceeds the percentage set forth in this subsection.
 - (4) Notwithstanding any provision of the general statutes, and except as provided in this section, on and after October 1, 2015, any individual, firm or corporation that enters into a contract for a quasi-public agency project shall, prior to awarding such contract, notify the contractor to be awarded such project of the requirements of this section and the requirements concerning nondiscrimination and affirmative action under sections 4a-60 and 4a-60a, as amended by this act. Any such contractor awarded a contract for a quasi-public agency project shall, on the basis of competitive bidding procedures, (A) set aside at least twenty-five per cent of the total value of the state's financial assistance for such contract for award to subcontractors who are small contractors, and (B) of that portion to be set aside in accordance with subparagraph (A) of this subdivision, reserve a portion equivalent to twenty-five per cent of the total value of the contract or portions thereof to be set aside for awards to subcontractors who are minority business enterprises.
 - (5) Eligibility of nonprofit corporations under the provisions of this section shall be limited to predevelopment contracts awarded by the Commissioner of Housing for housing projects.
 - (6) In calculating the percentage of contracts to be set aside under subdivisions (2) to (4), inclusive, of this subsection, the awarding agency or contractor shall exclude any contract that may not be set aside due to a conflict with a federal law or regulation.
- (c) The head of any awarding agency may, in lieu of setting aside any contract or portions thereof, require any general or trade contractor or any other entity authorized by such agency to award contracts, to set aside a portion of any contract for subcontractors who are eligible for set-aside contracts under this section. Nothing in this subsection shall be construed to diminish the total value of contracts which are required to be set aside by any awarding agency pursuant to this section.
 - (d) The head of each awarding agency shall notify the Commissioner of Administrative Services of all contracts to be set aside pursuant to subdivision (2) of subsection (b) or

subsection (c) of this section at the time that bid documents for such contracts are made available to potential contractors.

- (e) The awarding authority shall require that a contractor or subcontractor awarded a contract or a portion of a contract under this section perform not less than thirty per cent of the work with the workforces of such contractor or subcontractor and shall require that not less than fifty per cent of the work be performed by contractors or subcontractors eligible for awards under this section. A contractor awarded a contract or a portion of a contract under this section shall not subcontract with any person with whom the contractor is affiliated. No person who is affiliated with another person shall be eligible for awards under this section if both affiliated persons considered together would not qualify as a small contractor or a minority business enterprise under subsection (a) of this section. The awarding authority shall require that a contractor awarded a contract pursuant to this section submit, in writing, an explanation of any subcontract to such contract that is entered into with any person that is not eligible for the award of a contract pursuant to this section, prior to the performance of any work pursuant to such subcontract.
- (f) The awarding authority may require that a contractor or subcontractor awarded a contract or a portion of a contract under this section furnish the following documentation: (1) A copy of the certificate of incorporation, certificate of limited partnership, partnership agreement or other organizational documents of the contractor or subcontractor; (2) a copy of federal income tax returns filed by the contractor or subcontractor for the previous year; and (3) evidence of payment of fair market value for the purchase or lease by the contractor or subcontractor of property or equipment from another contractor who is not eligible for set-aside contracts under this section.
- (g) The awarding authority or the Commissioner of Administrative Services or the Commission on Human Rights and Opportunities may conduct an audit of the financial, corporate and business records and conduct an investigation of any small contractor or minority business enterprise which applies for or is awarded a set-aside contract for the purpose of determining eligibility for awards or compliance with the requirements established under this section.
- (h) The provisions of this section shall not apply to (1) any awarding agency for which the total value of all contracts or portions of contracts of the types enumerated in subdivision (2) of subsection (b) of this section is anticipated to be equal to ten thousand dollars or less, or (2) any municipal public works contract or contract for a quasi-public agency project for which the total value of the contract is anticipated to be equal to fifty thousand dollars or less.
- (i) In lieu of a performance, bid, labor and materials or other required bond, a contractor or subcontractor awarded a contract under this section may provide to the awarding authority, and the awarding authority shall accept a letter of credit. Any such letter of credit shall be in an amount equal to ten per cent of the contract for any contract that is less than one hundred thousand dollars and in an amount equal to twenty-five per cent of the contract for any contract that exceeds one hundred thousand dollars.
- (j)
 - (1) Whenever the awarding agency has reason to believe that any contractor or subcontractor awarded a state set-aside contract has wilfully violated any provision of this section, the awarding agency shall send a notice to such contractor or subcontractor by certified mail, return receipt requested. Such

notice shall include: (A) A reference to the provision alleged to be violated; (B) a short and plain statement of the matter asserted; (C) the maximum civil penalty that may be imposed for such violation; and (D) the time and place for the hearing. Such hearing shall be fixed for a date not earlier than fourteen days after the notice is mailed. The awarding agency shall send a copy of such notice to the Commission on Human Rights and Opportunities.

- (2) The awarding agency shall hold a hearing on the violation asserted unless such contractor or subcontractor fails to appear. The hearing shall be held in accordance with the provisions of chapter 54. If, after the hearing, the awarding agency finds that the contractor or subcontractor has wilfully violated any provision of this section, the awarding agency shall suspend all set-aside contract payments to the contractor or subcontractor and may, in its discretion, order that a civil penalty not exceeding ten thousand dollars per violation be imposed on the contractor or subcontractor. If such contractor or subcontractor fails to appear for the hearing, the awarding agency may, as the facts require, order that a civil penalty not exceeding ten thousand dollars per violation be imposed on the contractor or subcontractor. The awarding agency shall send a copy of any order issued pursuant to this subsection by certified mail, return receipt requested, to the contractor or subcontractor named in such order. The awarding agency may cause proceedings to be instituted by the Attorney General for the enforcement of any order imposing a civil penalty issued under this subsection.

(k)

- (1) On or before January 1, 2000, the Commissioner of Administrative Services shall establish a process for certification of small contractors and minority business enterprises as eligible for set-aside contracts. Each certification shall be valid for a period not to exceed two years. Any paper application for certification shall be no longer than six pages. The Department of Administrative Services shall maintain on its web site an updated directory of small contractors and minority business enterprises certified under this section.
- (2) The Commissioner of Administrative Services may deny an application for the initial issuance or renewal of such certification after issuing a written decision to the applicant setting forth the basis for such denial. The commissioner may revoke such certification for cause after notice and an opportunity for a hearing in accordance with the provisions of chapter 54. Any person aggrieved by the commissioner's decision to deny the issuance or renewal of or to revoke such certification may appeal such decision to the Superior Court, in accordance with the provisions of section 4-183.
- (3) Whenever the Commissioner of Administrative Services has reason to believe that a small contractor or minority business enterprise who has applied for or received certification under this section has included a materially false statement in his or her application, the commissioner may impose a penalty not exceeding ten thousand dollars after notice and a hearing held in accordance with chapter 54. Such notice shall include (A) a reference to the statement or statements contained in the application alleged to be false, (B) the maximum civil penalty that may be imposed for such misrepresentation, and (C) the time and place of the hearing. Such hearing shall be fixed for a date not later than fourteen days

from the date such notice is sent. The commissioner shall send a copy of such notice to the Commission on Human Rights and Opportunities.

- (4) The commissioner shall hold a hearing prior to such revocation or denial or the imposition of a penalty, unless such contractor or subcontractor fails to appear. If, after the hearing, the commissioner finds that the contractor or subcontractor has wilfully included a materially false statement in his or her application for certification under this subsection, the commissioner shall revoke or deny the certification and may order that a civil penalty not exceeding ten thousand dollars be imposed on the contractor or subcontractor. If such contractor or subcontractor fails to appear for the hearing, the commissioner may, as the facts require, revoke or deny the certification and order that a civil penalty not exceeding ten thousand dollars be imposed on the contractor or subcontractor. The commissioner shall send a copy of any order issued pursuant to this subsection to the contractor or subcontractor named in such order. The commissioner may cause proceedings to be instituted by the Attorney General for the enforcement of any order imposing a civil penalty issued under this subsection.
- (l) On or before August first of each year, each awarding agency setting aside contracts or portions of contracts under subdivision (2) of subsection (b) of this section shall prepare a report establishing small and minority business state set-aside program goals for the twelve-month period beginning July first in the same year. Each such report shall be submitted to the Commissioner of Administrative Services, the Commission on Human Rights and Opportunities and the cochairpersons and ranking members of the joint standing committees of the General Assembly having cognizance of matters relating to planning and development and government administration.
- (m) On or before November first of each year and on a quarterly basis thereafter, each awarding agency setting aside contracts or portions of contracts under subdivision (2) of subsection (b) of this section shall prepare a status report on the implementation and results of its small business and minority business enterprise state set-aside program goals during the three-month period ending one month before the due date for the report. Each report shall be submitted to the Commissioner of Administrative Services and the Commission on Human Rights and Opportunities. Any awarding agency that achieves less than fifty per cent of its small contractor and minority business enterprise state set-aside program goals by the end of the second reporting period in any twelve-month period beginning on July first shall provide a written explanation to the Commissioner of Administrative Services and the Commission on Human Rights and Opportunities detailing how the awarding agency will achieve its goals in the final reporting period. The Commission on Human Rights and Opportunities shall: (1) Monitor the achievement of the annual goals established by each awarding agency; and (2) prepare a quarterly report concerning such goal achievement. The report shall be submitted to each awarding agency that submitted a report, the Commissioner of Economic and Community Development, the Commissioner of Administrative Services and the cochairpersons and ranking members of the joint standing committees of the General Assembly having cognizance of matters relating to planning and development and government administration. Failure by any awarding agency to submit any reports required by this section shall be a violation of section 46a-77.

- (n) Nothing in this section shall be construed to apply to the janitorial or service contracts awarded pursuant to subsections (b) to (d), inclusive, of section 4a-82.
- (o) The Commissioner of Administrative Services may adopt regulations in accordance with the provisions of chapter 54 to implement the provisions of this section.

Sec. 46a-68b. Definition of public works contract.

As used in this section and sections 4a-60, as amended by this act, 4a-60a, as amended by this act, 4a-62, as amended by this act, 46a-56, as amended by this act, and 46a-68c to 46a-68k, inclusive, as amended by this act: "Public works contract" means any agreement between any individual, firm or corporation and the state or any political subdivision of the state other than a municipality for construction, rehabilitation, conversion, extension, demolition or repair of a public building, highway or other changes or improvements in real property, or which is financed in whole or in part by the state, including, but not limited to, matching expenditures, grants, loans, insurance or guarantees and "municipal public works contract", "quasi-public agency project" and "awarding agency" have the same meanings as provided in section 4a-60g, as amended by this act.

Sec. 46a-68c. Contractors required to file affirmative action plan. Certificate of compliance issued by commission. Revocation.

In addition to the provisions of section 4a-60, as amended by this act, each contractor with fifty or more employees awarded a public works contract, municipal public works contract or contract for a quasi-public agency project in excess of fifty thousand dollars in any fiscal year, but not subject to the provisions of section 46a-68d, as amended by this act, shall develop and file with the Commission on Human Rights and Opportunities an affirmative action plan which shall comply with regulations adopted by the commission. Failure to develop an approved affirmative action plan pursuant to this section shall act as a bar to bidding on or the award of future contracts until such requirement has been met. When the commission approves an affirmative action plan pursuant to this section, it shall issue a certificate of compliance to the contractor. This certificate shall be prima facie proof of the contractor's eligibility to bid or be awarded contracts for a period of two years from the date of the certificate. Such certificate shall not excuse the contractor from monitoring by the commission or from the reporting and record-keeping requirements of sections 46a-68e and 46a-68f. The commission may revoke the certificate of a contractor if the contractor does not implement its affirmative action plan in compliance with this section and sections 4a-60, as amended by this act, 4a-60g, as amended by this act, 4a-62, as amended by this act, 46a-56, as amended by this act, 46a-68b, as amended by this act, 46a-68d, as amended by this act, and 46a-68e to 46a-68k, inclusive, as amended by this act.

Sec. 46a-68d. Public works contracts subject to affirmative action requirements. Conditional acceptance by commission. Advance filing of plan.

In addition to the provisions of section 4a-60, as amended by this act, every public works contract, municipal public works contract or contract for a quasi-public agency project subject to the provisions of part II of chapter 60 shall also be subject to the provisions of this section. After a bid has been accepted but before a contract is awarded, the successful bidder shall file with

and have obtained the approval of the commission for an affirmative action plan. The commission may provide for conditional acceptance of an affirmative action plan provided written assurances are given by the contractor that it will amend its plan to conform to affirmative action requirements. In the case of a public works contract, the state shall withhold two per cent of the total contract price per month from any payment made to such contractor until such time as the contractor has developed an affirmative action plan, and received the approval of the commission. In the case of a municipal public works contract or contract for a quasi-public agency project, the municipality or entity, as applicable, shall withhold two per cent of the total contract price per month from any payment made to such contractor until such time as the contractor has developed an affirmative action plan and received the approval of the commission. Notwithstanding the provisions of this section, a contractor subject to the provisions of this section may file a plan in advance of or at the same time as its bid. The commission shall review plans submitted pursuant to this section within sixty days of receipt and either approve, approve with conditions or reject such plan. When the commission approves an affirmative action plan pursuant to this section, it shall issue a certificate of compliance to the contractor as provided in section 46a-68c, as amended by this act.

Sec. 46a-68e. Contractors and subcontractors required to file compliance reports.

Each contractor shall file, and shall cause each of his subcontractors to file, with the commission such compliance reports at such times as the commission may direct. Compliance reports shall contain such information as to the practices, policies, programs and employment policies, employment programs, and employment statistics of the contractor and each subcontractor and be in such form as the commission may prescribe.

Sec. 46a-68f. Compliance reports to include labor union practices.

Whenever the contractor or subcontractor has a collective bargaining agreement or other contract or understanding with a labor union or an agency referring workers or providing or supervising apprenticeship or training for such workers, the compliance report shall include information pertaining to such labor union's or agency's practices and policies affecting compliance, as the commission may prescribe; provided, to the extent such information is within the exclusive possession of a labor union or an agency referring workers or providing or supervising apprenticeship or training and such labor union or agency refuses to furnish information to the contractor, the contractor shall so certify to the commission as part of its compliance report and shall set forth what efforts have been made to obtain such information.

**Construction Contracts - Required Contract Provisions
(State Funded Only Contracts)**

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1. Contractor Work Force Utilization / Equal Employment Opportunity

- (a) The Contractor shall comply with the Contractor Work Force Utilization / Equal Employment Opportunity requirements attached at Exhibit A and hereby made part of this Contract, whenever a contractor or subcontractor at any tier performs construction work in excess of \$10,000. These goals shall be included in each contract and subcontract. Goal achievement is calculated for each trade using the hours worked under each trade.
- (b) Companies with contracts, agreements or purchase orders valued at \$10,000 or more will develop and implement an Affirmative Action Plan utilizing the ConnDOT Affirmative Action Plan Guideline. This Plan shall be designed to further the provision of equal employment opportunity to all persons without regard to their race, color, religion, sex or national origin, and to promote the full realization of equal employment opportunity through a positive continuation program. Plans shall be updated as required by ConnDOT.

2. Contract Wage Rates

The Contractor shall comply with:

The State wage rate requirements indicated in Exhibit C hereof are hereby made part of this Contract.

Prevailing Wages for Work on State Highways; Annual Adjustments. With respect to contracts for work on state highways and bridges on state highways, the Contractor shall comply with the provisions of Section 31-54 and 31-55a of the Connecticut General Statutes, as revised.

As required by section 1.05.12 (Payrolls) of the State of Connecticut, Department of Transportation's Standard Specification for Roads, Bridges and Incidental Construction (FORM 817), as may be revised, every Contractor or subcontractor performing project work on a federal aid project is required to post the relevant prevailing wage rates as determined by the United States Secretary of Labor. The wage rate determinations shall be posted in prominent and easily accessible places at the work site.

3. Americans with Disabilities Act of 1990, as Amended

This provision applies to those Contractors who are or will be responsible for compliance with the terms of the Americans with Disabilities Act of 1990, as amended (42 U.S.C. 12101 et seq.), (Act), during the term of the Contract. The Contractor represents that it is familiar with the terms of this Act and that it is in compliance with the Act. Failure of the Contractor to satisfy this standard as the same applies to performance under this Contract, either now or during the term of the Contract as it may be amended, will render the Contract voidable at the option of the State upon notice to the contractor. The Contractor warrants that it will hold the State harmless and indemnify the State from any liability which may be imposed upon the State as a result of any failure of the Contractor to be in compliance with this Act, as the same applies to performance under this Contract.

4. Connecticut Statutory Labor Requirements

- (a) **Construction, Alteration or Repair of Public Works Projects; Wage Rates.** The Contractor shall comply with Section 31-53 of the Connecticut General Statutes, as revised. The wages paid on an hourly basis to any person performing the work of any mechanic, laborer or worker on the work herein contracted to be done and the amount of payment or contribution paid or payable on behalf of each such person to any employee welfare fund, as defined in subsection (i)

of section 31-53 of the Connecticut General Statutes, shall be at a rate equal to the rate customary or prevailing for the same work in the same trade or occupation in the town in which such public works project is being constructed. Any contractor who is not obligated by agreement to make payment or contribution on behalf of such persons to any such employee welfare fund shall pay to each mechanic, laborer or worker as part of such person's wages the amount of payment or contribution for such person's classification on each pay day.

(b) Debarment List. Limitation on Awarding Contracts. The Contractor shall comply with Section 31-53a of the Connecticut General Statutes, as revised.

(c) Construction Safety and Health Course. The Contractor shall comply with section 31-53b of the Connecticut General Statutes, as revised. The contractor shall furnish proof to the Labor Commissioner with the weekly certified payroll form for the first week each employee begins work on such project that any person performing the work of a mechanic, laborer or worker pursuant to the classifications of labor under section 31-53 of the Connecticut General Statutes, as revised, on such public works project, pursuant to such contract, has completed a course of at least ten hours in duration in construction safety and health approved by the federal Occupational Safety and Health Administration or, has completed a new miner training program approved by the Federal Mine Safety and Health Administration in accordance with 30 CFR 48 or, in the case of telecommunications employees, has completed at least ten hours of training in accordance with 29 CFR 1910.268.

Any employee required to complete a construction safety and health course as required that has not completed the course, shall have a maximum of fourteen (14) days to complete the course. If the employee has not been brought into compliance, they shall be removed from the project until such time as they have completed the required training.

Any costs associated with this notice shall be included in the general cost of the contract. In addition, there shall be no time granted to the contractor for compliance with this notice. The contractor's compliance with this notice and any associated regulations shall not be grounds for claims as outlined in Section 1.11 – "Claims".

(d) Awarding of Contracts to Occupational Safety and Health Law Violators Prohibited. The Contract is subject to Section 31-57b of the Connecticut General Statutes, as revised.

(e) Residents Preference in Work on Other Public Facilities. NOT APPLICABLE TO FEDERAL AID CONTRACTS. Pursuant to Section 31-52a of the Connecticut General Statutes, as revised, in the employment of mechanics, laborers or workmen to perform the work specified herein, preference shall be given to residents of the state who are, and continuously for at least six months prior to the date hereof have been, residents of this state, and if no such person is available, then to residents of other states

5. Tax Liability - Contractor's Exempt Purchase Certificate (CERT – 141)

The Contractor shall comply with Chapter 219 of the Connecticut General Statutes pertaining to tangible personal property or services rendered that is/are subject to sales tax. The Contractor is responsible for determining its tax liability. If the Contractor purchases materials or supplies pursuant to the Connecticut Department of Revenue Services' "Contractor's Exempt Purchase Certificate (CERT-141)," as may be revised, the Contractor acknowledges and agrees that title to such materials and supplies installed or placed in the project will vest in the State simultaneously with passage of title

from the retailers or vendors thereof, and the Contractor will have no property rights in the materials and supplies purchased.

Forms and instructions are available anytime by:

Internet: Visit the DRS website at www.ct.gov/DRS to download and print Connecticut tax forms; or Telephone: Call 1-800-382-9463 (Connecticut calls outside the Greater Hartford calling area only) and select Option 2 or call 860-297-4753 (from anywhere).

6. Executive Orders and Other Enactments

- (a) All references in this Contract to any Federal, State, or local law, statute, public or special act, executive order, ordinance, regulation or code (collectively, "Enactments") shall mean Enactments that apply to the Contract at any time during its term, or that may be made applicable to the Contract during its term. This Contract shall always be read and interpreted in accordance with the latest applicable wording and requirements of the Enactments. At the Contractor's request, the Client Agency shall provide a copy of these Enactments to the Contractor. Unless otherwise provided by Enactments, the Contractor is not relieved of its obligation to perform under this Contract if it chooses to contest the applicability of the Enactments or the Client Agency's authority to require compliance with the Enactments.
- (b) This Contract is subject to the provisions of Executive Order No. Three of Governor Thomas J. Meskill, promulgated June 16, 1971, concerning labor employment practices, Executive Order No. Seventeen of Governor Thomas J. Meskill, promulgated February 15, 1973, concerning the listing of employment openings and Executive Order No. Sixteen of Governor John G. Rowland promulgated August 4, 1999, concerning violence in the workplace, all of which are incorporated into and are made a part of this Contract as if they had been fully set forth in it.
- (c) This Contract may be subject to (1) Executive Order No. 14 of Governor M. Jodi Rell, promulgated April 17, 2006, concerning procurement of cleaning products and services; (2) **Executive Order No. 61 of Governor Dannel P. Malloy promulgated December 13, 2017 concerning the Policy for the Management of State Information Technology Projects, as issued by the Office of Policy and Management, Policy ID IT-SDLC-17-04**; and (3) Executive Order Nos. 13F and 13G of Governor Ned Lamont, promulgated September 3, 2021 and September 10, 2021, respectively, concerning protection of public health and safety during COVID-19 pandemic, as extended by Executive Order No. 14A of Governor Ned Lamont, promulgated September 30, 2021. If any of the Executive Orders referenced in this subsection is applicable, it is deemed to be incorporated into and made a part of this Contract as if fully set forth in it.

7. Non Discrimination Requirement and Certification (pursuant to section 4a-60 and 4a-60a of the Connecticut General Statutes, as revised): References to "minority business enterprises" in this Section are not applicable to Federal-aid projects/contracts. Federal-aid projects/contracts are instead subject to the Federal Disadvantaged Business Enterprise Program.

(a) For purposes of this Section, the following terms are defined as follows:

- (1) "Commission" means the Commission on Human Rights and Opportunities;
- (2) "Contract" and "contract" include any extension or modification of the Contract or contract;
- (3) "Contractor" and "contractor" include any successors or assigns of the Contractor or contractor;

- (4) "Gender identity or expression" means a person's gender-related identity, appearance or behavior, whether or not that gender-related identity, appearance or behavior is different from that traditionally associated with the person's physiology or assigned sex at birth, which gender-related identity can be shown by providing evidence including, but not limited to, medical history, care or treatment of the gender-related identity, consistent and uniform assertion of the gender-related identity or any other evidence that the gender-related identity is sincerely held, part of a person's core identity or not being asserted for an improper purpose.
- (5) "good faith" means that degree of diligence which a reasonable person would exercise in the performance of legal duties and obligations;
- (6) "good faith efforts" shall include, but not be limited to, those reasonable initial efforts necessary to comply with statutory or regulatory requirements and additional or substituted efforts when it is determined that such initial efforts will not be sufficient to comply with such requirements;
- (7) "marital status" means being single, married as recognized by the state of Connecticut, widowed, separated or divorced;
- (8) "mental disability" means one or more mental disorders, as defined in the most recent edition of the American Psychiatric Association's "Diagnostic and Statistical Manual of Mental Disorders", or a record of or regarding a person as having one or more such disorders;
- (9) "minority business enterprise" means any small contractor or supplier of materials fifty-one percent or more of the capital stock, if any, or assets of which is owned by a person or persons: (1) who are active in the daily affairs of the enterprise, (2) who have the power to direct the management and policies of the enterprise, and (3) who are members of a minority, as such term is defined in subsection (a) of Connecticut General Statutes § 32-9n; and
- (10) "public works contract" means any agreement between any individual, firm or corporation and the State or any political subdivision of the State other than a municipality for construction, rehabilitation, conversion, extension, demolition or repair of a public building, highway or other changes or improvements in real property, or which is financed in whole or in part by the State, including, but not limited to, matching expenditures, grants, loans, insurance or guarantees.

For purposes of this Section, the terms "Contract" and "contract" do not include a contract where each contractor is (1) a political subdivision of the State of Connecticut, including, but not limited to municipalities, unless the contract is a municipal public works contract or quasi-public agency project contract, (2) any other state of the United States, including but not limited to, the District of Columbia, Puerto Rico, U.S. territories and possessions, and federally recognized Indian tribal governments, as defined in Connecticut General Statutes § 1-267, (3) the federal government, (4) a foreign government, or (5) an agency of a subdivision, state or government described in subdivision (1), (2), (3), or (4) of this subsection.

- (b) (1) The Contractor agrees and warrants that in the performance of the Contract such Contractor will not discriminate or permit discrimination against any person or group of persons on the grounds of race, color, religious creed, age, marital status, national origin, ancestry, sex, gender identity or expression, status as a veteran, intellectual disability, mental disability or physical disability, including, but not limited to, blindness, unless it is shown by such Contractor that such disability prevents performance of the work involved, in any manner prohibited by the laws of the United States or of the State of Connecticut; and the Contractor further agrees to take affirmative action to insure that applicants with job-related qualifications are employed and that employees are treated when employed without regard to their race, color, religious creed, age, marital status, national origin, ancestry, sex, gender identity or expression, status as a veteran, intellectual disability, mental disability or physical disability, including, but not limited to, blindness, unless it is shown

by the Contractor that such disability prevents performance of the work involved; (2) the Contractor agrees, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, to state that it is an "affirmative action-equal opportunity employer" in accordance with regulations adopted by the Commission; (3) the Contractor agrees to provide each labor union or representative of workers with which the Contractor has a collective bargaining agreement or other contract or understanding and each vendor with which the Contractor has a contract or understanding, a notice to be provided by the Commission, advising the labor union or workers' representative of the Contractor's commitments under this section and to post copies of the notice in conspicuous places available to employees and applicants for employment; (4) the Contractor agrees to comply with each provision of this Section and Connecticut General Statutes §§ 46a-68e and 46a-68f and with each regulation or relevant order issued by said Commission pursuant to Connecticut General Statutes §§ 46a-56, 46a-68e and 46a-68f; and (5) the Contractor agrees to provide the Commission on Human Rights and Opportunities with such information requested by the Commission, and permit access to pertinent books, records and accounts, concerning the employment practices and procedures of the Contractor as relate to the provisions of this Section and Connecticut General Statutes § 46a-56. If the contract is a public works contract, the Contractor agrees and warrants that he will make good faith efforts to employ minority business enterprises as subcontractors and suppliers of materials on such public works projects.

- (c) Determination of the Contractor's good faith efforts shall include, but shall not be limited to, the following factors: The Contractor's employment and subcontracting policies, patterns and practices; affirmative advertising, recruitment and training; technical assistance activities and such other reasonable activities or efforts as the Commission may prescribe that are designed to ensure the participation of minority business enterprises in public works projects.
- (d) The Contractor shall develop and maintain adequate documentation, in a manner prescribed by the Commission, of its good faith efforts.
- (e) The Contractor shall include the provisions of subsection (b) of this Section in every subcontract or purchase order entered into in order to fulfill any obligation of a contract with the State and such provisions shall be binding on a subcontractor, vendor or manufacturer unless exempted by regulations or orders of the Commission. The Contractor shall take such action with respect to any such subcontract or purchase order as the Commission may direct as a means of enforcing such provisions including sanctions for noncompliance in accordance with Connecticut General Statutes §46a-56; provided if such Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the Commission, the Contractor may request the State of Connecticut to enter into any such litigation or negotiation prior thereto to protect the interests of the State and the State may so enter.
- (f) The Contractor agrees to comply with the regulations referred to in this Section as they exist on the date of this Contract and as they may be adopted or amended from time to time during the term of this Contract and any amendments thereto.
- (g) (1) The Contractor agrees and warrants that in the performance of the Contract such Contractor will not discriminate or permit discrimination against any person or group of persons on the grounds of sexual orientation, in any manner prohibited by the laws of the United States or the State of Connecticut, and that employees are treated when employed without regard to their sexual orientation; (2) the Contractor agrees to provide each labor union or representative of workers with which such Contractor has a collective bargaining agreement or other contract or understanding and each vendor with which such Contractor has a contract or understanding, a notice to be provided by the Commission on Human Rights and Opportunities advising the labor union or workers' representative of the Contractor's commitments under this section, and to post copies of the notice in conspicuous places available to employees and applicants for employment; (3) the Contractor agrees to comply with each provision of this section and with each regulation or relevant order issued by said Commission pursuant to Connecticut General Statutes § 46a-56; and

(4) the Contractor agrees to provide the Commission on Human Rights and Opportunities with such information requested by the Commission, and permit access to pertinent books, records and accounts, concerning the employment practices and procedures of the Contractor which relate to the provisions of this Section and Connecticut General Statutes § 46a-56.

(h) The Contractor shall include the provisions of the foregoing paragraph in every subcontract or purchase order entered into in order to fulfill any obligation of a contract with the State and such provisions shall be binding on a subcontractor, vendor or manufacturer unless exempted by regulations or orders of the Commission. The Contractor shall take such action with respect to any such subcontract or purchase order as the Commission may direct as a means of enforcing such provisions including sanctions for noncompliance in accordance with Connecticut General Statutes § 46a-56; provided, if such Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the Commission, the Contractor may request the State of Connecticut to enter into any such litigation or negotiation prior thereto to protect the interests of the State and the State may so enter.

(i) Nondiscrimination Certification

Pursuant to subsection (c) of section 4a-60 and subsection (b) of section 4a-60a of the Connecticut General Statutes, the Contractor, for itself and its authorized signatory of this Contract, affirms that it understands the obligations of this section and that it will maintain a policy for the duration of the Contract to assure that the Contract will be performed in compliance with the nondiscrimination requirements of such sections. The Contractor and its authorized signatory of this Contract demonstrate their understanding of this obligation by either (A) having provided an affirmative response in the required online bid or response to a proposal question which asks if the contractor understands its obligations under such sections, or (B) initialing this nondiscrimination affirmation in the following

box:

8. Whistleblower Provision

The following clause is applicable if the Contract has a value of Five Million Dollars (\$5,000,000) or more.

Whistleblowing. This Contract may be subject to the provisions of Section 4-61dd of the Connecticut General Statutes. In accordance with this statute, if an officer, employee or appointing authority of the Contractor takes or threatens to take any personnel action against any employee of the Contractor in retaliation for such employee's disclosure of information to any employee of the contracting state or quasi-public agency or the Auditors of Public Accounts or the Attorney General under the provisions of subsection (a) of such statute, the Contractor shall be liable for a civil penalty of not more than five thousand dollars for each offense, up to a maximum of twenty per cent of the value of this Contract. Each violation shall be a separate and distinct offense and in the case of a continuing violation, each calendar day's continuance of the violation shall be deemed to be a separate and distinct offense. The State may request that the Attorney General bring a civil action in the Superior Court for the Judicial District of Hartford to seek imposition and recovery of such civil penalty. In accordance with subsection (f) of such statute, each large state contractor, as defined in the statute, shall post a notice of the provisions of the statute relating to large state contractors in a conspicuous place which is readily available for viewing by the employees of the Contractor.

9. Connecticut Freedom of Information Act

(a) Disclosure of Records. This Contract may be subject to the provisions of section 1-218 of the Connecticut General Statutes. In accordance with this statute, each contract in excess of two million five hundred thousand dollars between a public agency and a person for the performance of a governmental function shall (a) provide that the public agency is entitled to receive a copy of records and files related to the performance of the governmental

function, and (b) indicate that such records and files are subject to FOIA and may be disclosed by the public agency pursuant to FOIA. No request to inspect or copy such records or files shall be valid unless the request is made to the public agency in accordance with FOIA. Any complaint by a person who is denied the right to inspect or copy such records or files shall be brought to the Freedom of Information Commission in accordance with the provisions of sections 1-205 and 1-206 of the Connecticut General Statutes.

- (b) Confidential Information.** The State will afford due regard to the Contractor's request for the protection of proprietary or confidential information which the State receives from the Contractor. However, all materials associated with the Contract are subject to the terms of the FOIA and all corresponding rules, regulations and interpretations. In making such a request, the Contractor may not merely state generally that the materials are proprietary or confidential in nature and not, therefore, subject to release to third parties. Those particular sentences, paragraphs, pages or sections that the Contractor believes are exempt from disclosure under the FOIA must be specifically identified as such. Convincing explanation and rationale sufficient to justify each exemption consistent with the FOIA must accompany the request. The rationale and explanation must be stated in terms of the prospective harm to the competitive position of the Contractor that would result if the identified material were to be released and the reasons why the materials are legally exempt from release pursuant to the FOIA. To the extent that any other provision or part of the Contract conflicts or is in any way inconsistent with this section, this section controls and shall apply and the conflicting provision or part shall not be given effect. If the Contractor indicates that certain documentation is submitted in confidence, by specifically and clearly marking the documentation as "CONFIDENTIAL," DOT will first review the Contractor's claim for consistency with the FOIA (that is, review that the documentation is actually a trade secret or commercial or financial information and not required by statute), and if determined to be consistent, will endeavor to keep such information confidential to the extent permitted by law. See, *e.g.*, Conn. Gen. Stat. §1-210(b)(5)(A-B). The State, however, has no obligation to initiate, prosecute or defend any legal proceeding or to seek a protective order or other similar relief to prevent disclosure of any information that is sought pursuant to a FOIA request. Should the State withhold such documentation from a Freedom of Information requester and a complaint be brought to the Freedom of Information Commission, the Contractor shall have the burden of cooperating with DOT in defense of that action and in terms of establishing the availability of any FOIA exemption in any proceeding where it is an issue. In no event shall the State have any liability for the disclosure of any documents or information in its possession which the State believes are required to be disclosed pursuant to the FOIA or other law.

10. Service of Process

The Contractor, if not a resident of the State of Connecticut, or, in the case of a partnership, the partners, if not residents, hereby appoints the Secretary of State of the State of Connecticut, and his successors in office, as agent for service of process for any action arising out of or as a result of this Contract; such appointment to be in effect throughout the life of this Contract and six (6) years thereafter.

11. Substitution of Securities for Retainages on State Contracts and Subcontracts

This Contract is subject to the provisions of Section 3-112a of the General Statutes of the State of Connecticut, as revised.

12. Health Insurance Portability and Accountability Act of 1996 (HIPAA)

The Contractor shall comply, if applicable, with the Health Insurance Portability and Accountability Act of 1996 and, pursuant thereto, the provisions attached at Exhibit B, and hereby made part of this Contract.

13. Forum and Choice of Law

Forum and Choice of Law. The parties deem the Contract to have been made in the City of Hartford, State of Connecticut. Both parties agree that it is fair and reasonable for the validity and construction of the Contract to be, and it shall be, governed by the laws and court decisions of the State of Connecticut, without giving effect to its principles of conflicts of laws. To the extent that any immunities provided by Federal law or the laws of the State of Connecticut do not bar an action against the State, and to the extent that these courts are courts of competent jurisdiction, for the purpose of venue, the complaint shall be made returnable to the Judicial District of Hartford only or shall be brought in the United States District Court for the District of Connecticut only, and shall not be transferred to any other court, provided, however, that nothing here constitutes a waiver or compromise of the sovereign immunity of the State of Connecticut. The Contractor waives any objection which it may now have or will have to the laying of venue of any Claims in any forum and further irrevocably submits to such jurisdiction in any suit, action or proceeding.

14. Summary of State Ethics Laws

Pursuant to the requirements of section 1-101qq of the Connecticut General Statutes (a) the State has provided to the Contractor the summary of State ethics laws developed by the State Ethics Commission pursuant to section 1-81b of the Connecticut General Statutes, which summary is incorporated by reference into and made a part of this Contract as if the summary had been fully set forth in this Contract; (b) the Contractor represents that the chief executive officer or authorized signatory of the Contract and all key employees of such officer or signatory have read and understood the summary and agree to comply with the provisions of state ethics law; (c) prior to entering into a contract with any subcontractors or consultants, the Contractor shall provide the summary to all subcontractors and consultants and each such contract entered into with a subcontractor or consultant on or after July 1, 2021, shall include a representation that each subcontractor or consultant and the key employees of such subcontractor or consultant have read and understood the summary and agree to comply with the provisions of state ethics law; (d) failure to include such representations in such contracts with subcontractors or consultants shall be cause for termination of the Contract; and (e) each contract with such contractor, subcontractor or consultant shall incorporate such summary by reference as a part of the contract terms.

15. Audit and Inspection of Plants, Places of Business and Records

- (a) The State and its agents, including, but not limited to, the Connecticut Auditors of Public Accounts, Attorney General and State's Attorney and their respective agents, may, at reasonable hours, inspect and examine all of the parts of the Contractor's and Contractor Parties' plants and places of business which, in any way, are related to, or involved in, the performance of this Contract. For the purposes of this Section, "Contractor Parties" means the Contractor's members, directors, officers, shareholders, partners, managers, principal officers, representatives, agents, servants, consultants, employees or any one of them or any other person or entity with whom the Contractor is in privity of oral or written contract and the Contractor intends for such other person or entity to Perform under the Contract in any capacity.

- (b) The Contractor shall maintain and shall require each of the Contractor Parties to maintain, accurate and complete Records. The Contractor shall make all of its and the Contractor Parties' Records available at all reasonable hours for audit and inspection by the State and its agents.
- (c) The State shall make all requests for any audit or inspection in writing and shall provide the Contractor with at least twenty-four (24) hours' notice prior to the requested audit and inspection date. If the State suspects fraud or other abuse, or in the event of an emergency, the State is not obligated to provide any prior notice.
- (d) The Contractor shall keep and preserve or cause to be kept and preserved all of its and Contractor Parties' Records until three (3) years after the latter of (i) final payment under this Agreement, or (ii) the expiration or earlier termination of this Agreement, as the same may be modified for any reason. The State may request an audit or inspection at any time during this period. If any Claim or audit is started before the expiration of this period, the Contractor shall retain or cause to be retained all Records until all Claims or audit findings have been resolved.
- (e) The Contractor shall cooperate fully with the State and its agents in connection with an audit or inspection. Following any audit or inspection, the State may conduct and the Contractor shall cooperate with an exit conference.
- (f) The Contractor shall incorporate this entire Section verbatim into any contract or other agreement that it enters into with any Contractor Party.

16. Campaign Contribution Restriction

For all State contracts, defined in section 9-612 of the Connecticut General Statutes as having a value in a calendar year of \$50,000 or more, or a combination or series of such agreements or contracts having a value of \$100,000 or more, the authorized signatory to this Contract represents that they have received the State Elections Enforcement Commission's notice advising state contractors of state campaign contribution and solicitation prohibitions, and will inform its principals of the contents of the notice.

17. Tangible Personal Property

- (a) The Contractor on its behalf and on behalf of its Affiliates, as defined below, shall comply with the provisions of Conn. Gen. Stat. §12-411b, as follows:
 - (1) For the term of the Contract, the Contractor and its Affiliates shall collect and remit to the State of Connecticut, Department of Revenue Services, any Connecticut use tax due under the provisions of Chapter 219 of the Connecticut General Statutes for items of tangible personal property sold by the Contractor or by any of its Affiliates in the same manner as if the Contractor and such Affiliates were engaged in the business of selling tangible personal property for use in Connecticut and had sufficient nexus under the provisions of Chapter 219 to be required to collect Connecticut use tax;
 - (2) A customer's payment of a use tax to the Contractor or its Affiliates relieves the customer of liability for the use tax;
 - (3) The Contractor and its Affiliates shall remit all use taxes they collect from customers on or before the due date specified in the Contract, which may not be later than the last day of the month next succeeding the end of a calendar quarter or other tax collection period during which the tax was collected;
 - (4) The Contractor and its Affiliates are not liable for use tax billed by them but not paid to them by a customer; and
 - (5) Any Contractor or Affiliate who fails to remit use taxes collected on behalf of its customers by the due date specified in the Contract shall be subject to the interest and penalties provided for persons required to collect sales tax under chapter 219 of the general statutes.
- (b) For purposes of this section of the Contract, the word "Affiliate" means any person, as defined in section 12-1 of the general statutes, that controls, is controlled by, or is under common control with another person. A person controls another person if the person owns, directly or indirectly, more than ten per cent of the voting securities of the other person. The word "voting security" means a

security that confers upon the holder the right to vote for the election of members of the board of directors or similar governing body of the business, or that is convertible into, or entitles the holder to receive, upon its exercise, a security that confers such a right to vote. "Voting security" includes a general partnership interest.

- (c) The Contractor represents and warrants that each of its Affiliates has vested in the Contractor plenary authority to so bind the Affiliates in any agreement with the State of Connecticut. The Contractor on its own behalf and on behalf of its Affiliates shall also provide, no later than 30 days after receiving a request by the State's contracting authority, such information as the State may require to ensure, in the State's sole determination, compliance with the provisions of Chapter 219 of the Connecticut General Statutes, including, but not limited to, §12-411b.

18. Bid Rigging and/or Fraud – Notice to Contractor

The Connecticut Department of Transportation is cooperating with the U.S. Department of Transportation and the Justice Department in their investigation into highway construction contract bid rigging and/or fraud.

A toll-free "HOT LINE" telephone number 800-424-9071 has been established to receive information from contractors, subcontractors, manufacturers, suppliers or anyone with knowledge of bid rigging and/or fraud, either past or current. The "HOT LINE" telephone number will be available during normal working hours (8:00 am – 5:00 pm EST). Information will be treated confidentially and anonymity respected.

19. Consulting Agreements Representation

Pursuant to section 4a-81 of the Connecticut General Statutes, the Contractor represents that it has not entered into any consulting agreements in connection with this Contract, except for the agreements listed below. "Consulting agreement" means any written or oral agreement to retain the services, for a fee, of a consultant for the purposes of (A) providing counsel to a contractor, vendor, consultant or other entity seeking to conduct, or conducting, business with the State, (B) contacting, whether in writing or orally, any executive, judicial, or administrative office of the State, including any department, institution, bureau, board, commission, authority, official or employee for the purpose of solicitation, dispute resolution, introduction, requests for information, or (C) any other similar activity related to such contracts. "Consulting agreement" does not include any agreements entered into with a consultant who is registered under the provisions of chapter 10 of the Connecticut General Statutes as of the date such contract is executed in accordance with the provisions of section 4a-81 of the Connecticut General Statutes.

Consultant's Name and Title	Name of Firm (if applicable)

Start Date	End Date	Cost

The basic terms of the consulting agreement are: _____

Description of Services Provided: _____

Is the consultant a former State employee or former public official? YES NO

If YES: _____
 Name of Former State Agency

 Termination Date of Employment

20. Sovereign Immunity

The parties acknowledge and agree that nothing in the Solicitation or the Contract shall be construed as a modification, compromise or waiver by the State of any rights or defenses of any immunities provided by Federal law or the laws of the State of Connecticut to the State or any of its officers and employees, which they may have had, now have or will have with respect to all matters arising out of the Contract. To the extent that this section conflicts with any other section, this section shall govern.

21. Large State Contract Representation for Contractor

Pursuant to section 4-252 of the Connecticut General Statutes and Acting Governor Susan Bysiewicz Executive Order No. 21-2, promulgated July 1, 2021, the Contractor, for itself and on behalf of all of its principals or key personnel who submitted a bid or proposal, represents:

- (1) That no gifts were made by (A) the Contractor, (B) any principals and key personnel of the Contractor, who participate substantially in preparing bids, proposals or negotiating State contracts, or (C) any agent of the Contractor or principals and key personnel, who participates substantially in preparing bids, proposals or negotiating State contracts, to (i) any public official or State employee of the State agency or quasi-public agency soliciting bids or proposals for State contracts, who participates substantially in the preparation of bid solicitations or requests for proposals for State contracts or the negotiation or award of State contracts, or (ii) any public official or State employee of any other State agency, who has supervisory or appointing authority over such State agency or quasi-public agency;
- (2) That no such principals and key personnel of the Contractor, or agent of the Contractor or of such principals and key personnel, knows of any action by the Contractor to circumvent such prohibition on gifts by providing for any other principals and key personnel, official, employee or agent of the Contractor to provide a gift to any such public official or State employee; and
- (3) That the Contractor is submitting bids or proposals without fraud or collusion with any person.

22. Large State Contract Representation for Official or Employee of State Agency

Pursuant to section 4-252 of the Connecticut General Statutes and Acting Governor Susan Bysiewicz Executive Order No. 21-2, promulgated July 1, 2021, the State agency official or employee represents that the selection of the most qualified or highest ranked person, firm or corporation was not the result of collusion, the giving of a gift or the promise of a gift, compensation, fraud or inappropriate influence from any person.

23. Iran Energy Investment Certification

(a) Pursuant to section 4-252a of the Connecticut General Statutes, the Contractor certifies that it

has not made a direct investment of twenty million dollars or more in the energy sector of Iran on or after October 1, 2013, as described in Section 202 of the Comprehensive Iran Sanctions, Accountability and Divestment Act of 2010, and has not increased or renewed such investment on or after said date.

(b) If the Contractor makes a good faith effort to determine whether it has made an investment described in subsection (a) of this section shall not be subject to the penalties of false statement pursuant to section 4-252a of the Connecticut General Statutes. A "good faith effort" for purposes of this subsection includes a determination that the Contractor is not on the list of persons who engage in certain investment activities in Iran created by the Department of General Services of the State of California pursuant to Division 2, Chapter 2.7 of the California Public Contract Code. Nothing in this subsection shall be construed to impair the ability of the State agency or quasi-public agency to pursue a breach of contract action for any violation of the provisions of the Contract.

24. Access to Contract and State Data

The Contractor shall provide to the Client Agency access to any data, as defined in Conn. Gen Stat. Sec. 4e-1, concerning the Contract and the Client Agency that are in the possession or control of the Contractor upon demand and shall provide the data to the Client Agency in a format prescribed by the Client Agency and the State Auditors of Public Accounts at no additional cost.

EXHIBIT A

CONTRACTOR WORKFORCE UTILIZATION / EQUAL EMPLOYMENT OPPORTUNITY

1. Project Workforce Utilization Goals:

These goals are applicable to all the Contractor’s construction work (whether or not it is Federal or Federally assisted or funded) performed in the covered area. If the contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for the geographical area where the work is actually performed.

Whenever the Contractor, or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000 the provisions of these specifications which contain the applicable goals for minority and female participation.

The goals for minority and female utilization are expressed in percentage terms for the contractor’s aggregate work-force in each trade on all construction work in the covered area, are referenced in the Appendix A below.

STATE FUNDED PROJECTS (only)
APPENDIX A
(Labor Market Goals)

LABOR MARKET AREA GOAL
Female

Minority

Bridgeport				22.7%
1.4%				

Ansonia	Beacon Falls	Bridgeport	Derby
Easton	Fairfield	Milford	Monroe
Oxford	Seymour	Shelton	Stratford
Trumbull			

Danbury				10.7%
3.8%				

Bethel	Bridgewater	Brookfield	Danbury
Kent	New Fairfield	New Milford	Newtown
Redding	Ridgefield	Roxbury	Sherman
Washington			

Danielson				4.3%
1.8%				

Brooklyn	Eastford	Hampton	Killingly
Pomfret	Putnam	Scotland	Sterling
Thompson	Voluntown	Union	Woodstock

Hartford				13.7%
2.1%				

Andover	Ashford	Avon	Barkhamsted
Belin	Bloomfield	Bolton	Bristol
Burlington	Canton	Chaplin	Colchester
Columbia	Coventry	Cromwell	Durham
East Granby	East Haddam	East Hampton	East Hartford
East Windsor	Ellington	Enfield	Farmington
Glastonbury	Granby	Haddam	Hartford
Harwinton	Hebron	Lebanon	Manchester
Mansfield	Marlborough	Middlefield	Middletown
Newington	Plainville	Plymouth	Portland
Rocky Hill	Simsbury	Somers	South Windsor
Southington	Stafford	Suffield	Tolland
Vernon	West Hartford	Wethersfield	Willington
Winchester	Windham	Windsor	Windsor Locks

Lower River				4.3%
1.8%				

Chester	Deep River	Essex	Old Lyme
Westbrook			

LABOR MARKET AREA GOAL**Minority****Female**

New Haven				17.9%
3.1%				

Bethany	Branford	Cheshire	Clinton
East Haven	Guilford	Hamden	Killingworth

Madison	Meriden	New Haven	North Branford
North Haven	Orange	Wallingford	West Haven
Woodbridge			

New London	7.4%
3.1%	

Bozrah	Canterbury	East Lyme	Franklin
Griswold	Groton	Ledyard	Lisbon
Montville	New London	North Stonington	Norwich
Old Lyme	Old Saybrook	Plainfield	Preston
Salem	Sprague	Stonington	Waterford
Hopkinton	RI – Westerly Rhode Island		

Stamford	33.2%
2.1%	

Darien	Greenwich	New Canaan	Norwalk
Stamford	Weston	Westport	Wilton

Torrington	4.3%
1.8%	

Canaan	Colebrook	Cornwall	Goshen
Hartland	Kent	Litchfield	Morris
Norfolk	North Canaan	Salisbury	Sharon
Torrington	Warren		

Waterbury	12.4%
1.6%	

Bethlehem	Middlebury	Naugatuck	Prospect
Southbury	Thomaston	Waterbury	Watertown
Wolcott	Woodbury		

Rev. 4/24/2019

EXHIBIT B**Health Insurance Portability and Accountability Act of 1996 (“HIPAA”).**

- (a) If the Contactor is a Business Associate under the requirements of the Health Insurance Portability and Accountability Act of 1996 (“HIPAA”), the Contractor must comply with all terms and conditions of this Section of the Contract. If the Contractor is not a Business Associate under HIPAA, this Section of the Contract does not apply to the Contractor for this Contract.
- (b) The Contractor is required to safeguard the use, publication and disclosure of information on all applicants for, and all clients who receive, services under the Contract in accordance with all applicable federal and state law regarding confidentiality, which includes but is not limited to HIPAA, more specifically with the Privacy and Security Rules at 45 C.F.R. Part 160 and Part 164, subparts A, C, and E; and
- (c) The State of Connecticut Agency named on page 1 of this Contract (hereinafter the “Department”) is a “covered entity” as that term is defined in 45 C.F.R. § 160.103; and
- (d) The Contractor, on behalf of the Department, performs functions that involve the use or disclosure of “individually identifiable health information,” as that term is defined in 45 C.F.R. § 160.103; and
- (e) The Contractor is a “business associate” of the Department, as that term is defined in 45 C.F.R. § 160.103; and
- (f) The Contractor and the Department agree to the following in order to secure compliance with the HIPAA, the requirements of Subtitle D of the Health Information Technology for Economic and Clinical Health Act (hereinafter the HITECH Act), (Pub. L. 111-5, sections 13400 to 13423), and more specifically with the Privacy and Security Rules at 45 C.F.R. Part 160 and Part 164, subparts A, C, and E.
- (g) Definitions
 - (1) “Breach shall have the same meaning as the term is defined in section 13400 of the HITECH Act (42 U.S.C. §17921(1))
 - (2) “Business Associate” shall mean the Contractor.
 - (3) “Covered Entity” shall mean the Department of the State of Connecticut named on page 1 of this Contract.
 - (4) “Designated Record Set” shall have the same meaning as the term “designated record set” in 45 C.F.R. § 164.501.
 - (5) “Electronic Health Record” shall have the same meaning as the term is defined in section 13400 of the HITECH Act (42 U.S.C. §17921(5))

- (6) “Individual” shall have the same meaning as the term “individual” in 45 C.F.R. § 160.103 and shall include a person who qualifies as a personal representative as defined in 45 C.F.R. § 164.502(g).
 - (7) “Privacy Rule” shall mean the Standards for Privacy of Individually Identifiable Health Information at 45 C.F.R. part 160 and parts 164, subparts A and E.
 - (8) “Protected Health Information” or “PHI” shall have the same meaning as the term “protected health information” in 45 C.F.R. § 160.103, limited to information created or received by the Business Associate from or on behalf of the Covered Entity.
 - (9) “Required by Law” shall have the same meaning as the term “required by law” in 45 C.F.R. § 164.103.
 - (10) “Secretary” shall mean the Secretary of the Department of Health and Human Services or his designee.
 - (11) “More stringent” shall have the same meaning as the term “more stringent” in 45 C.F.R. § 160.202.
 - (12) “This Section of the Contract” refers to the HIPAA Provisions stated herein, in their entirety.
 - (13) “Security Incident” shall have the same meaning as the term “security incident” in 45 C.F.R. § 164.304.
 - (14) “Security Rule” shall mean the Security Standards for the Protection of Electronic Protected Health Information at 45 C.F.R. part 160 and parts 164, subpart A and C.
 - (15) “Unsecured protected health information” shall have the same meaning as the term as defined in section 13402(h)(1)(A) of HITECH. Act. (42 U.S.C. §17932(h)(1)(A)).
- (h) Obligations and Activities of Business Associates.
- (1) Business Associate agrees not to use or disclose PHI other than as permitted or required by this Section of the Contract or as Required by Law.
 - (2) Business Associate agrees to use appropriate safeguards to prevent use or disclosure of PHI other than as provided for in this Section of the Contract.
 - (3) Business Associate agrees to use administrative, physical and technical safeguards that reasonably and appropriately protect the confidentiality, integrity, and availability of electronic protected health information that it creates, receives, maintains, or transmits on behalf of the Covered Entity.
 - (4) Business Associate agrees to mitigate, to the extent practicable, any harmful effect that is known to the Business Associate of a use or disclosure of PHI by Business Associate in violation of this Section of the Contract.

- (5) Business Associate agrees to report to Covered Entity any use or disclosure of PHI not provided for by this Section of the Contract or any security incident of which it becomes aware.
- (6) Business Associate agrees to insure that any agent, including a subcontractor, to whom it provides PHI received from, or created or received by Business Associate, on behalf of the Covered Entity, agrees to the same restrictions and conditions that apply through this Section of the Contract to Business Associate with respect to such information.
- (7) Business Associate agrees to provide access, at the request of the Covered Entity, and in the time and manner agreed to by the parties, to PHI in a Designated Record Set, to Covered Entity or, as directed by Covered Entity, to an Individual in order to meet the requirements under 45 C.F.R. § 164.524.
- (8) Business Associate agrees to make any amendments to PHI in a Designated Record Set that the Covered Entity directs or agrees to pursuant to 45 C.F.R. § 164.526 at the request of the Covered Entity, and in the time and manner agreed to by the parties.
- (9) Business Associate agrees to make internal practices, books, and records, including policies and procedures and PHI, relating to the use and disclosure of PHI received from, or created or received by, Business Associate on behalf of Covered Entity, available to Covered Entity or to the Secretary in a time and manner agreed to by the parties or designated by the Secretary, for purposes of the Secretary determining Covered Entity's compliance with the Privacy Rule.
- (10) Business Associate agrees to document such disclosures of PHI and information related to such disclosures as would be required for Covered Entity to respond to a request by an Individual for an accounting of disclosures of PHI in accordance with 45 C.F.R. § 164.528 and section 13405 of the HITECH Act (42 U.S.C. § 17935) and any regulations promulgated thereunder.
- (11) Business Associate agrees to provide to Covered Entity, in a time and manner agreed to by the parties, information collected in accordance with clause h. (10) of this Section of the Contract, to permit Covered Entity to respond to a request by an Individual for an accounting of disclosures of PHI in accordance with 45 C.F.R. § 164.528 and section 13405 of the HITECH Act (42 U.S.C. § 17935) and any regulations promulgated thereunder. Business Associate agrees at the Covered Entity's direction to provide an accounting of disclosures of PHI directly to an individual in accordance with 45 C.F.R. § 164.528 and section 13405 of the HITECH Act (42 U.S.C. § 17935) and any regulations promulgated thereunder.
- (12) Business Associate agrees to comply with any state or federal law that is more stringent than the Privacy Rule.
- (13) Business Associate agrees to comply with the requirements of the HITECH Act relating to privacy and security that are applicable to the Covered Entity and with the requirements of 45 C.F.R. sections 164.504(e), 164.308, 164.310, 164.312, and 164.316.

- (14) In the event that an individual requests that the Business Associate (a) restrict disclosures of PHI; (b) provide an accounting of disclosures of the individual's PHI; or (c) provide a copy of the individual's PHI in an electronic health record, the Business Associate agrees to notify the covered entity, in writing, within two business days of the request.
- (15) Business Associate agrees that it shall not, directly or indirectly, receive any remuneration in exchange for PHI of an individual without (1) the written approval of the covered entity, unless receipt of remuneration in exchange for PHI is expressly authorized by this Contract and (2) the valid authorization of the individual, except for the purposes provided under section 13405(d)(2) of the HITECH Act,(42 U.S.C. § 17935(d)(2)) and in any accompanying regulations
- (16) Obligations in the Event of a Breach
- A. The Business Associate agrees that, following the discovery of a breach of unsecured protected health information, it shall notify the Covered Entity of such breach in accordance with the requirements of section 13402 of HITECH (42 U.S.C. 17932(b) and the provisions of this Section of the Contract.
- B. Such notification shall be provided by the Business Associate to the Covered Entity without unreasonable delay, and in no case later than 30 days after the breach is discovered by the Business Associate, except as otherwise instructed in writing by a law enforcement official pursuant to section 13402 (g) of HITECH (42 U.S.C. 17932(g)) . A breach is considered discovered as of the first day on which it is, or reasonably should have been, known to the Business Associate. The notification shall include the identification and last known address, phone number and email address of each individual (or the next of kin of the individual if the individual is deceased) whose unsecured protected health information has been, or is reasonably believed by the Business Associate to have been, accessed, acquired, or disclosed during such breach.
- C. The Business Associate agrees to include in the notification to the Covered Entity at least the following information:
1. A brief description of what happened, including the date of the breach and the date of the discovery of the breach, if known.
 2. A description of the types of unsecured protected health information that were involved in the breach (such as full name, Social Security number, date of birth, home address, account number, or disability code).
 3. The steps the Business Associate recommends that individuals take to protect themselves from potential harm resulting from the breach.
 4. A detailed description of what the Business Associate is doing to investigate the breach, to mitigate losses, and to protect against any further breaches.
 5. Whether a law enforcement official has advised either verbally or in writing the Business Associate that he or she has determined that notification or notice to

individuals or the posting required under section 13402 of the HITECH Act would impede a criminal investigation or cause damage to national security and; if so, include contact information for said official.

- D. Business Associate agrees to provide appropriate staffing and have established procedures to ensure that individuals informed by the Covered Entity of a breach by the Business Associate have the opportunity to ask questions and contact the Business Associate for additional information regarding the breach. Such procedures shall include a toll-free telephone number, an e-mail address, a posting on its Web site and a postal address. Business Associate agrees to include in the notification of a breach by the Business Associate to the Covered Entity, a written description of the procedures that have been established to meet these requirements. Costs of such contact procedures will be borne by the Contractor.
- E. Business Associate agrees that, in the event of a breach, it has the burden to demonstrate that it has complied with all notifications requirements set forth above, including evidence demonstrating the necessity of a delay in notification to the Covered Entity.

(i) Permitted Uses and Disclosure by Business Associate.

(1) General Use and Disclosure Provisions Except as otherwise limited in this Section of the Contract, Business Associate may use or disclose PHI to perform functions, activities, or services for, or on behalf of, Covered Entity as specified in this Contract, provided that such use or disclosure would not violate the Privacy Rule if done by Covered Entity or the minimum necessary policies and procedures of the Covered Entity.

(2) Specific Use and Disclosure Provisions

(A) Except as otherwise limited in this Section of the Contract, Business Associate may use PHI for the proper management and administration of Business Associate or to carry out the legal responsibilities of Business Associate.

(B) Except as otherwise limited in this Section of the Contract, Business Associate may disclose PHI for the proper management and administration of Business Associate, provided that disclosures are Required by Law, or Business Associate obtains reasonable assurances from the person to whom the information is disclosed that it will remain confidential and used or further disclosed only as Required by Law or for the purpose for which it was disclosed to the person, and the person notifies Business Associate of any instances of which it is aware in which the confidentiality of the information has been breached.

(C) Except as otherwise limited in this Section of the Contract, Business Associate may use PHI to provide Data Aggregation services to Covered Entity as permitted by 45 C.F.R. § 164.504(e)(2)(i)(B).

(j) Obligations of Covered Entity.

- (1) Covered Entity shall notify Business Associate of any limitations in its notice of privacy practices of Covered Entity, in accordance with 45 C.F.R. § 164.520, or to the extent that such limitation may affect Business Associate's use or disclosure of PHI.
 - (2) Covered Entity shall notify Business Associate of any changes in, or revocation of, permission by Individual to use or disclose PHI, to the extent that such changes may affect Business Associate's use or disclosure of PHI.
 - (3) Covered Entity shall notify Business Associate of any restriction to the use or disclosure of PHI that Covered Entity has agreed to in accordance with 45 C.F.R. § 164.522, to the extent that such restriction may affect Business Associate's use or disclosure of PHI.
- (k) Permissible Requests by Covered Entity. Covered Entity shall not request Business Associate to use or disclose PHI in any manner that would not be permissible under the Privacy Rule if done by the Covered Entity, except that Business Associate may use and disclose PHI for data aggregation, and management and administrative activities of Business Associate, as permitted under this Section of the Contract.
- (l) Term and Termination.
- (1) Term. The Term of this Section of the Contract shall be effective as of the date the Contract is effective and shall terminate when the information collected in accordance with clause h. (10) of this Section of the Contract is provided to the Covered Entity and all of the PHI provided by Covered Entity to Business Associate, or created or received by Business Associate on behalf of Covered Entity, is destroyed or returned to Covered Entity, or, if it is infeasible to return or destroy PHI, protections are extended to such information, in accordance with the termination provisions in this Section.
 - (2) Termination for Cause Upon Covered Entity's knowledge of a material breach by Business Associate, Covered Entity shall either:
 - (A) Provide an opportunity for Business Associate to cure the breach or end the violation and terminate the Contract if Business Associate does not cure the breach or end the violation within the time specified by the Covered Entity; or
 - (B) Immediately terminate the Contract if Business Associate has breached a material term of this Section of the Contract and cure is not possible; or
 - (C) If neither termination nor cure is feasible, Covered Entity shall report the violation to the Secretary.
 - (3) Effect of Termination
 - (A) Except as provided in (l)(2) of this Section of the Contract, upon termination of this Contract, for any reason, Business Associate shall return or destroy all PHI received from Covered Entity, or created or received by Business Associate on behalf of Covered Entity. Business Associate shall also provide the information collected in accordance with clause h. (10) of this Section of the Contract to the Covered Entity

within ten business days of the notice of termination. This provision shall apply to PHI that is in the possession of subcontractors or agents of Business Associate. Business Associate shall retain no copies of the PHI.

(B) In the event that Business Associate determines that returning or destroying the PHI is infeasible, Business Associate shall provide to Covered Entity notification of the conditions that make return or destruction infeasible. Upon documentation by Business Associate that return or destruction of PHI is infeasible, Business Associate shall extend the protections of this Section of the Contract to such PHI and limit further uses and disclosures of PHI to those purposes that make return or destruction infeasible, for as long as Business Associate maintains such PHI. Infeasibility of the return or destruction of PHI includes, but is not limited to, requirements under state or federal law that the Business Associate maintains or preserves the PHI or copies thereof.

(m) Miscellaneous Provisions.

(1) Regulatory References. A reference in this Section of the Contract to a section in the Privacy Rule means the section as in effect or as amended.

(2) Amendment. The Parties agree to take such action as is necessary to amend this Section of the Contract from time to time as is necessary for Covered Entity to comply with requirements of the Privacy Rule and the Health Insurance Portability and Accountability Act of 1996, Pub. L. No. 104-191.

(3) Survival. The respective rights and obligations of Business Associate shall survive the termination of this Contract.

(4) Effect on Contract. Except as specifically required to implement the purposes of this Section of the Contract, all other terms of the Contract shall remain in force and effect.

(5) Construction. This Section of the Contract shall be construed as broadly as necessary to implement and comply with the Privacy Standard. Any ambiguity in this Section of the Contract shall be resolved in favor of a meaning that complies, and is consistent with, the Privacy Standard.

(6) Disclaimer. Covered Entity makes no warranty or representation that compliance with this Section of the Contract will be adequate or satisfactory for Business Associate's own purposes. Covered Entity shall not be liable to Business Associate for any claim, civil or criminal penalty, loss or damage related to or arising from the unauthorized use or disclosure of PHI by Business Associate or any of its officers, directors, employees, contractors or agents, or any third party to whom Business Associate has disclosed PHI contrary to the provisions of this Contract or applicable law. Business Associate is solely responsible for all decisions made, and actions taken, by Business Associate regarding the safeguarding, use and disclosure of PHI within its possession, custody or control.

(7) Indemnification. The Business Associate shall indemnify and hold the Covered Entity harmless from and against any and all claims, liabilities, judgments, fines, assessments, penalties, awards and any statutory damages that may be imposed or assessed pursuant to HIPAA, as amended or the

December 2021

HITECH Act, including, without limitation, attorney's fees, expert witness fees, costs of investigation, litigation or dispute resolution, and costs awarded thereunder, relating to or arising out of any violation by the Business Associate and its agents, including subcontractors, of any obligation of Business Associate and its agents, including subcontractors, under this section of the contract, under HIPAA, the HITECH Act, the Privacy Rule and the Security Rule.

EXHIBIT C

State Wages and Other Related Information

Please refer to the Department of Labor website for the latest updates, annual adjusted wage rate increases, certified payroll forms and applicable statutes.

<http://www.ctdol.state.ct.us/wgwkstnd/prevailwage.htm>

Prevailing Wage Law Poster Language

**THIS IS A PUBLIC WORKS PROJECT Covered by the
PREVAILING WAGE LAW CT General Statutes Section 31-53**

If you have QUESTIONS regarding your wages CALL (860) 263-6790

Section 31-55 of the CT State Statutes requires every contractor or subcontractor performing work for the state to post in a prominent place the prevailing wages as determined by the Labor Commissioner.

Informational Bulletin

THE 10-HOUR OSHA CONSTRUCTION SAFETY AND HEALTH COURSE (applicable to public building contracts entered into on or after July 1, 2007, where the total cost of all work to be performed is at least \$100,000)

- (1) This requirement was created by Public Act No. 06-175, which is codified in Section 31-53b of the Connecticut General Statutes (pertaining to the prevailing wage statutes);
- (2) The course is required for public building construction contracts (projects funded in whole or in part by the state or any political subdivision of the state) entered into on or after July 1, 2007;
- (3) It is required of private employees (not state or municipal employees) and apprentices who perform manual labor for a general contractor or subcontractor on a public building project where the total cost of all work to be performed is at least \$100,000;
- (4) The ten-hour construction course pertains to the ten-hour Outreach Course conducted in accordance with federal OSHA Training Institute standards, and, for telecommunications workers, a ten-hour training course conducted in accordance with federal OSHA standard, 29 CFR 1910.268;
- (5) The internet website for the federal OSHA Training Institute is http://www.osha.gov/fso/ote/training/edcenters/fact_sheet.html;
- (6) The statutory language leaves it to the contractor and its employees to determine who pays for the cost of the ten-hour Outreach Course;

- (7) Within 30 days of receiving a contract award, a general contractor must furnish proof to the Labor Commissioner that all employees and apprentices performing manual labor on the project will have completed such a course;
- (8) Proof of completion may be demonstrated through either: (a) the presentation of a bona fide student course completion card issued by the federal OSHA Training Institute; or (2) the presentation of documentation provided to an employee by a trainer certified by the Institute pending the actual issuance of the completion card;
- (9) Any card with an issuance date more than 5 years prior to the commencement date of the construction project shall not constitute proof of compliance;
- (10) Each employer shall affix a copy of the construction safety course completion card to the certified payroll submitted to the contracting agency in accordance with Conn. Gen. Stat. § 31-53(f) on which such employee's name first appears;
- (11) Any employee found to be in non-compliance shall be subject to removal from the worksite if such employee does not provide satisfactory proof of course completion to the Labor Commissioner by the fifteenth day after the date the employee is determined to be in noncompliance;
- (12) Any such employee who is determined to be in noncompliance may continue to work on a public building construction project for a maximum of fourteen consecutive calendar days while bringing his or her status into compliance;
- (13) The Labor Commissioner may make complaint to the prosecuting authorities regarding any employer or agent of the employer, or officer or agent of the corporation who files a false certified payroll with respect to the status of an employee who is performing manual labor on a public building construction project;
- (14) The statute provides the minimum standards required for the completion of a safety course by manual laborers on public construction contracts; any contractor can exceed these minimum requirements; and
- (15) Regulations clarifying the statute are currently in the regulatory process, and shall be posted on the CTDOL website as soon as they are adopted in final form.
- (16) Any questions regarding this statute may be directed to the Wage and Workplace Standards Division of the Connecticut Labor Department via the internet website of <http://www.ctdol.state.ct.us/wgwkstnd/wgemenu.htm>; or by telephone at (860)263-6790.

THE ABOVE INFORMATION IS PROVIDED EXCLUSIVELY AS AN EDUCATIONAL RESOURCE, AND IS NOT INTENDED AS A SUBSTITUTE FOR LEGAL INTERPRETATIONS WHICH MAY ULTIMATELY ARISE CONCERNING THE CONSTRUCTION OF THE STATUTE OR THE REGULATIONS.

November 29, 2006

Notice

To All Mason Contractors and Interested Parties Regarding Construction Pursuant to Section 31-53 of the Connecticut General Statutes (Prevailing Wage)

The Connecticut Labor Department Wage and Workplace Standards Division is empowered to enforce the prevailing wage rates on projects covered by the above referenced statute. Over the past few years the Division has withheld enforcement of the rate in effect for workers who operate a forklift on a prevailing wage rate project due to a potential jurisdictional dispute. The rate listed in the schedules and in our Occupational Bulletin (see enclosed) has been as follows:

Forklift Operator:

- **Laborers (Group 4) Mason Tenders** - operates forklift solely to assist a mason to a maximum height of nine feet only.

- **Power Equipment Operator (Group 9)** - operates forklift to assist any trade and to assist a mason to a height over nine feet.

The U.S. Labor Department conducted a survey of rates in Connecticut but it has not been published and the rate in effect remains as outlined in the above Occupational Bulletin.

Since this is a classification matter and not one of jurisdiction, effective January 1, 2007 the Connecticut Labor Department will enforce the rate on each schedule in accordance with our statutory authority.

Your cooperation in filing appropriate and accurate certified payrolls is appreciated.

**CONNECTICUT DEPARTMENT OF LABOR
WAGE AND WORKPLACE STANDARDS DIVISION**

**CONTRACTORS WAGE CERTIFICATION FORM
Construction Manager at Risk/General Contractor/Prime Contractor**

I, _____ of _____
Officer, Owner, Authorized Rep. Company Name

do hereby certify that the _____
Company Name

Street

City

and all of its subcontractors will pay all workers on the

Project Name and Number

Street and City

the wages as listed in the schedule of prevailing rates required for such project (a copy of which is attached hereto).

Signed

Subscribed and sworn to before me this _____ day of _____, _____.

Notary Public

Return to: Connecticut Department of Labor
Wage & Workplace Standards Division
200 Folly Brook Blvd.
Wethersfield, CT 06109

Rate Schedule Issued (Date): _____

Information Bulletin Occupational Classifications

The Connecticut Department of Labor has the responsibility to properly determine "job classification" on prevailing wage projects covered under C.G.S. Section 31-53(d).

Note: This information is intended to provide a sample of some occupational classifications for guidance purposes only. It is not an all-inclusive list of each occupation's duties. This list is being provided only to highlight some areas where a contractor may be unclear regarding the proper classification. If unsure, the employer should seek guidelines for CTDOL.

Below are additional clarifications of specific job duties performed for certain classifications:

□ **ASBESTOS WORKERS**

Applies all insulating materials, protective coverings, coatings and finishes to all types of mechanical systems.

□ **ASBESTOS INSULATOR**

Handle, install apply, fabricate, distribute, prepare, alter, repair, dismantle, heat and frost insulation, including penetration and fire stopping work on all penetration fire stop systems.

□ **BOILERMAKERS**

Erects hydro plants, incomplete vessels, steel stacks, storage tanks for water, fuel, etc. Builds incomplete boilers, repairs heat exchanges and steam generators.

□ **BRICKLAYERS, CEMENT MASONS, CEMENT FINISHERS, MARBLE MASONS, PLASTERERS, STONE MASONS, PLASTERERS. STONE MASONS, TERRAZZO WORKERS, TILE SETTERS**

Lays building materials such as brick, structural tile and concrete cinder, glass, gypsum, terra cotta block. Cuts, tools and sets marble, sets stone, finishes concrete, applies decorative steel, aluminum and plastic tile, applies cements, sand, pigment and marble chips to floors, stairways, etc.

□ **CARPENTERS, MILLWRIGHTS. PILEDRIVERMEN. LATHERS. RESILEINT FLOOR LAYERS, DOCK BUILDERS, DIKERS, DIVER TENDERS**

Constructs, erects, installs and repairs structures and fixtures of wood, plywood and wallboard. Installs, assembles, dismantles, moves industrial machinery. Drives piling into ground to provide foundations for structures such as buildings and bridges, retaining walls for earth embankments, such as cofferdams. Fastens wooden, metal or rockboard lath to walls, ceilings and partitions of buildings, acoustical tile layer, concrete form builder. Applies firestopping materials on fire resistive joint systems only. Installation of curtain/window walls only where attached to wood or metal studs. Installation of insulated material of all types whether blown, nailed or attached in other ways to walls, ceilings and floors of buildings. Assembly and installation of modular furniture/furniture systems. Free-standing furniture is not covered. This includes free standing:

student chairs, study top desks, book box desks, computer furniture, dictionary stand, atlas stand, wood shelving, two-position information access station, file cabinets, storage cabinets, tables, etc.

☐ **LABORER, CLEANING**

- The clean up of any construction debris and the general (heavy/light) cleaning, including sweeping, wash down, mopping, wiping of the construction facility and its furniture, washing, polishing, and dusting.

☐ **DELIVERY PERSONNEL**

- If delivery of supplies/building materials is to one common point and stockpiled there, prevailing wages are not required. If the delivery personnel are involved in the distribution of the material to multiple locations within the construction site then they would have to be paid prevailing wages for the type of work performed: laborer, equipment operator, electrician, ironworker, plumber, etc.

- An example of this would be where delivery of drywall is made to a building and the delivery personnel distribute the drywall from one "stockpile" location to further sub-locations on each floor. Distribution of material around a construction site is the job of a laborer or tradesman, and not a delivery personnel.

☐ **ELECTRICIANS**

Install, erect, maintenance, alteration or repair of any wire, cable, conduit, etc., which generates, transforms, transmits or uses electrical energy for light, heat, power or other purposes, including the Installation or maintenance of telecommunication, LAN wiring or computer equipment, and low voltage wiring. *License required per Connecticut General Statutes: E-1,2 L-5,6 C-5,6 T-1,2 L-1,2 V-1,2,7,8,9.

☐ **ELEVATOR CONSTRUCTORS**

Install, erect, maintenance and repair of all types of elevators, escalators, dumb waiters and moving walks. *License required by Connecticut General Statutes: R-1, 2, 5, 6.

☐ **FORK LIFT OPERATOR**

Laborers Group 4) Mason Tenders - operates forklift solely to assist a mason to a maximum height of nine (9) feet only.

Power Equipment Operator Group 9 - operates forklift to assist any trade, and to assist a mason to a height over nine (9) feet.

☐ **GLAZIERS**

Glazing wood and metal sash, doors, partitions, and 2 story aluminum storefronts. Installs glass windows, skylights, store fronts and display cases or surfaces such as building fronts, interior walls, ceilings and table tops and metal store fronts. Installation of aluminum window walls and curtain walls is the "joint" work of glaziers and ironworkers, which require equal composite workforce.

□ **IRONWORKERS**

Erection, installation and placement of structural steel, precast concrete, miscellaneous iron, ornamental iron, metal curtain wall, rigging and reinforcing steel. Handling, sorting, and installation of reinforcing steel (rebar). Metal bridge rail (traffic), metal bridge handrail, and decorative security fence installation. Installation of aluminum window walls and curtain walls is the "joint" work of glaziers and ironworkers which require equal composite workforce.

□ **INSULATOR**

- Installing fire stopping systems/materials for "Penetration Firestop Systems": transit to cables, electrical conduits, insulated pipes, sprinkler pipe penetrations, ductwork behind radiation, electrical cable trays, fire rated pipe penetrations, natural polypropylene, HVAC ducts, plumbing bare metal, telephone and communication wires, and boiler room ceilings.

□ **LABORERS**

Acetylene burners, asphalt rakers, chain saw operators, concrete and power buggy operator, concrete saw operator, fence and guard rail erector (except metal bridge rail (traffic), decorative security fence (non-metal).

installation.), hand operated concrete vibrator operator, mason tenders, pipelayers (installation of storm drainage or sewage lines on the street only), pneumatic drill operator, pneumatic gas and electric drill operator, powermen and wagon drill operator, air track operator, block paver, curb setters, blasters, concrete spreaders.

□ **PAINTERS**

Maintenance, preparation, cleaning, blasting (water and sand, etc.), painting or application of any protective coatings of every description on all bridges and appurtenances of highways, roadways, and railroads. Painting, decorating, hardwood finishing, paper hanging, sign writing, scenic art work and drywall hhg for any and all types of building and residential work.

□ **LEAD PAINT REMOVAL**

- Painter's Rate 1. Removal of lead paint from bridges. 2. Removal of lead paint as preparation of any surface to be repainted. 3. Where removal is on a Demolition project prior to reconstruction. • Laborer's Rate 1. Removal of lead paint from any surface NOT to be repainted. 2. Where removal is on a TOTAL Demolition project only.

□ **PLUMBERS AND PIPEFITTERS**

Installation, repair, replacement, alteration or maintenance of all plumbing, heating, cooling and piping. ***License required per Connecticut General Statutes: P-1,2,6,7,8,9 J1,2,3,4 SP-1,2 S-1,2,3,4,5,6,7,8 B-1,2,3,4 D-1,2,3,4.**

☐ **POWER EQUIPMENT OPERATORS**

Operates several types of power construction equipment such as compressors, pumps, hoists, derricks, cranes, shovels, tractors, scrapers or motor graders, etc. Repairs and maintains equipment. ***License required, crane operators only, per Connecticut General Statutes.**

☐ **ROOFERS**

Covers roofs with composition shingles or sheets, wood shingles, slate or asphalt and gravel to waterproof roofs, including preparation of surface. (demolition or removal of any type of roofing and or clean-up of any and all areas where a roof is to be relaid.)

☐ **SHEETMETAL WORKERS**

Fabricate, assembles, installs and repairs sheetmetal products and equipment in such areas as ventilation, air-conditioning, warm air heating, restaurant equipment, architectural sheet metal work, sheetmetal roofing, and aluminum gutters. Fabrication, handling, assembling, erecting, altering, repairing, etc. of coated metal material panels and composite metal material panels when used on building exteriors and interiors as soffits, fascia, louvers, partitions, canopies, cornice, column covers, awnings, beam covers, cladding, sun shades, lighting troughs, spires, ornamental roofing, metal ceilings, mansards, copings, ornamental and ventilation hoods, vertical and horizontal siding panels, trim, etc. The sheet metal classification also applies to the vast variety of coated metal material panels and composite metal material panels that have evolved over the years as an alternative to conventional ferrous and non-ferrous metals like steel, iron, tin, copper, brass, bronze, aluminum, etc. Fabrication, handling, assembling, erecting, altering, repairing, etc. of architectural metal roof, standing seam roof, composite metal roof, metal and composite bathroom/toilet partitions, aluminum gutters, metal and composite lockers and shelving, kitchen equipment, and walk-in coolers. To include testing and air –balancing ancillary to installation and construction.

☐ **SPRINKLER FITTERS**

Installation, alteration, maintenance and repair of fire protection sprinkler systems. ***License required per Connecticut General Statutes: F-1, 2, 3, 4.**

☐ **TILE MARBLE AND TERRAZZO FINISHERS**

Assists and tends the tile setter, marble mason and terrazzo worker in the performance of their duties.

☐ **TRUCK DRIVERS**

~How to pay truck drivers delivering asphalt is under REVISION~

Truck Drivers are requires to be paid prevailing wage for time spent "working" directly on the site. These drivers remain covered by the prevailing wage for any time spent transporting between the actual construction location and facilities (such as fabrication, plants, mobile factories, batch plant, borrow pits, job headquarters, tool yards, etc.) dedicated exclusively, or nearly so, to performance

of the contract or project, which are so located in proximity to the actual construction location that it is reasonable to include them. ***License required, drivers only, per Connecticut General Statutes.**

For example:

- Material men and deliverymen are not covered under prevailing wage as long as they are not directly involved in the construction process. If, they unload the material, they would then be covered by prevailing wage for the classification they are performing work in: laborer, equipment operator, etc.
- Hauling material off site is not covered provided they are not dumping it at a location outlined above.
- Driving a truck on site and moving equipment or materials on site would be considered covered work, as this is part of the construction process.

Any questions regarding the proper classification should be directed to:

**Public Contract Compliance Unit
Wage and Workplace Standards Division
Connecticut Department of Labor
200 Folly Brook Blvd, Wethersfield, CT 06109
(860) 263-6543.**

**Connecticut Department of Labor
Wage and Workplace Standards Division
FOOTNOTES**

□ Please Note: If the “Benefits” listed on the schedule for the following occupations includes a letter(s) (+ a or + a+b for instance), refer to the information below.

Benefits to be paid at the appropriate prevailing wage rate for the listed occupation.

If the “Benefits” section for the occupation lists only a dollar amount, disregard the information below.

Bricklayers, Cement Masons, Cement Finishers, Concrete Finishers, Stone Masons
(Building Construction) and (Residential- Hartford, Middlesex, New Haven, New London and Tolland Counties)

a. Paid Holiday: Employees shall receive 4 hours for Christmas Eve holiday provided the employee works the regularly scheduled day before and after the holiday. Employers may schedule work on Christmas Eve and employees shall receive pay for actual hours worked in addition to holiday pay.

Elevator Constructors: Mechanics

a. Paid Holidays: New Year’s Day, Memorial Day, Independence Day, Labor Day, Veterans’ Day, Thanksgiving Day, Christmas Day, plus the Friday after Thanksgiving.

b. Vacation: Employer contributes 8% of basic hourly rate for 5 years or more of service or 6% of basic hourly rate for 6 months to 5 years of service as vacation pay credit.

Glaziers

a. Paid Holidays: Labor Day and Christmas Day.

Power Equipment Operators

(Heavy and Highway Construction & Building Construction)

a. Paid Holidays: New Year’s Day, Good Friday, Memorial day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day, provided the employee works 3 days during the week in which the holiday falls, if scheduled, and if scheduled, the working day before and the working day after the holiday. Holidays falling on Saturday may be observed on Saturday, or if the employer so elects, on the preceding Friday.

Ironworkers

a. Paid Holiday: Labor Day provided employee has been on the payroll for the 5 consecutive work days prior to Labor Day.

Laborers (Tunnel Construction)

a. Paid Holidays: New Year’s Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day. No employee shall be eligible for holiday pay when he

fails, without cause, to work the regular work day preceding the holiday or the regular work day following the holiday.

Roofers

a. Paid Holidays: July 4th, Labor Day, and Christmas Day provided the employee is employed 15 days prior to the holiday.

Sprinkler Fitters

a. Paid Holidays: Memorial Day, July 4th, Labor Day, Thanksgiving Day and Christmas Day, provided the employee has been in the employment of a contractor 20 working days prior to any such paid holiday.

Truck Drivers

(Heavy and Highway Construction & Building Construction)

a. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Christmas day, and Good Friday, provided the employee has at least 31 calendar days of service and works the last scheduled day before and the first scheduled day after the holiday, unless excused.

Rev. 7/1/19

SEE BELOW FOR STATE WAGE RATES

INSERT STATE WAGES HERE

PREVAILING WAGE RATE SCHEDULE

Minimum Rates and Classifications for
Heavy/Highway Construction

ID#: 24-67722

Connecticut Department of Labor
Wage and Workplace Standards Division

By virtue of the authority vested in the Labor Commissioner under provisions of Section 31-53 of the General Statutes of Connecticut, as amended, the following are declared to be the prevailing rates and welfare payments and will apply only where the contract is advertised for bid within 20 days of the date on which the rates are established. Any contractor or subcontractor not obligated by agreement to pay to the welfare and pension fund shall pay this amount to each employee as part of his/her hourly wages.

Project Number:

Project Town: Old Saybrook

State#:

FAP#:

Project: Replacement of Bridge No. 105003, Beaver Dam Trail over Fishing Brook

CLASSIFICATION	Hourly Rate	Benefits
1) Boilermaker	46.21	29.35
1a) Bricklayer, Cement Masons, Cement Finishers, Plasterers, Stone Masons	41.63	34.50
2) Carpenters, Piledrivermen	39.54	28.68
2a) Diver Tenders	39.54	28.68
3) Divers	48.0	28.68
03a) Millwrights	40.56	28.87
4) Painters: (Bridge Construction) Brush, Roller, Blasting (Sand, Water, etc.), Spray	57.85	25.95
4a) Painters: Brush and Roller	38.07	25.80
4b) Painters: Spray Only	41.07	25.80

4c) Painters: Steel Only	40.07	25.80
4d) Painters: Blast and Spray	41.07	25.80
4e) Painters: Tanks, Tower and Swing	40.07	25.80
4f) Elevated Tanks (60 feet and above)	47.07	25.80
5) Electrician (Trade License required: E-1,2 L-5,6 C-5,6 T-1,2 L-1,2 V-1,2,7,8,9)	44.6	34.71+3% of gross wage
6) Ironworkers: Ornamental, Reinforcing, Structural, and Precast Concrete Erection	45.25	41.27 + a
7) Plumbers (Trade License required: (P-1,2,6,7,8,9 J-1,2,3,4 SP-1,2) and Pipefitters (Including HVAC Work) (Trade License required: S-1,2,3,4,5,6,7,8 B-1,2,3,4 D-1,2,3,4 G-1, G-2, G-8, G-9)	49.58	36.15
----LABORERS-----		
8) Group 1: General Laborers and concrete specialist	34.5	27.26
8) Group 1a: Acetylene Burners (Hours worked with a torch)	35.5	27.26
9) Group 2: Chain saw operators, fence and guard rail erectors, pneumatic tool operators, powdermen	34.75	27.26
10) Group 3: Pipelayers	35.0	27.26
11) Group 4: Jackhammer/Pavement breaker (handheld); mason tenders (cement/concrete), catch basin builders, asphalt rakers, air track operators, block paver, curb setter and forklift operators	35.0	27.26

12) Group 5: Toxic waste removal (non-mechanical systems)	36.5	27.26
13) Group 6: Blasters	36.25	27.26
Group 7: Asbestos/lead removal, non-mechanical systems (does not include leaded joint pipe)	37.5	27.26
Group 8: Traffic control signalmen	20.7	27.26
Group 9: Hydraulic Drills	35.25	27.26
Group 10: Toxic Waste Removers A or B With PPE	37.5	27.26
----LABORERS (TUNNEL CONSTRUCTION, FREE AIR). Shield Drive and Liner Plate Tunnels in Free Air.----		
13a) Miners, Motormen, Mucking Machine Operators, Nozzle Men, Grout Men, Shaft & Tunnel Steel & Rodmen, Shield & Erector, Arm Operator, Cable Tenders	36.73	27.26 + a
13b) Brakemen, Trackmen, Miners' Helpers and all other men	35.76	27.26 + a
----CLEANING, CONCRETE AND CAULKING TUNNEL----		
14) Concrete Workers, Form Movers, and Strippers	35.76	27.26 + a
15) Form Erectors	36.09	27.26 + a
----ROCK SHAFT LINING, CONCRETE, LINING OF SAME AND TUNNEL IN FREE AIR:----		
16) Brakemen, Trackmen, Tunnel Laborers, Shaft Laborers, Miners Helpers	35.76	27.26 + a

17) Laborers Topside, Cage Tenders, Bellman	35.65	27.26 + a
18) Miners	36.73	27.26 + a
----TUNNELS, CAISSON AND CYLINDER WORK IN COMPRESSED AIR: ---		
-		
18a) Blaster	43.22	27.26 + a
19) Brakemen, Trackmen, Groutman, Laborers, Outside Lock Tender, Gauge Tenders	43.02	27.26 + a
20) Change House Attendants, Powder Watchmen, Top on Iron Bolts	41.04	27.26 + a
21) Mucking Machine Operator, Grout Boss, Track Boss	43.81	27.26 + a
----TRUCK DRIVERS----(*see note below)		
Two Axle Trucks, Helpers	33.16	32.36 + a
Three Axle Trucks; Two Axle Ready Mix	33.27	32.36 + a
Three Axle Ready Mix	33.33	32.36 + a
Four Axle Trucks	33.39	32.36 + a
Four Axle Ready-Mix	33.44	32.36 + a
Heavy Duty Trailer (40 tons and over)	35.66	32.36 + a

Specialized earth moving equipment other than conventional type on-the road trucks and semi-trailer (including Euclids)	33.44	32.36 + a
Heavy Duty Trailer (up to 40 tons)	34.39	32.36 + a
Snorkle Truck	33.54	32.36 + a
----POWER EQUIPMENT OPERATORS----		
Group 1: Crane Handling or Erecting Structural Steel or Stone, Hoisting Engineer (2 drums or over). (Trade License Required)	55.42	28.80 + a
Group 1a: Front End Loader (7 cubic yards or over); Work Boat 26 ft. and over.	50.79	28.80 + a
Group 2: Cranes (100 ton rate capacity and over); Bauer Drill/Caisson. (Trade License Required)	55.03	28.80 + a
Group 2a: Cranes (under 100 ton rated capacity).	54.09	28.80 + a
Group 2b: Excavator over 2 cubic yards; Pile Driver (\$3.00 premium when operator controls hammer).	50.4	28.80 + a
Group 3: Excavator; Gradall; Master Mechanic; Hoisting Engineer (all types of equipment where a drum and cable are used to hoist or drag material regardless of motive power of operation), Rubber Tire Excavator (Drott-1085 or similar); Grader Operator; Bulldozer Fine Grade (slopes, shaping, laser or GPS, etc.). (Trade License Required)	49.45	28.80 + a
Group 4: Trenching Machines; Lighter Derrick; CMI Machine or Similar; Koehring Loader (Skooper).	48.97	28.80 + a
Group 5: Specialty Railroad Equipment; Asphalt Paver; Asphalt Spreader; Asphalt Reclaiming Machine; Line Grinder; Concrete Pumps; Drills with Self Contained Power Units; Boring Machine; Post Hole Digger; Auger; Pounder; Well Digger; Milling Machine (over 24" mandrel)	48.22	28.80 + a

Group 5 continued: Side Boom; Combination Hoe and Loader; Directional Driller.	48.22	28.80 + a
Group 6: Front End Loader (3 up to 7 cubic yards); Bulldozer (rough grade dozer).	47.83	28.80 + a
Group 7: Asphalt Roller; Concrete Saws and Cutters (ride on types); Vermeer Concrete Cutter; Stump Grinder; Scraper; Snooper; Skidder; Milling Machine (24" and under Mandrel)	47.4	28.80 + a
Group 8: Mechanic, Grease Truck Operator, Hydroblaster, Barrier Mover, Power Stone Spreader; Welder; Work Boat under 26 ft.; Transfer Machine.	46.9	28.80 + a
Group 9: Front End Loader (under 3 cubic yards), Skid Steer Loader regardless of attachments (Bobcat or Similar); Fork Lift, Power Chipper; Landscape Equipment (including hydroseeder), Vacuum Excavation Truck and Hydrovac Excavation Truck (27 HG pressure or greater).	46.35	28.80 + a
Group 10: Vibratory Hammer, Ice Machine, Diesel and Air Hammer, etc.	43.77	28.80 + a
Group 11: Conveyor, Earth Roller; Power Pavement Breaker (whiphammer), Robot Demolition Equipment.	43.77	28.80 + a
Group 12: Wellpoint Operator.	43.69	28.80 + a
Group 13: Compressor Battery Operator.	42.97	28.80 + a
Group 14: Elevator Operator; Tow Motor Operator (Solid Tire No Rough Terrain).	41.52	28.80 + a
Group 15: Generator Operator; Compressor Operator; Pump Operator; Welding Machine Operator; Heater Operator.	41.01	28.80 + a
Group 16: Maintenance Engineer.	40.19	28.80 + a

Group 17: Portable Asphalt Plant Operator; Portable Crusher Plant Operator; Portable Concrete Plant Operator., Portable Grout Plant Operator, Portable Water Filtration Plant Operator.	45.63	28.80 + a
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Group 18: Power Safety Boat; Vacuum Truck; Zim Mixer; Sweeper; (minimum for any job requiring CDL license).	42.57	28.80 + a
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Surveyor: Chief of Party	45.87	28.80 + a
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Surveyor: Assistant Chief of Party	42.3	28.80 + a
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Surveyor: Instrument Man	40.7	28.80 + a
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Surveyor: Rodman or Chairman	35.03	28.80 + a
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**NOTE: SEE BELOW

----LINE CONSTRUCTION----(Railroad Construction and Maintenance)----

20) Lineman, Cable Splicer, Technician	48.84	18.07
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21) Heavy Equipment Operator	42.26	6.5% + 19.88
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22) Equipment Operator, Tractor Trailer Driver, Material Men	40.96	6.5% + 19.21
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23) Driver Groundmen	26.5	6.5% + 9.00
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23a) Truck Driver	40.96	6.5% + 17.76
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----LINE CONSTRUCTION----

24) Driver Groundmen	30.92	6.5% + 9.70
25) Groundmen	22.67	6.5% + 6.20
26) Heavy Equipment Operators	37.1	6.5% + 10.70
27) Linemen, Cable Splicers, Dynamite Men	41.22	6.5% + 12.20
28) Material Men, Tractor Trailer Drivers, Equipment Operators	35.04	6.5% + 10.45

Welders: Rate for craft to which welding is incidental.

Surveyors: Hazardous material removal: \$3.00 per hour premium.

*Note: Hazardous waste removal work receives additional \$1.25 per hour for truck drivers.

**Note: Hazardous waste premium \$3.00 per hour over classified rate

- Crane with 150 ft. boom (including jib) - \$1.50 extra
- Crane with 200 ft. boom (including jib) - \$2.50 extra
- Crane with 250 ft. boom (including jib) - \$5.00 extra
- Crane with 300 ft. boom (including jib) - \$7.00 extra
- Crane with 400 ft. boom (including jib) - \$10.00 extra

All classifications that indicate a percentage of the fringe benefits must be calculated at the percentage rate times the "base hourly rate".

Apprentices duly registered under the Commissioner of Labor's regulations on "Work Training Standards for Apprenticeship and Training Programs" Section 31-51-d-1 to 12, are allowed to be paid the appropriate percentage of the prevailing journeymen hourly base and the full fringe benefit rate, providing the work site ratio shall not be less than one full-time journeyman instructing and supervising the work of each apprentice in a specific trade.

--Connecticut General Statute Section 31-55a: Annual Adjustments to wage rates by contractors doing state work
 --

The Prevailing wage rates applicable to this project are subject to annual adjustments each July 1st for the duration of the project.

Each contractor shall pay the annual adjusted prevailing wage rate that is in effect each July 1st, as posted by the Department of Labor.

It is the contractor's responsibility to obtain the annual adjusted prevailing wage rate increases directly from the Department of Labor's website.

The annual adjustments will be posted on the Department of Labor's Web page: www.ct.gov/dol. For those without internet access, please contact the division listed below.

The Department of Labor will continue to issue the initial prevailing wage rate schedule to the Contracting Agency for the project.

All subsequent annual adjustments will be posted on our Web Site for contractor access.

Contracting Agencies are under no obligation pursuant to State labor law to pay any increase due to the annual adjustment provision.

Effective October 1, 2005 - Public Act 05-50: any person performing the work of any mechanic, laborer, or worker shall be paid prevailing wage

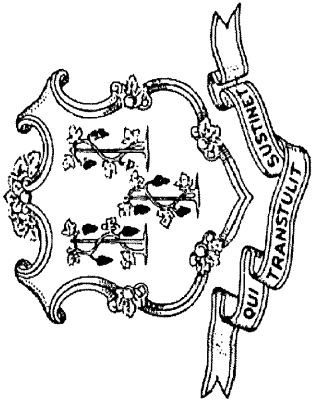
All Person who perform work ON SITE must be paid prevailing wage for the appropriate mechanic, laborer, or worker classification.

All certified payrolls must list the hours worked and wages paid to All Persons who perform work ON SITE regardless of their ownership i.e.: (Owners, Corporate Officers, LLC Members, Independent Contractors, et. al)

Reporting and payment of wages is required regardless of any contractual relationship alleged to exist between the contractor and such person.

~~Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clause (29 CFR 5.5 (a) (1) (ii)).

Please direct any questions which you may have pertaining to classification of work and payment of prevailing wages to the Wage and Workplace Standards Division, telephone (860)263-6790.



THIS IS A PUBLIC WORKS PROJECT

Covered by the

PREVAILING WAGE LAW

CT General Statutes Section 31-53

**If you have QUESTIONS regarding your wages
CALL (860) 263-6790**

Section 31-55 of the CT State Statutes requires every contractor or subcontractor performing work for the state to post in a prominent place the prevailing wages as determined by the Labor Commissioner.

(a) by adding Subdivs. (1) and (2) designators, adding Subdiv. (3) re submittal of false, misleading or materially inaccurate information, and making technical changes, effective July 1, 2021.

Cited. 223 C. 573.

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Sec. 31-53b. Worker training requirements for public works projects. Enforcement. Regulations. Exceptions. (a) Each contract for a public works project entered into on or after July 1, 2009, by the state or any of its agents, or by any political subdivision of the state or any of its agents, described in subsection (h) of section 31-53, shall contain a provision requiring that each contractor furnish proof with the weekly certified payroll form for the first week each employee begins work on such project that any person performing the work of a mechanic, laborer or worker pursuant to the classifications of labor under section 31-53 on such public works project, pursuant to such contract, has completed a course of at least ten hours in duration in construction safety and health approved by the federal Occupational Safety and Health Administration or, has completed a new miner training program approved by the Federal Mine Safety and Health Administration in accordance with 30 CFR 46 or, in the case of telecommunications employees, has completed at least ten hours of training in accordance with 29 CFR 1910.268, and, on or after July 1, 2012, that any plumber or electrician subject to the continuing education requirements of section 20-334d, who has completed a course of at least ten hours in duration in construction safety and health approved by the federal Occupational Safety and Health Administration five or more years prior to the date such electrician or plumber begins work on such public works project, has completed a supplemental refresher training course of at least four hours in duration in construction safety and health taught by a federal Occupational Safety and Health Administration authorized trainer.

(b) Any person required to complete a course or program under subsection (a) of this section who has not completed the course or program shall be subject to removal from the worksite if the person does not provide documentation of having completed such course or program by the fifteenth day after the date the person is found to be in noncompliance. The Labor Commissioner or said commissioner's designee shall enforce this section.

(c) Not later than January 1, 2012, the Labor Commissioner shall adopt regulations, in accordance with the provisions of chapter 54, to implement the provisions of subsections (a) and (b) of this section. Such regulations shall require that the ten-hour construction safety and health courses required under subsection (a) of this section be conducted in accordance with federal Occupational Safety and Health Administration Training Institute standards, or, in the case of a supplemental refresher training course, shall include, but not be limited to, an update of revised Occupational Safety and Health Administration standards and a review of required construction hazards training, or in accordance with Federal Mine Safety and Health Administration Standards or in accordance with 29 CFR 1910.268, as appropriate. The Labor Commissioner shall accept as sufficient proof of compliance with the provisions of subsection (a) or (b) of this section a student course completion card issued by the federal Occupational Safety and Health Administration Training Institute, or such other proof of compliance said commissioner deems appropriate, dated no earlier than five years before the commencement date of such public works project or, in the case of supplemental refresher training, a student course completion card issued by said Occupational Safety and Health Administration authorized trainer dated not earlier than five years prior to the date such electrician or plumber begins work on such public works project.

(d) This section shall not apply to employees of public service companies, as defined in section 16-1, or drivers of commercial motor vehicles driving the vehicle on the public works project and delivering or picking up cargo from public works projects provided they perform no labor relating to the project other than the loading and unloading of their cargo.

(P.A. 06-175, S. 1; P.A. 08-83, S. 1; P.A. 10-47, S. 2; P.A. 11-63, S. 1.)

History: P.A. 08-83 amended Subsec. (a) by making provisions applicable to public works project contracts entered into on or after July 1, 2009, replacing provision re total cost of work with reference to Sec. 31-53(g),

requiring proof in certified payroll form that new mechanic, laborer or worker has completed a 10-hour or more construction safety course and adding provision re new miner training program, amended Subsec. (b) by substituting “person” for “employee” and adding “or program”, amended Subsec. (c) by adding “or in accordance with Federal Mine Safety and Health Administration Standards” and setting new deadline of January 1, 2009, deleted former Subsec. (d) re “public building”, added new Subsec. (d) re exemptions for public service company employees and delivery drivers who perform no labor other than delivery and made conforming and technical changes, effective January 1, 2009; P.A. 10-47 made a technical change in Subsec. (a); P.A. 11-63 amended Subsec. (a) by adding provision re supplemental refresher training course for plumbers and electricians subject to Sec. 20-334d, amended Subsec. (c) by adding provisions re regulations and subject matter of refresher training course and refresher training course student completion cards, and made technical changes, effective July 1, 2011.

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Sec. 31-53c. Construction projects funded by the Department of Economic and Community Development; wage rates. Penalties. (a) For purposes of this section:

- (1) “Business organization” means any sole proprietorship, partnership, corporation, limited liability company, association, firm or other form of business or legal entity;
- (2) “Financial assistance” means any and all forms of loans, cash payments, extensions of credit, guarantees, equity investments, tax abatements or any other form of financing totaling one million dollars or more; and
- (3) “Project” means any construction, remodeling, refinishing, refurbishing, rehabilitation, alteration or repair of any property owned by a business organization.

(b) On and after July 1, 2018, if the Department of Economic and Community Development provides financial assistance to any business organization for any construction project of such business organization, the Department of Economic and Community Development shall require, as a condition of providing such financial assistance, that any contract entered into by the business organization for such project shall contain the following provision: “The wages paid on an hourly basis to any person performing the work of any mechanic, laborer or worker on the work herein contracted to be done and the amount of payment or contribution paid or payable on behalf of each such person to any employee welfare fund, as defined in subsection (i) of section 31-53, shall be at a rate equal to the rate customary or prevailing for the same work in the same trade or occupation in the town in which such construction, remodeling, refinishing, refurbishing, rehabilitation, alteration or repair project is being undertaken. Any contractor who is not obligated by agreement to make payment or contribution on behalf of such persons to any such employee welfare fund shall pay to each mechanic, laborer or worker as part of such person's wages the amount of payment or contribution for such person's classification on each pay day.”

(c) Any contractor or subcontractor who knowingly or wilfully employs any mechanic, laborer or worker in any project receiving financial assistance from the Department of Economic and Community Development for such project, at a rate of wage on an hourly basis that is less than the rate customary or prevailing for the same work in the same trade or occupation in the town in which such project is located, or who fails to pay the amount of payment or contributions paid or payable on behalf of each such person to any employee welfare fund, as defined in subsection (i) of section 31-53, or in lieu thereof to the person, as provided by subsection (b) of this section, shall be fined not less than two thousand five hundred dollars but not more than five thousand dollars for each offense and (1) for the first violation, shall be disqualified from bidding on contracts for projects for which the Department of Economic and Community Development provides financial assistance until the contractor or subcontractor has made full restitution of the back wages owed to such persons and for an additional six months thereafter, and (2) for subsequent violations, shall be disqualified from bidding on contracts for projects for which the Department of Economic and Community Development provides financial assistance until the contractor or subcontractor has made full restitution of the back wages owed to such persons and for not less than an additional two years thereafter. In addition, if it is found by the contracting officer

Informational Bulletin

THE 10-HOUR OSHA CONSTRUCTION SAFETY AND HEALTH COURSE

(applicable to public building contracts entered into *on or after July 1, 2007*, where the total cost of all work to be performed is at least \$100,000)

- (1) This requirement was created by Public Act No. 06-175, which is codified in Section 31-53b of the Connecticut General Statutes (pertaining to the prevailing wage statutes);
- (2) The course is required for public building construction contracts (projects funded in whole or in part by the state or any political subdivision of the state) entered into on or after July 1, 2007;
- (3) It is required of private employees (not state or municipal employees) and apprentices who perform manual labor for a general contractor or subcontractor on a public building project where the total cost of all work to be performed is at least \$100,000;
- (4) The ten-hour construction course pertains to the ten-hour Outreach Course conducted in accordance with federal OSHA Training Institute standards, and, for telecommunications workers, a ten-hour training course conducted in accordance with federal OSHA standard, 29 CFR 1910.268;
- (5) The internet website for the federal OSHA Training Institute is http://www.osha.gov/fso/ote/training/edcenters/fact_sheet.html;
- (6) The statutory language leaves it to the contractor and its employees to determine who pays for the cost of the ten-hour Outreach Course;
- (7) Within 30 days of receiving a contract award, a general contractor must furnish proof to the Labor Commissioner that all employees and apprentices performing manual labor on the project will have completed such a course;
- (8) Proof of completion may be demonstrated through either: (a) the presentation of a *bona fide* student course completion card issued by the federal OSHA Training Institute; *or* (2) the presentation of documentation provided to an employee by a trainer certified by the Institute pending the actual issuance of the completion card;
- (9) Any card with an issuance date more than 5 years prior to the commencement date of the construction project shall not constitute proof of compliance;

- (10) Each employer shall affix a copy of the construction safety course completion card to the certified payroll submitted to the contracting agency in accordance with Conn. Gen. Stat. § 31-53(f) on which such employee's name first appears;
- (11) Any employee found to be in non-compliance shall be subject to removal from the worksite if such employee does not provide satisfactory proof of course completion to the Labor Commissioner by the fifteenth day after the date the employee is determined to be in noncompliance;
- (12) Any such employee who is determined to be in noncompliance may continue to work on a public building construction project for a maximum of fourteen consecutive calendar days while bringing his or her status into compliance;
- (13) The Labor Commissioner may make complaint to the prosecuting authorities regarding any employer or agent of the employer, or officer or agent of the corporation who files a false certified payroll with respect to the status of an employee who is performing manual labor on a public building construction project;
- (14) The statute provides the minimum standards required for the completion of a safety course by manual laborers on public construction contracts; any contractor can exceed these minimum requirements; and
- (15) Regulations clarifying the statute are currently in the regulatory process, and shall be posted on the CTDOL website as soon as they are adopted in final form.
- (16) Any questions regarding this statute may be directed to the Wage and Workplace Standards Division of the Connecticut Labor Department via the internet website of <http://www.ctdol.state.ct.us/wgwkstnd/wgemenu.htm>; or by telephone at (860)263-6790.

THE ABOVE INFORMATION IS PROVIDED EXCLUSIVELY AS AN EDUCATIONAL RESOURCE, AND IS NOT INTENDED AS A SUBSTITUTE FOR LEGAL INTERPRETATIONS WHICH MAY ULTIMATELY ARISE CONCERNING THE CONSTRUCTION OF THE STATUTE OR THE REGULATIONS.

November 29, 2006

Notice
To All Mason Contractors and Interested Parties
Regarding Construction Pursuant to Section 31-53 of the
Connecticut General Statutes (Prevailing Wage)

The Connecticut Labor Department Wage and Workplace Standards Division is empowered to enforce the prevailing wage rates on projects covered by the above referenced statute.

Over the past few years the Division has withheld enforcement of the rate in effect for workers who operate a forklift on a prevailing wage rate project due to a potential jurisdictional dispute.

The rate listed in the schedules and in our Occupational Bulletin (see enclosed) has been as follows:

Forklift Operator:

- **Laborers (Group 4) Mason Tenders** - operates forklift solely to assist a mason to a maximum height of nine feet only.

- **Power Equipment Operator (Group 9)** - operates forklift to assist any trade and to assist a mason to a height over nine feet.

The U.S. Labor Department conducted a survey of rates in Connecticut but it has not been published and the rate in effect remains as outlined in the above Occupational Bulletin.

Since this is a classification matter and not one of jurisdiction, effective January 1, 2007 the Connecticut Labor Department will enforce the rate on each schedule in accordance with our statutory authority.

Your cooperation in filing appropriate and accurate certified payrolls is appreciated.

Sec. 31-55. Posting of wage rates by contractors doing state work. Every contractor or subcontractor performing work for the state subject to the provisions of section 31-53 or 31-54 shall post the prevailing wages as determined by the Labor Commissioner in prominent and easily accessible places at the site of work or at such place or places as are used to pay its employees their wages.

(1955, S. 3020d; P.A. 97-263, S. 16.)

History: P.A. 97-263 incorporated changes to Secs. 31-53 and 31-54 by reference.

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Sec. 31-55a. Annual adjustments to wage rates by contractors doing state work. Each contractor that is awarded a contract on or after October 1, 2002, for (1) the construction of a state highway or bridge that falls under the provisions of section 31-54, or (2) the construction, remodeling, refinishing, refurbishing, rehabilitation, alteration or repair of any public works project that falls under the provisions of section 31-53 shall contact the Labor Commissioner on or before July first of each year, for the duration of such contract, to ascertain the prevailing rate of wages on an hourly basis and the amount of payment or contributions paid or payable on behalf of each mechanic, laborer or worker employed upon the work contracted to be done, and shall make any necessary adjustments to such prevailing rate of wages and such payment or contributions paid or payable on behalf of each such employee, effective each July first.

(P.A. 02-69, S. 1.)

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Sec. 31-56. Hours of labor on state bridges. Section 31-56 is repealed, effective October 1, 2008.

(1949 Rev., S. 2208; 1963, P.A. 240, S. 2; 1969, P.A. 768, S. 261; P.A. 08-101, S. 31.)

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Sec. 31-56a. Definitions. For the purposes of this section and sections 31-56b and 31-56c:

- (1) "Project labor agreement" means a prehire agreement covering the terms and conditions for all persons who will perform work on a specific public works project;
- (2) "Public entity" means the state and any agency, instrumentality or political subdivision thereof;
- (3) "Public works project" means the construction, reconstruction, alteration, remodeling, repair or demolition of any public building or any other public works by a public entity.

(P.A. 12-70, S. 4.)

History: P.A. 12-70 effective June 6, 2012.

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Sec. 31-56b. Project labor agreements for public works projects. (a) Notwithstanding the provisions of any general statute, regulation or requirement regarding procurement of goods or services, a public entity may require a project labor agreement for any public works project when such public entity has determined, on a project-by-project basis and acting within its discretion, that it is in the public's interest to require such an

[New] In accordance with Section 31-53b(a) of the C.G.S. each contractor shall provide a copy of the OSHA 10 Hour Construction Safety and Health Card for each employee, to be attached to the first certified payroll on the project.

PAYROLL CERTIFICATION FOR PUBLIC WORKS PROJECTS												
In accordance with Connecticut General Statutes, 31-53 Certified Payrolls with a statement of compliance shall be submitted monthly to the contracting agency.					Connecticut Department of Labor Wage and Workplace Standards Division 200 Folly Brook Blvd. Wethersfield, CT 06109							
WEEKLY PAYROLL												
CONTRACTOR NAME AND ADDRESS:												
SUBCONTRACTOR NAME & ADDRESS												
WORKER'S COMPENSATION INSURANCE CARRIER												
POLICY #												
EFFECTIVE DATE:												
EXPIRATION DATE:												
PAYROLL NUMBER	Week-Ending Date	PERSON/WORKER, ADDRESS and SECTION	APPR RATE % AND RACE*	MALE/FEMALE AND RACE*	WORK CLASSIFICATION	PROJECT NAME & ADDRESS						
						S	M	T	W	TH	F	S
HOURS WORKED EACH DAY												
TOTAL DEDUCTIONS												
FEDERAL STATE												
WITH- HOLDING												
FICA												
GROSS PAY FOR THIS PREVAILING RATE JOB												
CHECK # AND NET PAY												
GROSS PAY FOR ALL WORK PERFORMED THIS WEEK												
TYPE OF FRINGE BENEFITS Per Hour 1 through 6 (see back)												
BASE HOURLY RATE												
TOTAL FRINGE BENEFIT PLAN CASH												
1. \$												
2. \$												
3. \$												
4. \$												
5. \$												
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6. \$												

12/9/2013 WWS-CPI *IF REQUIRED

PAGE NUMBER OF

OSHA 10 ~ATTACH CARD TO 1ST CERTIFIED PAYROLL

***FRINGE BENEFITS EXPLANATION (P):**

Bona fide benefits paid to approved plans, funds or programs, except those required by Federal or State Law (unemployment tax, worker's compensation, income taxes, etc.).

Please specify the type of benefits provided:

- 1) Medical or hospital care _____
- 2) Pension or retirement _____
- 3) Life Insurance _____
- 4) Disability _____
- 5) Vacation, holiday _____
- 6) Other (please specify) _____

CERTIFIED STATEMENT OF COMPLIANCE

For the week ending date of _____,

I, _____ of _____, (hereafter known as Employer) in my capacity as _____ (title) do hereby certify and state:

Section A:

1. All persons employed on said project have been paid the full weekly wages earned by them during the week in accordance with Connecticut General Statutes, section 31-53, as amended. Further, I hereby certify and state the following:

- a) The records submitted are true and accurate;
- b) The rate of wages paid to each mechanic, laborer or workman and the amount of payment or contributions paid or payable on behalf of each such person to any employee welfare fund, as defined in Connecticut General Statutes, section 31-53 (h), are not less than the prevailing rate of wages and the amount of payment or contributions paid or payable on behalf of each such person to any employee welfare fund, as determined by the Labor Commissioner pursuant to subsection Connecticut General Statutes, section 31-53 (d), and said wages and benefits are not less than those which may also be required by contract;
- c) The Employer has complied with all of the provisions in Connecticut General Statutes, section 31-53 (and Section 31-54 if applicable for state highway construction);
- d) Each such person is covered by a worker's compensation insurance policy for the duration of his employment which proof of coverage has been provided to the contracting agency;
- e) The Employer does not receive kickbacks, which means any money, fee, commission, credit, gift, gratuity, thing of value, or compensation of any kind which is provided directly or indirectly, to any prime contractor, prime contractor employee, subcontractor, or subcontractor employee for the purpose of improperly obtaining or rewarding favorable treatment in connection with a prime contract or in connection with a prime contractor in connection with a subcontractor relating to a prime contractor; and
- f) The Employer is aware that filing a certified payroll which he knows to be false is a class D felony for which the employer may be fined up to five thousand dollars, imprisoned for up to five years or both.

2. OSHA~The employer shall affix a copy of the construction safety course, program or training completion document to the certified payroll required to be submitted to the contracting agency for this project on which such persons name first appears.

(Signature) (Title) Submitted on (Date)

*****THIS IS A PUBLIC DOCUMENT***
DO NOT INCLUDE SOCIAL SECURITY NUMBERS**

[New] In accordance with Section 31-53b(a) of the C.G.S. each contractor shall provide a copy of the OSHA 10 Hour Construction Safety and Health Card for each employee, to be attached to the first certified payroll on the project.

PAYROLL CERTIFICATION FOR PUBLIC WORKS PROJECTS												
WEEKLY PAYROLL												
Connecticut Department of Labor Wage and Workplace Standards Division 200 Folly Brook Blvd. Waterbury, CT 06109												
WORKERS COMPENSATION INSURANCE CARRIER Travelers Insurance Company POLICY # #BAC6888928 EFFECTIVE DATE: 1/1/09 EXPIRATION DATE: 12/31/09												
SUBCONTRACTOR NAME & ADDRESS XYZ Corporation 2 Main Street Yantic, CT 06389												
CONTRACTOR NAME AND ADDRESS: London Corporation, 15 Connecticut Avenue, Northford, CT 06472												
PAYROLL NUMBER	Week-Ending Date	APPR RATE %	MALE/FEMALE AND RACE	WORK CLASSIFICATION	DAY AND DATE							Total ST Hours
					S	M	T	W	TH	F	S	
PERSON/WORKER ADDRESS and SECTION	APPRAISAL DATE	RATE	RACE	CLASSIFICATION	HOURS WORKED EACH DAY							Total O-T Hours
					S	M	T	W	TH	F	S	
1	9/26/09				20	21	22	23	24	25	26	
Robert Craft 81 Maple Street Williamantic, CT 06226	MC			Electrical Lineman E-1 1234567 Owner OSHA 123456	8	8	8	8	8	8	8	40
Ronald Jones 212 Elm Street Norwich, CT 06360	M/B	65%		Electrical Apprentice OSHA 234567	8	8	8	8	8	8	8	40
Franklin T. Smith 234 Washington Rd. New London, CT 06320 SECTION B	M/H			Project Manager	8							8
*IF REQUIRED 7/13/2009 WWS-CP1												

*SEE REVERSE SIDE

PAGE NUMBER 1 OF 2

OSHA 10 ~ATTACH CARD TO 1ST CERTIFIED PAYROLL

***FRINGE BENEFITS EXPLANATION (P):**

Bona fide benefits paid to approved plans, funds or programs, except those required by Federal or State Law (unemployment tax, worker's compensation, income taxes, etc.).

Please specify the type of benefits provided:

- 1) Medical or hospital care Blue Cross 4) Disability _____
- 2) Pension or retirement _____ 5) Vacation, holiday _____
- 3) Life Insurance Utopia 6) Other (please specify) _____

CERTIFIED STATEMENT OF COMPLIANCE

For the week ending date of 9/26/09.

I, Robert Craft of XYZ Corporation, (hereafter known as

Employer) in my capacity as Owner (title) do hereby certify and state:

Section A:

1. All persons employed on said project have been paid the full weekly wages earned by them during the week in accordance with Connecticut General Statutes, section 31-53, as amended. Further, I hereby certify and state the following:

- a) The records submitted are true and accurate;
- b) The rate of wages paid to each mechanic, laborer or workman and the amount of payment or contributions paid or payable on behalf of each such employee to any employee welfare fund, as defined in Connecticut General Statutes, section 31-53 (h), are not less than the prevailing rate of wages and the amount of payment or contributions paid or payable on behalf of each such employee to any employee welfare fund, as determined by the Labor Commissioner pursuant to subsection Connecticut General Statutes, section 31-53 (d), and said wages and benefits are not less than those which may also be required by contract;
- c) The Employer has complied with all of the provisions in Connecticut General Statutes, section 31-53 (and Section 31-54 if applicable for state highway construction);
- d) Each such employee of the Employer is covered by a worker's compensation insurance policy for the duration of his employment which proof of coverage has been provided to the contracting agency;
- e) The Employer does not receive kickbacks, which means any money, fee, commission, credit, gift, gratuity, thing of value, or compensation of any kind which is provided directly or indirectly, to any prime contractor, prime contractor employee, subcontractor, or subcontractor employee for the purpose of improperly obtaining or rewarding favorable treatment in connection with a prime contract or in connection with a prime contractor in connection with a subcontractor relating to a prime contractor; and
- f) The Employer is aware that filing a certified payroll which he knows to be false is a class D felony for which the employer may be fined up to five thousand dollars, imprisoned for up to five years or both.

2. OSHA--The employer shall affix a copy of the construction safety course, program or training completion document to the certified payroll required to be submitted to the contracting agency for this project on which such employee's name first appears.

Robert Craft owner 10/2/09
 (Signature) (Title) Submitted on (Date)

Section B: Applies to CONNDOT Projects ONLY

That pursuant to CONNDOT contract requirements for reporting purposes only, all employees listed under Section B who performed work on this project are not covered under the prevailing wage requirements defined in Connecticut General Statutes Section 31-53.

Robert Craft owner 10/2/09
 (Signature) (Title) Submitted on (Date)

Note: CTDOL will assume all hours worked were performed under Section A unless clearly delineated as Section B WWS-CP1 as such. Should an employee perform work under both Section A and Section B, the hours worked and wages paid must be segregated for reporting purposes.

THIS IS A PUBLIC DOCUMENT
 DO NOT INCLUDE SOCIAL SECURITY NUMBERS

Information Bulletin

Occupational Classifications

The Connecticut Department of Labor has the responsibility to properly determine "job classification" on prevailing wage projects covered under C.G.S. Section 31-53(d).

Note: This information is intended to provide a sample of some occupational classifications for guidance purposes only. It is not an all-inclusive list of each occupation's duties. This list is being provided only to highlight some areas where a contractor may be unclear regarding the proper classification. If unsure, the employer should seek guidelines for CTDOL.

Below are additional clarifications of specific job duties performed for certain classifications:

- **ASBESTOS WORKERS**

Applies all insulating materials, protective coverings, coatings and finishes to all types of mechanical systems.

- **ASBESTOS INSULATOR**

Handle, install apply, fabricate, distribute, prepare, alter, repair, dismantle, heat and frost insulation, including penetration and fire stopping work on all penetration fire stop systems.

- **BOILERMAKERS**

Erects hydro plants, incomplete vessels, steel stacks, storage tanks for water, fuel, etc. Builds incomplete boilers, repairs heat exchanges and steam generators.

- **BRICKLAYERS, CEMENT MASONS, CEMENT FINISHERS, MARBLE MASONS, PLASTERERS, STONE MASONS, PLASTERERS. STONE MASONS, TERRAZZO WORKERS, TILE SETTERS**

Lays building materials such as brick, structural tile and concrete cinder, glass, gypsum, terra cotta block. Cuts, tools and sets marble, sets stone, finishes concrete, applies decorative steel, aluminum and plastic tile, applies cements, sand, pigment and marble chips to floors, stairways, etc.

- **CARPENTERS, MILLWRIGHTS. PILEDRIVERMEN. LATHERS. RESILEINT FLOOR LAYERS, DOCK BUILDERS, DIKERS, DIVER TENDERS**

Constructs, erects, installs and repairs structures and fixtures of wood, plywood and wallboard. Installs, assembles, dismantles, moves industrial machinery. Drives piling into ground to provide foundations for structures such as buildings and bridges, retaining walls for earth embankments, such as cofferdams. Fastens wooden, metal or rockboard lath to walls, ceilings and partitions of buildings, acoustical tile layer, concrete form builder. Applies firestopping materials on fire resistive joint systems only. Installation of curtain/window walls only where attached to wood or metal studs. Installation of insulated material of all types whether blown, nailed or attached in other ways to walls, ceilings and floors of buildings. Assembly and installation of modular furniture/furniture systems. Free-standing furniture is not covered. This includes free standing: student chairs, study top desks, book box desks, computer furniture, dictionary stand, atlas stand, wood shelving, two-position information access station, file cabinets, storage cabinets, tables, etc.

- **LABORER, CLEANING**

- The clean up of any construction debris and the general (heavy/light) cleaning, including sweeping, wash down, mopping, wiping of the construction facility and its furniture, washing, polishing, and dusting.

- **DELIVERY PERSONNEL**

- If delivery of supplies/building materials is to one common point and stockpiled there, prevailing wages are not required. If the delivery personnel are involved in the distribution of the material to multiple locations within the construction site then they would have to be paid prevailing wages for the type of work performed: laborer, equipment operator, electrician, ironworker, plumber, etc.

- An example of this would be where delivery of drywall is made to a building and the delivery personnel distribute the drywall from one "stockpile" location to further sub-locations on each floor. Distribution of material around a construction site is the job of a laborer or tradesman, and not a delivery personnel.

- **ELECTRICIANS**

Install, erect, maintenance, alteration or repair of any wire, cable, conduit, etc., which generates, transforms, transmits or uses electrical energy for light, heat, power or other purposes, including the installation or maintenance of telecommunication, LAN wiring or computer equipment, and low voltage wiring. ****License required per Connecticut General Statutes: E-1,2 L-5,6 C-5,6 T-1,2 L-1,2 V-1,2,7,8,9.***

- **ELEVATOR CONSTRUCTORS**

Install, erect, maintenance and repair of all types of elevators, escalators, dumb waiters and moving walks. **License required by Connecticut General Statutes: R-1,2,5,6.*

- **FORK LIFT OPERATOR**

Laborers Group 4) Mason Tenders - operates forklift solely to assist a mason to a maximum height of nine (9) feet only.

Power Equipment Operator Group 9 - operates forklift to assist any trade, and to assist a mason to a height over nine (9) feet.

- **GLAZIERS**

Glazing wood and metal sash, doors, partitions, and 2 story aluminum storefronts. Installs glass windows, skylights, store fronts and display cases or surfaces such as building fronts, interior walls, ceilings and table tops and metal store fronts. Installation of aluminum window walls and curtain walls is the "joint" work of glaziers and ironworkers, which require equal composite workforce.

- **IRONWORKERS**

Erection, installation and placement of structural steel, precast concrete, miscellaneous iron, ornamental iron, metal curtain wall, rigging and reinforcing steel. Handling, sorting, and installation of reinforcing steel (rebar). Metal bridge rail (traffic), metal bridge handrail, and decorative security fence installation. Installation of aluminum window walls and curtain walls is the "joint" work of glaziers and ironworkers which require equal composite workforce.

- **INSULATOR**

- Installing fire stopping systems/materials for "Penetration Firestop Systems": transit to cables, electrical conduits, insulated pipes, sprinkler pipe penetrations, ductwork behind radiation, electrical cable trays, fire rated pipe penetrations, natural polypropylene, HVAC ducts, plumbing bare metal, telephone and communication wires, and boiler room ceilings.

- **LABORERS**

Acetylene burners, asphalt rakers, chain saw operators, concrete and power buggy operator, concrete saw operator, fence and guard rail erector (except metal bridge rail (traffic), decorative security fence (non-metal)).

installation.), hand operated concrete vibrator operator, mason tenders, pipelayers (installation of storm drainage or sewage lines on the street only), pneumatic drill operator, pneumatic gas and electric drill operator, powermen and wagon drill operator, air track operator, block paver, curb setters, blasters, concrete spreaders.

- **PAINTERS**

Maintenance, preparation, cleaning, blasting (water and sand, etc.), painting or application of any protective coatings of every description on all bridges and appurtenances of highways, roadways, and railroads. Painting, decorating, hardwood finishing, paper hanging, sign writing, scenic art work and drywall hhg for any and all types of building and residential work.

- **LEAD PAINT REMOVAL**

- Painter's Rate

1. Removal of lead paint from bridges.
2. Removal of lead paint as preparation of any surface to be repainted.
3. Where removal is on a Demolition project prior to reconstruction.

- Laborer's Rate

1. Removal of lead paint from any surface NOT to be repainted.
2. Where removal is on a *TOTAL* Demolition project only.

- **PLUMBERS AND PIPEFITTERS**

Installation, repair, replacement, alteration or maintenance of all plumbing, heating, cooling and piping. ****License required per Connecticut General Statutes: P-1,2,6,7,8,9 J-1,2,3,4 SP-1,2 S-1,2,3,4,5,6,7,8 B-1,2,3,4 D-1,2,3,4.***

- **POWER EQUIPMENT OPERATORS**

Operates several types of power construction equipment such as compressors, pumps, hoists, derricks, cranes, shovels, tractors, scrapers or motor graders, etc. Repairs and maintains equipment. ****License required, crane operators only, per Connecticut General Statutes.***

- **ROOFERS**

Covers roofs with composition shingles or sheets, wood shingles, slate or asphalt and gravel to waterproof roofs, including preparation of surface. (demolition or removal of any type of roofing and or clean-up of any and all areas where a roof is to be relaid.)

- **SHEETMETAL WORKERS**

Fabricate, assembles, installs and repairs sheetmetal products and equipment in such areas as ventilation, air-conditioning, warm air heating, restaurant equipment, architectural sheet metal work, sheetmetal roofing, and aluminum gutters. Fabrication, handling, assembling, erecting, altering, repairing, etc. of coated metal material panels and composite metal material panels when used on building exteriors and interiors as soffits, fascia, louvers, partitions, canopies, cornice, column covers, awnings, beam covers, cladding, sun shades, lighting troughs, spires, ornamental roofing, metal ceilings, mansards, copings, ornamental and ventilation hoods, vertical and horizontal siding panels, trim, etc. The sheet metal classification also applies to the vast variety of coated metal material panels and composite metal material panels that have evolved over the years as an alternative to conventional ferrous and non-ferrous metals like steel, iron, tin, copper, brass, bronze, aluminum, etc. Fabrication, handling, assembling, erecting, altering, repairing, etc. of architectural metal roof, standing seam roof, composite metal roof, metal and composite bathroom/toilet partitions, aluminum gutters, metal and composite lockers and shelving, kitchen equipment, and walk-in coolers. To include testing and air –balancing ancillary to installation and construction.

- **SPRINKLER FITTERS**

Installation, alteration, maintenance and repair of fire protection sprinkler systems.

****License required per Connecticut General Statutes: F-1,2,3,4.***

- **TILE MARBLE AND TERRAZZO FINISHERS**

Assists and tends the tile setter, marble mason and terrazzo worker in the performance of their duties.

- **TRUCK DRIVERS**

~How to pay truck drivers delivering asphalt is under REVISION~

Truck Drivers are requires to be paid prevailing wage for time spent "working" directly on the site. These drivers remain covered by the prevailing wage for any time spent transporting between the actual construction location and facilities (such as fabrication, plants, mobile factories, batch plant, borrow pits, job headquarters, tool yards, etc.) dedicated exclusively, or nearly so, to performance of the contract or project, which are so located in proximity to the actual construction location that it is reasonable to include them. ****License required, drivers only, per Connecticut General Statutes.***

For example:

- Material men and deliverymen are not covered under prevailing wage as long as they are not directly involved in the construction process. If, they unload the material, they would then be covered by prevailing wage for the classification they are performing work in: laborer, equipment operator, etc.
- Hauling material off site is not covered provided they are not dumping it at a location outlined above.
- Driving a truck on site and moving equipment or materials on site would be considered covered work, as this is part of the construction process.

➤ *Any questions regarding the proper classification should be directed to:*
Public Contract Compliance Unit
Wage and Workplace Standards Division
Connecticut Department of Labor
200 Folly Brook Blvd, Wethersfield, CT 06109
(860) 263-6790.

Connecticut Department of Labor
Wage and Workplace Standards Division
FOOTNOTES

⇒ Please Note: If the “Benefits” listed on the schedule for the following occupations includes a letter(s) (+ a or + a+b for instance), refer to the information below.

Benefits to be paid at the appropriate prevailing wage rate for the listed occupation.

If the “Benefits” section for the occupation lists only a dollar amount, disregard the information below.

Bricklayers, Cement Masons, Cement Finishers, Concrete Finishers, Stone Masons
(Building Construction) and
(Residential- Hartford, Middlesex, New Haven, New London and Tolland Counties)

- a. Paid Holiday: Employees shall receive 4 hours for Christmas Eve holiday provided the employee works the regularly scheduled day before and after the holiday. Employers may schedule work on Christmas Eve and employees shall receive pay for actual hours worked in addition to holiday pay.

Elevator Constructors: Mechanics

- a. Paid Holidays: New Year’s Day, Memorial Day, Independence Day, Labor Day, Veterans’ Day, Thanksgiving Day, Christmas Day, plus the Friday after Thanksgiving.
- b. Vacation: Employer contributes 8% of basic hourly rate for 5 years or more of service or 6% of basic hourly rate for 6 months to 5 years of service as vacation pay credit.

Glaziers

- a. Paid Holidays: Labor Day and Christmas Day.

Power Equipment Operators
(Heavy and Highway Construction & Building Construction)

- a. Paid Holidays: New Year’s Day, Good Friday, Memorial day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day, provided the employee works 3 days during the week in which the holiday falls, if scheduled, and if scheduled, the working day before and the working day after the holiday. Holidays falling on Saturday may be observed on Saturday, or if the employer so elects, on the preceding Friday.

Ironworkers

- a. Paid Holiday: Labor Day provided employee has been on the payroll for the 5 consecutive work days prior to Labor Day.

Laborers (Tunnel Construction)

- a. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day. No employee shall be eligible for holiday pay when he fails, without cause, to work the regular work day preceding the holiday or the regular work day following the holiday.

Roofers

- a. Paid Holidays: July 4th, Labor Day, and Christmas Day provided the employee is employed 15 days prior to the holiday.

Sprinkler Fitters

- a. Paid Holidays: Memorial Day, July 4th, Labor Day, Thanksgiving Day and Christmas Day, provided the employee has been in the employment of a contractor 20 working days prior to any such paid holiday.

Truck Drivers

(Heavy and Highway Construction & Building Construction)

- a. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Christmas day, and Good Friday, provided the employee has at least 31 calendar days of service and works the last scheduled day before and the first scheduled day after the holiday, unless excused.

Rev. 7/1/19

WORK CHANGE DIRECTIVE NO.: [Number of Work Change Directive]

Owner: _____ Owner's Project No.: _____
Engineer: _____ Engineer's Project No.: _____
Contractor: _____ Contractor's Project No.: _____
Project: _____
Contract Name: _____
Date Issued: _____ Effective Date of Work Change Directive: _____

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

Description:

[Description of the change to the Work]

Attachments:

[List documents related to the change to the Work]

Purpose for the Work Change Directive:

[Describe the purpose for the change to the Work]

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

Notes to User—Check one or both of the following

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:

CHANGE ORDER NO.: [Number of Change Order]

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

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

Description:

[Description of the change]

Attachments:

[List documents related to the change]

Change in Contract Price	Change in Contract Times [State Contract Times as either a specific date or a number of days]
Original Contract Price: \$ _____	Original Contract Times: Substantial Completion: _____ Ready for final payment: _____
[Increase] [Decrease] from previously approved Change Orders No. 1 to No. [Number of previous Change Order] : \$ _____	[Increase] [Decrease] from previously approved Change Orders No.1 to No. [Number of previous Change Order] : Substantial Completion: _____ Ready for final payment: _____
Contract Price prior to this Change Order: \$ _____	Contract Times prior to this Change Order: Substantial Completion: _____ Ready for final payment: _____
[Increase] [Decrease] this Change Order: \$ _____	[Increase] [Decrease] this Change Order: Substantial Completion: _____ Ready for final payment: _____
Contract Price incorporating this Change Order: \$ _____	Contract Times with all approved Change Orders: Substantial Completion: _____ Ready for final payment: _____

Recommended by Engineer (if required)	Authorized by Owner
By: _____	_____
Title: _____	_____
Date: _____	_____
Authorized by Owner	Approved by Funding Agency (if applicable)
By: _____	_____
Title: _____	_____
Date: _____	_____

FIELD ORDER NO.: [Number of Field Order]

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:

[Description of the change to the Work]

Attachments:

[List documents supporting change]

Issued by Engineer

By: _____

Title: _____

Date: _____

SECTION 01 00 50 - SPECIFICATION FORMAT

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This Section generally describes the Contract Document Specification format and is provided as a supplementary aid.
- B. This Section identifies the Standard Specifications.

1.02 GENERAL FORMAT

- A. The Specifications are arranged generally according to the Construction Specifications Institute (CSI) format.
- B. Most technical and construction related requirements are specified in the technical sections, which are grouped by CSI into fifty (50) major divisions according to trade or type of work. All major divisions may not be utilized on any particular contract.
- C. Technical sections are arranged in numerical order; however, section numbers may not be consecutive from section to section.
- D. Most sections are generally broken down into three parts:
 - 1. PART 1 - GENERAL
 - 2. PART 2 - PRODUCTS
 - 3. PART 3 - EXECUTION
- E. Paragraph designations are subordinate to each part.
- F. The format described hereinabove is general and flexible in nature. Some overlapping of information between the various portions of the Specifications. In all cases, the entire requirements of the Contract Documents, as a whole, apply and shall be met.

1.03 EXPLANATIONS

- A. Descriptions - Technical sections typically begin with a paragraph entitled "SECTION INCLUDES", "SCOPE", or similar wording. This paragraph provides a brief non-inclusive description of the work generally specified in that Section. Requirements of the entire Contract Documents apply, whether or not specifically mentioned in said descriptions.
- B. Related Requirements - Technical sections may provide a list of other specifications that may contain work closely related to the specified work. Such listings are non-inclusive.
- C. These specifications are written in imperative mood. This imperative language is directed to the Contractor, unless specifically noted otherwise.

1.04 STANDARD SPECIFICATIONS

- A. The Standard Specifications referred to in this Contract Document shall be the Connecticut Department of Transportation Standard Specifications for Roads, Bridges, Facilities and Incidental Construction, Form 818, 2020, as revised by the supplemental specifications dated through to the date of the Contract Documents. Unless otherwise noted, only the "Materials" and/or "Construction Methods" portions of the Standard Specifications shall apply, including

such supplements or amendments included herein. Within the referred to portions of the Standard Specifications wherein the following terms are used, such terms shall mean respectively:

<u>Terms Used</u>	<u>Meaning for this Contract</u>
Owner	Town of Old Saybrook, Connecticut
Engineer	Nathan L. Jacobson & Associates, Inc.
Inspector	Nathan L. Jacobson & Associates, Inc.
Laboratory	Laboratory approved by the Owner
Department	Connecticut Department of Transportation

1.05 DEFINITIONS

- A. "Typical" means representative or indicative of features or work shown elsewhere but not specifically called out. Where an item of work is identified as "typical", such work shall apply to all such similar instances whether specifically identified or not.

PART 2 PRODUCTS

(Not Used)

PART 3 EXECUTION

(Not Used)

END OF SECTION

SECTION 01 11 00 - SUMMARY OF WORK

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Work in general.
- B. Work by others.
- C. Contractor's use of site.
- D. Owner occupancy.
- E. Work restrictions.

1.02 WORK IN GENERAL

- A. The Work to be performed consists principally of removal of an existing metal culvert pipe and replacement with a precast concrete rigid frame.

1.03 WORK BY OTHERS

- A. The Owner will perform or coordinate others to perform the work identified on the Drawings as "By Others" or "Not in Contract".
- B. Existing utilities run underground at the site, not overhead.

1.04 CONTRACTOR'S USE OF SITE

- A. Access to site – via School House Road to Kitteridge Hill Road to Beaver Dam Trail.
- B. Construction staging - If needed and not shown on the Drawings, the Contractor shall be responsible for securing such areas and making his own agreements with the owner on whose property the construction staging will take place.
- C. Hours for construction operations shall be limited to 7:00 AM to 5:00 PM Monday through Saturday.
- D. Existing Utilities
 1. Obtain written authorization of the utility service recipients prior to interrupting a utility service.
 2. Contact utility owners to coordinate the relocation/protection of their utilities on the Project site a minimum of two weeks prior to the start of any work on the Project involving their utilities. The Contractor is responsible for coordination of utility work and its integration with the overall project schedule, so as not to delay the progress of the Work.

The Connecticut Light & Power Company dba Eversource Energy - Electric Distribution
Mr. Christopher L. Beebe, Electric Service Designer
135 New Road, Madison, CT 06443
PHONE: 203-245-5325
E-MAIL: christopher.beebe@eversource.com

Frontier Communications of Connecticut
Mr. Joe Calvo, Conduit Engineer
1441 North Colony Road, Meriden, CT 06450
PHONE: (203) 238-5661
Mobile: (203) 694-4394
E-MAIL: Lynne.m.delucia@ftr.com

Comcast of Connecticut, Inc.
Mr. Reynaldo A. Cruz, Construction Specialist
222 New Park Drive
Berlin, CT 06037
Mobile: (860) 215-0315
E-MAIL: Reynaldo-Cruz@comcast.com

3. Various underground and overhead utilities may be located within and adjacent to the Contract area. In all cases, whether underground structures have or have not been delineated, the Owner and Engineer accept no responsibility for their location and such locations as shown on the Drawings are to be considered approximate only.
 4. Various overhead utilities lines may exist adjacent to the Contract area. The Contractor, prior to commencement of construction, shall take all appropriate safety steps to ensure that these lines are secured from contact or physical damage during construction unless otherwise provided for in the Contract Documents. Unless otherwise specifically provided for, no additional compensation will be considered for any required relocation, temporary support, protection, or other costs involved with or about these facilities.
 5. Contact "Call Before You Dig" (1-800-922-4455 or www.cbyd.com) prior to initiating any subsurface work. Obtain subsurface survey investigation service from a qualified subcontractor to locate private underground utilities if present on-site. Maintain underground utility location markings. Notify utility company of any utility location markings that become removed during construction to replace markings.
 6. Ensure that utility valve boxes and manholes are always readily accessible . Do not store materials over such facilities. Should it become necessary to cover boxes or manholes with spoil, devise a method for locating them quickly, and assist the utility company in uncovering them. All such facilities shall be left uncovered during non-working hours.
- E. Phasing of the construction to facilitate minimal inconvenience to the traveling public may be indicated on the Drawings. If so, such phasing shall not be deviated from without prior approval of the Engineer.
- F. Obtain written consent from private property owners prior to encroaching on any portion of their property beyond the temporary or permanent easement boundaries as defined by the Owner.
- 1.05 OWNER OCCUPANCY
- A. The Owner may choose to occupy all or portion of the nearly completed Project.
 - B. The opening of a roadway, sidewalk, or parking area shall not be held to be in any way an acceptance of the Work, or any part of it, or as a waiver of any of the requirements of the Contract Documents as a whole. The opening of a roadway or parking area or portion thereof shall not constitute a basis for claims for damage due to interruptions to, or interference with, the Contractor's operations.

- C. Necessary repairs on any section of a roadway, sidewalk, or parking area due to its being opened to traffic under instructions from the Owner, pending completion of the Work, shall be performed at the expense of the Contractor - except that when damage was caused as a result of the Owner's equipment engaged in the control of snow and ice, the Contractor shall be reimbursed by the Owner. When the damage was caused by a traffic accident, the Contractor shall seek recovery from the responsible person through means available to him.
- D. Cooperate with Owner to minimize conflict and to facilitate Owner's operations. Schedule the Work to accommodate this requirement.

1.06 WORK RESTRICTIONS

- A. In-River Construction Window – The In-River Construction Window for unconfined construction activities is shown on the Drawings. In-river unconfined construction activities shall not occur at any other time of the year except during the in-river construction window period. "Confined" shall be defined as behind a cofferdam, and for purposes of cofferdam installation and removal, behind a containment boom.

PART 2 PRODUCTS

(Not Used)

PART 3 EXECUTION

(Not Used)

END OF SECTION

SECTION 01 22 00 - MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 SCOPE

- A. This Section supplements Article 15 of the General Conditions, the Supplementary Conditions, and the various paragraphs of these Specifications that specify measurement and payment requirements.

PART 2 MEASUREMENTS

2.01 MEASUREMENT REQUIREMENTS

- A. Assist Engineer and Inspector in performing required measurements. Allow for and afford the Engineer and Inspector ample time, space, and equipment to make measurements.
- B. Notify Engineer and Inspector, as far in advance as possible, of the making of measurements so that the Engineer and Inspector may observe existing conditions, work being performed and measurements being made.
- C. Notify Engineer and Inspector where payments are anticipated by the Contractor for removing rock and existing materials. Upon notification, the Engineer or Inspector shall inspect, verify, and measure the materials to be removed.
- D. Measurements for payment shall not exceed the limits shown on the Drawings or indicated in the Specifications, unless written approval is provided by the Engineer.
- E. Provide weight slips to Engineer or Inspector for deliveries where measurement for payment is on a weight basis. All deliveries shall be made on a state certified scale.

PART 3 PAYMENTS

3.01 PAYMENT REQUIREMENTS

- A. Payments will only be made for pay items stipulated in the Bid. All costs in connection with the Work shall be included in one or more of the pay items.
- B. Work performed and accepted that is not identified as a specific unit price item will be paid for under Bid Item No. 1 lump sum price in the Bid.
- C. Work requiring measurements will not be paid for without compliance, verified by the Engineer or Inspector, to the Measurement Requirements specified in this Section and the measurement and payment requirements specified in the pay item's Specification Section.
- D. No payments will be made for costs incurred by the Contractor that are associated with the repair or remediation of damages caused by the Contractor during construction operations.

END OF SECTION

SECTION 01 31 19 - PROJECT MEETINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This section includes requirements for regularly scheduled project meetings to coordinate construction operations with Owner, Contractor, Inspector, and Engineer.

1.02 RELATED REQUIREMENTS

- A. Section 01 55 26 - Maintenance and Protection of Traffic

1.03 MEETING SPECIFICS

- A. Date and Time:
 - 1. Preconstruction/Work Zone Safety Meeting: At mutually acceptable time for Owner, Contractor, and Engineer prior to the start of construction activities.
 - 2. Regular Bi-weekly Meetings: As mutually agreed upon by Engineer, Owner, and Contractor. The Engineer, Owner, and Contractor may mutually agree to a more or less frequent regular meeting schedule should the project schedule warrant it.
 - 3. Other Meetings: On call.
- B. Place: At Project site or other mutually agreed upon location.

1.04 MINIMUM ATTENDANCE

- A. Contractor, Subcontractors and suppliers. Representatives present for each party shall be authorized to act on their behalf.
- B. Owner's representative.
- C. Others as appropriate.

1.05 ATTENDEE RESPONSIBILITIES

- A. Engineer will prepare agenda, preside at meetings, and prepare and distribute a summary transcript of proceedings to all parties.
- B. Contractor shall provide data required and be prepared to discuss all items on agenda.

1.06 MEETING AGENDA

- A. Agenda will include, but will not necessarily be limited to, the following:
 - 1. Transcript of previous meeting.
 - 2. Progress since last meeting.
 - 3. Planned progress for next period.
 - 4. Work zone safety.
 - 5. Problems, conflicts and observations.
 - 6. Processing of Shop Drawings.
 - 7. Change Orders.
 - 8. Applications for payment.
 - 9. Quality standards and control.

10. Schedule, including off-site fabrication and delivery schedules. Corrective measures required.
11. Coordination between parties.
12. Record Drawings.
13. Other business.

PART 2 PRODUCTS

(Not Used)

PART 3 EXECUTION

(Not Used)

END OF SECTION

SECTION 01 32 23 - FIELD ENGINEERING AND SURVEYS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This Section includes procedures and general requirements for preparing to install, erect, or apply products identified in the Work.

1.02 RELATED REQUIREMENTS

- A. Section 01 78 39 - Project Record Documents

1.03 QUALITY ASSURANCE

- A. Survey, layout, and related work shall be performed by persons fully qualified to do such work, as approved by the Engineer.
- B. Replacement of property markers damaged or removed shall be performed under the direction of a land surveyor licensed in the Project's state.

PART 2 PRODUCTS

2.01 GENERAL

- A. Provide surveys, to the accuracy required by the Engineer, by regulatory agencies, or as required for the proper prosecution of the Work.
- B. Materials shall be of good professional quality and in first-class condition.

2.02 MATERIALS

- A. Furnish instruments, tapes, rods, measures, mounts and tripods, and other equipment required to perform the Work.
- B. Provide stakes and hubs, nails, ribbons, other reference markers, and other materials required to perform the Work.
- C. Lasers, transits, and other instruments shall be calibrated and maintained in accurate calibration.

PART 3 EXECUTION

3.01 GENERAL

- A. Take extreme care to cause minimal to no disturbance to existing property and the landscape in general.

3.02 EXISTING MONUMENTS AND POINTS

- A. Protect monuments, survey markers, and survey points and safe-guard against their displacement or removal.

- B. Replace survey points that become accidentally or intentionally disturbed or removed during the Work.

3.03 LINES AND GRADES

- A. Stake out the proposed Work and set grade stakes.
- B. Preserve all stakes, benchmarks, nails and other markers, set or established along the line of the work.
- C. Maintain grade lines throughout the duration of construction of pipe lines laid at specified gradient. When necessary to remove a grade marker for construction operations, maintain grade lines parallel with the trench extending along at least three grade markers.
- D. Obtain working and construction lines and grades from these base lines and benchmarks shown on the Drawings.
- E. Preserve marks given.
- F. Reset marks if destroyed or removed without authority.
- G. Work done without lines or levels or instructions shall be removed and replaced.
- H. In conjunction with maintaining proper grades and alignment of the Work, the occasion may occur when batter boards, double side lines, or similar controls will be desired. In establishing these controls, only approved survey devices will be allowed. The use of a "line level" is not permitted.
- I. Keep the Engineer informed of Work times and places in order that the Engineer may have an ample opportunity to furnish and/or to check the lines and elevations with a minimum of inconvenience to the Engineer or of delay to the Contractor.

END OF SECTION

SECTION 01 33 00 - SUBMITTAL PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This Section includes the types of submittals required, procedures for making submittals, the preparation of submittals, and the times submittals are required.
- B. Additional submittals are required by the Information for Bidders, the General Conditions and the Supplementary Conditions. Such submittals generally include: Proposal and Bidding Documents; insurance policies; certification of bond and insurance coverage; applications for payment; requests for Change Orders; guarantees; permits; certifications and documents required by Federal, State and Local authorities; submittals required by utility companies and other persons, firms, or organizations; plans required by specifications; and other such submittals.
- C. This Section supplements Article 7.16 of the General Conditions and Supplementary Conditions and supplements the various paragraphs of these Specifications that address shop drawings, samples, and other submittals.

PART 2 SUBMITTALS

2.01 GENERAL

- A. Submittals shall be complete, exact, neat, clear, and legible.

2.02 PRELIMINARY SCHEDULES

- A. Comply with the General Conditions, Article 2.03 for Progress Schedule, Schedule of Submittals, and Schedule of Values.
 - 1. Include in the Progress Schedule an estimated time for fabrication and delivery of the materials and equipment required for Work.
 - 2. If the Work falls behind current Progress Schedule, submit revised schedule that adopts additional means and procedures in construction to make up time and assure Project completion by the time allotted in the Agreement.

2.03 SHOP DRAWINGS

- A. Comply with the General Conditions, Article 7.16.B.1.b.
- B. Shop Drawings include certifications, product data, technical data, delegated designs, pre-driving documents, and test reports.
- C. Include layout drawings when required for fabricated work, for manufactured items, and for other items specifically required by the Specifications.
- D. Review shop drawings prepared by Subcontractors, suppliers, or manufacturers prior to submitting to the Engineer.
- E. Certifications shall be properly authenticated by the written signature, in ink, of an owner, officer, or a duly authorized representative of the person, firm, or organization issuing such certification when requested in the Specification Section.

2.04 SAMPLES

- A. Comply with the General Conditions, Article 7.16.B.2.b.
- B. Materials, supplies and equipment incorporated in the Work shall be in accordance with samples submitted by the Contractor when no exceptions have been noted by the Engineer or noted exceptions by the Engineer have been addressed. The Engineer's approval shall be only for conformance with the design concept of the Project and for compliance with the information given in the Contract Documents and will not be for the purpose of checking dimensions, weights, clearances, fittings, tolerances, interferences, coordination of trades or contractors or similar items.
- C. Wherever the Specifications set forth or imply the performance required of any material, equipment or process; secure certificates from the manufacturer or supplier of the same certifying to the Contractor and the Owner jointly that the material, equipment or process will meet in every way the performance so required. Certificates must be turned over to the Engineer by the Contractor before approval will be given to the furnishing and installing of any such material, equipment, or process.
- D. Materials specified by reference to the number or symbol of a specific standard, such as an ASTM Standard, a Federal Specification or other similar standard, shall comply with requirements in the latest revision thereof and any amendment or supplement thereto in effect on the date of the Advertisement for Bids, except as limited to type, class or grade, or modified in such reference. The standards referred to, except as modified in the Specifications, shall have full force and effect as though printed herein.
- E. Materials incorporated in the Work shall be new, of standard and first grade quality, and of the best workmanship and design. Inferior or low-grade materials are not acceptable, and work of assembly and construction must be done in a neat, first-class, and workmanlike manner.

PART 3 SUBMITTAL PROCEDURES

3.01 GENERAL

- A. Submit shop drawings and other submittals electronically as PDF files to the Engineer unless otherwise noted in the Specification Section or requested by Owner or Engineer.
- B. Submit samples as indicated in the Specification Section.
- C. Use a submittal sheet with each submittal. Include on the submittal sheet the project name and location, date, submittal number, description, applicable specification section, and areas for the contractor's and engineer's stamp. Fill out the submittal sheet in its entirety. Omission of any information required on the submittal sheet is grounds for the submittal to be returned to the Contractor without review.
- D. Include the Contractor's stamp of approval on Shop Drawings to comply with General Conditions Article 7.16.A.2. Indicate the Specification section, material, manufacturer's catalog numbers, and the use for which intended on each submittal. Samples not in compliance in this respect will be returned to the Contractor for proper resubmission without review.
- E. Make submittals far enough in advance of anticipated dates, as presented in the Schedule of Submittals, for incorporation of that respective item into the Work, such that sufficient time is allowed for Engineer's review, resubmittals, and subsequent Engineer's reviews, ordering,

manufacturing, fabrication, delivery, and preparation for installation or construction. No extension to the Contract time will be granted for failure of compliance in this respect.

3.02 SHOP DRAWINGS

- A. The Engineer may hold Shop Drawings where a partial submission cannot be reviewed until the complete submission has been received or where Shop Drawings cannot be reviewed until correlated items affected by them have been received. When the Engineer holds up such Shop Drawings, the Engineer shall so advise the Contractor in writing that the drawings submitted will not be reviewed until all related items have been received.
- B. After review, the Engineer will stamp the Shop Drawing submittal "No Exceptions Noted", "Exceptions Noted", "Revise and Resubmit", "Rejected", or "For Information Only". The Engineer will return the reviewed Shop Drawing submittal electronically as a PDF file. In the case of a Shop Drawing which is reviewed and stamped "Revise and Resubmit" or "Rejected" the Contractor shall make all indicated corrections and resubmit. The Contractor shall note on resubmission the changes from earlier submissions whether or not called for by the Engineer.
- C. If a Shop Drawing involves only a minor deviation from the requirements of the Contract Documents and such deviation is in the best interests of the Owner and does not involve a change in Contract Price or Contract Time, the Engineer may approve the drawing. The approval shall be general, shall not relieve the Contractor from his responsibility for adherence to the Contract Documents or for any error in the drawing.
- D. Furnish to other Project Contractors as many additional copies of Shop Drawings, machinery details, layout drawings, etc., as are necessary for the proper coordination of the Work.
- E. The Engineer's review and approval of Shop Drawings shall be only for conformance with the design concept of the Project and for compliance with the information given in the Contract Documents, and will not be for the purpose of checking dimensions, weights, clearances, fittings, tolerances, interferences, coordination of trades or contractors, or similar items. The approval of a separate item as such will not indicate approval of the assembly in which the item functions. Further, approval by the Engineer of Shop Drawings shall not relieve the Contractor from responsibility for (1) errors of any sort in submittals; or (2) deviations from Drawings and Specifications unless the Contractor, at the time of submission, has given notice to the Engineer of any such deviations, flagged by marks and writing in red ink on the Shop Drawings or in an accompanying letter.
- F. Material should not be purchased or fabricated for equipment or structures until the Engineer has reviewed the Shop Drawings, which shall represent all materials and equipment involved in the Work. No materials or equipment should be delivered to the site until the Shop Drawings have been reviewed by the Engineer and stamped with a status "No Exceptions Noted" or exceptions noted have been addressed. Any action by the Contractor contrary to the foregoing will be the Contractor's responsibility. Materials ordered or delivered to the site of the Work, prior to approval of the Shop Drawings by the Engineer, will be rejected by the Engineer should they prove unacceptable for the Work.

3.03 SAMPLES

- A. Each manufacturer's or supplier's certificate shall be endorsed or accompanied by the Contractor's certificate that the material certified by the manufacturer or supplier will be the material incorporated in the Work.

3.04 ATTACHMENT

A. Example of Contractor's Stamp of Approval

Contractor's Stamp of Approval

(Contractor's Name)

(Contractor's Name) certifies, to the Owner and Engineer, that it has either determined, checked and verified all quantities, dimensions, field measurements, field construction criteria, materials, catalog numbers and similar data, or assumes full responsibility for doing so, and has reviewed or coordinated this submittal with the requirements of the Work and the Contract Documents.

By: _____
Date: _____

Submittal No. _____

END OF SECTION

SECTION 01 42 13 - ABBREVIATIONS AND SYMBOLS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This section defines many of the abbreviations and symbols used throughout the Contract Documents.
- B. Additional abbreviations, symbols, codes, standards and definitions are specified on the Drawings and elsewhere in the Specifications and other Contract Documents.
- C. In the absence of a specific definition herein for any abbreviation or notation, it shall be understood that the standard industry-wide definition shall apply.
- D. Where doubt exists as to the meaning of any abbreviation or symbol, consult the Engineer, who will issue a formal definition therefor.

1.02 CODES AND STANDARDS

- A. The following is a partial list of typical abbreviations which may be used in the Specifications and the organizations to which they refer (unless otherwise noted elsewhere in the Contract Documents):

AA	Aluminum Association
AAN	American Association of Nurserymen
AASHO or AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AGA	American Gas Association
AGMA	American Gear Manufacturer's Association
AIA	American Institute of Architects
ALS	American Lumber Standard
ASTM	American Society for Testing and Materials
AIEE	American Institute of Electrical Engineers
AISC	American Institute of Steel Construction
AISI	American Iron & Steel Institute
AMCA	Air Moving and Conditioning Association, Inc.
ANSI	American National Standards Institute (formerly ASA)
API	American Petroleum Institute
AREA	American Railway Engineering Association
ASA	American Standards Association (now ANSI)
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASPA	American Sod Producers Association
ASTM	American Society for Testing and Materials
AWI	Architectural Woodwork Institute
AWPA	American Wood Preserver's Association
AWPB	American Wood Preserver's Bureau
AWS	American Welding Society
AWWA	American Water Works Association
CHRO	Connecticut Commission on Human Rights and Opportunities

CIPRA	Cast Iron Pipe Research Association
CBM	Certified Ballast Manufacturers
CRSI	Concrete Reinforcing Steel Institute
CS	Commercial Standard
CSA	Canadian Standard Association
CTDOT	Connecticut Department of Transportation
DAS	Connecticut Department of Administrative Services
DEC	State of New York, Department of Environmental Conservation
DEP	State of Connecticut, Department of Environmental Protection
DOT	Department of Transportation of the State in which the Project is located
EIA	Electronic Industries Association
EPA	United States Environmental Protection Agency
ETL	Electrical Testing Laboratories, Inc.
FM	Factory Mutual Laboratories
FmHA	United States Department of Agriculture, Farmers Home Administration
FS	Federal Specification
HUD	United States Department of Housing and Urban Development
IEEE	Institute of Electrical and Electronics Engineers
IPCEA	International Power Cable Engineers Association
ISO	International Organization for Standardization
NBFU	National Board of Fire Underwriters
NBS	National Bureau of Standards
NCHRP	National Cooperative Highway Research Program
NEC	National Electric Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association or National Forest & Paper Association
NSC	National Safety Council
NSF	National Sanitation Foundation
NWMA	National Window Manufacturers Association
NYDOT	New York Department of Transportation
PCI	Prestressed Concrete Institute
PS	Product Standard
OSHA	United States Occupational Safety and Health Administration
SAE	Society of Automotive Engineers
SCS	United States Soil Conservation Service
SDI	Steel Door Institute
SPI	Society of the Plastics Industry
SPIB	Southern Pine Inspection Bureau
UL	Underwriters Laboratories, Inc.
USGM	United States Glazing Manufacturers
VTM	Virginia Department of Highways and Transportation Test Method
WPCF	Water Pollution Control Federation
WWPA	Western Wood Products Association

1.03 OTHER ABBREVIATIONS

- A. The following is a partial list of typical other abbreviations which may be used in the Specifications and their meanings (unless otherwise noted elsewhere in the Contract Documents):

ACCMP	asphalt coated corrugated metal pipe
ASP	alloy steel pipe
AOBA	as ordered by Architect
AOBE	as ordered by Engineer

A.C.	alternating current
ACZA	ammoniacal copper zinc arsenate
Alum.	aluminum
AWG	American or Brown and Sharpe Wire Gage
MBH	one thousand BTU per hour
NC	American National Coarse Threads
NF	American National Fine Threads
NPT	American National Taper Pipe Threads
Amp, A or a	amperes
ACP	asbestos cement pipe
A	asphalt
AC conc.	asphaltic cement concrete
aux.	auxiliary
bit.	bituminous
B.V.	butterfly valve
CCA	Chromated copper arsenate
CIP	cast iron pipe
CISP	cast iron soil pipe
cm	centimeters
C.V.	check valve
COD	chemical oxygen demand
CB	circuit breaker
Cl.	class
CLDI	cement lined ductile iron pipe
CO	cleanout
conc.	concrete
cont.	continuous
CPEP	corrugated polyethylene pipe
CPET	corrugated polyethylene tubing
Cu	copper
CMP	corrugated metal pipe
cu.	cubic
cc	cubic centimeters
CU.DM or dm ³	cubic decimeter
C.F.	cubic feet
CFS or cfs	cubic feet per second
CU.M or m ³	cubic meter
C.Y.	cubic yards
CT	current transformer
DL	dead load
D	deep
°C	degrees Centigrade
°F	degrees Fahrenheit
d,D,or ø	diameter
D.C.	direct current
DO	dissolved oxygen
Dwg.	drawing
dr	drive
DIP	cement lined ductile iron pipe
EF	each face
ES	each side
EW	each way
eff.	efficiency

el or elev	elevation
EH	extra heavy
ES	extra strength
ft.	feet
'	feet or minutes
fps	feet per second
FF	finish floor
BOD	five day, 20°C biochemical oxygen demand
flex.	flexible
ftg.	footing
FM	force main
gal.	gallons
GPD or gpd	gallons per day
GPM or gpm	gallons per minute
galv.	galvanized
gar.	garage
G.V.	gate valve
ga.	gauge
gr.	grade
g.	grams
H-O-A	hand-off-automatic
HZ or hz	hertz
HMA	hot mix asphalt
HP	horsepower or high point
H.O.	hose outlet
HC	house connection
"	inches or seconds
I.D.	inside diameter
incr.	increaser
IP	instrument panel
inv.	invert
KG or kg	kilogram
KL or kl	kiloliter
KVA or kva	kilovolts-amperes
KW or kw	kilowatts
KW-hr.	kilowatt-hours
L	length or liter
LPA	lighting panel
lin.	linear
L.F.	linear feet
LL	live load or lowest level elevation
L.P.	low point
L.S.	lump sum
MI	malleable iron
MH	manhole
max.	maximum
MJ	mechanical joint
M or m.	meter
mi.	miles
mA	milliamperes
mg	milligrams
mg/l	milligrams per liter
MM or mm	millimeters

MGD or mgd	million gallons per day
min.	minutes or minimum
MCC	motor control center
NOD	nitrogenous oxygen demand
nom.	nominal
NFWH	non-freezing wall hydrant
N.T.S.	not to scale
no.	number
#	number or pound
OC	on center
oz	ounces
O.D.	outside diameter
O.S. & Y.	outside screw and yoke
ppm	parts per million
pvt.	pavement
%	percent
∅	phase or diameter
PE	plain end, polyethylene, or professional engineer
P.V.	plug valve
PC	point of curvature
PI	point of intersection
PVI	point of vertical intersection
PVT	point of vertical tangency
PVC	polyvinyl chloride, polyvinyl chloride pipe or point of vertical curvature
PT	potential transformer or point of tangency
lbs.	pounds
PPD	pounds per day
plf	pounds per linear foot
psi, psig	pounds per square inch gauge (above atmospheric pressure)
psf	pounds per square foot
pri.	primary
PS	pumping station
P/B	pullbox
pb	pushbutton
PO.	push-on joint
R or rad.	radius
red.	reducer
RCP	reinforced concrete pipe
ROW or R/W	right-of-way
RSF	recirculation sand filter
sch.	schedule
sec.	secondary or seconds
STP	sewage treatment plant
SW	sidewalk
S	slope
sq.	square
S.F.	square feet
SQ.M or m ²	square meters
S.Y	square yards
std.	standard
Stl.W.G.	U.S. Steel Wire, Washburn and Moer, American Steel and Wire Co., or Roebbling Gage
CFM or cfm or	standard cubic feet per minute

SCFM or scfm	
SDR	standard dimension ratio
SP	static pressure
st.	steel
S/S/P	stop-start-pilot station
SD or D	storm drain
SR	stress rated
thk.	thick
M	thousand
MBM	thousand board-feet measures
T&B	top and bottom
TDH	total dynamic head
TKN	total Kjeldahl nitrogen
TL	Test level
TOC	total organic carbon
SS or TSS	total suspended solids
typ.	typical
UOD	ultimate oxygen demand
USS Gage	United States Standard Gage
v	velocity
VF	vertical feet
VERT.M or Vert. M	vertical meter
VCP	vitriified clay pipe
V or v	volts
V	volume
W.S.	wall sleeve
WSP	working steam pressure
WO	waste outlet
W or w	watts
w/	with
yd.	yards
125-lb standard	American Standard for Cast Iron Pipe Flanges and Flanged Fittings, Class 125

PART 2 PRODUCTS

(Not Used)

PART 3 EXECUTION

(Not Used)

END OF SECTION

SECTION 01 45 00 - QUALITY CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This Section includes administrative and procedural requirements for testing to evaluate completed activities and elements for conformance with the requirements.
- B. This Section supplements Article 14 of the General Conditions, the Supplementary Conditions, and the various paragraphs of these Specifications that specify testing requirements.

1.02 SUBMITTALS

- A. Submit copy of report of inspection of facilities made by Materials Reference Laboratory of National Bureau of Standards during the most recent tour of inspection, with memorandum of remedies of any deficiencies reported by the inspection.
- B. Submit the preliminary design mix proposed to be used for concrete and other material mixes which require control by laboratory.
- C. Submit a copy of each test and inspection report to Engineer. Each report shall include:
 - 1. Date issued.
 - 2. Project title and number.
 - 3. Testing laboratory name, address and telephone number.
 - 4. Name and signature of laboratory inspector.
 - 5. Name, signature, and certification of responsible officer of testing agency.
 - 6. Date and time of sampling or inspection.
 - 7. Record of temperature and weather conditions.
 - 8. Date of test.
 - 9. Identification of product and Specification section.
 - 10. Location of sample or test in the Work.
 - 11. Type of inspection or test.
 - 12. Results of tests and compliance with Contract Documents.
 - 13. Interpretation of test results when requested by Engineer.

1.03 TESTING AGENCY QUALIFICATIONS

- A. Test Agency shall:
 - 1. Meet "Recommended Requirements for Independent Laboratory Qualification", published by American Council of Independent Laboratories;
 - 2. Meet basic requirements of ASTM E329, "Standards of Recommended Practice for Inspection and Testing Agencies for Concrete and Steel as Used in Construction";
 - 3. Be authorized to operate in the state in which Project is located;
 - 4. Be reputable, experienced, and capable of performing required tests.
- B. Testing equipment:
 - 1. Calibrated at reasonable intervals by devices of accuracy traceable to either:
 - a. National Bureau of Standards.
 - b. Accepted values of natural physical constants.

- C. The on-site portion of the required concrete testing, such as taking cylinder samples, testing slump, etc., may be performed by qualified persons other than the testing agency. Said persons shall be qualified by the American Concrete Institute as a Concrete Field Testing Technician - Grade I.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Use extreme care with taking, storing, handling, and delivering samples and test specimens to avoid breakage, damage, and disturbance.
- B. Deliver samples and test specimens to the laboratory or have the laboratory collect the samples and test specimens.

PART 2 PRODUCTS

(Not Used)

PART 3 EXECUTION

3.01 FIELD QUALITY CONTROL

- A. Determine the following based on specifications:
 - 1. Number of samples to be taken;
 - 2. Date and time samples will be taken and tests made;
 - 3. Number and type of tests to be performed;
 - 4. Who will collect the samples;
 - 5. How the samples will be handled and stored;
 - 6. When the laboratory is required at the site;
 - 7. And the required qualifications of the laboratory's employee.

3.02 GENERAL

- A. Employ the services of an independent testing laboratory to perform specified testing unless specified otherwise.
 - 1. Obtain Owner approval of testing laboratory used to perform specified tests.
 - a. Owner reserves the right to disapprove the use of a previously approved testing laboratory. Should this occur, dispense of the disapproved testing laboratory services and retain services from a testing laboratory approved by Owner.
- B. Employment of the laboratory by Owner for acceptance testing shall not relieve Contractor's obligations to perform field quality control testing.
- C. Inspections and tests required by laws, ordinances, rules, regulations, orders for approval of public authorities.
- D. Cooperate with laboratory personnel and provide access to work.
- E. Furnish incidental labor and facilities:
 - 1. To provide access to work to be tested.
 - 2. To obtain and handle samples at the Project site or at the source of the product to be tested.
 - 3. To facilitate inspections and tests.
 - 4. For storage and curing of test sample.

- F. Secure and deliver to the laboratory adequate quantities of representational samples of materials proposed to be used and which require testing, as ordered by the Engineer.
- G. Notify laboratory sufficiently in advance of operations to allow for laboratory assignment of personnel and scheduling of tests.
- H. Notify Engineer at least 24 hours in advance of taking samples and performing tests.
- I. Cooperate with Engineer; provide qualified personnel during all levels of backfilling.
- J. Perform specified inspections, sampling, and testing of materials and methods of construction.
- K. Comply with specified standards.
- L. Ascertain compliance of materials with requirements of Contract Documents prior to incorporating material into the Work.
- M. Promptly notify Engineer of observed irregularities or deficiencies of work or products.
- N. Perform additional tests as required by Engineer or the Owner.
- O. Replace materials found defective through visual inspection by the Engineer regardless of test or analysis results performed by independent or mill agency. Independent or mill agencies shall perform tests and analyses in accordance with the applicable ASTM standards and be supplemented by visual inspection.
- P. Laboratory is not authorized to:
 - 1. Release, revoke, alter or enlarge on requirements of Contract Documents.
 - 2. Approve or accept any portion of the Work.
 - 3. Perform any duties of the Contractor.

END OF SECTION

SECTION 01 51 00 - TEMPORARY UTILITIES

PART 1 GENERAL

1.01 DESCRIPTION

- A. This Section includes procedures and requirements for installation, maintenance, and removal of temporary utilities and facilities used during construction.

1.02 QUALITY ASSURANCE

- A. Perform Work in accordance with the requirements of authorities having jurisdiction and as required by Federal, State, and Local laws, codes, regulations and ordinances, and these Specifications.

PART 2 PRODUCTS

2.01 GENERAL

- A. Provide products required to meet the conditions of Paragraph 1.02.A of this Specification.

2.02 SANITARY FACILITIES

- A. Provide a toilet facility for personnel on the job, Owner, and Engineer. Maintain in a sanitary manner. Screen toilet facilities from public observation. Obtain Engineer approval for the facilities location(s) and method of waste disposal. Connect toilet waste to existing sanitary facilities where available.

2.03 POTABLE WATER

- A. Provide a potable drinking water supply for personnel of the job, Owner, and Engineer. Maintain in a sanitary manner.

2.04 WATER FOR CONSTRUCTION PURPOSES

- A. Abide by the rules and regulations of regulatory agencies having jurisdiction and make arrangements to obtain water required for the Work.

2.05 POWER, LIGHTING, AND HEATING

- A. Make arrangements for electric current or power required for the Work. Furnish temporary light and heat for such period of time and at such intensity or temperature as may be required for the proper protection and execution of the Work.

2.06 PARKING FACILITIES

- A. Do not park in locations that will create a nuisance, unsafe, or hazardous conditions.

PART 3 EXECUTION

3.01 GENERAL

- A. Provide and maintain all temporary utilities and facilities as necessary throughout the performance of the Work.
- B. Meet all applicable requirements of regulatory agencies.
- C. Remove temporary utilities and facilities when the need for them is gone. Restore disturbed areas.

END OF SECTION

SECTION 01 55 26 - MAINTENANCE AND PROTECTION OF TRAFFIC

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This Section includes the requirements for maintenance and protection of traffic.

1.02 RELATED REQUIREMENTS

- A. Section 01 51 00 - Temporary Utilities
- B. Section 01 57 00 - Temporary Controls

1.03 REFERENCE STANDARDS

- A. Manual on Uniform Traffic Control Devices for Streets and Highways 2009 Edition (MUTCD), with subsequent revisions, published by the U.S. Department of Transportation, Federal Highway Administration.
- B. AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals", latest revision.
- C. ASTM D2241 - Standard Specification for Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series)
- D. ASTM D3034 - Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings
- E. ASTM D4956 - Standard Specification for Retroreflective Sheeting for Traffic Control

1.04 SUBMITTALS

- A. Delegated Design Submittal - Submit for approval a plan and a schedule of operation methods for detours to each governmental agency having jurisdiction over the roadway and the Engineer prior to implementation.
- B. Construction signs and supports - Submit a copy of the Letter of Acceptance issued by the FHWA to the manufacturer documenting that construction signs and their supports (tested together) conform to NCHRP Report 350 (TL-3) or the AASHTO MASH for Category 2 Devices.
- C. Construction barricades and drums - Submit a copy of the Letter of Acceptance issued by the FHWA to the manufacturer documenting that the barricades comply with the requirements of NCHRP Report 350 (TL-3) or the AASHTO MASH for Category 2 Devices.

1.05 QUALITY ASSURANCE

- A. Comply with the Manual on Uniform Traffic Control Devices, published by U.S. Department of Transportation, Federal Highway Administration.
- B. Comply with Connecticut Department of Transportation "Traffic Control During Construction Operations". This Document is attached and made part of this Specification Section.

- C. Comply with requirements of each governing agency having jurisdiction over the roadway for the maintenance and protection of vehicular and pedestrian traffic. Contact each governing agency having jurisdiction to ascertain requirements.
- D. Maintain vehicular and pedestrian traffic, protect the public from damage to persons and property, and minimize inconveniences to the residents and businesses adjacent to the Work.
- E. Provide public health, welfare, and convenience within Work areas. Ascertain, at least one (1) week prior to starting Work, the specific needs of individuals whose access to their homes or businesses may be hindered as a result of the Work. Make arrangements with health, safety and protective agencies to ensure emergency or accidental needs of seriously hampered individuals are cared for.
- F. Conduct operations in a manner to ensure the safety of motorists, pedestrians, and workers. It is the Contractor's responsibility to maintain safe conditions within the Contract area.
- G. The governmental agencies having jurisdiction over the project roadways are:
 - 1. The Town of Old Saybrook Public Works Department and the contact person is:
Mr. William Claffey, Acting Director of Public Works
Department of Public Works
Town Garage, Old Saybrook, CT 06475
(860) 395-3186
- H. Roadways utilized in the detour may or may not be under the same jurisdiction as the governmental agency listed above associated with the project roadway.
- I. Obtain permits as required from agencies having jurisdiction.

PART 2 PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. Provide materials and equipment necessary to maintain and regulate traffic. Temporary materials and equipment require approval from the governing agency having jurisdiction over the roadway. Temporary materials and equipment remains the property of the contractor.
- B. Provide working crews with proper necessary tools to properly affect the Work.
- C. Traffic Cones shall be:
 - 1. Constructed of materials thick enough to withstand impact without damage to cones or vehicles.
 - 2. Of sufficient mass or have bases to which ballasts may be added to assure they are not blown over or displaced by wind or passing vehicles.
 - 3. Reflectorized by Type VI or Type IX Reflective Sheeting in accordance with the Standard Specifications.
- D. Traffic Drums shall be:
 - 1. Manufactured of plastic or rubber devices in accordance with the latest MUTCD and designed to allow the installation of barricade warning lights.
 - 2. Stabilized with the use of sandbags or other approved methods.
 - 3. Reflectorized by Type IX Reflective Sheeting in accordance with the Standard Specifications.

- E. Construction signs shall consist of the following materials:
1. Construction signs and appurtenances shall conform to the Standard Specifications.
 2. Mesh, non-rigid, roll-up, corrugated, or waffle board types substrates, foam core and composite aluminum sign substrates are not permitted for use.
- F. Construction barricades shall consist of the following materials:
1. The frame shall be of polyvinyl chloride pipe conforming to ASTM D2241 for PVC 1120 or 1220, SDR21 (pressure rating 200 psi (1380 kPa)); ASTM D3034, SDR 35 or an approved equal. All straight members shall be of white color.
 2. Wyes, tees and elbows for joint connections shall be polyvinyl chloride of suitable size and strength for the purpose intended.
 3. Joints shall not be glued and a 3/16 in (5.0 mm) nylon rope (or equivalent) shall be threaded loosely through the pipe to keep sections from flying if hit by a vehicle.
 4. Face panels used as horizontal members shall be constructed of a suitable plastic material, 0.060-inch high impact styrene, anodized aluminum of no less than 0.025-inch thickness or a comparable substitute approved by the Engineer.
 5. All hardware shall be in accordance with standard commercial specifications and shall be approved by the Engineer.
 6. Alternate stripes of white and orange Type IV or Type IX retroreflective sheeting applied to the horizontal members shown on the Drawings. Only one type of sheeting shall be used on a barricade and all barricades furnished shall have the same type of reflective sheeting. Retroreflective sheeting materials shall appear on the Connecticut Department of Transportations' Qualified Product List for the application intended and shall be in accordance with ASTM D4956.
 7. Construction barricades shall be designed and fabricated to prevent them from being blown over or displaced by the wind from passing vehicles.
- G. Barricade warning lights are portable, lens-directed, enclosed lights. The color of the light emitted shall be yellow. They may be used in either a steady-burn or flashing mode. Barricade warning lights shall be in accordance with the requirements of the ITE Standard for Flashing and SteadyBurn Barricade Warning Lights and the following table:

	<u>Type A</u>	<u>Type B</u>	<u>Type C</u>
	<u>Low Intensity</u>	<u>High Intensity</u>	<u>SteadyBurn</u>
Lens Directional Faces	1 o 2	1	1 or 2
Flash Rate per minute	55 to 75	55 to 75	Constant
Flash Duration	10%	8%	Constant
Minimum Effective Intensity ¹	4.0 Candelas	3.5 Candelas	-
Minimum Beam Candelas ²	-	-	2 Candelas
Hours of Operation	Dusk to dawn	24 hours per day	Dusk to dawn

¹ Length of time that instantaneous intensity is equal to or greater than effective intensity.

² These values must be maintained within a solid angle 9° on each side of the vertical axis and 5° above and 5° below the horizontal axis.

- H. Temporary Impact Attenuation System shall consist of he following materials:
1. The system modules shall be chosen from the Connecticut Department of Transportations' Qualified Products List. The color of the modules shall be yellow.

2. The sand shall contain no more than 3% inorganic silt and clay by actual dry weight (mass) using AASHTO Method T 11, shall conform to the gradation requirements in the table below, have a maximum moisture content of 3%, and be thoroughly mixed with 20% sodium chloride by weight. Sodium chloride shall meet the requirements of AASHTO M 143, Type 1, and Grade 1.

<u>Square Mesh Sieves</u>	<u>Percent Passing by Weight</u>
Pass 1/2"	100
Pass 3/8"	95-100
Pass #4	80-100
Pass #50	10-30
Pass #100	0-10

2.02 TRAFFICPERSON

- A. Conform to requirements of Section 9.70 of the Standard Specifications for Trafficperson (Uniformed Municipal Police Officer) as required.

2.03 TRAVEL WAY

- A. The travel way is a surface that is safe and wide enough for vehicular traffic. It shall be marked with signs, delineation, and other methods such that a person who has no knowledge of the conditions may safely travel through or avoid portions of the Work under construction with minimum discomfort.
- B. The travel way shall be well-drained, reasonably smooth, hard, and free of potholes, bumps, irregularities, and depressions that hold water. It shall be free of foreign objects such as rocks, timber, and other items that may fall from transporting vehicles.

PART 3 EXECUTION

3.01 GENERAL

- A. Comply with attached document "Traffic Control During Construction Operations".
- B. Comply with the latest edition of the MUTCD.
- C. Furnish and erect enough signs, barricades, drums, traffic cones, delineators, and precast concrete barrier curbs to forewarn traffic of the construction as shown on the approved traffic control plans and schedule of operation methods or as directed by the authority having jurisdiction. Provide such safety measures, pavement markings, warning devices, and signs as deemed necessary to safeguard and guide the traveling public through or around the project site as directed by the authority having jurisdiction and in accordance with the ATSSA guidelines.
- D. Do not use unapproved signs, barricades, drums, traffic cones, or delineators.
- E. Mount signs in any one signing pattern at the same height above the traveled surface. Keep signs in proper position, clean, legible, and in clear view. Remove or cover legend of signs that do not reflect the current existing travel conditions.
- F. Remove, store, protect, keep clean, and replace existing street signs as directed by Engineer. Deliver discarded signs not to be replaced to the Owner as directed by the Engineer. Replace signs or markers lost or damaged resulting from Contractor's negligence at the Contractor's

expense. Maintain route marker. Ensure signs remain visible to traffic if construction stages require sign relocation.

- G. Backfill open trenches before the end of the workday unless written approval from Engineer is obtained.

3.02 TRAFFICPERSON

- A. Employ enough competent Trafficpersons (Uniformed Municipal Police Officers) and/or temporary traffic control devices and lights, while maintaining one lane traffic conditions. One way traffic is allowed only with prior approval from the governing agency having jurisdiction over the roadway, unless already shown on the Drawings.

3.03 TRAVEL WAY

- A. Provide a travel way suitable to accommodate at least one lane of alternating traffic if the roadway or section thereof is not permitted to be closed. Limit one lane of alternating traffic to the immediate work area for the shortest possible time period. Provide a travel way suitable for maintaining two lanes of traffic at the end of each work day, unless otherwise approved by the Engineer.
- B. Remove immediately any spillage of material from a carrying vehicle resulting from the Contractor's hauling operations along or across any public travel way.
- C. Ensure minimum traffic delays.
- D. Maintain adequate ingress and egress for pedestrian and vehicular traffic to and from private driveways, business and commercial establishments, and for street intersections and heavily traveled crossings.
- E. Grade and stabilize travel ways temporarily located outside accustomed traffic lanes to ensure these locations will satisfactorily carry the traffic.

3.04 DETOURS AND TRAVEL WAY DELINEATION

- A. Furnish enough traffic drums to fulfill all the requirements specified in the Contract to provide adequate traffic control during period of unforeseen circumstances or emergencies.
- B. Furnish and securely mount barricade warning lights as follows:
 1. Type A - on separate portable supports, Class II barricades, and vertical channelizing devices. Portable supports shall be a minimum mounting height of 36 inches.
 2. Type B - on advance warning signs, independent supports, and, in extremely hazardous site conditions, they may be mounted on Class II barricades, signs or supports.
 3. Type C - to delineate the travel way edge on detour curves, lane changes, lane closures, and other similar conditions.
 4. Or as directed by Engineer.

3.05 RESTORATION

- A. Replace barricade warning lights and drums that are missing, damaged, defaced, or improperly functioning as determined by the Engineer and in accordance with ATSSA guidelines.
- B. Replace damaged, obliterated, destroyed, or disturbed facilities with equal or better quality products.
- C. Restore roadway striping obliterated during construction

- D. Restore and repair travel ways located outside accustomed traffic lanes to equal or better than original conditions when the temporary travel way is removed, unless otherwise shown on the Drawings.
- E. Repair or replace traffic signal wires, pressure pads, magnetic loops, and other traffic signal devices removed or damaged during the course of construction. Restore, repair, and replace in accordance with the governmental agency having jurisdiction over the roadway requirements.

3.06 MAINTENANCE

- A. Provide material, labor and equipment to immediately repair, remedy and prevent washouts, formation of holes, ruts, depressions, and sunken trenches during construction times, nights, weekends, holidays and times when Work is temporarily suspended.
- B. Keep the travel way free of foreign objects such as rocks, timber and other items that may fall from transporting vehicles. Immediately remove spillage from a Contractor's hauling operations along or across public travel ways.
- C. Maintain and relocate barricade warning lights. Dispose of them upon final removal.

3.07 ATTACHMENTS

- A. Select pages from Connecticut Department of Transportation, Bureau of Engineering and Construction, Special Provision Item #0971001A - "Traffic Control during Construction Operations", Rev. 10/14. Where reference is made to "DOT Construction" it shall mean the "Engineer". Where reference is made to "District Engineer", "Office of Construction", or "District Office", it shall mean the "Owner".

END OF SECTION

Traffic Control During Construction Operations

The following guidelines shall assist field personnel in determining when and what type of traffic control patterns to use for various situations. These guidelines shall provide for a safer and more efficient movement of traffic through work zones and enhance the safety of work forces in the work area.

Traffic Control Patterns

Traffic control patterns shall be used when a work operation requires that all or part of any vehicle or work area protrudes onto any part of a travel lane or shoulder or is within the clear zone. For each situation, the installation of traffic control devices shall be based on the following:

- Speed and volume of traffic.
- Duration of operation.
- Exposure to hazards.

Traffic control patterns shall be uniform, neat, and orderly in order to command respect from the motorist.

Lane reduction tapers should be placed so that the entire length of the taper is installed on a tangent section of roadway and the entire taper area can be seen by the motorist.

All existing conflicting signs shall be removed, covered with an opaque material, or turned so that they are not legible to oncoming traffic prior to implementing a traffic control pattern. The existing signs shall be uncovered or reinstalled once the pattern is removed.

A buffer area should be provided during installation of a traffic control pattern and maintained for the duration of the work. The buffer area shall be free of any equipment, workers, materials, and parked vehicles.

Construction Traffic Control Plans 19 through 25 should be used for moving operations such as line striping, rumble strips, pothole patching, mowing, or sweeping when it is necessary for equipment to occupy a travel lane.

Traffic control patterns are not required for vehicles on an emergency patrol type activity or for a short duration stop of up to one hour, as long as the equipment is contained within the shoulder. Flashing lights, arrow boards, truck-mounted or trailer-mounted impact attenuators, and appropriate Trafficperson(s) shall be used when required.

In a situation not adequately covered by the Construction Traffic Control Plans, the Contractor shall contact the Engineer for assistance prior to setting up a traffic control pattern.

Placement of Signs

Signs shall be placed in a position that allows motorists the opportunity to reduce their speed prior to the work area. Signs shall be installed on the same side of the roadway as the work area. On multi-lane divided highways, advance warning signs shall be installed on both sides of the highway. On directional roadways (on-ramps, off-ramps, one-way roads) where the sight distance to signs is restricted, these signs should be installed on both sides of the roadway.

Allowable Adjustment of Signs and Devices Shown on the Construction Traffic Control Plans

The Construction Traffic Control Plans contained herein show the location and spacing of signs and devices under ideal conditions. Signs and devices should be installed as shown on these plans.

The proper application of the Construction Traffic Control Plans and installation of traffic control devices is dependent upon actual field conditions.

In the case of a horizontal or vertical sight restriction in advance of the work area, the traffic control pattern shall be extended to provide adequate sight distance for approaching traffic.

Adjustments to the Construction Traffic Control Plans shall only be made at the direction of the Engineer.

Table 1 indicates the minimum taper lengths required for a lane closure based on the posted speed limit and lane width of the roadway. These taper lengths shall only be used when the recommended taper lengths shown on the Construction Traffic Control Plans cannot be achieved.

Table 1 – Minimum Taper Length

POSTED SPEED LIMIT (MPH)	MINIMUM TAPER LENGTH FOR A SINGLE LANE CLOSURE (FEET)	
	FREEWAYS	SECONDARY ROADS
30 OR LESS	180	165
35	245	225
40	320	295
45	540	495
50	600	550
55	660	605
65	780	715

1. Work Zone Safety Meetings

- 1.a) Prior to the commencement of work, a Work Zone Safety Meeting shall be conducted with representatives from DOT Construction, Connecticut State Police (Local Barracks), Municipal Police, the Contractor (Project Superintendent) and the Traffic Control Subcontractor (if different than the prime Contractor) to review the traffic operations, lines of responsibility, and operating guidelines which will be used on the Project. DOT Traffic Engineering shall be invited to the Work Zone Safety Meeting. Other Work Zone Safety Meetings during the course of the Project should be scheduled as needed.
- 1.b) A Work Zone Safety Meeting Agenda shall be developed and used at the Meeting to outline the anticipated traffic control issues during the construction of this Project. Any issues that can't be resolved at these Meetings will be brought to the attention of the District Engineer and the Office of Construction. The agenda shall include:
 - i. Review Project scope of work and time;
 - ii. Review Section 1.08, Prosecution and Progress;
 - iii. Review Section 9.70, Trafficpersons;
 - iv. Review Section 9.71, Maintenance and Protection of Traffic;
 - v. Review Contractor's schedule and method of operations;
 - vi. Review special concern areas: ramps, turning roadways, medians, lane drops, etc.;
 - vii. Open discussion of work zone questions and issues;
 - viii. Discussion of review and approval process for changes in Contract requirements as they relate to work zone areas.

2. General

- 2.a) Traffic control patterns shall only be installed if the required minimum number of signs, traffic cones, traffic drums, and other equipment (i.e. one Arrow Board for each lane closed, two Truck-Mounted or Trailer-Mounted Attenuators (TMAs), Changeable Message Sign, etc.) are on Site.
- 2.b) The Contractor shall have spare maintenance and protection of traffic equipment (TMAs, Arrow Board, Changeable Message Sign(s), construction signs, traffic cones, traffic drums, etc.) available at all times in case of mechanical failures, etc. Spare maintenance and protection of traffic equipment installed as a result of a sudden equipment breakdown shall be replaced by the Contractor within 24 hours.
- 2.c) Failure of the Contractor to have the required minimum number of signs, personnel, and equipment, which results in the pattern not being installed, shall not be a reason for a time extension or claim for lost time.
- 2.d) In cases of differences of opinion between the Contractor and the Inspection staff, the Contractor shall follow the directions of the Engineer. The matter shall be brought to the District Office for resolution immediately or, in the case of work after regular business hours, on the next business day.

3. Installing and Removing Traffic Control Patterns

- 3.a) Lane closures shall be installed beginning with the advance warning signs and proceeding forward toward the work area.
- 3.b) Lane closures shall be removed in the reverse order, beginning at the end of the work area, or traffic control pattern, and proceeding back toward the advance warning signs.
- 3.c) Stopping traffic may be allowed within the allowable hours stated in Section 1.08.04:
 - i. For those activities stated within the Contract.
 - ii. During paving, milling operations, or similar activities where, in the middle of the operation, it is necessary to flip the pattern to complete the operation on the other half of the roadway so traffic does not travel across the longitudinal joint or difference in roadway elevation.
 - iii. To move slow moving equipment across live traffic lanes into the work area.
- 3.d) The Contractor shall adhere to using the proper signs, placing the signs correctly, and ensuring the proper spacing of signs.
- 3.e) Additional devices are required on entrance ramps, exit ramps, and intersecting roads to warn and/or move traffic into the proper travel path prior to merging with or exiting from the mainline traffic. This shall be completed before installing the mainline pattern past the ramp or intersecting roadway.
- 3.f) Workers are prohibited from crossing the travel lanes on limited access roadways to install and remove signs or other devices on the opposite side of the roadway. Any signs or devices on the opposite side of the roadway shall be installed and removed separately.

4. Implementation of Rolling Road Block (RRB)

- 4.a) Temporary road closures using a RRB may be allowed on limited access highways for operations associated with the installation and removal of temporary lane closures. RRB may be allowed for the installation and removal of lead signs and lane tapers only and shall meet the following requirements:
- i. Refer to the Limitation of Operations Chart provided in Section 1.08.04 for the hours allowed for implementing a RRB operation. The Contractor shall only implement a RRB operation within the hours shown in the Chart.
 - ii. In areas with good sight lines and full shoulders, signs on the side of the road opposite the traffic pattern should be installed in a separate operation.
 - iii. TMAs equipped with Arrow Boards shall be used to slow traffic to implement the RRB. State Police Officers in marked vehicles may be used to support the implementation of the RRB. The RRB shall start by having all vehicles, including TMAs and police vehicles, leave the shoulder or on-ramp and accelerate to normal roadway speeds in each lane. The vehicles will then position themselves side by side and decelerate to the RRB speed on the highway.
 - iv. A Pre-Warning Vehicle, as specified elsewhere in the Contract, shall be used to advise the motorists that sign pattern installation or removal is underway.
 - v. The RRB duration shall not exceed 15 minutes from the start of the traffic block until all lanes are opened as designated in the Limitation of Operations chart. If the RRB duration exceeds 15 minutes on 2 successive shifts, no further RRB will be allowed until the Contractor obtains approval for a revised installation procedure from the District.
 - vi. RRB shall not be used to expand a lane closure pattern to an additional lane during the shift. The workers and equipment required to implement the additional lane closure should be staged from within the closed lane. TMAs (and State Police if available) shall be used to protect the workers installing the taper in the additional lane.
 - vii. Exceptions to these work procedures may be submitted to the District Office for consideration. A minimum of 2 business days shall be allowed for review and comment by the District.
 - viii. The Engineer and the Contractor will review and discuss the RRB procedures (including any revisions) in advance of the work. The implementation of the agreed upon plan will be reviewed with the State Police during the Work Zone Safety Meeting held before each shift involving temporary lane closures. If the State Police determine that alternative procedures should be implemented for traffic control during the work shift, the Department and Contractor will attempt to resolve any discrepancies with the duty sergeant at the Troop. If the discrepancies are unable to be resolved prior to the start of the shift, then the work will proceed as recommended by the Department. Any unresolved issues shall be addressed the following day.

5. Use of Arrow Boards

- 5.a) On limited access roadways, one Arrow Board shall be used for each lane that is closed. The Arrow Board shall be installed concurrently with the installation of the traffic control pattern and its placement shall be as shown on the Construction Traffic Control Plans. Additional Arrow Boards shall be deployed if sight distances are limited.
- 5.b) On non-limited access roadways, the use of an Arrow Board for lane closures is optional. The roadway geometry, sight distance, and traffic volume shall be considered in the decision to use the Arrow Board.
- 5.c) A vehicle displaying an arrow board shall be equipped with high-intensity rotating, flashing, oscillating, or strobe lights.
- 5.d) The flashing arrow mode shall be used for lane closure (merge) tapers.
- 5.e) The flashing arrow mode shall not be used for temporary alternating one-way traffic operations or to laterally shift lanes of traffic.
- 5.f) The flashing double arrow mode shall only be used for closing a center lane on a multilane roadway where adjacent left and right lanes remain open.
- 5.g) For shoulder work or roadside work near the shoulder, the Arrow Board shall be positioned in the shoulder and the flashing alternating diamond mode should be used.
- 5.h) The flashing alternating diamond caution mode should also be used when supplemental Arrow Boards are positioned in an already closed lane.

6. Use of Truck-Mounted or Trailer-Mounted Impact Attenuators (TMAs)

- 6.a) On limited access roadways, lane closures shall use a minimum of two TMAs to install and remove traffic control patterns. If two TMAs are not available, then the pattern shall not be installed.
- 6.b) On non-limited access roadways, the use of TMAs to install and remove patterns closing a lane(s) is optional. The roadway geometry, sight line distance, and traffic volume shall be considered in the decision to utilize the TMAs.
- 6.c) On limited access roadways, one TMA shall be placed on the shoulder and the second TMA shall be approximately 1,000 feet ahead blocking the lane to establish the advance and transition signing. The Arrow Board mounted on the TMA shall be in the arrow mode when taking the lane. The sign truck and workers shall be at sufficient distance ahead of the second TMA. In no case shall the TMA be used as the sign truck or a work truck. Once the transition is in place, the TMAs shall travel in the closed lane until all Portable Changeable Message Signs, signs, Arrow Boards, and cones/drums are installed. The

Arrow Board mounted on the TMA should be in the flashing alternating diamond caution mode when traveling in the closed lane.

- 6.d) A TMA shall be placed prior to the first work area in the pattern. If there are multiple work areas within the same pattern, then additional TMAs shall be positioned at each additional work area as needed. The Arrow Board mounted on the TMA should be in the flashing alternating diamond caution mode when in the closed lane.
- 6.e) TMAs shall be positioned a sufficient distance prior to the workers or equipment being protected to allow for appropriate vehicle roll-ahead in the event that the TMA is hit, but not so far that an errant vehicle could travel around the TMA and into the work area. For additional placement and use details, refer to Section 18.06. Some operations, such as paving and concrete repairs, do not allow for placement of the TMA(s) within the specified distances. In these situations, the TMA(s) shall be placed at the beginning of the work area and shall be advanced as the paving or concrete operations proceed.
- 6.f) TMAs will be paid for in accordance with how the unit is used. If it is used as a TMA and is in the proper location as specified, then it will be paid for at the specified hourly rate for Truck-Mounted or Trailer-Mounted Impact Attenuator. When the TMA is used as an Arrow Board, it will be paid for at the daily rate for Arrow Board. If a TMA is used to install and remove a pattern and is also used as an Arrow Board in the same day, then the unit will be paid for as a Truck-Mounted or Trailer-Mounted Impact Attenuator for the hours used to install and remove the pattern, typically 2 hours (1 hour to install and 1 hour to remove). If the TMA is also used as an Arrow Board during the same day, then the unit will only be paid for at the daily rate as an Arrow Board.

7. Use of Traffic Drums and Traffic Cones

- 7.a) On limited-access highways, ramps, and turning roadways:
 - i. Traffic drums shall be used for taper channelization.
 - ii. Traffic drums shall be used to delineate raised catch basins and other hazards.
 - iii. Traffic cones with a minimum height of 42 inches may be used in place of drums in the tangent section of a closed lane or shoulder.
 - iv. Traffic cones less than 42 inches in height shall not be used.
- 7.b) On all roadways:
 - i. Traffic drums shall be used in place of traffic cones in traffic control patterns that are in effect for more than a 36-hour duration.
 - ii. Traffic cones shall not be left unattended.
 - iii. Traffic cones with a minimum height of 42 inches shall be used when the posted speed limit is 45 MPH or above.
- 7.c) Typical spacing of traffic drums and/or cones shown on the Construction Traffic Control Plans in the Contract are maximum spacings and may be reduced to meet actual field conditions as required.

8. Use of Barricade Warning Lights

- 8.a) Barricade Warning Lights may be installed on channelizing devices when used in a merge taper. The Barricade Warning Lights shall flash in a sequential pattern when used in a merge taper. The successive flashing shall occur from the upstream end (beginning) of the merge taper to the downstream end (end) of the merge taper.
- 8.b) Type C Barricade Warning Lights may be used at night to delineate the edge of the travel way.
- c) Type B Barricade Warning Lights shall be used on post-mounted advanced warning signs.

9. Use of Portable Changeable Message Signs (PCMS)

- 9.a) On limited access roadways, one PCMS shall be used in advance of the traffic control pattern for all lane closures. Prior to installing the pattern, the PCMS shall be installed and in operation, displaying the appropriate lane closure information. The PCMS shall be positioned ½ to 1 mile ahead of the start of the lane closure taper. If the distance to the nearest exit ramp is greater than the specified ½ to 1 mile distance, then an additional PCMS shall be positioned a sufficient distance ahead of the exit ramp (and before the previous on-ramp where practical) to alert motorists to the work and therefore offer them an opportunity to take the exit.
- 9.b) On non-limited access roadways, the use of PCMS for lane closures is optional. The roadway geometry, sight line distance, and traffic volume shall be considered in the decision to use the PCMS.
- 9.c) PCMS should be placed off the shoulder of the roadway and behind a traffic barrier, if practical. Where a traffic barrier is not available to shield the PCMS, it should be placed off the shoulder and outside of the clear zone. If a PCMS has to be placed on the shoulder of the roadway or within the clear zone, it should be placed on the paved shoulder with a minimum of five traffic drums placed in a taper in front of it to delineate its position. The taper shall meet minimum distance requirements for a shoulder closure. The PCMS shall be protected if it is used for a continuous duration of 36 hours or more.
- 9.d) The PCMS shall be removed from the clear zone and have the display screen cleared and turned 90 degrees away from the roadway when the PCMS is no longer required.
- 9.e) The PCMS should not be used within 1,000 feet of an existing PCMS or Variable Message Sign (VMS).
- 9.f) A PCMS message shall:
 - i. consist of no more than two phases;
 - ii. contain no more than three lines of text per phase;
 - iii. have no more than eight characters per line, including spaces.

- 9.g) The PCMS should be used for specific situations that need to command the motorist's attention which cannot be conveyed with standard construction signs. The PCMS should not be used for generic messages (ex.: Road Work Ahead, Bump Ahead, Gravel Road, etc.) or for messages that need to be displayed for long periods of time, such as during stage construction. These types of messages should be displayed with construction signs. Special signs shall be coordinated with the Office of Construction and the Division of Traffic Engineering for the proper layout/dimensions required.
- 9.h) Typical messages that are allowed on the PCMS are shown below. Approval must be received from the Office of Construction for any message(s) different than the typical messages shown in Figure 1.
- 9.i) All messages shall comply with the information provided in Tables 2 and 3.

<u>Message No.</u>	<u>Phase 1</u>	<u>Phase 2</u>	<u>Message No.</u>	<u>Phase 1</u>	<u>Phase 2</u>
1	LEFT LANE CLOSED	MERGE RIGHT	9	LANES CLOSED AHEAD	REDUCE SPEED
2	2 LEFT LANES CLOSED	MERGE RIGHT	10	LANES CLOSED AHEAD	USE CAUTION
3	LEFT LANE CLOSED	REDUCE SPEED	11	EXIT XX CLOSED	USE EXIT YY
4	2 LEFT LANES CLOSED	REDUCE SPEED	12	EXIT XX CLOSED USE YY	FOLLOW DETOUR
5	RIGHT LANE CLOSED	MERGE LEFT	13	2 LANES SHIFT AHEAD	USE CAUTION
6	2 RIGHT LANES CLOSED	MERGE LEFT	14	3 LANES SHIFT AHEAD	USE CAUTION
7	RIGHT LANE CLOSED	REDUCE SPEED			
8	2 RIGHT LANES CLOSED	REDUCE SPEED			

Figure 1: Typical PCMS Messages

Table 2: Acceptable Abbreviations

Word Message	Standard Abbreviation	Word Message	Standard Abbreviation
Access	ACCS	Minimum	MIN
Afternoon / Evening	PM	Minor	MNR
Ahead	AHD	Minute(s)	MIN
Alternate	ALT	Monday	MON
Avenue	AVE, AV	Morning / Late Night	AM
Bicycle	BIKE	Mount	MT
Blocked	BLKD	Mountain	MTN
Boulevard	BLVD	National	NATL
Bridge	BR	Normal	NORM
CB Radio	CB	North	N
Center	CTR	Northbound	NBND
Center	CNTR	Oversized	OVRSZ
Chemical	CHEM	Parking	PKING
Circle	CIR	Parkway	PKWY
Compressed Natural Gas	CNG	Pavement	PVMT
Condition	COND	Pedestrian	PED
Congested	CONG	Place	PL
Construction	CONST	Pounds	LBS
Court	CT	Prepare	PREP
Crossing	XING	Quality	QLTY
Crossing (other than highway-rail)	XING	Right	RT
Downtown	DWNTN	Road	RD
Drive	DR	Roadwork	RDWK
East	E	Route	RT, RTE
Eastbound	EBND	Saint	ST
Electric Vehicle	EV	Saturday	SAT
Emergency	EMER	Service	SERV
Entrance, Enter	ENT	Shoulder	SHLDR
Exit	EX	Slippery	SLIP
Express	EXP	South	S
Expressway	EXPWY	Southbound	SBND
Feet	FT	Speed	SPD
Freeway	FRWY, FWY	State, county, or other non-US or non-Interstate numbered route	[Route Abbreviation determined by highway agency]**
Friday	FRI	Street	ST
Frontage	FRNTG	Sunday	SUN
Hazardous	HAZ	Telephone	PHONE
Hazardous Material	HAZMAT	Temporary	TEMP
High Occupancy Vehicle	HOV	Terrace	TER
Highway	HWY	Thruway	THWY

Highway-Rail Grade Crossing	RR XING	Thursday	THURS
Hospital	HOSP	Tons of Weight	T
Hour(s)	HR, HRS	Traffic	TRAF
Information	INFO	Trail	TR
International	INTL	Travelers	TRVLRS
Interstate	I-	Tuesday	TUES
Junction / Intersection	JCT	Turnpike	TPK
Lane	LN	Two-Way Intersection	2-WAY
Left	LFT	Two-Wheeled Vehicles	CYCLES
Liquid Propane Gas	LP-GAS	Upper	UPR
Local	LOC	US Numbered Route	US
Lower	LWR	Vehicle(s)	VEH, VEHS
Maintenance	MAINT	Warning	WARN
Major	MAJ	Wednesday	WED
Maximum	MAX	West	W
Mile(s)	MI	Westbound	WBND
Miles Per Hour	MPH		

** A space and no dash shall be placed between the abbreviation and the number of the route.

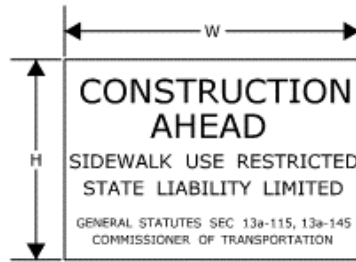
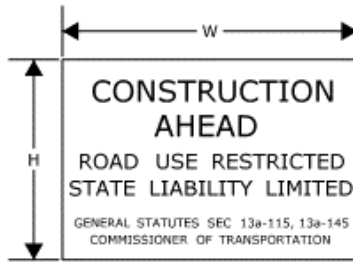
Table 3: Unacceptable Abbreviations

Unacceptable Abbreviation	Intended Word	Common Misinterpretation
ACC	Accident	Access (Road)
CLRS	Clears	Colors
DLY	Delay	Daily
FDR	Feeder	Federal
L	Left	Lane (Merge)
LT	Light (Traffic)	Left
PARK	Parking	Park
POLL	Pollution (Index)	Poll
RED	Reduce	Red
STAD	Stadium	Standard
WRNG	Warning	Wrong

10. Use of State Police Officers

- 10.a) State Police may be used only on limited access highways and secondary roadways that are under their primary jurisdiction. A minimum of one Officer may be used per critical sign pattern; however, a State Police presence is not required. Shoulder closures and right lane closures can generally be implemented without the presence of a State Police Officer. Left lane closures may also be implemented without State Police presence in areas with only moderate traffic and wide, unobstructed medians. It may be desirable to have a State Police presence, when available, under specific situations, such as nighttime lane closures; left lane closures with minimal width for setting up advance signs and staging; lane and shoulder closures on turning roadways/ramps or mainline where sight distance is minimal; and closures where extensive turning movements or traffic congestion regularly occur; however, they are not required.
- 10.b) If a State Police presence is provided, once the pattern is in place, the State Police Officer should be positioned in a non- hazardous location in advance of the pattern to provide advance warning to the motorist. If traffic backs up beyond the beginning of the pattern, then the State Police Officer shall reposition so that they are located prior to the backup. The State Police Officer should not be located immediately behind or within the roll ahead area of any TMA or within the work zone buffer area. The State Police Officer shall not be positioned in such a way that the State Police Officer obstructs any construction warning signs or PCMS from view of the motorist.
- 10.c) Other functions of the State Police Officer(s) may include:
- i. Assisting construction vehicles entering and exiting the work area.
 - ii. Enforcement of motor vehicle laws within the work area, if specifically requested by the Engineer.
- 10.d) State Police Officers assigned to a work site shall take direction from the Engineer.

SERIES 16 SIGNS



		W	H
16-E	80-1605	84" x 60"	
16-H	80-1608	60" x 42"	
16-M	80-1613	30" x 24"	

		W	H
16-S	80-1619	48" x 30"	

SIGN 16-S SHALL BE USED ON ALL PROJECTS THAT REQUIRE SIDEWALK RECONSTRUCTION OR RESTRICT PEDESTRIAN TRAVEL ON AN EXISTING SIDEWALK.

SERIES 16 SIGNS SHALL BE INSTALLED IN ADVANCE OF THE TRAFFIC CONTROL PATTERNS. SERIES 16 SIGNS SHOULD BE LOCATED TO ALLOW MOTORISTS THE OPPORTUNITY TO AVOID A WORK ZONE. SERIES 16 SIGNS SHOULD BE INSTALLED ON MAJOR INTERSECTING ROADWAYS THAT APPROACH THE WORK ZONE. ON LIMITED-ACCESS HIGHWAYS, THESE SIGNS SHOULD BE LOCATED IN ADVANCE OF THE NEAREST UPSTREAM EXIT RAMP AND ON ANY ENTRANCE RAMPS PRIOR TO OR WITHIN THE WORK ZONE LIMITS.

SIGNS 16-E AND 16-H SHALL BE POST-MOUNTED.

SIGN 16-E SHALL BE USED ON ALL FREEWAYS AND EXPRESSWAYS.

SIGN 16-H SHALL BE USED ON ALL RAMPS, OTHER STATE ROADWAYS AND MAJOR TOWN/CITY ROADWAYS.

SIGN 16-M SHALL BE USED ON OTHER TOWN ROADWAYS.

CONSTRUCTION TRAFFIC CONTROL PLAN
SERIES 16 SIGNS

SCALE: NONE

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED

Tracy L. Fogarty
PRINCIPAL ENGINEER

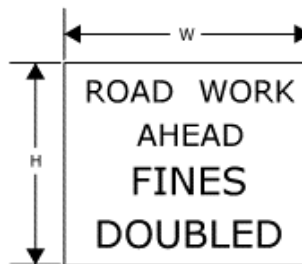
Tracy L. Fogarty, P.E.
2013.10.09 16:30:32-0400

REGULATORY SIGN "ROAD WORK AHEAD, FINES DOUBLED"

THE REGULATORY SIGN "ROAD WORK AHEAD FINES DOUBLED" SHALL BE INSTALLED FOR ALL WORK ZONES THAT OCCUR ON ANY STATE HIGHWAY AND MUNICIPAL ROAD IN CONNECTICUT WHERE THERE ARE WORKERS PRESENT ON THE HIGHWAY.

THE "ROAD WORK AHEAD FINES DOUBLED" REGULATORY SIGN SHALL BE PLACED AFTER THE SERIES 16 SIGN AND IN ADVANCE OF THE "ROAD WORK AHEAD" SIGN.

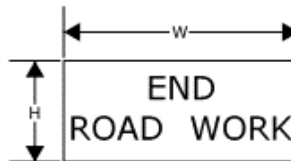
	W	H
31-1906	48"	42"
31-1907	60"	54"



"END ROAD WORK" SIGN

THE LAST SIGN IN THE PATTERN SHALL BE THE "END ROAD WORK" SIGN.

	W	H
80-9606	36"	18"
80-9612	48"	24"



CONSTRUCTION TRAFFIC CONTROL PLAN
ROAD WORK AHEAD
SIGNS

SCALE: NONE

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED

Tracy L. Fogarty
PRINCIPAL ENGINEER

Tracy L. Fogarty, P.E.
2019.08.12 15:56:44 04/07

NOTES FOR TRAFFIC CONTROL PLANS

1. IF A TRAFFIC STOPPAGE OCCURS IN ADVANCE OF SIGN (A), THEN AN ADDITIONAL SIGN (A) SHALL BE INSTALLED IN ADVANCE OF THE STOPPAGE.
2. SIGNS (AA), (A), AND (D) SHOULD BE OMITTED WHEN THESE SIGNS HAVE ALREADY BEEN INSTALLED IN ADVANCE TO DESIGNATE A LARGER WORK ZONE THAN THE WORK ZONE THAT IS ENCOMPASSED ON THIS PLAN.
3. SEE TABLE 1 FOR ADJUSTMENT OF TAPERS IF NECESSARY.
4. TRAFFIC CONES AND PORTABLE CONSTRUCTION SIGNS SHALL NOT BE LEFT UNATTENDED.
5. ALL CONFLICTING SIGNS WITHIN THE LIMITS OF A ROADWAY / LANE CLOSURE AREA SHALL BE COVERED WITH AN OPAQUE MATERIAL WHILE THE CLOSURE IS IN EFFECT, AND UNCOVERED WHEN THE ROADWAY / LANE CLOSURE IS RE-OPENED TO ALL LANES OF TRAFFIC.
6. IF THIS PLAN REMAINS IN CONTINUOUS OPERATION FOR MORE THAN 48 HOURS, THEN ANY EXISTING CONFLICTING PAVEMENT MARKINGS SHALL BE ERADICATED OR COVERED, AND TEMPORARY PAVEMENT MARKINGS THAT DELINEATE THE PROPER TRAVELPATHS SHALL BE INSTALLED.
7. DISTANCES BETWEEN SIGNS IN THE ADVANCE WARNING AREA MAY BE REDUCED TO 100' ON LOW-SPEED URBAN ROADS (SPEED LIMIT \leq 40 MPH).
8. IF THIS PLAN IS TO REMAIN IN OPERATION FROM SUNSET TO SUNRISE, INSTALL BARRICADE WARNING LIGHTS - HIGH INTENSITY ON ALL POST-MOUNTED DIAMOND SIGNS IN THE ADVANCE WARNING AREA.
9. A PORTABLE CHANGEABLE MESSAGE SIGN SHALL BE INSTALLED ONE HALF MILE TO ONE MILE IN ADVANCE OF THE LANE CLOSURE TAPER.
10. SIGN (P) SHALL BE MOUNTED A MINIMUM OF 7 FEET FROM THE PAVEMENT SURFACE TO THE BOTTOM OF THE SIGN.

TABLE 1 - MINIMUM TAPER LENGTHS

POSTED SPEED LIMIT (MILES PER HOUR)	MINIMUM TAPER LENGTH FOR A SINGLE LANE CLOSURE
30 OR LESS	180'
35	245'
40	320'
45	540'
50	600'
55	660'
65	780'

CONSTRUCTION TRAFFIC CONTROL PLAN

NOTES

SCALE: NONE

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

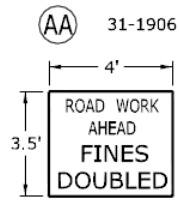
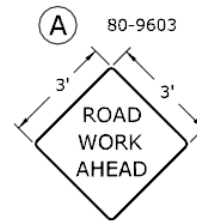
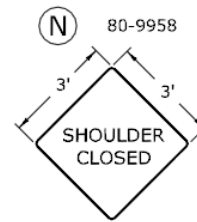
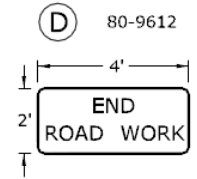
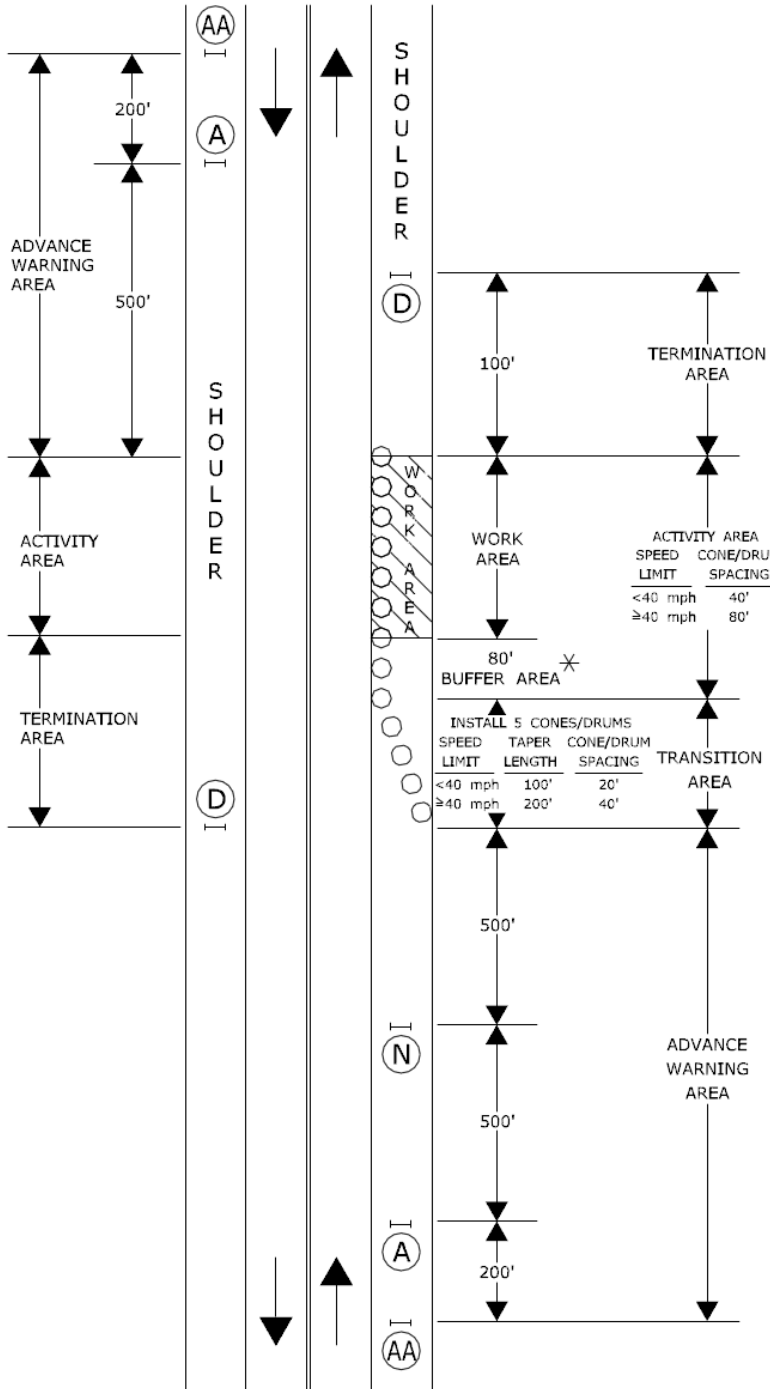
APPROVED

Tracy L. Fogarty
PRINCIPAL ENGINEER

Tracy L. Fogarty, P.E.
2019.08.13 08:47:47-04'07'

WORK IN SHOULDER - TWO LANE HIGHWAY

SIGN FACE
71 SQ. FT (MIN.)



SPEED LIMIT	CONE/DRUM SPACING
<40 mph	40'
≥40 mph	80'

SPEED LIMIT	TAPER LENGTH	CONE/DRUM SPACING
<40 mph	100'	20'
≥40 mph	200'	40'

- TRAFFIC CONE **OR** TRAFFIC DRUM
- ✱ OPTIONAL ⊗ TRAFFIC DRUM — PORTABLE SIGN SUPPORT
- ◀ HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW



SCALE: NONE

CONSTRUCTION TRAFFIC CONTROL PLAN

PLAN 14

SEE NOTES 1, 2, 4, 7, 8

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

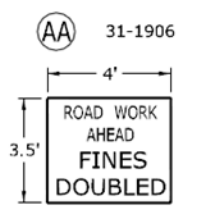
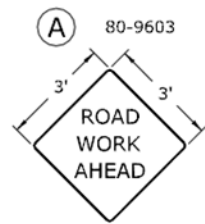
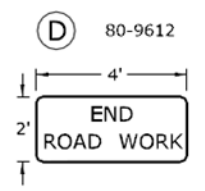
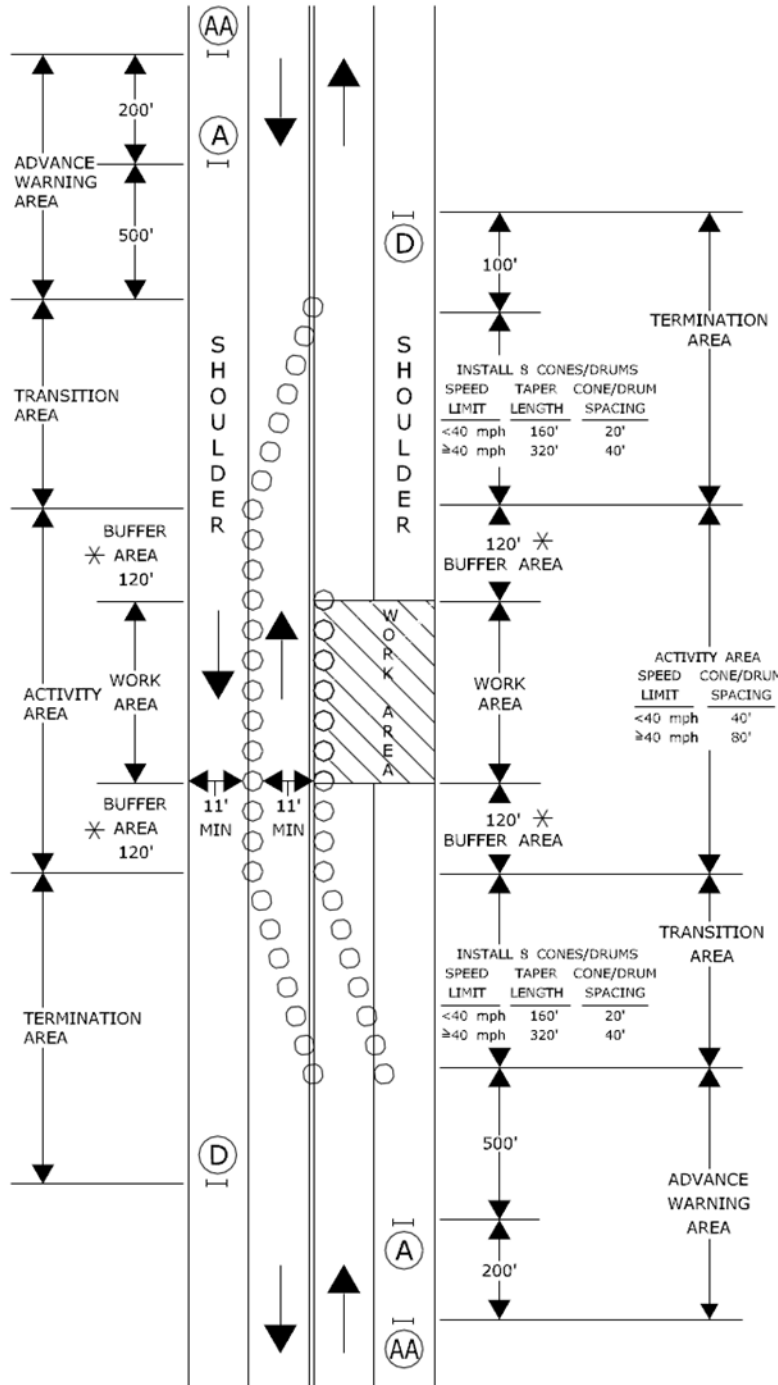
APPROVED

Charles S. Harlow
PRINCIPAL ENGINEER

Charles S. Harlow
2012.06.05 15:56:09-04'00"

WORK IN TRAVEL LANE AND SHOULDER TWO LANE HIGHWAY

SIGN FACE
62 SQ. FT (MIN.)



INSTALL 8 CONES/DRUMS

SPEED LIMIT	TAPER LENGTH	CONE/DRUM SPACING
<40 mph	160'	20'
≥40 mph	320'	40'

ACTIVITY AREA

SPEED LIMIT	CONE/DRUM SPACING
<40 mph	40'
≥40 mph	80'

INSTALL 8 CONES/DRUMS

SPEED LIMIT	TAPER LENGTH	CONE/DRUM SPACING
<40 mph	160'	20'
≥40 mph	320'	40'

- TRAFFIC CONE OR TRAFFIC DRUM
- ✱ OPTIONAL ✕ TRAFFIC DRUM — PORTABLE SIGN SUPPORT
- ◀ HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW



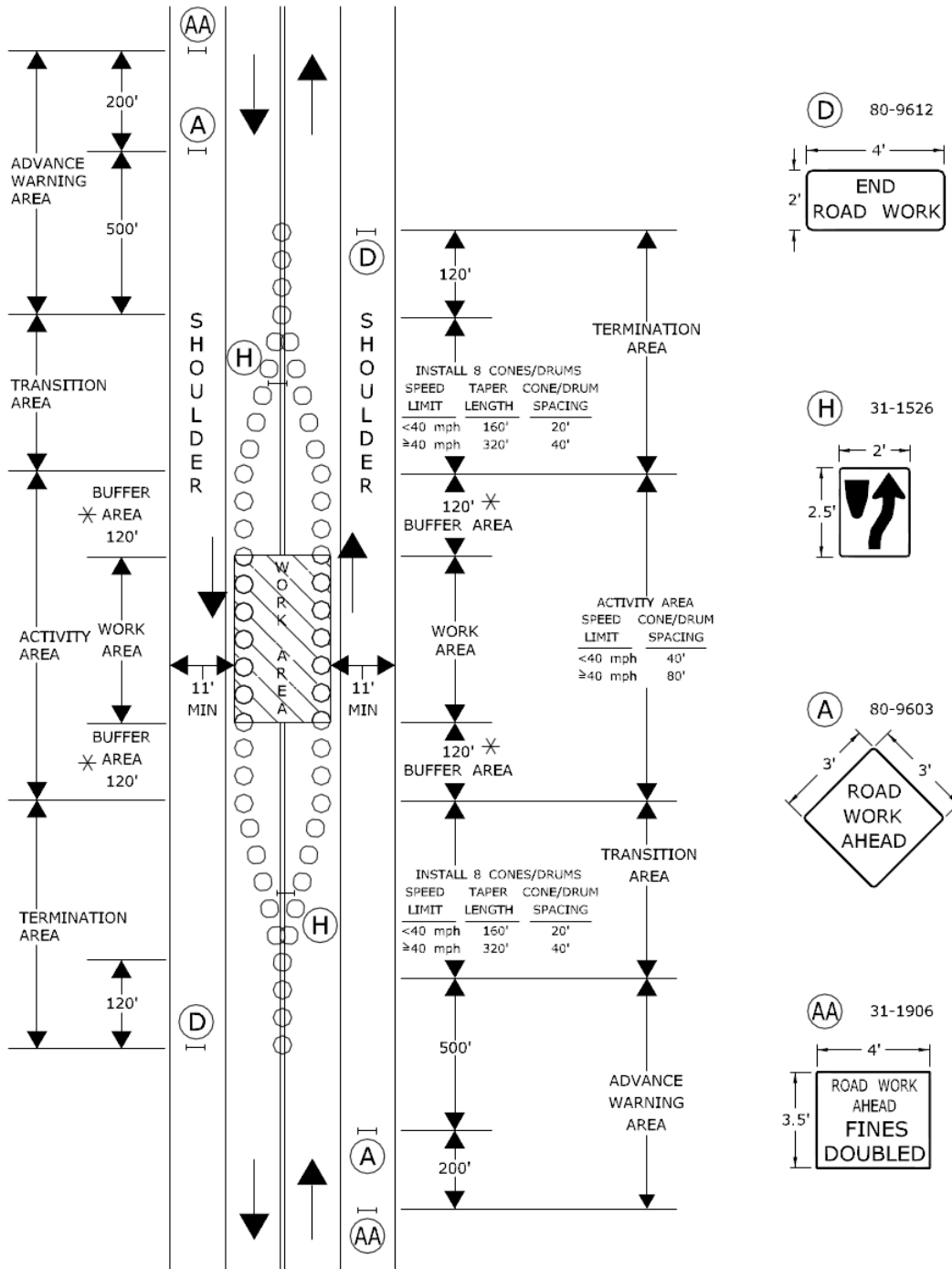
CONSTRUCTION TRAFFIC CONTROL PLAN
PLAN 15
SEE NOTES 1, 2, 4, 6, 7, 8

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED *Charles S. Harlow* Charles S. Harlow
2012.06.05 15:56:29-04'00"
PRINCIPAL ENGINEER

WORK IN MIDDLE OF ROADWAY TWO LANE HIGHWAY

SIGN FACE
72 SQ. FT (MIN.)



- TRAFFIC CONE **OR** TRAFFIC DRUM
- ✱ OPTIONAL ⊗ TRAFFIC DRUM — PORTABLE SIGN SUPPORT
- ◀ HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW



SCALE: NONE

CONSTRUCTION TRAFFIC CONTROL PLAN

PLAN 16

SEE NOTES 1, 2, 4, 6, 7, 8

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

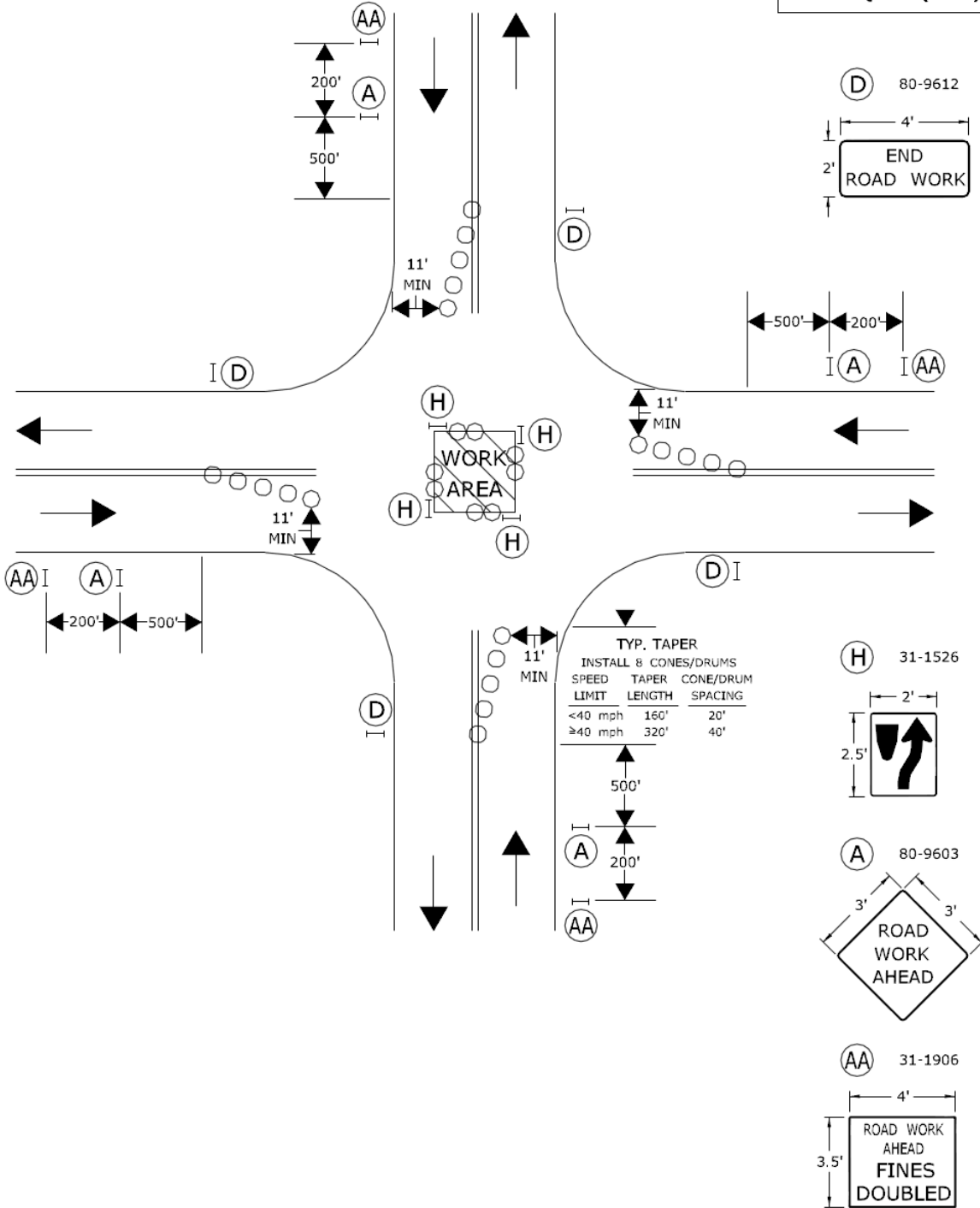
APPROVED

Charles S. Harlow
PRINCIPAL ENGINEER

Charles S. Harlow
2012.08.05 15:56:51-04'00"

WORK IN MIDDLE OF ROADWAY AT INTERSECTION

SIGN FACE
144 SQ. FT. (MIN.)



- TRAFFIC CONE **OR** TRAFFIC DRUM
- ✱ OPTIONAL ⊗ TRAFFIC DRUM — PORTABLE SIGN SUPPORT
- ◀ HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW



SCALE: NONE

CONSTRUCTION TRAFFIC CONTROL PLAN

PLAN 17

SEE NOTES 1, 2, 4, 6, 7, 8

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED

Charles S. Harlow
PRINCIPAL ENGINEER

Charles S. Harlow
2012.08.05 15:57:16-04'00"

SECTION 01 57 00 - TEMPORARY CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This Section includes procedures and requirements for temporary environmental controls during the Work.
- B. Oil absorbent booms and blankets.

1.02 QUALITY ASSURANCE

- A. Comply with the regulatory agencies having jurisdiction requirements. Failure to meet these requirements is sufficient grounds for suspension of the affected portion of the Work until such time as proper conditions are provided. No additional compensation or extension of time will be considered therefore.

1.03 SUBMITTALS

- A. Certifications that materials proposed for use meet the requirements of this specification, unless otherwise approved by the Engineer.
- B. Erosion and sediment control plan.

PART 2 PRODUCTS

2.01 GENERAL

- A. Furnish equipment and materials required to execute water control, erosion control, dust control, noise control, and pollution control.
- B. Furnish electronically driven equipment for night operations to the maximum extent possible to minimize noise.

2.02 MATERIALS

- A. Oil absorbent booms and blankets - As manufactured by Sorbent Products, Inc., as distributed by Atlantic Environmental Corporation, Trumbull, Connecticut.

PART 3 EXECUTION

3.01 GENERAL

- A. Provide and maintain temporary controls during construction.
- B. Remove temporary controls and restore disturbed areas as the Work progresses and when the need for such controls no longer exists.
- C. Maintain oil absorbent booms and blankets on Project site.

3.02 POLLUTION CONTROL

- A. Do not permit pollutants such as chemicals, fuels, lubricants, solvents, sewage, water containing sediments, and other deleterious, poisonous, toxic, or oxygen demanding substances to enter streams, lakes, other surface waters, or into the groundwater.
- B. Do not store, service, refuel, wash, or flush out vehicles in locations where leaks, spillage, waste materials, cleaners, or waters will be introduced into the soil, or flow into storm drains, wetlands, or watercourses. Immediately notify the Owner, Engineer, and the local water company of any containment spills.
- C. Remediate surface and ground waters damaged by construction operations to the satisfaction of the Owner, Engineer and the local water company.

3.03 FLOOD CONTROL

- A. Take necessary precautions and furnish equipment required to handle water, sewage, storm, seepage, surface, and flood flows which may be encountered during construction and assume associated costs.
- B. Provide for all water courses interrupted or rerouted during the progress of the Work.

3.04 EROSION CONTROL

- A. Take necessary measures to keep ground surface well drained, but in a manner to avoid erosion of embankments, excavations, the job site and public and private property.
- B. Provide excavation dewatering required for temporary control of erosion.
- C. Provide control of sedimentation from dewatering operations by the proper installation and maintenance of sediment basins, hay bales, filter bags, and/or other means as approved by the Engineer.
- D. Do not directly discharge dewatering operations to any wetlands, streams, storm drainage or any other surface water areas.
- E. Do not discharge dewatering operations to a sanitary sewer system.

3.05 DUST CONTROL

- A. Take the necessary measures to control dust resulting from the Work.
- B. Whenever directed by the Engineer, immediately apply water, calcium chloride, or other approved means to control dust at locations and in such quantities and frequencies as required to prevent dust from becoming a nuisance to the surrounding area.

3.06 NOISE CONTROL

- A. Maintain mufflers and noise control devices and replace when necessary. Operate construction equipment such that there will be a minimum amount of noise and vibration.
- B. Use electronically driven pumps and other equipment during night operations to the maximum extent possible.

3.07 OIL ABSORBENT BOOMS AND BLANKETS

- A. Continuously provide and maintain at each re-fueling area eighty (80) linear feet of new oil absorbent booms and four-hundred fifty (450) square feet of new oil absorbent blankets for the duration of the construction. As blankets and booms are used during the construction, the supply shall be continuously replaced, at all times maintaining the required quantity specified herein at each location.

END OF SECTION

SECTION 01 71 33 - PROTECTION OF PERSONS, WORK AND PROPERTY

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Work covered by this Section includes requirements for protection, maintenance, and restoration of public and private property, easements, rights-of-way, and protection of persons and the public in general, during the course of the Work.

1.02 RELATED SECTIONS

- A. Section 01 51 00 - Temporary Utilities
- B. Section 01 55 26 - Maintenance and Protection of Traffic
- C. Section 01 57 00 - Temporary Controls
- D. Section 31 22 00 - Grading
- E. Section 31 23 16 – Excavation
- F. Section 31 25 00 - Soil Erosion and Sediment Control
- G. Section 32 92 00 - Turf Establishment

PART 2 PRODUCTS

(Not used)

PART 3 EXECUTION

3.01 PERFORMANCE

- A. Conduct all operations so as to interfere as little as possible with private business and public travel. Protect from damage all buildings and other public or private structures, walls, lawns, terraces, trees, curbs, gutters, flagging, crosswalks, water pipes, hydrants, electric, light, and telephone poles, water stop cocks, manholes, gas pipes, traffic signs, highway markers, conduits, drains and other underground appurtenances on the line of the Work, and adjacent thereto. Unless otherwise directed by the Engineer, repair or replace, to the satisfaction of the respective owners and the Engineer, all of the aforementioned items which may become damaged or disturbed at any time during the progress of the Work. Maintain fences, install shoring, provide watchmen, maintain red lights, post danger signs warning against the hazards created by the construction work, and take such other precautions as may be necessary to protect life and property. The Contractor is responsible for all damages occasioned in any way by its act or neglect, or that of its agents, employees or workmen.

3.02 WEATHER CONDITIONS/WORK IN FREEZING WEATHER

- A. In the event of temporary suspensions of work, or during inclement weather, the Contractor will, and will cause its Subcontractors to, carefully protect all of their work and materials against damage or injury from the weather. If, in the opinion of the Engineer, any work or materials shall have been damaged or injured by reason of failure on the part of the Contractor or any

of its Subcontractors to protect their work, such materials shall be removed and replaced at the expense of the Contractor.

- B. Unless written permission is given, work liable to be affected by frost shall be suspended during freezing weather. When work proceeds under such conditions, the Contractor shall provide approved facilities for heating the materials and for protecting the finished work.

3.03 WORK IN EASEMENTS, RIGHTS-OF-WAY, AND EXISTING LANDSCAPED AREAS

- A. Consult with the Engineer ten (10) days prior to removing or disturbing any tree, shrub, fence, wall, sidewalk, building, structure, roof drain, foundation drain or improvement that may be encountered in the line of the Work, or in the path of an easement.
- B. Maintain proper enclosures, barricades, warning signs and lights which shall be kept burning during periods of darkness, for all work in easements and rights-of-way. Prior to commencing construction, contact the Owner, who will provide the widths and boundaries of all temporary and permanent easements obtained thereby.
- C. Construction easements will be of various widths. The Contractor shall be held responsible for all damage that may occur which may be directly or indirectly attributed to its operations.
- D. Do not operate equipment or store materials on private property, outside the construction easement, without first having obtained written consent from the owner of the property.
- E. Observe all laws and ordinances with respect to trees. Where trees of any size are encountered in, adjacent to, or adjoining the path of operation, consult the Engineer.
- F. In locations where trees of size and maturity exist, the Contractor shall be responsible for notifying the Engineer in sufficient time to obtain opinions, advice and direction concerning the procedure to be followed in protecting and preserving these trees.
- G. Protect all trees located along the perimeter of the Project site to avoid damage resulting from the Contractor's operations. Trees, shrubs and other landscape features which do not interfere with the Work, or which are designated to be left-in-place, shall be protected from scarring, debarking or other injuries during construction operations. Snow fence shall be placed around trees, shrubs and other landscape features designated to remain, within the limits of the Work. If, during the prosecution of the Work, the Contractor damages trees or any part thereof, the treatment and restoration of the trees shall be accomplished under the direction of a qualified nurseryman and, before acceptance of the Work, the Contractor shall furnish the Engineer with a certificate from the nurseryman stipulating that the trees have been properly cared for, treated and restored under his direction.
- H. All trees to be removed shall be flagged well in advance of construction or clearing. The Engineer will, upon notification that the trees to be removed are flagged, make the necessary inspection and grant approval if the extent of cutting is reasonable. In no case will work begin in rights-of-way or easements until this condition is met. In the event the Contractor fails to observe this provision, he shall pay an equitable sum for each and every tree unnecessarily removed, the sum to be determined on the basis of new plantings of trees of a manageable size, plus damage for other values placed thereon by the property owner.
- I. The trees and stumps so removed shall become the property of the Contractor and his responsibility for off-site disposal. Burning of trees, stumps, brush and similar materials is not permitted. If trees are damaged during the winter season, they shall be repaired before springtime. If trees are damaged during the summer season, they shall be repaired before

autumn. Compensation for treatment, restoration, removal and replacement of trees shall be included in the various unit and lump sum prices in the Bid for the Work.

- J. As soon as subsurface work in easements and rights-of-way is completed, restore private properties to their original conditions, to the satisfaction of the owners and the Engineer. In case of failure on the part of the Contractor to restore damaged or disturbed property, the Engineer may, upon forty-eight (48) hours written notice to the Contractor, proceed to have the necessary repairs, rebuilding or restoration work performed, and the cost thereof may be deducted from any moneys due, or to become due, the Contractor under this Contract, or the Owner may deduct from any moneys due, or to become due, the Contractor under this Contract a sum sufficient, in the judgment of the Engineer, to reimburse the owners of the property so damaged or injured. Restoration of lawns, which may have been disturbed or altered during the progress of the Work shall commence as soon as possible and in accordance with Section 32 92 00.

END OF SECTION

SECTION 01 74 00 - CLEANING AND WASTE MANAGEMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This Section includes requirements for maintaining the site in a neat and clean condition during construction and requirements for final clean up prior to final payment.

1.02 CLEANING UP AND REMOVAL OF DEBRIS

- A. Clean up refuse, rubbish, excess or unused materials, scrap materials, and debris caused by construction operations at the end of each day and frequently enough to maintain a neat and orderly construction site.
- B. Before final payment, remove surplus material, falsework, temporary structures and their foundations, and debris of every nature resulting from construction operations and put the site in a neat orderly condition.
- C. Before final payment, restore material and equipment storage areas and areas disturbed by construction operations to the area's original condition, or to a condition satisfactory to and approved by the Owner.

PART 2 PRODUCTS

(Not Used)

PART 3 EXECUTION

(Not Used)

END OF SECTION

SECTION 01 77 00 - CLOSEOUT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This Section includes the administration and procedural requirements for meeting satisfactory conditions for final inspection and acceptance of the Work.
- B. This Section supplements Article 15 of the General Conditions, the Supplementary Conditions, and the various paragraphs of these Specifications that specify closeout procedure requirements.

1.02 QUALITY OF WORK

- A. Turn Work over to the Owner in good operating condition upon completion. Make such adjustments in the Work, additional tests, and all else as may be necessary, in the opinion of the Engineer, in order that all parts of the Work covered by such Contract will operate together, properly, in accordance with the intent of the Contract Documents.
- B. Upon completion of the Work and just prior to final inspection, clean up the site. The entire Project site, all areas that have been used for storage of materials and equipment and that have been disturbed by Contractor's operations and the Work, shall be in a clean and finished state.

1.03 SUBSTANTIAL COMPLETION

- A. Comply with Article 15.03 of the General Conditions.

1.04 FINAL INSPECTION

- A. Comply with Article 15.05 of the General Conditions.
- B. FINAL PAYMENT
- C. Comply with Article 15.06 of the General Conditions.

PART 2 PRODUCTS

(Not Used)

PART 3 EXECUTION

3.01 GENERAL

- A. Furnish all labor, equipment, and materials required by Engineer to assist in the various types of inspections.

END OF SECTION

SECTION 01 78 39 - PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This Section generally describes the requirements for Project Record Documents, including making of measurements, keeping of records and preparation of record documents of all work performed and all existing utilities and facilities encountered during the course of the Work.

1.02 PROJECT RECORD DOCUMENTS

- A. Maintain and keep on-site, throughout the progress of construction, a set of current, detailed field record drawings, to scale, indicating significant deviations from the Drawings, Shop Drawings, and/or installation drawings, and exact location of concealed work, including underground utilities. This requirement does not authorize any deviations without approval of the Engineer.

- 1. The field record information shall be marked in a legible manner on prints of approved Shop Drawings and/or installation drawings furnished by the Contractor or, where such drawings do not apply, on prints of the Drawings furnished by the Engineer. The field information to be so marked shall include, but is not necessarily limited to:
 - a. Significant deviations of any nature made during construction.
 - b. Existing underground facilities encountered in the course of the Work.
 - c. Proposed underground facilities installed and relocated within the Contract.

1.03 MEASUREMENTS

- A. Conduct and record necessary measurements for Project Record Documents.
- B. Take at least three (3) tying measurements for each facility location point from permanent physical objects. The location of all such measurements shall be as approved by the Engineer.

1.04 SUBMITTALS

- A. Submit field record information marked on approved Shop Drawings and/or installation drawings and Contract Drawings to the Engineer upon completion of Work.

PART 2 PRODUCTS

(Not used)

PART 3 EXECUTION

(Not used)

END OF SECTION

SECTION 02 41 13 - SITE DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Site demolition work as shown on the Drawings.

1.02 RELATED SECTIONS

- A. Section 31 10 00 – Site Preparation

1.03 QUALITY ASSURANCE

- A. Comply with governing codes and regulations.
- B. Use experienced workmen.
- C. Protect new work and items to remain from damage during demolition.

PART 2 PRODUCTS

(Not Used)

PART 3 EXECUTION

3.01 DEMOLITION

- A. Remove items as indicated on the Drawings. Preserve items to be reused or relocated. Deliver items reserved for the Owner to the designated storage location. All other items shall become the property of the Contractor for salvage or disposal in a lawful manner.
- B. Remove pavement and base courses in area indicated on the Drawings.
- C. Remove existing concrete and masonry to a minimum depth of two (2) feet below the proposed grade. Where new structures are to be installed in the same location, remove existing concrete and masonry completely.
- D. Cease operations if public safety or remaining structures are endangered. Perform temporary corrective measures until operations can be continued properly.
- E. Maintain mailboxes for continuous mail delivery by the U.S. Postal Service. Comply with requirements of the U.S. Postal Service.

END OF SECTION

SECTION 03 30 00 - CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Cast-in-place concrete.

1.02 RELATED REQUIREMENTS

- A. Section 31 23 16 – Excavation
- B. Section 31 23 23 - Backfilling
- C. Section 33 42 00 – Precast Concrete Rigid Frame
- D. Section 34 71 13 - Guiderail

1.03 REFERENCE STANDARDS

- A. See Sections 6.01 and M.03 of the Standard Specifications as attached.
- B. See Sections 6.02 and M.06.01 of the Standard Specifications as attached.
- C. ASTM A767 – Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement.
- D. ASTM A884 - Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement.
- E. ASTM C206 - Standard Specification for Finishing Hydrated Lime.
- F. ASTM C387 - Standard Specification for Packaged, Dry Combined Materials for Concrete and High Strength Mortar.
- G. ASTM C1714 - Standard Specification for Pre-blended Dry Mortar Mix for Unit Masonry.
- H. ASTM D41 - Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.
- I. ASTM D449 - Standard Specification for Asphalt Used in Dampproofing and Waterproofing.
- J. ASTM D1227 - Standard Specification for Emulsified Asphalt Used as a Protective Coating for Roofing.
- K. ASTM D4479 - Standard Specification for Asphalt Roof Coatings-Asbestos-Free.
- L. AASHTO M 284 - Standard Specification for Epoxy-Coated Reinforcing Bars: Materials and Coating Requirements.
- M. TT-S-00230C Federal Specification - Sealing Compound: Elastomeric Type, Single Component.

1.04 SUBMITTALS

- A. Product Data:

1. Submit concrete mix designs.
 2. Submit product literature, including material and mill certificates.
- B. Certifications - Submit the name, address, and telephone number of concrete plant proposed for use, proposed mix design, and a certification that:
1. The batch plant used to produce the concrete has been inspected and approved by the Chief, Materials Section of the Connecticut Department of Transportation and that such approval is current and effective throughout the period when the concrete is produced for this Project.
 2. The concrete delivered to the project site conforms in all respects to the requirements of the mixture class specified.
- C. Delegated Design Submittal - Submit a Cold-Weather Concreting Plan if concrete placement or curing operations plan to take place during ambient air-temperatures below 40°F.
- D. Reinforcing steel shop drawings.
- E. Field Quality Control Submittal - Submit concrete delivery slips.

1.05 QUALITY ASSURANCE

- A. Comply with governing codes and regulations.
- B. Provide at least one person who shall be thoroughly familiar with the specified requirements, completely trained and experienced in the necessary skills, and who shall be present at the Project site and shall direct all work performed under this Section. Use adequate numbers of skilled workmen.
- C. Prepare design mixes for each type of concrete, using previously tested and approved materials. These mix designs shall be prepared under the supervision of a concrete technologist experienced in the special considerations of materials and mixes.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Portland Cement Concrete
 1. Conform to Section M.03 of the Standard Specifications, as attached, for the class of concrete specified on the Drawings or indicated elsewhere within these specifications.
 2. Implementing substitutions for concrete ingredients following approval of design mixes is prohibited. Same materials must be used throughout construction of the Project, with adequate checking of the aggregate to assure uniformity with materials submitted for mix designs.
 3. Admixtures other than those specified shall be used only when and as approved by the Engineer.
 4. Calcium Chloride is prohibited.
 5. No concrete shall be delivered to the project site until mix designs have been approved.
- B. Reinforcement

1. Deformed Steel Bars - Conform to Section M.06, Article M.06.01 of the Standard Specifications, as attached. Galvanized after fabrication shall conform to ASTM A767, class 1, including supplemental requirements.
 2. Welded Wire Mesh - Conform to Section M.06, Article M.06.01 of the Standard Specifications, as attached. Galvanized after fabrication shall conform to ASTM A767, class 1, including supplemental requirements.
 3. Supports for reinforcement - Wire bar supports, such as ferrous metal chairs and bolsters, shall conform to industry practice as described in the CRSI "Manual of Standard Practice of the Concrete Reinforcing Steel Institute". All bolsters or chairs which bear against the forms for exposed surfaces shall be equipped with snug fitting, high density, polyethylene tips which provide 1/2-inch minimum clearance between the metal and any exposed surface. For galvanized or epoxy-coated reinforcement, all wire bar supports and bar clips shall be galvanized, epoxy or plastic coated. Do not use wood and other unacceptable materials.
- C. Grout - Non-metallic, non-shrink type, "Five Star" premixed grout, as manufactured by U.S. Grout Corp.
- D. Preformed Expansion Joint Filler - Conform to Section M.03, Article M.03.08-4(a) of the Standard Specifications as attached.
- E. Joint Seal - Shall be one component polyurethane base elastomeric sealant conforming to federal specification TT-S-00230C Type II - Class A.
- F. Dampproofing – materials for this work shall conform to the following requirements:
1. Asphalt for Primer: ASTM D41.
 2. Asphalt for Seal Coat: shall meet one of the following:
 - a. Hot-applied asphalt seal coat – ASTM D449, Type 1
 - b. Cold-applied asphalt seal coat – ASTM D4479, Type 1 (Asbestos Free)
 - c. Cold-applied emulsified asphalt seal coat – ASTM D1227, Type III or IV
- G. Mortar
1. Mortar shall be either pre-blended or pre-packaged material conforming to: ASTM C1714; ASTM C387; or, be composed of one part Portland cement and two parts, by volume, of surface dry fine aggregate blended on site. Hydrated lime, in an amount not to exceed 4 pounds of lime to each bag of cement, may be added when the material is blended on site at the option of the Engineer. Cement and hydrated lime shall conform to the following requirements:
 - a. Portland cement, Types I, II, or III, and water shall conform to the requirements of Article M.03 as attached.
 - b. Hydrated lime shall conform to the requirements of ASTM C206.
 2. For laying stone, precast units, or for shotcrete, the fine aggregate shall conform to Grading A as follows:

<u>Square Mesh Sieve</u>	<u>Percent Passing by Weight</u>
3/8"	100
#4	95-100
#8	80-100
#16	50-85
#30	25-60
#50	10-30
#100	2-10

Source: Standard Specifications, Article M.11.04 Grading "A".

3. For pointing stone or the precast units and for laying brick or sealing pipe joints, the fine aggregate shall conform to Grading B as follows:

<u>Square Mesh Sieve</u>	<u>Percent Passing by Weight</u>
#8	100
#50	10-40
#100	0-10

Source: Standard Specifications, Article M.11.04 Grading "B".

- H. Backfill Materials – As shown on the Drawings and in accordance with Section 31 23 23.
- I. Bagged Stone – As shown on the Drawings and in accordance with Section 31 23 23.
- J. Penetrating Sealer Protective Compound - shall be a single component, 100% silane or silane siloxane from the list of materials below. The materials shall be selected in anticipation of the expected ambient and surface temperature at the time of installation.

The following products may be used when ambient and surface temperatures at 40°F and above:

SIL-ACT ATS-100 (Silane)
Advanced Chemical Technologies, Inc.
9608 North Robison Ave.
Oklahoma City, OK 73114
405-843-2585
www.advchemtech.com

Armor SX 5000 EXT-100 or SX 5000 WB (Silane Siloxane)
Foundation Armor, LLC.
472 Amherst St. STE 14
Nashua, NH 03063
866-306-0246
www.foundationarmor.com

Aquinil Plus 100 (Silane)
ChemMasters
300 Edwards Street
Madison, OH 44057
440-428-2105, 800-486-7866
www.chemmasters.net/Aquanil100.php

The following product may be used when ambient and surface temperatures are 20°F and above:

Certi-Vex Penseal 244 100% (Silane)
Vexcon Chemicals
7240 State Road
Philadelphia, PA 19135
888-839-2661
www.Vexcon.com

PART 3 EXECUTION

3.01 PERFORMANCE

- A. Portland Cement Concrete - Conform to Section 6.01, Article 6.01.03 of the Standard Specifications as attached.
- B. Reinforcement - Conform to Section 6.02, Article 6.02.03 of the Standard Specifications as attached.
- C. Grout - Store, mix and place non-shrink grout in strict accordance with manufacturer's instructions as approved by the Engineer.
- D. Preformed Expansion Joint Filler - The expansion joint fillers shall be continuous. Do not use damaged or repaired joint filler unless approved by the Engineer. Hold the expansion joint filler in a vertical position.
- E. Joint Seal - Store, mix and place joint seal in strict accordance with manufacturer's written instructions as approved by the Engineer.
- F. Dampproofing - Thoroughly clean and dry the concrete, brick or other surfaces which are to be protected by damp-proofing before the primer is applied. No loose or foreign material or dirt shall be on the surface. Apply one (1) coat of primer and one (1) coat of sealer using methods, application rates, and temperature constraints as recommended by the manufacturer of each product. Take care to confine all applied material to the areas to be damp-proofed and to prevent disfigurement of any other parts of the structure by dripping or spreading.
- G. Backfill Materials - As shown on the Drawings and in accordance with Section 31 23 23.
- H. Bagged Stone - As shown on the Drawings and in accordance with Section 31 23 23.
- I. Coat all aluminum surfaces in contact with concrete with an approved bitumastic paint.
- J. Penetrating Sealer Protective Compound
 - 1. Surface Preparation - Concrete surfaces to which penetrating sealer will be applied shall be dry, clean and free of grease, oil and other surface contaminants. New concrete and newly placed repair concrete shall be allowed to cure for at least 28 days before applying sealer. After rain or water cleaning, allow existing concrete surfaces to dry for at least 8 hours before applying sealer. Dry surfaces may be cleaned by sweeping with brushes or brooms, and blowing clean with oil-free, compressed air. Take care not to damage the concrete surface finish during cleaning operations. Care should be taken so that cleaning methods do not damage joint sealants or other components of structure.
 - 2. Application - Application of the sealer can only begin after the Engineer evaluates the concrete surfaces for cleanliness and moisture, and determined that the conditions are appropriate for application.

The sealer shall saturate the concrete surface with a rate of application of 200 square feet per gallon of sealer. The dispersion shall run six to eight inches down a vertical surface from the spray pattern. The maximum run-down is 12 inches. Monitor and record the number of square feet per gallon of sealer used to verify that the required application rate is being met. Additional sealer may be needed if surfaces are porous, rough or textured.

The Engineer will inspect the concrete surface during application and after the sealer has had adequate time to penetrate. As a test, water sprayed from a bottle on the sealed surface shall bead up and not be absorbed. Should water be absorbed into the concrete at

a test area, additional areas shall be tested to determine which areas should receive additional application of sealer. Apply additional sealer to the identified areas until absorption of water is prevented.

3.02 FIELD QUALITY CONTROL

- A. Employ a laboratory to test concrete once per day or every seventy-five (75) cubic yards of concrete placement if more than seventy-five (75) cubic yards are poured within 24-hours. Testing methods shall be in accordance with ASTM C31, ASTM C143, ASTM C172, ASTM C231, and ASTM C1064.
- B. The Owner may employ a laboratory for acceptance testing of concrete. Such testing does not relieve the Contractor of responsibility for quality control for the Work and delivering the Work in compliance with specification requirements.
- C. Cooperate with and provide access to the Work for the testing laboratory.
- D. Should testing of a material fail to meet the specification requirements, the Contractor will be notified, and the Contractor shall resolve the problem as appropriate.

3.03 ATTACHMENTS

- A. Section 6.01 - Concrete for Structures of the Standard Specifications. Subsections 6.01.04 through 6.01.05 are not included and are not applicable to this Contract.
- B. Section M.03 - Portland Cement Concrete of the Standard Specifications.
- C. Section 6.02 - Reinforcing Steel of the Standard Specifications. Subsections 6.02.04 through 6.02.05 are not included and are not applicable to this Contract.
- D. Section M.06 - Metals - Reinforcing Steel of the Standard Specifications.
- E. Section M.01 - Aggregates of the Standard Specifications.

END OF SECTION

**SECTION 6.01
CONCRETE FOR STRUCTURES**

6.01.01—Description**6.01.02—Materials****6.01.03—Construction Methods****I. Contractor Quality Control (QC) Requirements for Bridge Deck and Parapet Construction**

1. General
2. Contractor Organization
3. Concrete Mix Design
4. Transportation and Delivery of Concrete
5. Placement and Finishing of Concrete
6. Curing of Concrete
7. Contractor QC testing
8. Quality Control Manager (QCM)
9. Pre-Placement Meeting
10. Submission
11. Test Results/CQCP Changes

II. Requirements for New Construction

1. Falsework and Forms
2. Protection from Environmental Conditions
3. Transportation and Delivery of Concrete
4. Acceptance Testing and Specimens
5. Progression Cylinders and Compressive Strength Specimens
6. Handling and Placing Concrete
7. Finishing Plastic Concrete
8. Bearing Surfaces
9. Curing Concrete
10. Finishing Concrete Surfaces
11. Mortar, Grout, Epoxy and Joint Seal
12. Application of Loads
13. Dispute Resolution

III. Additional Requirements for Surface Repairs and Structural Repairs

1. Work Area Access and Shielding
2. Concrete Removal
3. Surface Preparation
4. Installation of Embedded Galvanic Anodes
5. Welded Wire Fabric in Vertical and Overhead Surface Repairs
6. Formwork
7. Concrete Placement and Curing
8. Form Removal and Sequence of Repair
9. Finishing
10. Sounding of Completed Repairs
11. Sealing Concrete Surfaces

6.01.04—Method of Measurement

1. Concrete used for New Construction
2. Underwater Concrete
3. Concrete used for Surface or Structural Repairs
4. Joint Filler
5. Closed Cell Elastomer

6.01.05—Basis of Payment

1. Concrete
2. Underwater Concrete
3. Concrete Used for Structural Steel Repairs or Surface Repairs
4. Joint Filler
5. Closed Cell Elastomer

6.01.01—Description: This item shall include cast-in-place (CIP) concrete for use in new construction, surface repair or structural repair of bridges and culverts, walls, catch basins, drop inlets and other incidental construction. The concrete shall be composed of Portland cement, pozzolans, fine and coarse aggregate, admixtures and water, prepared and constructed in accordance with these specifications, at the locations and of the form dimensions and class shown on the plans, or as directed by the Engineer.

The use of concrete from dry batch or central mixed plants is permitted for all CIP concrete mixtures.

6.01.02—Materials: The materials for this work shall meet the requirements of M.03. Surface or structural repair concrete shall be documented on the delivery ticket, as required in 6.01.03-II-3(a), as having the plastic properties necessary for confined placement to ensure appropriate workability for consolidation within the forms.

6.01.03—Construction Methods:

I. Concrete Quality Control (QC) Requirements for All Bridge Deck and Bridge Parapet

Construction: The Contractor must demonstrate to the Engineer that the materials and work that will be provided by their field staff, subcontractors, and suppliers meets Contract specification requirements.

This effort shall be documented with a **Concrete Quality Control Plan (CQCP)** and shall address the communication with all parties, on-site inspection, sampling and testing frequency necessary to keep the production, placement and finishing operations in control, to determine when an operation has gone out of control and anticipated procedure to correct the situation in a timely manner.

1. General – provide an overview of the means and methods anticipated to perform the work including any anticipated conditions that may need additional attention (such as seasonal conditions requiring heating or cooling of concrete)
2. Contractor Organization – address authority levels/duties by position and name of persons holding those positions; include those who have decision making authority with regard to quality control, materials, sampling and testing who can be contacted by the Engineer
3. Concrete Mix Design – identify concrete supplier(s); provide copies of all applicable mix designs to field staff; and address submittal timeframe
4. Transportation and Delivery of Concrete – identify the supplier’s plant capacity and ability to ensure continuous delivery to the Project to meet the requirements of the mix design and a corrective procedure if it does not meet Project requirements; include a provision for the addition of admixtures and follow up testing
5. Placement and Finishing of Concrete – identify and describe:
 - (a) placement equipment
 - (b) placement method(s) to be used (chute, pump, hopper or other)
 - (c) starting point and direction of placement (logistical sequencing)
 - (d) slip forming, formwork, stay-in-place forms or other forming method(s)
 - (e) joint construction method(s)
 - (f) process and documentation that the elevations, base, forms, reinforcement (including support chairs and ties), utility inserts or any other appurtenance installations have been inspected by the Contractor prior to concrete placement
 - (g) equipment and method(s) to be used for vibrating and consolidating concrete
 - (h) procedure for verifying adequate consolidation and how segregation will be addressed
 - (i) schedule and method(s) to be used for finishing all exposed surfaces
6. Curing of Concrete – describe schedule and method(s) for curing of concrete and how the method(s) will be monitored and maintained
7. Contractor QC testing – identify person(s) or firms responsible for Contractor QC testing and provide copies of their certification(s) (see 6.01.03-II-5), and testing facility location(s). In addition, describe the process used for communication between the QC testing personnel and the Contractor project staff; describe what measures will be taken when test results are out of compliance; this shall include what increased frequency of testing is to be performed to verify that concrete properties are in compliance; the threshold at which time placement ceases; describe what protective measures will be used in case of unforeseen weather
8. The CQCP shall include the name and qualifications of a Quality Control Manager (QCM) provided by the Contractor. The QCM shall be responsible for the administration of the CQCP, and any modifications that may become necessary. The QCM shall have the ability to direct all Contractor personnel on the Project during concreting operations and must communicate directly with the concrete

supplier. The QCM shall be certified as either a **Concrete Transportation Construction Inspector by the American Concrete Institute (ACI)** or a **NETTCP Concrete Inspector**.

9. The CQCP must include a provision for pre-placement meeting(s) to be held with representatives of the Engineer, the concrete supplier, the QCM and the Contractor's field staff supervising the work.

- (a) Timing and number of the meeting(s) will be determined by the complexity of the mix design or placement.
- (b) Non-Standard mix designs that require trial placements will be discussed at the Preconstruction Meeting to remind the Contractor of the time needed for testing. Additional meeting(s) should be scheduled at least 90 days prior to first use of non-standard mix designs, to allow suppliers to perform trial batches and testing.
- (c) Discussions shall include the configuration and specific application that the concrete will be used for, plastic properties and workability, any mix design challenges, trial placement procedures and subsequent trial results, timing and quantities. Refer to 6.01.03-II-6(e) for additional requirements.

10. The CQCP shall be submitted to the Engineer and concrete supplier for review and comment a minimum of 30 days prior to production or placement. Production and placement shall not occur until all comments of the Engineer and supplier have been addressed by the Contractor. Changes to the CQCP based on data not available at time of submittal may be added via addendum.

11. The Contractor shall provide the Engineer QC test results within 48 hours after testing or inspection in a format acceptable to the Engineer. The Contractor shall also maintain complete records of all QC tests.

Review of the CQCP does not relieve the Contractor of its responsibility to comply with the Project specifications. The Contractor may modify the CQCP as work progresses and must document the changes in writing prior to resuming operations. These changes include but are not limited to changes in quality control procedures or personnel.

II. Requirements for New Construction:

1. Falsework and Forms: Falsework is considered to be any temporary structure which supports structural elements of concrete, steel, masonry or other material during the construction or erection. Forms are to be considered to be the enclosures or panels which contain the fluid concrete and withstand the forces due to its placement and consolidation. Forms may in turn be supported on falsework.

This work shall consist of the construction and removal of falsework and forms that are designed by the Contractor in the execution of the work, and whose failure to perform properly could adversely affect the character of the Contract work or endanger the safety of adjacent facilities, property, or the public. Forms shall be mortar tight. Forms and falsework shall be of sufficient rigidity and strength to safely support all loads imposed and to produce in the finished structure the lines and grades indicated in the Contract documents. Forms shall also impart the required surface texture and rustication and shall not detract from the uniformity of color of the formed surfaces. Forms shall be made of wood, steel or other material approved by the Engineer.

- (a) **Design:** The design of falsework and formwork shall conform to the *AASHTO Guide Design Specifications for Bridge Temporary Works*, or to other established and generally accepted design codes such as ACI Standard *ACI 347-Recommended Practice for Concrete Formwork* or specific form or falsework manufacturer specifications. When other than new or undamaged materials are used, appropriate reductions in allowable stresses, and decreases in resistance factors or imposed loads shall be used for design.
- (b) **Loads:** The design of the falsework and forms shall be based on load factors specified in the *AASHTO LRFD Bridge Design Specifications* and all applicable load combinations shall be investigated. The design load for falsework shall consist of the sum of appropriate dead and live vertical loads and any horizontal loads. As a minimum, dead loads shall include the weight of the falsework and all construction material to be supported. The combined unit weight of concrete, reinforcing and pre-stressing steel, and forms that is supported shall be assumed to be not less than:
 1. Normal-weight concrete: 0.16 kip/ft³
 2. Lightweight concrete: 0.13 kip/ft³

Live loads shall consist of the actual weight of any equipment to be supported, applied as concentrated loads at the points of contact and a uniform load of not less than 0.02 kip/ft² applied over the area supported, plus 0.075 kip/ft applied at the outside edge of deck overhangs.

The horizontal load used for the design of the falsework bracing system shall be the sum of the horizontal loads due to equipment; construction sequence including unbalanced hydrostatic forces

from fluid concrete and traffic control devices; stream flow, when applicable; and an allowance for wind. However, in no case shall the horizontal load to be resisted in any direction be less than 2% of the total dead load.

For post-tensioned structures, the falsework shall also be designed to support any increase in or redistribution of loads caused by tensioning of the structure. Loads imposed by falsework onto existing, new, or partially completed structures shall not exceed those permitted in 6.01.03-II-12, Application of Loads.

- (c) **Working Drawings:** The working drawings for falsework and formwork shall be prepared in accordance with 1.05.02 whenever the falsework or formwork exceeds 14.0 feet high or whenever vehicular, marine, or pedestrian traffic may travel under or adjacent to the falsework or formwork. Working drawings shall include the sequence, method and rate of placement of the concrete.

Manufacturer catalog cuts or written installation procedures shall be provided for any clips, braces, hangers or other manufactured parts used with the formwork or falsework.

- (d) **Construction:** Forms and falsework shall be built true to lines and grades shall be strong, stable, firm, mortar-tight and adequately braced or tied, or both. They shall be designed and constructed to withstand all loads and pressures including those imposed by plastic concrete, taking full account of the stresses due to the rate of placement, effect of vibration and conditions brought about by construction methods. Forms and falsework shall be constructed to compensate for variations in camber of supporting members and allow for deflections.

Falsework and formwork shall be chamfered at all sharp corners, unless otherwise ordered or permitted, and shall be given a slight bevel or draft in the case of projections to ensure satisfactory removal. Materials for falsework and formwork and their supports, ties and bracing, shall be of the type, quality and strength to achieve the structural requirements. Form material in contact with concrete shall provide the finished concrete surface smoothness as specified in 6.01.03-II-10, Finishing Concrete Surfaces, and shall have a uniform appearance.

Falsework and formwork shall be treated with form oil or other release agent approved by the Engineer before the reinforcing steel is placed or self-releasing forms approved by the Engineer may be used. Release agents which will adhere to or discolor the concrete shall not be used.

Falsework and formwork for concrete surfaces exposed to view shall produce a smooth surface of uniform texture, free of voids, indentations, protrusions and bulges. Panels lining falsework and formwork shall be arranged so that the joint lines form a symmetrical pattern conforming to the general lines of the structure. The same type of form-lining material shall be used throughout each element of a structure. Falsework and formwork shall be sufficiently rigid so that the undulation of the concrete surface shall not exceed 1/4 inch when checked with a 4 foot straightedge or template.

For non-exposed surfaces the falsework and formwork shall be sufficiently rigid so that the undulation of the concrete surface shall not exceed 1/2 inch when checked with a 4 foot straightedge or template.

Metal ties and anchors to hold the falsework and formwork in alignment and location shall be so constructed that the metal work can be removed to a depth of at least 2 inches from the concrete surface without damage to the concrete. All cavities resulting from the removal of metal ties shall be filled after removal of forms with cement mortar of the same proportions used in the body of the work or other materials approved by the Engineer, and the surface finished smooth and even, and if exposed in the finished work, shall be similar in texture and color of adjacent surfaces. With permission of the Engineer, the Contractor need not remove from the underneath side of bridge decks portions of metal devices used to support reinforcing steel providing such devices are of material, or are adequately coated with material, that will not rust or corrode. When coated reinforcing steel is required, all metal ties, anchorages, or spreaders that remain in the concrete shall be of corrosion-resistant material or coated with a dielectric material.

Forms shall be clean and clear of all debris. For narrow walls and columns where the bottom of the form is inaccessible, an access opening will be allowed in the form and falsework for cleaning out extraneous material.

- (e) **Vacant**
- (f) **Bridge Decks:** After erection of beams and prior to placing falsework and forms, the Contractor shall take elevations along the top of the beam at the points shown on the plans or as directed by the Engineer. The Contractor shall calculate the haunch depths and provide them to the Engineer a minimum of 7 days prior to installing the falsework and forms. The Contractor shall also provide

calculations for the setting of the overhang brackets based on the final beam deflection. These calculations shall be based on the final proposed deck grade and parapet elevations.

Falsework or formwork for deck forms on girder bridges shall be supported directly on the girders so that there will be no appreciable differential settlement during placing of the concrete. Girders shall be either braced and tied to resist any forces that would cause rotation or torsion in the girders caused by the placing of concrete for diaphragms or decks, or shown to be adequate for those effects. Unless specifically permitted, welding of falsework support brackets or braces to structural steel members or reinforcing steel shall not be allowed.

- (g) **Stay-In-Place Metal Forms for Bridge Decks:** These forms may be used if shown in the Contract documents or approved by the Engineer. Prior to the use of such forms and before fabricating any material, the Contractor shall submit working drawings to the Engineer for review in accordance with 1.05.02. These drawings shall include the proposed method of form construction, erection plans including placement plans, attachment details, weld procedure(s), material lists, material designation, gage of all materials, and the details of corrugation. Also, copies of the form design computations shall be submitted with the working drawings. Any changes necessary to accommodate stay-in-place forms, if approved, shall be at no cost to the Department.

The metal forms shall be designed on the basis of the dead load of the form, reinforcement and the plastic concrete, including the additional weight of concrete [considered to be equivalent to the weight imposed by an additional concrete thickness equal to 3% of the proposed deck thickness, but not to exceed 0.3 inch] due to the deflection of the metal forms, plus 50 psf for construction loads. The allowable stress in the corrugated form and the accessories shall not be greater than 0.725 times the yield strength of the furnished material and the allowable stress shall not exceed 36,000 psi. The span for design and deflection shall be the clear distance between edges of the beams or girders less 2 inches and shall be measured parallel to the form flutes. The maximum deflection under the weight of plastic concrete, reinforcement, and forms shall not exceed 1/180 of the form span or 0.5 inches, whichever is less. In no case shall the loading used to estimate this deflection be less than 120 psf. The permissible form camber shall be based on the actual dead load condition. Camber shall not be used to compensate for deflection in excess of the foregoing limits. The form support angles shall be designed as a cantilever and the horizontal leg of the form support angle shall not be greater than 3 inches.

No stay-in-place metal forms shall be placed over or be directly supported by the top flanges of beams or girders. The form supporting steel angles may be supported by or attached to the top flanges.

Stay-in-place metal forms shall not be used in bays where longitudinal slab construction joints are located, under cantilevered slabs such as the overhang outside of fascia members, and bridges where the clearance over a salt-laden body of water is less than 15 feet above mean high water level.

Welding to the top flanges of steel beams and girders is not permitted in the areas where the top flanges are in tension, or as indicated on the plans. Alternate installation procedures shall be submitted addressing this condition.

Drilling of holes in pre-stressed concrete beams or the use of power-actuated tools on the prestressed concrete beams for fastening of the form supports to the pre-stressed concrete beams will not be permitted. Welding of the reinforcing steel to the pre-stressed units is not permitted.

All edges of openings cut for drains, pipes, and similar appurtenances shall be independently supported around the entire periphery of the opening. All fabricated stay-in-place metal forms shall be unloaded, stored at the Project Site at least 4 inches above the ground on platforms, skids or other suitable supports and shall be protected against corrosion and damage and handled in such a manner as to preclude damage to the forms. Damaged material shall be replaced at no additional cost to the State.

Any exposed form or form support metal where the galvanized coating has been damaged, shall be thoroughly cleaned, wire brushed, then coated with 2 coats of Zinc Dust – Zinc Oxide primer, MIL-DTL-24441 or another product acceptable to the Engineer.

The forms shall be installed from the topside in accordance with the manufacturer's recommended installation procedures. The form supports shall ensure that the forms retain their correct dimensions and positions during use at all times. Form supports shall provide vertical adjustment to maintain design slab thickness at the crest of corrugation, to compensate for variations in camber of beams and girders and to allow for deflections. Stay-in-place metal forms shall have a minimum depth of

the form valley equal to 2 inches. The forms shall have closed tapered ends. Lightweight filler material shall be used in the form valleys.

All field cutting shall be done with a steel cutting saw or shears including the cutting of supports, closures and cutouts. Flame cutting of forms is not permitted.

All welding shall be performed by Department-certified welders in accordance with 1.05.17, Welding. Welding of forms to supports is not permitted.

The steel form supports shall be placed in direct contact with the flange of stringer or floor beam flanges and attached by bolts, clips, welding where permitted, or other approved means. Form sheets shall not be permitted to rest directly on the top of the stringer or floor beam flanges. The forms shall be securely fastened to form supports with self-drilling fasteners and shall have a minimum bearing length of 1 inch at each end. In the areas where the form sheets lap, the form sheets shall be securely fastened to one another by fasteners at a maximum spacing of 18 inches. The ends of the form sheets shall be securely attached to the support angles with fasteners at a maximum spacing of 18 inches or 2 corrugation widths, whichever is less.

The depth of the concrete slab shall be as shown on the plans and the corrugated forms shall be placed so that the top of the corrugation will coincide with the bottom of the deck slab. No part of the forms or their supports shall protrude into the slab. All reinforcement in the bottom reinforcement mat shall have a minimum concrete cover of 1 inch unless noted otherwise on the plans.

The completed stay-in-place metal form system shall be sufficiently tight to prevent leakage of mortar. Where forms or their installation are unsatisfactory in the judgment of the Engineer, either before or during placement of the concrete, the Contractor shall correct the defects before proceeding with the work.

- (h) **Construction Joints:** Construction joints other than those shown on the plans will not be permitted without prior approval of the Engineer. In joining fresh concrete to concrete that has already set, the work already in place shall have all loose and foreign material removed, and the surface roughened and thoroughly drenched with water.

All reinforcing steel shall extend continuously through joints. Where unplanned construction joints may be needed, they shall be constructed as directed by the Engineer.

- (i) **Expansion and Contraction Joints:** Expansion and contraction joints shall be constructed at the locations and in accordance with the details specified in the Contract. The forming of joint openings shall be dimensioned in accordance with the joint manufacturer's design requirements. Joints include open joints, filled joints, joints sealed with sealants, joints reinforced with steel armor plates or shapes, paraffin coated joints, and joints with combinations of these features.

Open joints shall be placed at locations designated on the plans and shall be formed by the insertion and subsequent removal of templates of wood, metal or other suitable material. The templates shall be so constructed that their removal may be readily accomplished without damage to the work.

Filled joints shall be made with joint filler, the materials for which shall meet the requirements of the plans and of these specifications.

For mechanical joint systems, the concrete shall be placed in such a manner that does not interfere with the movement of the joint.

- (j) **Pipes, Conduits and Utility Installations:** The Contractor shall coordinate the installation of pipes, conduits and utilities as shown on the plans and in accordance with the Contract or as directed by the Engineer. The openings accommodating such pipe, conduit and utility installations shall be incorporated into the formwork by the Contractor.

- (k) **Anchorage:** Anchor bolts and systems shall be set to the requirements of the plans and Contract. Anchor bolts and systems shall be clean and free of dirt, moisture or other foreign materials at the time of installation. The anchor bolts and systems shall be installed prior to placing concrete.

With the Engineer's approval, the Contractor may install anchorages after placement and setting of the concrete or in formed holes. The anchorages shall be installed into drilled or formed holes having a diameter and a depth suitable to receive the bolts in accordance with the grout manufacturer's requirements. Such holes shall be located to avoid damage to the existing reinforcement. All holes shall be perpendicular to the plane surface. The Contractor shall take every precaution necessary to prevent damage to the concrete due to freezing of water or grout in anchor bolt holes.

- (l) **Ornament or Reverse Moulds:** Ornamental work, when so noted on the plans, shall be formed by the use of reverse moulds. These moulds shall be produced by a qualified manufacturer approved by the Engineer. They shall be built in accordance with the general dimensions and appearance shown on the plans. The Contractor shall submit all detailed drawings, models, or carvings for review by the Engineer before the moulds are made.

The Contractor shall be responsible for their condition at all times, and shall be required to remove and replace any damaged or defective moulds at no additional cost to the State.

The surfaces of the moulds shall be given a coating of form release agent to prevent the adherence of concrete. Any material which will adhere to or discolor the concrete shall not be used.

Form Liners, if required, shall be installed as specified elsewhere.

- (m) **Removal of Falsework and Forms:** The Contractor shall consider the location and character of the structure, the weather, the materials used in the mix, and other conditions influencing the early strength of the concrete when removing forms and falsework. Methods of removal likely to cause damage to the concrete surface shall not be used. Supports shall be removed in such a manner as to permit the structure to uniformly and gradually take the stresses due to its own weight. For structures of 2 or more spans, the sequence of falsework release shall be as specified in the Contract or approved by the Engineer.

Removal shall be controlled by field-cured cylinder tests. The removal shall not begin until the concrete has achieved 75% of the design compressive strength. To facilitate finishing, side forms carrying no load may be removed after 24 hours with the permission of the Engineer, but the curing process must be continued for 7 days.

When the results of field-cured cylinder tests are unavailable, the time periods listed in Table 6.01.03-1, exclusive of days when the temperature drops below 40°F, may govern the removal of forms.

Table 6.01.03-1 Time Restrictions for Removal of Formwork

Structure Element	Minimum Time Period
Arch Centers, centering under beams, pier caps, and unsupported elements	14 days
Slabs on grade, Abutments and Walls	24 hours
Columns	2 days
Bridge Decks	28 days

The Contractor may submit for review and approval by the Engineer, alternate methods to determine the in-place strength of the concrete for removal of forms and falsework.

- 2. **Protection from Environmental Conditions:** The concrete shall be protected from damage due to weather or other environmental conditions during placing and curing periods. In-place concrete that has been damaged by weather conditions shall be either repaired to an acceptable condition or removed and replaced as determined by the Engineer.

- (a) **Rain Protection:** The placement of concrete shall not commence or continue unless adequate protection satisfactory to the Engineer is provided by the Contractor.
- (b) **Hot Weather Protection:** When the ambient air temperature is above 90°F, the forms, which will come in contact with the mix shall be cooled to below 90°F for a minimum of 1 hour prior to and 1 hour after completion of the concrete placement by means of a water spray or other methods satisfactory to the Engineer.
- (c) **Cold Weather Protection:** When there is a probability of ambient air temperature below 40°F during placement and curing, a Cold-Weather Concreting Plan shall be submitted to the Engineer for review and comment. The Plan shall detail the methods and equipment, including temperature measuring devices that will be used to ensure that the required concrete and air temperatures are maintained.
 1. Placement: The forms, reinforcing steel, steel beam flanges, and other surfaces which will come in contact with the mix shall be heated to a minimum of 40°F, by methods satisfactory to the Engineer, for a minimum of 1 hour prior to, and maintained throughout, concrete placement.
 2. Curing: For the first 6 days, considered the initial cure period, the concrete shall be maintained at a temperature of not less than 45°F and the air temperature surrounding the structure shall be maintained at a temperature of not less than 60°F. When the concrete mix includes pozzolans or

slag, the initial cure period shall be increased to 10 days. After the initial cure period, the air surrounding the structure shall be maintained above 40°F for an additional 8 days. If external heating is employed, the heat shall be applied and withdrawn gradually and uniformly so that no part of the concrete surface is heated to more than 90°F or caused to change temperature by more than 20°F in 8 hours. The Engineer may reduce or increase the amount of time that the structure must be protected or heated based on an indication of in-place concrete strength acceptable to the Engineer.

- (d) **Additional Requirements for Bridge Decks:** Prior to the application of curing materials, all the concrete placed on bridge decks shall be protected from damage due to rapid evaporation by methods acceptable to the Engineer. During periods of low humidity (less than 60% relative humidity), sustained winds of 25 mph or more, or ambient air temperatures greater than 80°F the Contractor shall provide written details of additional measures to be taken during placement and curing.

Protection may include increasing the humidity of the surrounding air with fog sprayers and employing wind-breaks or sun-shades. Additional actions may include reduction of the temperature of the concrete prior to placement, scheduling placement during the cooler times of days or nights, or any combination of these actions.

- (e) **Concrete Exposed to Salt Water:** No Construction joints shall be formed between the levels of extreme low water and extreme high water or the upper limit of wave action as determined by the Engineer.

3. Transportation and Delivery of Concrete: All material delivered to the Project shall be supplied by a producer qualified in accordance with M.03. The producer shall have sufficient plant capacity and trucks to ensure continuous delivery at the rate required to prevent the formation of cold joints.

- (a) **Material Documentation:** All vendors producing concrete must have their weigh scales and mixing plant automated to provide a detailed delivery ticket. Delivery tickets must include the following information:

1. State of Connecticut
2. Name of producer, identification of plant
3. Date and time of day
4. Type of material
5. Cubic yards of material contained
6. Project number, purchase order number, name of Contractor (if other than producer)
7. Truck identification number
8. Weights of individual aggregate, cement, water, and any admixtures
9. Water/cement ratio, and
10. Additional water allowance in gallons

A State inspector may be present to monitor batching or weighing operations.

The Contractor shall notify the Engineer immediately if there is a malfunction of the recording system in the automated plant or weigh scales.

Manually written tickets containing all required information may be allowed for up to 1 hour after malfunction but must be signed by an authorized representative of the producer.

- (b) **Transportation of Mixture:** Trucks delivering concrete shall be qualified in accordance with M.03.

If the concrete mix arrives at the Project with a slump lower than required, additional water may be added by the concrete producer's quality control staff or representative as a means to temper the concrete. This tempering may only be done after the Engineer and Contractor are notified. The quantity of water in gallons added to the concrete cannot exceed the allowance shown on the delivery ticket. The Contractor is responsible for subsequent testing of the concrete to demonstrate suitable workability has been achieved.

The concrete shall be completely discharged into the forms within 1-1/2 hours from the batch time indicated on the delivery ticket. This time may be extended if the measured temperature of the concrete is below 90°F. This time may also be reduced if the temperature of the concrete is over 90°F. Rejected concrete shall be disposed of by the Contractor at no cost to the State.

The addition of chemical admixtures or air entrainment admixtures at the Project Site, to increase the workability or to alter the time of set, will only be permitted if prior approval has been granted by the Engineer. The addition of air entrainment admixtures at the Project Site will only be

performed by the producer’s quality control staff or representative. The Contractor is responsible for follow-up quality control testing to verify compliance with the Specifications.

4. Acceptance Testing and Test Specimens: The Contractor shall furnish the facilities and concrete required for sampling, transport to the testing location in the field, performing field testing and for casting sample cylinders for compressive-strength determinations. The Department will furnish personnel for sampling and casting Acceptance specimens and the number of specimens required will be determined by the Engineer. The equipment for the Department’s testing is provided for elsewhere in the Contract.

- (a) **Temperature, Air Content and Slump:** Field testing in accordance with AASHTO T-23, “Making and Curing Concrete Test Specimens in the Field” will be performed at the point of placement and at a frequency determined by the Engineer.
- (b) **Acceptance Testing and Compressive Strength Specimens:** Concrete samples are to be taken at the point of placement into the forms or molds. Representatives of the Engineer will sample the mix.

Table 6.01.03-2 Plastic Properties of Portland Cement Concrete

Standard Mix Class	Air Content	Slump	Concrete Temperature
PCC0334Z ¹ (3300 psi)	6.0 +/- 1.5%	See note 3.	60°-90° F
PCC0336Z ¹ (3300 psi)			
PCC0446Z ¹ (4400 psi)			
PCCXXX8Z ¹	7.5 +/- 1.5%		
Modified Standards ²	6.0 +/- 1.5% ²		
Special Provision Mix ⁴	As specified		
¹ “Z” denotes the Exposure Factor 0, 1, 2, or 3 as described in Table M.03.02-1a			
² Modifications to Standard Mixes, including mixes placed by pumping, shall be reviewed by the Engineer prior to use. These include but are not limited to the use of chemical admixtures such as high range water reducing (HRWR) admixtures and the use of coarse aggregate sizes for that class not specified in M.03.			
³ Slump must be consistent with the workability required for proper placement of the concrete taking into account the minimum concrete cover and design clearances between surfaces or obstructions within the forms.			
⁴ All concrete mixes with a mix design strength not shown in the table must be reviewed by the Engineer on a case-by-case basis. Limits on the plastic properties and strength requirements of these mixes are listed in the Specifications.			

The Contractor shall provide and maintain facilities on the Project Site, acceptable to the Engineer, for sampling, transporting the initial sample, casting, safe storage and initial curing of the concrete test specimens as required by AASHTO T 23. This shall include a sampling receptacle, a means of transporting the initial concrete sample from the placement location to the testing location, a level and protected area of adequate size to perform testing, and a specimen storage container capable of maintaining the temperature and moisture requirements for initial curing. The distance from the location of concrete placement to the location of testing and initial curing shall be 100 feet or less, unless otherwise allowed by the Engineer.

The specimen storage container described in this section is in addition to the concrete cylinder curing box provided for elsewhere in the Contract. After initial curing, the test specimens will be transported by Department personnel and stored in the concrete cylinder curing box until they can be transported to the Department’s laboratory for strength evaluation. The results of this evaluation shall not be used to control stages or progression of the work in the field as further described in 6.01.03-II-5.

- (c) **Sampling Procedure for Pumping:** It is the responsibility of the Contractor to provide concrete that meets specification at the point of placement.

Samples of concrete shall be taken at the discharge end of the pump at the point of placement except for underwater concrete. The Contractor may submit an alternate location to provide a sample from the discharge end of the pump with verification showing that the characteristics of the mix will not be altered from that of which would have been attained at the point of placement. The

Engineer will review the documentation and other extenuating circumstances when evaluating the request.

In the case of underwater concrete the Contractor shall submit the proposed sampling location with the submittals required in 6.01.03-II-6(f).

- (d) Additional field testing:** Additional field testing such as density and yield measurements may be required at the time of placement as determined by the Engineer.

5. Progression Cylinders and Compressive Strength Specimens: Progression Cylinders outlined in this section are field cured compressive strength specimens taken for information related to when a structure or segment of a structure can be loaded or put into service, adequacy of curing and protection of concrete in the structure, or when formwork or shoring may be removed from the structure. The information produced from strength results of Progression Cylinders will not be considered for acceptance of the concrete.

The personnel, equipment, and molds for sampling, casting, curing and testing of Progression Cylinders shall be furnished by the Contractor at no expense to the Department.

Sampling, casting, and field curing of the specimens shall be performed in accordance with AASHTO T23 by an ACI Concrete Field Testing Technician Grade 1 or higher and will be witnessed by a representative of the Department.

The sample shall be taken at the point of placement into the forms or molds from 1 or more of the same truck loads that an Acceptance sample is taken from.

A minimum of 2 of cylinder results will be used to determine in-place strength.

Compression testing shall be performed in accordance with AASHTO T 22 by personnel approved by the Engineer.

A Certified Test Report in accordance with 1.06.07 or 1.20-1.06.07 shall be provided to the Engineer reporting the Progression Cylinder test results. A copy of the results of the compressive strength testing shall be provided to the Engineer at least 24 hours prior to any Project activity that the results may control.

6. Handling and Placing Concrete: Concrete shall be handled, placed, and consolidated by methods acceptable to the Engineer that will not segregate the mix and shall result in a dense homogeneous concrete. The methods used shall not cause displacement of reinforcing steel or other materials to be embedded in the concrete. Concrete shall not be placed until the forms and all materials have been inspected by the Engineer. All mortar from previous placements, debris, and foreign material shall be removed from the forms and steel prior to commencing placement. The forms and subgrade shall be thoroughly moistened with water immediately before concrete is placed. All water that has ponded within the forms shall also be removed. Temporary form spreader devices shall not be left in place.

All laitance or unsound material shall be removed before placing substructure concrete onto the surface of any concrete placed underwater.

Placement of concrete for each section of the structure shall be performed continuously between construction or expansion joints as shown on the plans. The delivery rate, placing sequence and methods shall be such that fresh concrete is always placed and consolidated against previously placed concrete before initial set has occurred. The temperature of the concrete mixture during placement shall be maintained between 60°F and 90°F. During and after placement of concrete, care shall be taken not to damage the concrete or break the bond with reinforcing steel. Platforms for workers and equipment shall not be supported directly on any reinforcing steel. Forces that may damage the concrete shall not be applied to the forms or reinforcing steel.

- (a) Sequence of Placement:** The sequence of placement shall be in accordance with the Contract or as permitted by the Engineer.

Concrete for integral horizontal members, such as caps, slabs, or footings shall not be placed until the concrete for the columns, substructure, culvert walls and similar vertical members has achieved sufficient strength as stated in 6.01.03-II-1(m).

The concrete in arches shall be placed in such a manner as to load the formwork uniformly and symmetrically.

The base slab or footings of cast-in-place box culverts shall reach sufficient strength before the remainder of the culvert is constructed.

- (b) Placement Methods:** The Contractor shall notify the Engineer at least 24 hours in advance of intention to place concrete.

Vibrators shall not be used to shift the fresh concrete horizontally. Vibrators shall be adequate to consolidate the concrete and integrate it with the previous lift.

The rate of concrete placement must not produce loadings that exceed those considered in the design of the forms.

The use of chutes and pipes for conveying concrete into the forms must be reviewed by the Engineer. Chutes shall be clean, lined with smooth watertight material and, when steep slopes are involved, shall be equipped with baffles or reverses. When the discharge must be intermittent, a hopper or other device for regulating the discharge shall be provided.

Aluminum shall not be permanently incorporated into the concrete unless otherwise specified.

When placing operations involve dropping the concrete more than 5 feet, the Contractor shall take action to prevent segregation of the mix and spattering of mortar on steel and forms above the elevation of the lift being placed. This restriction shall not apply to cast-in-place pilings.

When using stay-in-place forms, concrete shall not be dropped more than 3 feet above the top of the forms, and the concrete shall be discharged directly over the beams or girders.

- (c) **Pumping:** The Contractor shall use equipment specifically manufactured to pump concrete mixes and that meets the needs of the specific concrete placement.
- (d) **Consolidation:** Unless otherwise specified, all concrete, except concrete placed under water, shall be sufficiently consolidated by mechanical vibration immediately after placement.

The Contractor shall provide a sufficient number of commercially available mechanical immersion type vibrators to properly consolidate the concrete immediately after it is placed in the forms unless external form vibrators are used. The Contractor shall have an adequate number of operable vibrators available in case of breakdown.

External form vibrators may be used if submitted prior to concrete placement and reviewed by the Engineer.

Vibration shall not be applied directly to the reinforcement or hardened concrete. Special care shall be taken in placing and consolidating concrete around ornamental moulds, form liners and other embedded items. The vibrator shall not touch these items at any time.

- (e) **Additional Requirements for Bridge Decks:** At least 15 days before the erection of the screed rails, the Contractor shall submit screed erection plans, grades and sequence of concrete placement and proposed rate of placing concrete for review by the Engineer. These plans shall include details of equipment to be used in the placement and finishing of the concrete, including the number and type of personnel who will be engaged in placing the concrete. The screed equipment shall be a commercially available vibratory system. The use of wooden screeds is prohibited.

When setting screed rails for mechanical finishing, the Contractor shall take into consideration and make proper allowances for the deflection of the bridge superstructure due to all operations.

Screed and runway supports shall not be located on any stay-in-place metal form sheets, form supports or reinforcing steel. The Contractor shall operate the mechanical screed at least 24 hours prior to actual placement of the concrete to verify deck survey and equipment operations to the satisfaction of the Engineer.

A Pre-Placement Meeting shall be held on the Project Site with the Contractor, Engineer and concrete supplier 48 hours before the concrete deck pour. The Pre-Placement Meeting will document and include discussion on the following topics:

1. **Schedule:**
 - (a) Deck pour sequence
 - (b) Daily start and finish times for concrete delivery
 - (c) Anticipated completion time
2. **Key Personnel:**
 - (a) Concrete placement foreman
 - (b) Total number of personnel involved in deck pour and their roles during the pour
 - (c) Concrete supplier
 - (d) Concrete pump truck operator/service
 - (e) Discuss QC/QA
3. **Placement:**
 - (a) List of approved delivery trucks per pour
 - (b) Pre-wetting forms prior to placement
 - (c) Placement sequence
 - (d) Rate of concrete placement and vibrator process
 - (e) Monitor concrete temperature during placement

- (f) Transverse joint bulkheads
 - (g) Qualified concrete low-permeability mix design
4. **Curing:**
- (a) Curing materials (burlap, quilted blankets, etc.)
 - (b) Means for pre-soaking curing materials.
 - (c) Foggers
 - (d) Soaker hoses
 - (e) White Plastic Sheeting
 - (f) Water source and supply tanks

Concrete shall be deposited in a uniform manner across the entire width being placed, and only 2 passes of the transverse screed will be permitted over a given deck area, unless otherwise allowed by the Engineer.

If the Contractor proposes to place concrete outside of daylight hours, an adequate lighting system must be provided.

Concrete shall be deposited in accordance with the placement sequence as noted on the plans. If no sequence is indicated, the Contractor shall provide a placement sequence to the Engineer for review. The placement sequence shall proceed in such a manner that the total deflection or settlement of supporting members, and the final finishing of the surface will occur before the initial set of the concrete takes place.

At construction joints, concrete shall not be placed against the previously placed concrete for at least 12 hours unless otherwise allowed by the Engineer.

- (f) **Underwater Placement:** Concrete may only be placed under water within a cofferdam unless otherwise specified in the Contract or allowed by the Engineer. Placement shall begin following inspection and acceptance of the depth and character of the foundation material by the Engineer.

Underwater concrete mixes are considered non-standard designs and shall be submitted to the Engineer for approval. Typically a minimum of 10% additional cement than comparable non-underwater mixes will be required.

Underwater concrete shall be placed continuously with the surface of the concrete kept as horizontal as practical. To ensure thorough bonding, each succeeding layer shall be placed before the preceding layer has taken initial set. For large concrete placements, more than 1 tremie or pump shall be used to ensure compliance with this requirement.

Mass concrete placement requirements, outlined in 6.01.03-II-6(g), do not apply to underwater concrete.

To prevent segregation, underwater concrete shall be placed in a compact mass, in its final position, by means of a tremie, concrete pump, or other approved method and shall not be disturbed. Still water shall be maintained at the point of deposit. Cofferdams shall be vented during the placement and curing of the concrete to equalize the hydrostatic pressure and thus prevent flow of water through the concrete.

If a tremie is used, the method of depositing the concrete shall be detailed in a submission to the Engineer as a working drawing for review. The tube shall have watertight couplings and shall permit the free movement of the discharge end over the area of the work.

- (g) **Mass concrete placement:** Mass concrete placement shall be defined as any placement, excluding underwater concrete placement, in which the concrete being cast has dimensions of 5 feet or greater in each of 3 different directions. For placements with a circular cross-section, a mass concrete placement shall be defined as any placement that has a diameter of 6 feet or greater and a height of 5 feet or greater. For all mass concrete placements, the mix temperature shall not exceed 85°F as measured at point of discharge into the forms.

Any special concrete mix design proposed by the Contractor to meet the above temperature requirements shall be submitted to the Engineer for review.

7. **Finishing Plastic Concrete:** Unless otherwise specified in the Contract, after concrete has been consolidated and prior to final curing, all surfaces of concrete that are not placed against forms shall be struck-off to the planned elevation or slope. The surface shall be finished by floating with an acceptable tool. While the concrete is still in a workable state, all construction and expansion joints shall be tooled with an edger. Joint filler shall be left exposed. For requirements on float finish, refer to 6.01.03-II-10, Finishing Concrete Surfaces.

After completion of the placing and finishing operation and for at least 12 hours after the concrete has set, the Contractor shall not operate any equipment in the immediate vicinity of the freshly placed concrete if, in the judgment of the Engineer, it could cause excessive vibration, movement or deflection of the forms.

The addition of water to the surface of the concrete to assist in finishing operations will not be permitted.

- (a) **Bridge Decks:** After the concrete has been consolidated and brought to the proper elevation by the screed machine, it shall be finished by use of a suitable float. The Contractor shall not disturb the fresh concrete after it has been finished. All finishing work, including the application of the fog spray and placement of the curing mats, shall be performed from work bridges supported above the deck surface. A work bridge shall be made available to the Engineer for inspection of the concrete work.

Surfaces that are to be covered with a waterproofing membrane shall be finished to a smooth surface, free of mortar ridges and other projections and in accordance with the membrane manufacturer's recommendations.

Unless otherwise noted in the Contract, the concrete wearing surfaces shall be given a skid-resistant texture by dragging, brooming, tining, or by a combination of these methods. These methods shall be done after floating and at such time and in such manner that the desired texture will be achieved while minimizing displacement of the larger aggregate particles.

1. Dragging: The surface shall be finished by dragging a seamless strip of damp burlap over the surface. The burlap to be dragged shall consist of sufficient layers and have sufficient length in contact with the concrete to slightly groove the surface. The burlap shall be drawn longitudinally along the surface in a slow manner so as to leave an even texture. The burlap shall be kept damp, clean, and free of particles of hardened concrete. The Contractor may propose an alternate material for the Engineer's consideration.
2. Tining: Tining shall be in a transverse direction using a wire broom, comb, or float having a single row of tines or fins. The tining grooves shall be between 1/16 inch and 3/16 inch wide and between 1/8 inch and 3/16 inch deep, spaced 1/2 inch to 3/4 inch on centers. Tining shall be discontinued 12 inches from the curb line on bridge decks. The area adjacent to the curbs shall be given a light broom finish longitudinally. As an alternative, tining may be achieved using a machine designed specifically for tining or grooving concrete pavements.

The transverse grooving shall be performed when the grooves can be formed to a maximum depth of 3/16 inch with relative ease and without the walls of the grooves closing in on each other. The tining shall be aligned so as to prevent overlapping of grooves in any 2 successive transverse passes. The Contractor shall measure the depth of the grooves in the presence of the Engineer with an appropriate device to ensure compliance.

- (b) **Surface Testing and Correction:** The completed surface shall be constructed in accordance with grades and cross slopes shown on the plans. The entire surface shall be checked by the Contractor in the presence of the Engineer, with an acceptable 10 foot straightedge.

1. The surface shall not vary more than +/- 1/8 inch over 10 feet for decks which will not be covered with an overlay.
2. The surface shall not vary more than +/- 1/4 inch over 10 feet for decks which will be covered with an overlay.

Variances greater than these, which, in the judgment of the Engineer, may adversely affect the riding qualities of the surface shall be corrected, and this shall be done at the expense of the Contractor. The Contractor shall submit a corrective procedure to the Engineer for review and approval. The procedure shall correct such irregularities by methods such as, but not limited to, concrete planing or grooving.

8. Bearing Surfaces: Concrete surfaces under metallic masonry plates and elastomeric bearings shall have a float finish. After the concrete has set, the area which will be in contact with the masonry plate shall be ground as necessary to provide full and even bearing. The finished surface shall not vary from a straightedge laid on the surface in any direction within the limits of the masonry plate by more than 0.0625 inch. Surfaces which fail to conform shall be ground or filled until acceptable to the Engineer.

9. Curing Concrete: All newly placed concrete shall be cured to prevent loss of water by use of the methods specified. The Engineer may request that the Contractor furnish a curing plan.

The duration of the initial and final curing period in total shall continue uninterrupted for a minimum of 7 days.

(a) Curing Methods:

1. Forms-In-Place Method: Formed surfaces of concrete may be cured by retaining the forms in place without loosening. During periods of hot weather, water shall be applied to the forms until the Engineer determines that it is no longer required.
2. Water Method: Exposed concrete surfaces shall be kept continuously wet by ponding, spraying, or covering with materials that are kept continuously and thoroughly wet. Such materials may consist of cotton mats, multiple layers of burlap, or other approved materials that do not discolor or otherwise damage the concrete.
3. Waterproof Cover Method: This method shall consist of covering exposed surfaces with a waterproof sheet material to prevent moisture loss from the concrete. The concrete shall be wet at the time the cover is installed. The sheets shall be of the widest practicable width and adjacent sheets shall overlap a minimum of 6.0 inches to form a waterproof cover of the entire concrete surface and shall be adequately secured. Broken or damaged sheets shall be immediately repaired and the concrete shall be remoistened.

(b) Additional Requirements for Bridge Decks:

Curing Plan: The Contractor shall submit to the Engineer, at least 14 days prior to the placement of concrete for the bridge deck, a detailed curing plan that describes the following:

- A. the initial and final curing durations,
- B. equipment and materials to be used for curing concrete and monitoring concrete temperature,
- C. and proposed primary and secondary water and heat sources
 1. Initial Curing Period: A water fog spray shall be used by the Contractor from the time of initial placement until the final curing period begins. The amount of fog spray shall be strictly controlled so that accumulations of standing or flowing water on the surface of the concrete shall not occur.

Should atmospheric conditions render the use of fog spray impractical, the Contractor shall request approval from the Engineer to use a curing compound that meets the requirements of M.03 in lieu of a fog spray. The application shall be in accordance with the manufacturer's recommendation and be compatible with the membrane waterproofing.

2. Final Curing: After completion of finishing and as soon as any bleed water has dissipated and the concrete reaches sufficient strength to avoid marring, the Final curing period shall begin and the entire concrete surface shall be covered with water-retaining materials such as cotton mats, multiple layers of burlap, or other materials approved by the Engineer. Materials used shall be kept saturated by means of an acceptable sprinkler or wetting system.

The Contractor may cover the wet water-retaining material with a suitable polyethylene film to minimize evaporation during the curing period. The use of the polyethylene film does not relieve the Contractor from maintaining saturation of the curing materials.

3. Temperature Monitoring: The internal temperature of the concrete shall be monitored with a calibrated continuous recording thermometer for a minimum of 7 days. The air temperature at the concrete surface or the air temperature between the concrete surface and its protective covering shall be monitored with a minimum of 1 recording thermometer.

The number and placement of the thermometers will be determined by the Engineer. A minimum of 2 thermometers per concrete placement shall be provided by the Contractor.

The following types of thermometers shall be used to monitor curing temperatures:

- i) Continuously Recording Thermometer: The thermometer shall be capable of continuously recording temperatures within a range of -4°F to 122°F for a minimum of 24 hours.
- ii) Maximum-Minimum Recording Thermometer: For all placements, the thermometer shall be capable of recording maximum and minimum temperatures in a range of -4°F to 122°F.

10. Finishing Concrete Surfaces: Any minor repairs due to fins, bulges, offsets and irregular projections shall be performed immediately following the removal of forms. For areas of newly placed concrete that are honeycombed or segregated the Contractor shall provide a written corrective procedure for review by the Engineer prior to the work being performed. Construction and expansion joints in the completed work shall be left carefully tooled and free of mortar and concrete. The joint filler shall be left exposed for its full length with clean and true edges.

The cavities produced by form ties and all other holes, broken corners or edges, and other defects shall be cleaned, saturated with water, pointed and trued with a mortar conforming to M.11.04. Cement similar in color to the exposed surface being repaired shall be added to the mortar. Mortar used in pointing shall be

used within 1 hour of mixing. The concrete shall be finished as defined below if required and the cure continued as previously specified in 6.01.03-II-9, Curing Concrete.

Finishing work shall not interrupt the curing period unless permitted by the Engineer. The curing period may be extended to provide the minimum total number of days required.

Concrete surface finishes shall be classified as follows:

- (a) **Float Finish:** This finish shall be achieved by placing an excess of material in the form and removing or striking off of such excess forcing the coarse aggregate below the mortar surface. Concave surfaces in which water will be retained will not be allowed. After the concrete has been struck off, the surface shall be thoroughly worked and floated. Before this last finish has set, the surface shall be lightly stripped with a fine brush to remove the surface cement film, leaving a fine-grained, smooth, but sanded texture. Curing, as specified elsewhere, shall follow. Any surfaces that will support appurtenances such as light standards, railing, or fences shall be finished in accordance with 6.01.03-II-8, Bearing Surfaces.
- (b) **Rubbed Finish:** The initial rubbing shall only be allowed within 3 days after placement. The entire surface shall be thoroughly wet with a brush and rubbed with a No. 16 Carborundum Stone or an abrasive of equal quality, bringing the surface to a paste. The rubbing shall be continued sufficiently to remove all form marks and projections, producing a smooth, dense surface without pits or irregularities. The paste formed by the rubbing may be finished by striping with a clean brush, or it may be spread uniformly over the surface and allowed to re-set. If all or portions of the rubbed surface are unacceptable to the Engineer or a rubbed finish is not provided within 3 days after removal of forms, the Contractor will be directed to provide a grout clean down finish.
- (c) **Grout Clean-Down Finish:** As soon as all cavities have been filled as required elsewhere and the cement mortar has set sufficiently, grout clean-down shall be performed. All burrs, unevenness, laitance, including that in air holes, and any other material which will adversely affect the bond of the grout to the concrete, shall be removed by acceptable methods. This cleaning shall be done from the top or uppermost part of the surface to be finished to the bottom.

A mixture of a fine aggregate and Portland cement shall be thoroughly blended while dry. The proportions shall be such that when mixed with the proper amount of water, the color will match that of the concrete to be finished. Water shall be added to this mixture in an amount which will bring the grout to a workable thick paint-like consistency.

The surface to be treated shall be thoroughly wetted with enough water to prevent the absorption of water from the grout. Grout shall then be applied to the wetted surface before setting of the grout occurs. Grout which has set shall not be re-tempered and shall be disposed of by the Contractor at no cost to the State.

The grout shall be uniformly applied over the entire surface, completely filling all air bubbles and holes. Immediately after applying the grout, the surface shall be floated with a suitable float, scouring the surface vigorously. While the grout is still plastic, all excess grout shall be removed.

After the final rubbing is completed and the surface has dried, it shall be rubbed to remove loose powder and shall be left free from all unsound patches, paste, powder, and objectionable marks. Wetting, application and removal of excess grout shall be completed in 1 work shift.

All finished surfaces shall be cured for a minimum of 24 hours. Horizontal surfaces shall have a float finish and vertical exposed surfaces shall have a rubbed finish. A grout clean-down finish may be substituted for a rubbed finish as noted in this article or as directed by the Engineer.

11. Mortar, Grout, Epoxy and Joint Seal:

- (a) **Mortar and Grout:** This work consists of the making and placing of mortar and grout. At least 48 hours prior to the planned use, a copy of the installation instructions and MSDS sheets shall be provided to the Engineer for review and concurrence of their applicability and for verification of proper hole sizes in concrete structures. Such uses include mortar for filling under masonry plates, mortar used to fill voids and repair surface defects, grout used to fill sleeves for anchor bolts, and mortar and grout for other such uses where required.

Concrete areas to be in contact with the mortar or grout shall be cleaned of all loose or foreign material that would in any way prevent bond, and the concrete surfaces shall be flushed with water and allowed to dry until no free-standing water is present.

The mortar or grout shall completely fill and shall be tightly packed into recesses and holes, on surfaces, under structural members, and at other locations specified. After placing, all surfaces of mortar or grout shall be cured as previously specified in 6.01.03-II-9(a)-2, for a period of not less than 3 days.

Epoxy: The epoxy shall be prepared and placed in accordance with the manufacturer's directions and with the equipment prescribed by the manufacturer. Instructions furnished by the supplier for

the safe storage, mixing, handling and application of the epoxy shall be followed. Contents of damaged or previously opened containers shall not be used.

- (b) **Joint Seal:** This work consists of sealing joints where shown on the plans or as otherwise directed by the Engineer.

Before placement of the sealing material, the joints shall be thoroughly cleaned of all scale, loose concrete, dirt, dust or other foreign matter. Projections of concrete into the joint space shall be removed. The joint shall be clean and dry before the sealing compound is applied.

The joint sealant shall be prepared and placed in accordance with the manufacturer's directions and with the equipment prescribed by the manufacturer. The sealing compound shall be flush with, or not more than 1/8 inch above the adjacent surface of concrete, cutting off all excess compounds after the application. The joints shall be sealed in a neat and workmanlike manner and when the work is completed, the joints shall effectively seal against infiltration of moisture and water.

The Contractor shall arrange for, and have present at the commencement of the joint-sealing operation, a technically competent manufacturer's representative knowledgeable in the methods of installation of the sealant. The Contractor shall also arrange to have the representative present at such other times as the Engineer may request.

- (d) **Closed Cell Elastomer:** The closed cell elastomer shall be of the thickness specified and installed as shown on the plans and shall be in accordance with M.03.08-6.

12. Application of Loads: Loads shall not be applied to concrete structures until the concrete has attained sufficient strength and, when applicable, sufficient pre-stressing and post tensioning has been completed, so that damage will not occur. The means to determine when the concrete has attained sufficient strength shall be the use of Progression cylinders as defined in 6.01.03-II-5, or other means allowed in advance by the Engineer.

- (a) **Earth Loads:** The placement of backfill shall not begin until the concrete is cured and has reached at least 80% of its specified strength unless otherwise permitted by the Engineer. The sequence of placing backfill around structures shall minimize overturning or sliding forces and flexural stresses in the concrete.

- (b) **Construction Loads:** Light materials and equipment may be hand carried onto bridge decks only after the concrete has been in place at least 24 hours providing curing is not interfered with and the surface texture is not damaged.

Prior to the concrete achieving its specified compressive strength, any other live or dead loads imposed on existing, new, or partially completed portions of structures, shall not exceed the reduced load carrying capacity of the structure, or portion of structure. The Contractor may be required to submit calculations to the Engineer that verify these requirements are being met. The compressive strength of concrete ($f'c$) to be used in computing the load-carrying capacity shall be the smaller of the actual field compressive strength at the time of loading or the specified design strength of the concrete. The means to determine the actual field compressive strength shall be approved by the Engineer.

For post-tensioned structures, no live or dead loads shall be allowed on any span until the steel for that span has been tensioned.

- (c) Precast concrete or steel girders shall not be placed on substructure elements until the substructure concrete has attained 85% of its specified strength.

No load shall be allowed on mortar or grout that has been in place less than 72 hours.

- (d) **Traffic Loads:** The concrete deck will not be opened to traffic until at least 14 days after the last placement of deck concrete and until such concrete has attained its specified strength.

13. Dispute Resolution: The basis of any dispute resolution is side-by-side and quality control testing by the Contractor or the Contractor's representative. The Contractor and Engineer should perform independent testing on the material to reasonably establish the true characteristics of the material at the time of delivery. Absent of Contractor QC testing, the Engineer's test results will apply to the quantity of concrete represented by the sample, not to exceed 75 c.y.

Air Content: Contractor QC Testing must be performed by personnel qualified by The American Concrete Institute as an ACI Concrete Field Testing Technician Grade 1 or higher and performed in

accordance with AASHTO T 23. If the Contractor's test results vary from those of the Engineer, the Contractor shall immediately notify the Engineer of the difference and work cooperatively to determine the reasonable cause and recognize the valid test. Should there be agreement, the result of the valid test will be used for acceptance and adjustment purposes for that lot of material. Should there not be an agreement as to the valid test, an additional set of tests should be performed. Results of all valid tests on the same lot may be averaged and used for acceptance and adjustment purposes. Should the Contractor wish to perform additional QC testing on subsequent material, the lot sizes may be adjusted to the amount of material included in that specific delivery. Any such QC testing must be witnessed and agreed to by the Engineer.

Compressive Strength or Surface Resistivity: Contractor QC testing for compressive strength must be performed in accordance with AASHTO T 22 by personnel approved by the Engineer. Contractor QC testing for Surface Resistivity must be performed in accordance with AASHTO T 358 using 4 × 8 inch cylinders by personnel approved by the Engineer. All test results used for dispute must be obtained at the sample age specified in Table M.03.02-1. Samples used to dispute the Engineer's test results must be made simultaneously and from the same batch of concrete. Should the Contractor wish to pursue a dispute resolution regarding compressive strength or surface resistivity, the Contractor shall submit in writing to the Engineer all test results, control charts, or other documentation that may be useful in determining if the specific lot(s) of material met the Contract specifications. The Engineer will consider the submittal and may average specific test results on the disputed lot(s) for acceptance and adjustment purposes. Destructive testing of any kind on the placed concrete structure will not be allowed.

III. Additional Requirements for Surface Repairs and Structural Repairs

1. Work Area Access and Shielding: Prior to removal of existing concrete, the Contractor shall provide access to the anticipated work areas so that the inspector and the Contractor may together determine and delineate the exact limits and locations of the work.

The Contractor shall design, furnish, install and remove a shield(s) to prevent debris from entering areas adjacent or beneath the work. The Contractor shall submit working drawings to the Engineer in accordance with 1.05.02. The shield(s) shall be maintained by the Contractor and remain in place during all phases of the repair work.

2. Concrete Removal: The perimeter of each area to be repaired shall be saw cut as shown on the plans. All concrete within that area shall be removed to at least 1 inch beneath any visible reinforcing steel and to sound concrete. The reinforcing steel shall not be damaged or its bond in the surrounding concrete. The Contractor must use fifteen (15) pound hammers or other methods accepted by the Engineer.

In addition to removal of concrete to a depth of 1 inch below reinforcing steel, localized areas of removal may be required if embedded galvanic anodes are specified in the Contract, to allow a minimum of 2 inches of concrete cover over the anodes.

Any steel reinforcing scheduled to be left in place that is damaged during the concrete removal process shall be replaced in accordance with 6.02 to the satisfaction of the Engineer and at the expense of the Contractor.

Corroded, missing, or broken reinforcing steel shall be replaced in accordance with 6.02 and as shown on the plans or as directed by the Engineer.

The Contractor shall perform the work in a manner that prevents debris from entering roadway lanes or areas below the structure. All debris shall be removed from the Site and disposed of by the Contractor.

3. Surface Preparation: All newly exposed surfaces of concrete shall be sandblasted and be visibly free from oil, solvent, grease, loose particles, or any other foreign matter. Exposed reinforcing steel shall be sandblasted in accordance with SSPC-SP-6, Commercial Blast Cleaning, to remove all contaminants, rust and rust scale.

4. Installation of Embedded Galvanic Anodes: After sandblasting reinforcing steel, galvanic anodes shall be embedded where shown on the plans and in accordance with the Contract.

5. Welded Wire Fabric in Vertical and Overhead Surface Repairs: Prior to installing formwork, steel welded wire fabric meeting the requirements of M.06.01-3 shall be installed at the proper depth in those areas as shown on the plans or directed by the Engineer. The fabric shall be tied to exposed reinforcing steel or anchored to sound concrete using means approved by the Engineer.

6. Formwork: Forms and support systems shall be designed in accordance with 6.01.03-II-1. Forms shall be so designed so that access is from the top of the formwork. If access is not possible from the top of the formwork, the Contractor shall submit a method of concrete placement for review by the Engineer.

7. Concrete Placement and Curing: Bonding compounds shall not be used before or during the placement of the concrete. Exposed surfaces shall be wetted with water immediately prior to placement. There shall be no excessive water on the surface or in the formwork. Light rust on sandblasted reinforcing steel can be anticipated and is acceptable.

The temperature of the air and surface to be repaired at the time of placement and curing shall be a minimum of 45°F. Concrete shall be placed and consolidated immediately with appropriate vibratory equipment.

Forms shall be kept moist and shall be left in place for a minimum of 7 days or as shown on the plans.

8. Form Removal and Sequence of Repair: Form removal shall be in accordance with 6.01.03-II-1(m) unless otherwise noted on the plans. The Contractor shall follow the sequence of repairs shown on the plans.

9. Finishing: Immediately following curing and form stripping, the exposed faces shall be finished in accordance with 6.01.03-II-10(c) Grout Clean-Down Finish.

10. Sounding of Completed Repairs: Cured and finished areas may be sounded by the Engineer to detect the presence of subsurface voids or delamination. Such areas shall be removed and replaced by the Contractor at its expense until an acceptable repair is in place as determined by the Engineer.

11. Sealing Concrete Surfaces: After all repairs have been accepted, penetrating sealer shall be applied in accordance with the Contract to the repaired areas as well as all contiguous areas to the repair or as directed by the Engineer.

SECTION 6.02 REINFORCING STEEL

6.02.01—Description: Work under this item shall consist of furnishing and placing reinforcing steel and splicing materials, of the type and size designated, as shown on the plans, as directed by the Engineer and in accordance with these specifications.

6.02.02—Materials: The materials for this work shall meet the requirements of M.06.01.

6.02.03—Construction Methods:

1. Shop Drawings: Prior to fabricating any materials, the Contractor shall submit shop drawings of the reinforcing steel and splicing materials, with material lists, material designations, placement diagrams, bending diagrams and manufacturer's literature for mechanical connections, for review and approval, in accordance with 1.05.02. Any expenses incidental to the revision of materials furnished in accordance with shop drawing and order lists to make them comply with the requirements of the plans, specifications or special provisions shall be borne by the Contractor.

2. Fabrication:

(a) Cutting and Bending: Bar reinforcement shall be cut and bent to the shapes shown on the plans. Fabrication tolerances shall be in accordance with the requirements of ACI 315. All bars shall be bent cold, unless otherwise permitted.

Coated bars shall not be field cut, unless permitted by the Engineer. If allowed, field cutting of coated bars should be performed using hydraulic-powered cutters or friction cutting tools to minimize coating damage and field touch-up. Flame cutting of coated bars will not be permitted. Field cut coated bars shall be repaired immediately.

Bars partially embedded in concrete shall not be field bent, except as shown on the plans or permitted by the Engineer.

(b) Hooks and Bend Dimensions: The dimensions of hooks and the diameters of bends measured on the inside of the bar shall be as shown on the plans. When the dimensions of hooks or the diameter of bends are not shown, they shall be in accordance with the ACI 318, "Building Code Requirements for Reinforced Concrete" as amended by ASTM A767 for galvanized bars.

(c) Identification: Bar reinforcement shall be shipped in standard bundles, tagged and marked in accordance with the CRSI "Manual of Standard Practice."

3. Handling, Storing and Surface Condition of Reinforcement: Steel reinforcement shall be stored above the surface of the ground on platforms, skids, or other supports and shall be protected as far as practical from mechanical injury and surface deterioration caused by exposure to conditions producing rust.

Epoxy-coated and galvanized reinforcing steel shall be handled and stored by methods that will not damage the coating. All systems for handling coated reinforcement shall have adequately padded contact areas wherever possible. All bundling bands shall be padded and all bundles shall be lifted with a strong back, multiple supports, or platform bridge so as to prevent bar-to-bar abrasion from sags in the bar bundle. Bars or bundles shall not be dropped or dragged. Coated reinforcing steel shall be transported and stored on wooden or padded supports. Epoxy-coated reinforcing steel, stored at the job site, shall be protected by covering with opaque polyethylene or other suitable protective material. Provisions shall be made for adequate ventilation to prevent condensation under the covering. Since the epoxy coating is flammable, the epoxy coated reinforcing shall not be exposed to any fire or flame.

Prior to placement of concrete, all reinforcement shall be free from dirt, loose rust or scale, mortar, paint, grease, oil, or other materials that would reduce bond. Reinforcement shall be free from injurious defects such as cracks and laminations. Bonded rust, surface seams, surface irregularities, or mill scale will not be cause for rejection, provided the minimum dimensions, cross section area, and tensile properties of a hand wire brushed specimen meet the physical requirements for the size and grade of steel specified.

4. Placing and Fastening

(a) General: Steel reinforcement shall be accurately placed as shown on the plans and firmly held in position during the placing and setting of concrete. Bars shall be tied at all intersections except where the spacing is less than 12 inches between intersections shall be tied. Bars shall be tied at all intersections around the perimeter of each mat.

Bundled bars shall be tied together at not more than 6-foot centers. Lap splices shall have a minimum of 2 ties or be tied 12 inches apart for the length of the splice, whichever requires the greater number of ties. For epoxy-coated reinforcement, tie wires and metal clips shall be epoxy, plastic or nylon coated. For galvanized reinforcement, tie wires and metal clips shall be plastic coated or galvanized.

With the exception of tie down bars, welding (tack welding) will not be permitted for assembly of reinforcement, unless shown on the plans. Tie down bars shall be placed as shown on the plans and a top longitudinal reinforcing bar tied to these bars. When welding coated bars an appropriate protective mask must be worn, safety equipment used and suitable ventilation provided.

If wire fabric reinforcement is shipped in rolls, it shall be straightened into flat sheets before being placed.

(b) Support Systems: Reinforcing steel shall be supported in its proper position by use of precast mortar blocks, wire bar supports, supplementary bars (tie-down bars), side form spacers or other approved devices. Such devices shall be sufficiently strong and properly placed at frequent intervals so as to maintain the cover between the reinforcing and the surface of the concrete. When non-galvanized steel forms are proposed to be used adjacent to galvanized reinforcing bars, non-conductive materials shall be used for bar supports, side form spacers and any other device that could electrically connect the reinforcing to the forms. Metal devices must be properly insulated to protect against electrical conduction.

The reinforcing steel cover shall be no less than that shown on the plans and no greater than that shown plus 1/4 inch.

Platforms for the support of workers and equipment during concrete placement shall be supported directly on the forms and not on the reinforcing steel.

(c) Precast Mortar Blocks: Precast mortar blocks shall have a compressive strength not less than that of the concrete in which they are to be embedded. The face of the blocks in contact with forms for exposed surfaces shall not exceed 2 inches × 2 inches size and shall have a color and texture that will match the concrete surface. Precast mortar blocks shall not be used on exposed surfaces of precast concrete members. When used on vertical or sloping surfaces, such blocks shall have an embedded wire for securing the block to the reinforcing. When used in slabs, either such a tie wire or, when the weight of the reinforcing is sufficient to firmly hold the blocks in place, a groove in the top of the block may be used. For epoxy-coated bars, such tie wires shall be epoxy, plastic or nylon coated. For galvanized bars, such tie wires shall be plastic coated or galvanized.

(d) Wire Supports: Wire bar supports, such as ferrous metal chairs and bolsters, shall conform to industry practice as described in the CRSI "Manual of Standard Practice of the Concrete Reinforcing Steel Institute." All bolsters or chairs which bear against the forms for exposed surfaces shall be equipped with snug fitting, high density, polyethylene tips which provide 1/2-inch minimum clearance between the metal and any exposed surface. For epoxy-coated reinforcement, all wire bar supports and bar clips shall be epoxy or plastic coated. For galvanized reinforcement, chair and bar supports shall be hot-dip galvanized, after fabrication, in accordance with ASTM A123. Chair and bar supports between galvanized reinforcing and non-galvanized metal forms shall be made of non-conductive materials. Metal devices must be properly insulated to protect against electrical conduction.

The maximum spacing of slab bolster rows and high chair rows for concrete deck slabs shall be 4 feet unless otherwise directed by the Engineer.

(e) Repair of Coated Reinforcing Steel:

Epoxy-coated Reinforcing Steel - In addition to the requirements of ASTM D3963, all damage (i.e., scratches, nicks, cracks) to the epoxy coating of the bar reinforcement, visible to the unaided eye with corrective vision, caused during shipment, storage or placement shall be repaired by the Contractor at the Project Site with approved patching material. Ends of bars that have been sheared, saw cut or cut by other means shall be coated with approved patching material. The areas on the bars and tie down bars damaged by welding shall be repaired with approved patching material.

Patching of damaged areas shall be performed in accordance with the patching material manufacturer's recommendations. Any singular damaged surface area (prior to repair with approved patching material), shall not exceed 2% of the total surface area of the bar. The total bar surface area covered by patching material shall not exceed 5% of the total surface area of the bar. Should either of these limits be exceeded the bar shall be removed from the work and replaced with an acceptable bar. All patching material shall be fully cured prior to placing concrete.

The patching material shall be compatible with the epoxy coating, inert in concrete, and suitable for repairs in the field. The patching material shall be prequalified, as required for the coating material, and shall be either identified on the container as meeting the requirements of Annex A1 of ASTM D3963 or shall be accompanied by a Materials Certificate certifying that the material meets the requirements of said Annex A1.

Galvanized Reinforcing Steel - All damage (i.e. scratches, nicks, cracks) to the galvanized coating on bar reinforcement, visible to the unaided eye with corrective vision, caused during shipment, storage or

placement shall be repaired by the Contractor at the Project Site in accordance with ASTM A780, Annex A2 - "Repair using Zinc-Rich Paints." Ends of bars that have been sheared, saw cut or cut by other means shall be coated with zinc-rich paint. The area on the bars and tie down bars damaged by welding shall be repaired with zinc-rich paint.

Field coating of damaged areas shall be performed in accordance with the zinc-rich paint manufacturer's recommendations. The zinc-rich paint shall conform to FS TT-P-641, Type 1 and shall be brush applied to achieve a dry film thickness from 3 - 6 mils. All touchup paint shall be fully cured prior to placing concrete.

5. Splicing of Bars:

(a) **General:** All reinforcement shall be furnished in the full lengths indicated on the plans unless otherwise permitted. Except for splices shown on the plans, splicing of bars will not be permitted without written approval of the Engineer. Splices shall be staggered as far as possible.

(b) **Lapped Splices:** Lapped splices shall be of the lengths shown on the plans.

In contact lap splices, the bars shall be placed in contact and tied together in such a manner as to maintain the minimum distance to the surface of the concrete shown on the plans.

In non-contact lap splices, the bars shall be placed as shown on the plans and tied to adjacent bars in such a manner as to maintain the minimum distance to the surface of the concrete shown on the plans.

(c) **Welded Splices:** Welded splices shall be used at the locations shown on the plans. Welding shall conform to AWS publication "Structural Welding Code, Reinforcing Steel, AWS D1.4" and applicable special provisions.

Welded splices shall not be used on epoxy-coated or galvanized bars. No welding shall be performed close enough to epoxy-coated or galvanized bars to cause any heating of the coating.

(d) **Splices made with Dowel Bar Mechanical Connections:** Splices made with dowel bar mechanical connections shall be used at the locations shown on the plans. The minimum size of the bars and the length of the lap splices for the dowel bar mechanical connections shall be as shown on the plans.

The mechanical connections shall be installed in accordance with the manufacturer's recommendations. All tools and equipment required to install and field inspect the connections shall be provided by the Contractor. The Contractor shall take all measures necessary to prevent concrete from adhering to the threaded portions of the mechanical connections.

After installing the coated mechanical connectors, all damaged areas on the coated connectors shall be repaired in accordance with 6.02.03-4(e).

6. Splicing of Welded Wire Fabric: Welded wire fabric reinforcement shall be lap spliced as shown on the plans.

7. Substitutions: Substitution of different size bars will be permitted only when authorized by the Engineer. The substituted bars shall have an area equivalent to or larger than the area shown on the plans.

8. Inspection: Reinforcement in any member or component shall be placed, inspected and approved by the Engineer before placing of concrete begins. Concrete placed prior to approval of the reinforcement may be rejected and its removal required.

**DIVISION III
MATERIALS SECTION**

**SECTION M.01
AGGREGATES**

- M.01.01—General**
- M.01.02—Coarse Aggregates**
- M.01.03—Fine Aggregates**
- M.01.04—Portland Cement Concrete (PCC) Aggregates**
- M.01.05—Bituminous Concrete Aggregates**

M.01.01—General:

Each source of aggregate must be qualified for use by the Engineer as indicated in 1.06.01.

Material from a qualified source is still subject to Project-level testing and may be subject to rejection as indicated in 1.06.04.

Aggregates must not have expansive or reactive properties. Aggregates reclaimed from pavements or structures may only be used where specifically allowed in the specifications.

Aggregate stockpiles must be located on smooth, hard, sloped/well-drained areas. Each source and gradation of aggregate must have an individual stockpile or bin. Stockpiles must be managed to minimize segregation and contamination with foreign materials.

M.01.02—Coarse Aggregates:

Coarse aggregate must be uniform in consistency and only contain clean, hard, tough, durable fragments meeting the criteria in Table M.01.02-1.

TABLE M.01.02-1: Coarse Aggregate Criteria by Pit/Quarry Source

Item	Title	AASHTO Test Methods	Criteria
1	Material Passing No. 200 Sieve	T 11	1% maximum.
2	Loss on Abrasion	T 96	40% maximum
3	Soundness by Magnesium Sulfate	T 104	10% maximum @ 5 cycles

Standard sizes of coarse aggregate for applications other than bituminous concrete must meet the gradation requirements listed in Table M.01.02-2 as determined by AASHTO T 27.

TABLE M.01.02-2: Gradation of Standard Sizes of Coarse Aggregate

Square Mesh Sieves	Percent Passing by Weight					
	No. 3	No. 4	No. 6	No. 67	No. 8	No. 9
2 1/2 inches	100					
2 inches	90-100	100				
1 1/2 inches	35-70	90-100				
1 inch	0-15	20-55	100	100		
3/4 inch		0-15	90-100	90-100		
1/2 inch	0-5		20-55		100	
3/8 inch		0-5	0-15	20-55	85-100	100
No. 4			0-5	0-10	10-30	85-100
No. 8				0-5	0-10	10-40
No. 16					0-5	0-10
No. 50						0-5

M.01.03—Fine Aggregates:

Fine aggregate must consist of clean, hard, durable, tough, uncoated particles free from lumps, meeting the requirements listed in Table M.01.03-1.

TABLE M.01.03-1: Fine Aggregate Requirements

Item	Property	AASHTO Test	Criteria
1	Grading		
	Portland Cement Concrete	T 11 T 27	3% maximum passing No. 200 sieve Table M.01.04-1
	Bituminous Concrete	T 27	100% Passing 3/8 inch, 95% passing the No. 4 min.
2	Absorption	T 84	3% maximum
3	Plasticity limits	T 90	0 or not detectable
4	L.A. Abrasion	T 96	50% maximum (fine agg. particle size \geq No. 8)
5	Soundness by Magnesium Sulfate	T 104	15% maximum@ 5 cycles for PC Concrete 20% maximum@ 5 cycles for Bituminous Concrete
6	Clay Lumps and Friable Particles	T 112	3% maximum
7	Deleterious Material - organic or inorganic calcite, hematite, pyrrhotite, shale, clay, coal-lignite, shells, loam, mica, clinkers, or other organic matter (wood, etc.).	As determined by the Engineer	Must not contain more than 3% by mass of any individual listed constituent and not more than 5% by mass in total of all listed constituents.

Screenings and Dust must meet the requirements of Table M.01.03-2 as determined by AASHTO T 27.

TABLE M.01.03-2: Screenings and Dust Gradation

Square Mesh Sieves	Percent Passing by weight	
	Screenings	Dust
3/8 inch	100	
No. 4		100
No. 8	60-100	40-100

M.01.04—Portland Cement Concrete (PCC) Aggregates:

In addition to the requirements in M.01.01 through M.01.03, the aggregates used in Portland Cement Concrete must meet the following:

All Aggregates: Coarse and Fine aggregates must originate from the aggregate producers and locations included on the Department’s Qualified Materials List (QML). The list is available on the Department website. The criteria for inclusion in the QML are stated within the list.

Coarse Aggregate: Coarse aggregate of a size retained on a 1 inch square opening sieve must not contain more than 8% of flat and elongated pieces when tested in accordance to ASTM D4791 at a 1:5 ratio.

Reclaimed concrete aggregates must consist of clean, durable fragments of uniform quality. Materials must be from crushing or otherwise processing of concrete structures or portions thereof. Prior to demolition or removal, concrete structures must not exhibit signs of material degradation and be inspected by the Engineer. Reclaimed aggregate must be tested separately to confirm compliance with all requirements prior to blending with virgin aggregate.

Reclaimed coarse aggregate must not contain chlorides in excess of 0.5 lb./c.y. Chloride content must be determined in accordance with AASHTO T 260, Procedure A. Regardless of chloride content, reclaimed aggregates must not be used in concrete for pre-stressed concrete members.

Fine Aggregate: Manufactured sand must be produced from washed stone screenings; stone screenings or gravel; or combinations thereof, after mechanical screening or with a process approved by the Engineer.

The fineness modulus of fine aggregate from a source must not vary more than 0.20 from the base fineness modulus of that source.

The fine aggregate must not produce a color darker than Gardner Color Standard No. 11 in accordance with AASHTO T 21.

Fine aggregates that fail to meet soundness requirements as specified in Table M.01.03-1, but meet all other requirements, may be used with the approval of the Engineer on a case-by-case basis. Typically concrete composing any surface subject to polishing or abrasion (i.e., wheel traffic or running water) will not be allowed to contain such material.

Gradation of each size aggregate must be within the ranges listed in Table M.01.04-1 as determined by AASHTO T 27.

Table M.01.04-1: Fine Aggregate Gradations

Sieve Size	3/8 inch	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100
% passing	100	95-100	80-100	50-85	25-60	10-30	2-10

M.01.05—Bituminous Concrete Aggregates

In addition to the requirements in M.01.01 through M.01.03, the source of aggregates used in Bituminous Concrete must have a Quality Control Plan for Fine Aggregates (QCPFA) on file with the Engineer. The QCPFA must describe the locations and manufacturing processing methods used at the source. The QCPFA must describe how conformance to Items 1 through 7 in Table M.01.03-1 is monitored and what actions will be taken if nonconformance is observed. The QCPFA must be revised and resubmitted to the Engineer whenever the process, location, or manner of how the fine aggregate is produced or monitored changes. A source of fine aggregate may be suspended by the Engineer due to demonstrated noncompliance with the QCPFA or if consistent production of material does not meet Project specifications as determined by the Engineer.

**SECTION M.03
PORTLAND AND HYDRAULIC CEMENT CONCRETE**

M.03.01—Component Materials**M.03.02—Cast-in-place (CIP) Standard Mix Design Requirements****M.03.03—Producer Equipment and Production Requirements****M.03.04—Curing Materials****M.03.05—Non Shrink, Non Staining Grout****M.03.06—Expansive Cement for Anchoring****M.03.07—Vacant****M.03.08—Joint Materials****M.03.09—Protective Compound/Sealers****M.03.10—Formwork****M.03.01—Component Materials**

1. **Coarse Aggregate:** Coarse aggregate shall meet the requirements of M.01.
2. **Fine Aggregate:** Fine aggregate shall meet the requirements of M.01.
3. **Cement:** All cement shall be provided by a mill participating in the Departments' Cement Certification program. The requirements of the Certification Program are detailed in the Departments' Quality Assurance Program for Materials.
 - (a) **Portland Cement (PC):** Types I, II, and III Portland cement shall meet the requirements of AASHTO M 85. Type I and Type III Portland cement shall be used only when required or expressly permitted by the Project specification or the Engineer. The use of Type I or III will require that these mixtures be submitted as Non-standard Mix Designs.
 - (b) **Blended Hydraulic Cements:** Types IS, IP, IL, and IT hydraulic cements consisting of Portland Cement and supplemental cementitious materials shall meet the requirements of AASHTO M 240.
 - (c) **Supplemental Cementitious Material (SCM):** Unless already qualified as a Standard Mix Design, Contractor proposed Mix Designs with partial replacement of Portland Cement (PC) by the concrete producer with an SCM, shall be submitted in writing to the Engineer for approval prior to the start of work, on a project-by-project basis. The type of material, source, and the percentage of the PC replaced shall be clearly indicated. Upon request, a Certified Test Report for the SCM shall be provided to the Engineer for use during the Mix Design review.
 1. **Fly Ash:** Fly ash to be used as a partial replacement for Portland cement shall meet the requirements of AASHTO M 295, either Class C or Class F, including the uniformity requirements of Table 2A. Loss on Ignition for either class of fly ash shall not exceed 4.0%. Fly ash may be used to replace up to a maximum of 20% of the required Portland cement for mixes without permeability requirements. For mixes with permeability requirements, the maximum of 20% may be exceeded. The fly ash shall be substituted on a weight basis, with a minimum of 1 lb. of fly ash for 1 lb. of Portland cement. Different classes of fly ash or the same class from different sources shall not be permitted on any single project without the written approval of the Engineer.
 2. **Ground Granulated Blast Furnace Slag (GGBFS):** GGBFS used as a partial replacement for Portland cement shall meet the requirements of AASHTO M 302/ASTM C989, Grade 100 or 120. As determined by the Engineer, GGBFS may be used to replace a maximum of 30% of the required Portland cement for mixes without permeability requirements. For mixes with permeability requirements, the maximum of 30% may be exceeded. The Engineer may restrict or prohibit the use of GGBFS if ambient temperatures anticipated during the placement and initial curing of the concrete are low. The GGBFS shall be substituted on a weight basis, with a minimum of 1 lb. of slag for 1 lb. of Portland cement. Different sources of GGBFS shall not be permitted on any single project without the written approval of the Engineer.
 3. **Ground Glass Pozzolan (GGP):** GGP used as a partial replacement for Portland cement shall meet the requirements of ASTM C1866. Alkali-silica reactivity with aggregates contained in the mix will need to be evaluated by the concrete producer to the satisfaction of the Engineer prior to use. The Engineer may restrict or prohibit the use of GGP considering the ambient temperatures anticipated during the placement and initial curing of the concrete.

4. Water: All water used in the mixing of concrete shall be odorless and clear in appearance. Surface water may be used if not taken from shallow or muddy sources; classified as Class C or Class D on the Department of Energy and Environmental Protection (DEEP) Water Quality Classification mapping; and accommodations have been made to prevent contaminants from entering the supply to the satisfaction of the Engineer. The Engineer may request that water from any surface or ground source be tested in accordance with ASTM C1602 and ASTM D512 if the appearance or scent of the water is suspect. To be acceptable, the pH of the water must not be less than 6.0 or greater than 8.0 and Chloride Ion Concentration of the water must not exceed 250ppm. Potable water taken directly from a municipal or regional water supply may be used for mixing concrete without testing. Heating or cooling of water may be required to meet mix temperature requirements at time of placement.

5. Admixtures: All admixtures shall perform their function without injurious effects upon the concrete. If requested by the TDC, the Contractor shall present a certified statement from a recognized laboratory attesting to this requirement. A "recognized" laboratory is any cement and concrete laboratory accredited by the Cement and Concrete Reference Laboratory (CCRL). The statement shall contain results of compression tests of cylinder specimens made with concrete using the admixture(s) in proportions equal to those proposed by the Contractor. The results of at least five standard 6 inch × 12 inch cylinders of each mix design shall be listed with the results of at least five like-sized cylinders not using the admixture(s). Specimens must be made and cured in the laboratory in accordance with AASHTO T 126 and will be tested in accordance with AASHTO T 22.

- (a) **Air-Entraining Admixtures:** In the event that air entrained concrete is required, an admixture meeting the requirements of AASHTO M 154 may be used. Tests for 7 and 28 day compressive and flexural strengths and resistance to freezing and thawing are required whereas tests for bleeding, bond strength and volume change will not be required.
- (b) **Other Chemical Admixtures:** In the event that concrete properties are specified that require the use of additional admixtures, or the Contractor proposes the use of additional admixtures to facilitate placement, the admixtures shall meet the requirements of AASHTO M194M/M, including the 1 year performance data.

M.03.02—Cast-in-place (CIP) Standard Mix Design Requirements

1. Standard CTDOT Mix Designs: CIP Standard Mix Designs shall be developed in accordance with applicable sections of ACI 211 and ACI 318. The mixtures shall consistently demonstrate the properties listed in Table M.03.02-1. The CIP mixtures shall also be designed to obtain the plastic properties of Portland cement concrete as specified in Table 6.01.03-2.

Table M.03.02-1 Standard Portland and Hydraulic Cement Concrete Performance Criteria

Class ¹	Compressive Strength (psi) @ 28 days AASHTO T 22	Electrical Resistivity (Permeability) kΩ-cm AASHTO T 358
PCC0223Z	2200	NA
PCC0334Z	3300	NA
PCC0336Z	3300	NA
PCC0354Z	3500	NA
PCC0446Z	4400	NA
PCC04462	4400	29 minimum @ 56 days
PCC0556Z	5500	NA
PCC05562	5500	29 minimum @ 56 days
PCCXXX83 ²	XXX00	15 maximum @ 28 days
PCCXXX82	XXX00	29 minimum @ 56 days
¹ PCCXXXYZ where: PCC = Portland Cement Concrete XXX = 28-day minimum compressive strength (psi x 100) Y = Nominal Maximum Aggregate Size (U.S. Sieve No. Designation) Z = Exposure Factor (See Table M.03.02-1a)		
² When this class is paid for in a surface or structural repair concrete item, the plastic properties necessary for confined placement to ensure appropriate workability for consolidation within the forms shall be noted on the delivery ticket by the concrete supplier.		

Table M.03.02-1a Exposure Factor per Application

Exposure	Application
0 Benign	Elements not exposed to weather (buried, enclosed)
1 Moderate	Exposed Elements not in contact with salt water or deicing chemicals
2 Severe	Structural Elements in substantial and consistent contact with salt water, deicing chemicals, flowing/standing water (limited use)
3 Special	Thin Elements repaired with concrete incorporating sacrificial anodes (limited use)

Mix designs shall indicate the dosage of admixtures anticipated to provide plastic properties required in the Project specification. Plastic properties of standard mix classes of concrete in the plastic state are listed in Table 6.01.03-2.

Standard Mix Designs are required to be designed and submitted by the concrete producers and are qualified by the Department on a standing basis. Submittal or re-qualification of these Standard Mix Designs on an annual basis is not required. Previously qualified producer-designed Standard Mixes that have a record of satisfactory performance may be used on Department projects unless there is a change in the gravimetric properties or the sources of any materials. Revisions to the Standard Mix Designs, which

include changes in component sources, can be submitted at any time to the TDC, but must be qualified prior to use on Department projects.

2. Non-Standard CTDOT Mix Designs: Any proposed Mix Designs that do not comply with Table M.03.02-1 are required to be submitted 15 days prior to use on a project-by-project basis and qualified by the TDC prior to use. The use of an approved admixture with an otherwise qualified Standard Mix Design is not considered non-standard.

M.03.03—Producer Equipment and Production Requirements

1. General Requirements: The source of the concrete must be qualified by the Engineer prior to use on Department projects. Specifically, the location and capacity of the central mix or dry batch plant, and complement of truck mixers/haulers, shall be adequate for continuous placement of concrete on a typical Department project. Qualification may be revoked at any time in accordance with 1.06.01.

- (a) **Inspection:** The production facility supplying hydraulic cement concrete must have a current Certification of Ready Mixed Concrete Production Facilities from the National Ready Mixed Concrete Association (NRMCA), or equivalent certification acceptable to the Engineer.
- (b) In addition to the requirements of third party certification, the facility shall produce batch tickets that meet the requirements of 6.01.03-II-3(a) for each delivery to Department projects.
- (c) **Quality Control:** The Contractor is responsible for all aspects of Quality Control (QC). As determined by the Engineer, should material delivered to a project not meet specification, the Contractor may be required to submit to the Engineer a corrective procedure for approval within 3 calendar days. The procedure shall address any minor adjustments or corrections made to the equipment or procedures at the facility.
- (d) **Suspension:** As determined by the Engineer, repeated or frequent delivery of deficient material to a Department project may be grounds for suspension of that source of material. A detailed QC plan that describes all QC policies and procedures for that facility may be required to formally address quality issues. This plan must be demonstrated to the satisfaction of the Engineer and fully implemented, prior to reinstatement of that facility.

2. Hand Mixed Concrete: Hand mixing shall be permitted only with the permission of the Engineer. Hand mixed batches shall not exceed 1/2 c.y. in volume. Hand mixing will not be permitted for concrete to be placed under water.

M.03.04—Curing Materials

1. Water: Any water source deemed acceptable by the Engineer for mixing concrete may be used to provide water for curing purposes. Surface water may be used if classified as Class C or Class D on the Department of Energy and Environmental Protection (DEEP) Water Quality Classification mapping and accommodations have been made to prevent contaminants from entering the supply to the satisfaction of the Engineer. In general, water shall not be taken from shallow or muddy sources. In cases where sources of supply are relatively shallow, the intake pipe shall be enclosed to exclude silt, mud, grass, etc.; and the water in the enclosure shall be maintained at a depth of not less than 2 feet under the intake pipe.

2. Mats: Mats for curing concrete shall be capable of maintaining moisture uniformly on the surface of the concrete. The mats shall not contain any materials such as dyes, sugar, etc., that may be injurious to the concrete.

The length or width of the mats shall be sufficient to cover all concrete surfaces being cured. Should more than one mat be required, sufficient overlap shall be provided by the Contractor as determined by the Engineer.

3. Liquid Membrane-Forming Compound: Liquid membrane-forming compound shall meet the requirements of AASHTO M 148 Type 2, Class B, or shall be a water-soluble linseed oil-based compound meeting the requirements of AASHTO M 148, Type 2.

4. White Polyethylene Sheeting (Film): White polyethylene sheeting (film) shall meet the requirements of AASHTO M 171.

M.03.05—Non Shrink, Non Staining Grout

1. Bagged (pre-mixed): Bagged (pre-mixed) formulations of non-shrink grout shall meet the requirements of ASTM C1107. The grout shall be mixed with potable water for use. The grout shall be mixed to a flowable consistency as determined by ASTM C230. All bagged material shall be clearly marked with the manufacturer's name, date of production, batch number, and written instructions for proper mixing, placement and curing of the product.

2. Bulk: The Contractor may formulate and design a grout mix for use on the Project in lieu of using a pre-bagged product. The Contractor shall obtain prior written approval of the Engineer for any such proposed Mix Design. Any such Mix Design shall include the proportions of hydraulic cement, potable water, fine aggregates, expansive agent, and any other necessary additive or admixture. This material shall meet all of the same chemical and physical requirements as shall the pre-bagged grout, in accordance with ASTM C1107.

M.03.06—Expansive Cement for Anchoring

The premixed anchoring cement shall be non-metallic, concrete gray in color and prepackaged. The mix shall consist of hydraulic cement, fine aggregate, expansive admixtures and water meeting the following requirements:

1. The anchoring cement shall have a minimum 24 hour compressive strength of 2,600 psi when tested in accordance with ASTM C109.

2. The water content of the anchoring cement shall be as recommended by the manufacturer. Water shall meet the requirements of M.03.01-4.

The Contractor shall provide a Certified Test Report and Materials Certificate for the premixed anchoring cement in accordance with 1.06.07 or 1.20-1.06.07. The Contractor shall also provide, when requested by the Engineer, samples of the premixed anchoring cement for testing and approval.

M.03.07—Vacant

M.03.08—Joint Materials

1. Transverse Joints for Concrete Pavement: Transverse joints shall consist of corrosion resistant load transfer devices, poured joint seal and in the case of expansion joints, expansion joint filler, all meeting the following requirements:

- (a) The corrosion resistant load transfer device shall be coated steel or sleeved steel or be made of corrosion resistant material. The dimensions of any devices used shall be as shown on the plans, exclusive of any coating or sleeving. Coated or sleeved metallic devices shall be made of steel that meets or exceeds the requirements of AASHTO M 255 Grade 75. Nonmetallic devices shall meet the strength requirements applicable to metallic devices.
- (b) All load transfer devices shall be galvanized and shall meet the requirements of M.06.01. The use of field applied bond breakers will not be permitted.
- (c) The basis of acceptance for corrosion resistant load transfer devices shall be the submission of Certified Test Reports meeting the requirements of 1.06.07 or 1.20-1.06.07 demonstrating that the load transfer device meets these requirements. The Engineer reserves the right to reject any load transfer device deemed unsatisfactory for use.

2. Longitudinal Joint Devices for Concrete Pavement: The metal used in the fabrication of longitudinal joint devices shall meet ASTM requirements for each type of metal used. The dimensions shall be as shown on the plans.

3. Joint Filler for Concrete Sidewalks and Curbing: Expansion joint filler shall be either preformed expansion joint filler or preformed rubber as indicated on the plans and shall meet the following requirements:

- (a) Preformed expansion joint filler shall be a resilient bituminous cellular type that meets the physical requirements of AASHTO M 213 and the testing requirements of ASTM D545.
- (b) Preformed rubber joint filler shall be semi-rigid, non-extruding, resilient type, closed-cell polypropylene foam meeting the requirements of ASTM D8139.

Dimensions shall be as specified or shown on the plans; and tolerances of plus 1/16 inch thickness, plus 1/8 inch depth and plus 1/4 inch length will be permitted.

4. Expansion Joint Fillers for Bridges and Bridge Bearings:

- (a) Preformed expansion joint filler for bridges shall meet the requirements of AASHTO M 153, Type I or Type II.
- (b) Pre-molded expansion joint filler for bridge bearings shall meet the requirements of AASHTO M 33.

5. Joint Sealants:

- (a) **Joint Sealer for Pavement:** The joint sealer for pavement shall be a rubber compound of the hot-poured type and shall meet the requirements of ASTM D6690 unless otherwise noted on the plans or in the special provisions.
- (b) **Joint Sealer for Structures:** Structure joint sealers shall be one of the following type sealants:

1. Where "Joint Seal" is specified on the plans, it shall meet the requirements of ASTM C920 Type S (Single Component), Grade P (Pourable, Self-leveling), or Grade NS (Non-sag type), Class 50, or other approved single component polyurethane-base elastomeric sealant.

A Certified Test Report will be required in accordance with 1.06.07 or 1.20-1.06.07.

2. Where "Silicone Joint Sealant" is specified on the plans, it shall be one of the following sealants manufactured by the Dow Corning Corporation, or an approved equal:
 - i. DOWSIL 888 Silicone Joint Sealant
 - ii. DOWSIL 890-SL Self-Leveling Silicone Joint Sealant

6. Closed Cell Elastomer: The closed cell elastomer shall meet the requirements of ASTM D1056, Grade 2B2. The elastomer shall have a pressure-sensitive adhesive backing on one side.

The Contractor shall deliver the closed cell elastomer to the job site a minimum of 30 days prior to installation. Prior to the delivery of the closed cell elastomer, the Contractor shall notify the Engineer of the date of shipment and the expected date of delivery. Upon delivery of the closed cell elastomer to the job site, the Contractor shall immediately notify the Engineer.

Each separate length, roll or container shall be clearly tagged or marked with the manufacturer's name, trademark and lot number. A lot is defined as that amount of closed cell elastomer manufactured at 1 time from 1 batch of elastomer. A batch is defined as that amount of elastomer prepared and compounded at 1 time. The Contractor shall furnish a Certified Test Report in accordance with 1.06.07 or 1.20-1.06.07.

If requested by the MESU, the Contractor shall furnish a 1 foot length of closed cell elastomer in each lot for purposes of inspection and testing by the Engineer.

M.03.09—Protective Compound/Sealers

The brand and type of material must be listed on the Department's Qualified Products List and approved by the Engineer for the specified use.

M.03.10—Formwork

1. Stay-in-place Forms: Material for stay-in-place metal forms shall be made of zinc-coated (galvanized) steel sheet meeting ASTM A653 (Structural Steel (SS) Grade 33 through 80). The minimum thickness shall be 20 gauge. Coating weight shall meet the requirements of ASTM A924, Class G235, and shall otherwise meet all requirements relevant to steel stay-in-place metal forms and the placing of concrete as specified herein and as noted in the Contract.

Form supports shall either be fabricated and meet the same material requirements as the forms, or be fabricated from structural steel meeting the requirements of ASTM A36 and shall be hot-dip galvanized in accordance with ASTM A123.

Lightweight filler material for forms shall be as recommended by the form manufacturer.

2. Temporary Forms and Falsework: Forms and Falsework shall be of wood, steel or other material approved by the Engineer. This approval does not relieve the Contractor from employing adequately sized materials of sufficient rigidity to prevent objectionable distortion of the formed concrete surfaces caused by pressure of the plastic concrete and other loads incidental to the construction operations.

**SECTION M.06
METALS**

M.06.01—Reinforcing Steel

M.06.02—Structural Steel and Other Structural Materials

M.06.03—Galvanizing

M.06.04—Filler Metal for Welding

M.06.01—Reinforcing Steel: The materials for this work shall meet the following requirements:

1. Bar Reinforcement: Bar reinforcement shall be deformed and conform to the following:

Uncoated bar reinforcement shall meet the requirements of ASTM A615, Grade 60.

Epoxy coated bar reinforcement shall meet the requirements of ASTM A615, Grade 60 and shall be epoxy coated to the requirements of ASTM A775. All field repairs of the epoxy coating shall meet the requirements of ASTM D3963.

Galvanized bar reinforcement shall meet the requirements of ASTM A615, Grade 60 and be galvanized, after fabrication, to the requirements of ASTM A767, Class 1, including supplemental requirements.

Dowels and tie bars for masonry facing and for granite curbing shall be galvanized, after fabrication, in accordance with ASTM A767, Class 1.

Weldable bar reinforcement shall meet the requirements of ASTM A706.

2. Unit Weights: Listed below are the bar sizes with approximate weights, diameters, areas and perimeters.*

Bar Designation No.**	Nominal Weight lb./ft	Diameter Inches	Cross Sectional Area s.i.	Perimeter inches
3	0.376	0.375	0.11	1.178
4	0.668	0.500	0.20	1.571
5	1.043	0.625	0.31	1.963
6	1.502	0.750	0.44	2.356
7	2.044	0.875	0.60	2.749
8	2.670	1.000	0.79	3.142
9	3.400	1.128	1.00	3.544
10	4.303	1.270	1.27	3.990
11	5.313	1.410	1.56	4.430
14	7.65	1.693	2.25	5.32
18	13.60	2.257	4.00	7.09

* Nominal dimensions of deformed bars are equivalent to those of plain round bars having the same weight (pounds per foot) as deformed bars.

** Bar numbers are based on the number of eighths of an inch included in the nominal diameter of the bars.

3. Wire and Welded Steel Wire Fabric: Wire shall be cold-drawn steel wire meeting the requirements of ASTM A1064 (AASHTO M 32).

Welded steel wire fabric, when used as reinforcement in concrete, shall meet the requirements of ASTM A1064 (AASHTO M 55). The type of welded steel wire fabric shall be approved by the Engineer.

4. Bar Mat Reinforcement: Bar mat, reinforcement shall conform to the requirements of ASTM A184 (AASHTO M 54).

5. Dowel Bar Mechanical Connections: Dowel bar mechanical connections shall develop in tension and compression at least 125% of the specified yield strength of the bar reinforcement being spliced.

Epoxy coated mechanical connectors shall be epoxy coated in accordance with the requirements of ASTM D3963.

Galvanized mechanical connectors shall be galvanized, after fabrication, in accordance with the requirements of ASTM A767, Class 1, including supplemental requirements.

Prior to incorporation into the work, samples of the uncoated, epoxy coated and galvanized dowel bar mechanical connections shall be submitted to the Engineer for destructive testing in accordance with the latest edition of the Materials Testing Manual’s “Minimum Schedule for Acceptance Testing.”

6. Deformed Steel Wire and Welded Deformed Steel Wire Fabric: Deformed steel wire shall be cold-worked, deformed steel wire meeting the requirements of AASHTO M 225 (ASTM A1064). Welded

deformed steel wire fabric, when used as reinforcement in concrete, shall meet the requirements of AASHTO M 221 (ASTM A1064). The type of welded deformed steel wire fabric shall be approved by the Engineer.

7. Reinforcing Steel for Pavement: Reinforcing steel for pavement shall be in accordance with the applicable standard plans.

8. Reports and Certification: Mill test reports and materials certification shall be submitted for all types of reinforcing steel and dowel bar mechanical connections confirming they meet the requirements of the applicable specifications.

Materials Certificates shall be submitted in accordance with 1.06.07 for all types of reinforcing steel and dowel bar mechanical connections.

M.06.02—Structural Steel: Certified Test Reports and Materials Certificates for structural steel shall be submitted in accordance with 1.06.07 or 1.20-1.06.07.

The materials for this work shall meet the following requirements:

1. Structural Steel: Structural steel shall correspond to the designation shown on the plans.

Unless otherwise indicated in the plans or specifications, structural steel for non-bridge related members or components shall meet the requirements of ASTM A709, Grade 36.

All surfaces of steel plates and shapes used in fabrication shall be blast cleaned and visually inspected by the Contractor prior to any fabrication or preparation for fabrication. Blast cleaning shall meet the requirements of SSPC-SP-10-Near White Blast Cleaning.

All steel plates and shapes used in fabrication shall be substantially free from pitting and gouges, regardless of the cause. Substantially free is defined as:

- (a) The measured surface area of all pits and gouges regardless of depth represent less than 1% of the surface area of the plate or shape.
- (b) No pit or gouge greater than 1/32 inch deep.
- (c) No pit or gouge closer than 6 inches from another.

Any repair of plates or shapes shall be performed in accordance with ASTM A6.

2. Anchor Bolts: Unless otherwise designated on the plans, anchor bolts, including suitable nuts and washers, shall meet the following requirements:

- (a) Anchor bolt assemblies shall conform to the requirements of ASTM F1554, and the grade shall be as specified on the plans. All components of the bolt assembly shall be galvanized in accordance with ASTM F2329.
- (b) Certified Test Reports and Material Samples: The Contractor shall submit copies of Certified Test Reports in accordance with 1.06.07 or 1.20-1.06.07. Prior to incorporation into the work, the Contractor shall submit samples of the anchor bolt assemblies to the Engineer for testing in accordance with the latest edition of the Materials Testing Manual's "Minimum Schedule for Acceptance Testing." One (1) sample shall be submitted for each diameter, material designation, grade or coating of anchor bolt assembly.

3. High Strength Bolts: High strength bolts, including suitable nuts and hardened washers, shall meet the following requirements:

- (a) High strength bolts shall meet the requirements of ASTM F3125 Grade A325 or ASTM F3125 Grade A490 as shown on the plans. High-strength bolts used with coated steel shall be mechanically galvanized, unless otherwise specified. High-strength bolts used with uncoated weathering grades of steel shall be Type 3.

Nuts for ASTM F3125 Grade A325 bolts shall meet the requirements of ASTM A563, Grades DH, DH3, C, C3 and D. Where galvanized high-strength bolts are used, the nuts shall be galvanized, heat-treated Grade DH. Where Type 3 high-strength bolts are used, the nuts shall be Grade C3 or DH3.

Nuts for ASTM F3125 Grade A490 bolts shall meet the requirements of ASTM A563, Grade DH. Where Type 3 high-strength bolts are used, the nuts shall be Grade DH3.

All galvanized nuts shall be lubricated with a lubricant containing a visible dye of any color that contrasts with the color of the galvanizing. Black bolts must be oily to the touch when delivered and installed.

Circular flat and square or rectangular beveled, hardened steel washers shall meet the requirements of ASTM F436. Unless otherwise specified, galvanized washers meeting the requirements of ASTM B695, Class 55 shall be furnished when galvanized high-strength bolts are specified. Where Type 3 high-strength bolts are used, the washers shall be galvanized in

accordance with ASTM B695, Class 55 and coated with epoxy.

- (b) Identifying Marks:** ASTM F3125 Grade A325 for bolts and the specifications referenced therein for nuts require that bolts and nuts manufactured to the specification be identified by specific markings on the top of the bolt head and on one face of the nut. Markings shall be raised or depressed at the manufacturer's option and shall be visible after coating if coating is required. Head markings must identify the grade by the symbol "A325," the manufacturer and the type, if Type 3. Nut markings must identify the grade, the manufacturer and if Type 3, the type. Other washer markings must identify the manufacturer and if Type 3, the type.

ASTM F3125 Grade A490 for bolts and the specifications referenced therein for nuts require that bolts and nuts manufactured to the specifications be identified by specific markings on the top of the bolt head and on one face of the nut. Markings shall be raised or depressed at the manufacturer's option and shall be visible after coating if coating is required. Head markings must identify the grade by the symbol "A490" the manufacturer and the type, if Type 3. Nut markings must identify the grade, the manufacturer and if Type 3, the type. Other washer markings must identify the manufacturer and if Type 3, the type.

ASTM F3125 Grade A325 and ASTM F3125 Grade A490 bolt lengths up to 4 times the diameter which are fully threaded but which are not required to be fully threaded by the relevant ASME standard shall be marked with a "T" immediately after the grade designation, for example "A325T." Bolts with any other non-standard dimensions, including thread length, shall be marked with an "S" immediately after the grade designation, for example "A325S." All other markings, if used, such as a private label distributor's mark shall also be separate and distinct.

- (c) Dimensions:** Bolt and nut dimensions shall conform to the requirements for Heavy Hexagon Structural Bolts and for Heavy Semi-Finished Hexagon Nuts given in ASME Standard B18.2.6.
- (d) Galvanized Bolts:** Galvanized bolts shall meet the requirements of ASTM F3125 Grade A325, Type 1. The bolts shall be hot-dip galvanized in accordance with ASTM F2329, to a thickness of 50 µm or mechanically galvanized in accordance with ASTM B695, Class 55. Bolts, nuts, and washers of any assembly shall be galvanized by the same process. The nuts shall be overtapped to the minimum amount required for the fastener assembly, and shall be lubricated with a lubricant containing a visible dye so a visual check can be made for the lubricant at the time of field installation. Galvanized bolts shall be tension tested after galvanizing. ASTM F3125 Grade A490 bolts shall be uncoated or shall be coated in accordance with either ASTM F1136 Grade 3 or ASTM F2833 Grade 1.

- (e) Test Requirements:** The maximum hardness of ASTM F3125 Grade A325 bolts shall be 34 HRC. The maximum hardness of ASTM F3125 Grade A490 bolts shall be 38 HRC.

Plain, ungalvanized nuts shall have a minimum hardness of 89 HRB.

Proof load tests, in accordance with the requirements of ASTM F606 Method 1, shall be required for the bolts. Wedge tests of full-size bolts are required in accordance with Section 10.1 of ASTM F3125. Galvanized bolts shall be wedge tested after galvanizing. Proof load tests of ASTM A563 are required for nuts. Proof load tests for nuts used with galvanized bolts shall be performed after galvanizing, overtapping and lubricating.

Rotational-capacity tests are required and shall be performed on all plain or galvanized (after galvanizing) bolt, nut and washer assemblies by the manufacturer or distributor prior to shipping and by the Contractor at the Site.

The thickness of galvanizing on bolts, nuts and washers shall be measured. On bolts, it shall be measured on the wrench flats or on top of the bolt head, and on nuts it shall be measured on the wrench flats.

- (f) Certified Test Reports and Materials Certificates:** The Contractor shall submit copies of Certified Test Reports and Materials Certificates in accordance with 1.06.07 or 1.20-1.06.07 for fastener assemblies. In addition the Certified Test Reports and Materials Certificates shall include the following:
1. Mill test reports shall indicate the place where the material was melted and manufactured.
 2. Test reports for proof load tests, wedge tests, and rotational-capacity tests shall indicate where the tests were performed, date of tests, location of where the components were manufactured and lot numbers.
 3. The test report for galvanized components shall indicate the thickness of the galvanizing.

- (g) **Material Samples:** Prior to incorporation into the work, the Contractor shall submit samples of the bolt assemblies to the Engineer for testing in accordance with the latest edition of the Materials Testing Manual's "Minimum Schedule for Acceptance Testing." Samples shall be submitted for each diameter, length, material designation, grade, coating and manufacturer of bolt assembly.

4. Welded Stud Shear Connectors:

- (a) **Materials:** Stud shear connectors shall conform to the requirements of ASTM A108, cold-drawn bar, Grades 1015, 1018 or 1020, either semi- or fully-killed. If flux-retaining caps are used, the steel for the caps shall be of a low carbon grade suitable for welding and shall comply with ASTM A109.

Stud shear connectors shall be of a design suitable for electrically end-welding to steel with automatically timed stud welding equipment. The studs shall be of the sizes and dimensions noted on the plans. Flux for welding shall be furnished with each stud, either attached to the end of the stud or combined with the arc shield for automatic application in the welding operation. Each stud shall be furnished with a disposable ferrule of sufficient strength to remain intact during the welding operation and not crumble or break; it shall not be detrimental to the weld or create excessive slag.

Tensile properties, as determined by tests of bar stock after drawing or of finished studs, shall conform to the following requirements in which the yield strength is as determined by the 0.2% offset method:

Tensile strength (min.)	60,000 psi
Yield strength (min.)	50,000 psi
Elongation (min.)	20% in 2 inches
Reduction of area (min.)	50%

- (b) **Test Methods:** Tensile properties shall be determined in accordance with the applicable sections of ASTM A370. Tensile tests of finished studs shall be made on studs welded to test plates using a test fixture similar to that shown in Figure 7.2 of the current AASHTO/AWS D1.5 – Bridge Welding Code. If fracture occurs outside of the middle half of the gauge length, the test shall be repeated.
- (c) **Finish:** Finished studs shall be of uniform quality and condition, free from injurious laps, fins, seams, cracks, twists, bends or other injurious defects. Finish shall be as produced by cold-drawing, cold-rolling or machining.
- (d) **Certified Test Reports and Materials Certificates:** The Contractor shall submit a certified copy of the in-plant quality control test report in conformance with 1.06.07. The Contractor shall submit a Materials Certificate in conformance with 1.06.07 for the welded studs.
- (e) **Sample Materials for Testing:** Prior to incorporation into the work, the Contractor shall submit samples of the stud shear connectors to the Engineer for testing in accordance with Chapter 8 "Minimum Schedule for Acceptance Testing." in the latest edition of the Material Testing Manual's. One (1) sample shall be submitted for each diameter and length of welded stud.

M.06.03—Galvanizing: Unless otherwise specified on the plans or in the special provisions, the zinc coating on all iron and steel materials, other than wire, shall meet the requirements of ASTM A123, A153 or F2329, whichever shall apply.

The use of aerosol galvanizing products is strictly prohibited. This applies to both shop and field touch ups or repairs.

When mechanical galvanizing is used it shall meet the requirements of ASTM B695 Class 55.

M.06.04—Filler Metal for Welding: Unless otherwise shown on the plans or as indicated in the special provisions, fill metal for welding shall conform to the requirements of AWS.

The electrode classification number and other identification references for the proposed electrodes and flux shall be noted on the shop or working drawings.

SECTION 31 10 00 - SITE PREPARATION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Clearing and grubbing.
- B. Tree protection.

1.02 RELATED REQUIREMENTS

- A. Section 02 41 13 - Site Demolition
- B. Section 31 22 00 - Grading
- C. Section 31 25 00 - Soil Erosion and Sediment Control

1.03 QUALITY ASSURANCE

- A. Comply with governing codes and regulations.
- B. Use experienced workmen. Trimming of roots and branches shall be performed by or under the supervision of a licensed arborist.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Clearing and Grubbing - Provide materials necessary for the proper performance of this portion of the Work, including, but not limited to, snow fence, tree wrappings, and burlap.

PART 3 EXECUTION

3.01 PREPARATION

- A. Verify limits of clearing and grubbing with the Engineer prior to proceeding with these operations.
- B. Coordinate disturbance of items affecting traffic or security with Owner and Engineer. Provide Owner and Engineer with minimum two (2) weeks advance notice of such disturbance and provide Owner and Engineer with updates of work affecting traffic and security.
- C. Consult with the Engineer ten (10) days prior to removing or disturbing any tree, shrub, fence, wall, sidewalk, building, structure, roof drain, foundation drain or improvement that may be encountered in the line of the Work, or in the path of an easement.
- D. Delineate working areas to the extent of the easement boundaries in the field with snow fence or as directed by the Engineer. As work progresses, move or remove fence, fill and tamp fence holes, and restore surfaces.
- E. Trees, shrubs, and other landscape features which do not interfere with the Work, or which are designated to be left-in-place, shall be protected from scarring, debarking or other injuries

during construction operations. Snow fence shall be placed around trees, shrubs and other landscape features designated to remain, within the limits of the Work. If, during the prosecution of the Work, the Contractor damages trees or any part thereof, the treatment and restoration of the trees shall be accomplished under the direction of a qualified nurseryman and, before acceptance of the Work, the Contractor shall furnish the Engineer with a certificate from the nurseryman stipulating that the trees have been properly cared for, treated and restored under his direction.

3.02 CLEARING AND GRUBBING

- A. The use of explosives in clearing and grubbing operations is prohibited.
- B. Formulate clearing and grubbing schedules to provide minimum practical exposure of soils. Progress work in a manner that will minimize erosion.
- C. Coordinate tree disturbance within a public right-of-way or easements with the Town Tree Warden. Post trees sufficiently in advance of required disturbance in accordance with State and local laws and ordinances. Coordinate construction activities and the overall project schedule with the posting period.
- D. Clear only that portion of the site which is absolutely necessary and essential for construction in accordance with any approved staging plan. Limit clearing and grubbing to the minimum extent possible to properly install the Work. Do not exceed clearing limits shown on the Drawings, unless otherwise approved by the Engineer.
- E. Cut and dispose of all trees, down timber, shrubs, brush, bushes, snags, debris, and other objectionable matter and materials in a legal manner off site.
- F. Remove stumps under proposed pavements and areas where stumps conflicted with proposed grading. Backfill with common fill. Stump grinding to 6" below final grade is allowed in final vegetated areas when directed by the Engineer.
- G. Leave items affecting traffic, safety, and security in place as long as possible and replaced as soon as possible when such items must be removed.
- H. Remove, store, and protect fences, signs, mailboxes, and other items to be restored or relocated.
- I. Remove, protect, and return items to be removed and returned to Owner.
- J. Remove and dispose of off-site in a legal manner stumps, roots, grass, turf, sod, vegetation, walls, concrete foundations, and slabs, abandoned utilities (pipes, cables, conduits and appurtenances), pipeguards, debris, and other objectionable matter, and materials. Remove all of above to depth at least twelve (12) inches below finish grade and to the extent necessary to not interfere with new construction.
- K. Replace trees damaged by the Contractor within the same season the trees were damaged.

3.03 PROTECTION

- A. Do not disturb trees, shrubs, or other vegetation unless approved by the Engineer.
- B. Protect trees, lawns, and other features remaining as portion of final landscaping.
- C. Protect benchmarks, fences, signs, mailboxes, roads, existing structures, and above or below grade utilities which are to remain.

END OF SECTION

SECTION 31 22 00 - GRADING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Topsoil stripping and stockpiling.
- B. Subsoil stripping and stockpiling.
- C. Natural brook bottom material stripping and stockpiling.
- D. Grade to reshape contours.

1.02 RELATED REQUIREMENTS

- A. Section 01 32 23 - Field Engineering and Surveys
- B. Section 01 78 39 - Project Record Documents
- C. Section 31 10 00 - Site Preparation
- D. Section 31 23 16 - Excavation
- E. Section 31 23 17 - Rock Excavation
- F. Section 31 23 23 - Backfilling
- G. Section 31 25 00 - Soil Erosion and Sediment Control
- H. Section 32 92 00 - Turf Establishment
- I. Section 32 93 00 - Plants

1.03 SUBMITTALS

- A. Certification - Submit copy of "Call Before You Dig, Inc." notification.

1.04 CLOSEOUT SUBMITTALS

- A. Record Documents - Submit in accordance with Section 01 78 39.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Topsoil - As defined in Section 32 92 00.
- B. Subsoil - As defined in Section 31 23 23.
- C. Natural Brook Bottom Material – as defined in Section 31 23 23.

PART 3 EXECUTION

3.01 PREPARATION

- A. Identify required lines, levels, contours, and datum. Coordinate with Section 01 32 23.
- B. Notify "Call Before You Dig, Inc." (1-800-922-4455 or www.cbyd.com).
- C. Owner to identify known below-grade utilities. Contractor to stake and flag locations.
- D. Identify and flag above-grade utilities.

3.02 TOPSOIL STRIPPING

- A. Strip topsoil from areas to be further excavated, landscaped, or graded, and stockpile on site for later use.

3.03 SUBSOIL STRIPPING

- A. Strip subsoil from areas to be landscaped or graded, and stockpile on site for later use.
- B. Cut roots of trees to remain by hand with sharp axe. Apply pruning paint to cut ends of roots that are one (1) inch diameter and larger, otherwise apply wet burlap to prevent them from drying out.

3.04 NATURAL BROOK BOTTOM MATERIAL STRIPPING

- A. Strip natural brook bottom material from areas which are normally below the existing water elevation that are proposed to be disturbed, and stockpile on site for later use.

3.05 STOCKPILES

- A. Maintain stockpiles to heights and slopes while considering safety risks from instability and local land use regulations.

3.06 GRADING

- A. Rough grade area in which subsequent related work is to be performed, and establish lines and grades as shown on the Drawings.
- B. Fine grade working area to lines and grades shown on the Drawings after preceding Work is complete and backfilled.
- C. Conform to Section 31 23 23 where filling is required to establish lines and grades.
- D. Surplus Materials - Conform to Section 31 23 16.

3.07 TOLERANCES

- A. Top Surface of Subgrade - Plus or minus one (1) inch.

3.08 PROTECTION

- A. Protect trees, lawns, and other features remaining as portion of final landscaping.
- B. Protect bench marks, fences, and roads.

- C. Protect above or below grade utilities which are to remain.
- D. Use proper caution when excavating in and around utility service facilities. Machine excavation shall not come within eighteen (18) inches from the designated location of a utility line except for pavement materials when in a roadway. After locating and verifying the location of the utility line utilizing hand tools, the Contractor may proceed with the careful use of power equipment.
- E. Notify utility owner if accidental contact with a known utility or an unknown underground facility is discovered. Protect utility and facilities as directed by utility owner.

END OF SECTION

SECTION 31 23 16 - EXCAVATION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. All excavation except trenching.

1.02 RELATED REQUIREMENTS

- A. Section 31 22 00 - Grading
- B. Section 31 23 17 - Rock Excavation
- C. Section 31 23 19 - Dewatering
- D. Section 31 23 23 - Backfilling
- E. Section 31 25 00 - Soil Erosion and Sediment Control
- F. Section 31 50 00 - Sheeting and Bracing

1.03 MEASUREMENT AND PAYMENT

- A. Compensation for excavating and disposing of excavated material as ordered by the Engineer beyond excavation limits shown on the Drawings or specified shall be at the unit price established in the Bid for ADDITIONAL EXCAVATION (A.O.B.E.). Such compensation shall include all excavating, dewatering, hauling and disposing of material, removal of pavements, sheeting and bracing, and other work necessary and related thereto. Measurement for payment for this item will be the actual volume removed as measured in-place by the Engineer.
- B. No measurement for payment will be made for excavation of earthen material down to subgrade elevations shown on the Drawings.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Subsoil - Comply with Section 31 23 23.

PART 3 EXECUTION

3.01 PREPARATION

- A. Identify required lines, levels, contours, and datum.
- B. Sawcut pavements to be removed as delineated on the Drawings or as directed by the Engineer. Sawcut paved surfaces in neat and straight joint lines with a device approved by the Engineer. Pavements to be removed may be sawcut in advance but shall not be removed until the Work is ready to be installed.
- C. Rough grade to subgrade prior to excavating for structures.

- D. Underpin adjacent structures which may be damaged by excavation work, including service utilities and pipe chases. Repair damage caused by construction operations at no additional cost to Owner or owner of damaged structure, utility or pipe chase, as approved by owner of damaged structure, utility or pipe chase.

3.02 GENERAL

- A. Carry excavations for structures to subgrade as applicable.
- B. Notify Engineer of unexpected subsurface conditions and discontinue affected work in area until notified to resume work. Excavate unstable material, as ordered by Engineer, and replace with a layer of select fill materials as shown on the Drawings, as ordered by the Engineer.
- C. Do not excavate below a two (2) horizontal to one (1) vertical line drawn outward and down from the bottom edge of a footing (footing splay line). Notify the Engineer if in the opinion of the Contractor, such a situation may occur. Provide sheeting and bracing in accordance with Section 31 50 00 as required.
- D. Provide additional excavation and disposal as ordered by the Engineer (A.O.B.E.).
- E. Grade excavation top perimeter to prevent surface water run-off into excavation.
- F. Remove loose and disturbed rock to expose sound intact rock where Drawings call for footing bearing on sound bedrock.
- G. Cut roots of trees to remain by hand with sharp axe. Apply pruning paint to cut root ends that are one (1) inch diameter and larger, otherwise apply wet burlap to prevent from drying out.
- H. Remove and dispose of all surplus excavated materials off-site in a legal manner, unless otherwise directed by the Owner.

3.03 PROTECTION

- A. Protect excavations by shoring, bracing, sheet piling, underpinning or other methods required to prevent cave-in or loose soil from falling into excavation and as required by all applicable local, State, and Federal safety regulations and codes.
- B. Protect bottom of excavations and soil adjacent to and beneath foundations from frost.
- C. Use proper caution when excavating in and around utility service facilities. Machine excavation shall not come within eighteen (18) inches from the designated location of a utility line except for pavement materials when in a roadway. After locating and verifying the location of the utility line utilizing hand tools, the Contractor may proceed with the careful use of power equipment.
- D. Notify utility owner if accidental contact to a known utility or an unknown underground facility is discovered. Protect utility and facilities as directed by utility owner.

END OF SECTION

SECTION 31 23 17 - ROCK EXCAVATION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Rock excavation – no blasting permitted.

1.02 RELATED REQUIREMENTS

- A. Section 31 22 00 - Grading
- B. Section 31 23 16 - Excavation

1.03 MEASUREMENT AND PAYMENT

- A. Decomposed rock, which can be removed by means of a D6 Caterpillar tractor with ripper attachment or a Caterpillar 330 track excavator (or accepted substitution) adequately powered, properly equipped, in good conditions, and properly operated, will not be paid for under this Specification Section, and the cost of removing, hauling and disposing of the decomposed rock shall be included in the lump sum price bid for the Work.
- B. Payment for drilling, wedging, breaking, removing, hauling, and disposing of rock and all other related work will be made at the unit price shown in the Bid for ROCK EXCAVATION. payment shall be for quantities measured in place.
- C. If the rock section excavation is less than the limits shown on the Drawings or specified herein, only the actual excavation as measured by the Engineer will be allowed.
- D. The maximum payment limits of rock at concrete and masonry structures will be measured within vertical surfaces twelve (12) inches outside of the foundations of such structure and from the surface of the rock to a maximum of twelve (12) inches below the required bottom of the structure.
- E. The maximum payment limits of rock in trenches will be measured within vertical surfaces twelve (12) inches outside of the outside wall of the piping, tubing, or electrical conduit and from the surface of the rock to a maximum of eighteen (18) inches below the required invert elevation of the piping, tubing, or conduit.
- F. The maximum payment limits of rock at posts will be measured within vertical surfaces twelve (12) inches outside of the outside face of the posts or foundations of such posts as applicable and from the surface of the rock to a maximum of twelve (12) inches below the required bottom of the posts.
- G. The maximum payment limit for rock excavation beneath vegetated areas and surfaced areas will be from the surface of the rock to two (2) feet below finished grade, unless otherwise shown on the Drawings or directed by the Engineer.
- H. No payment will be made for removal of extra rock, or any other material, when such removal is made necessary by the Contractor's blasting operations or mismanagement. Neither at intersecting trenches nor at any other place will a double allowance be made for excavation, as the cubical contents at such places will be measured and paid for once only.

1.04 DEFINITIONS

- A. "Rock" includes rock in definite ledge formation, severed or fragmented rock that cannot be removed by means of a D6 Caterpillar tractor with ripper attachment for mass rock or Caterpillar 330 track excavator (or accepted substitution) for trench rock, adequately powered, properly equipped, in good condition and properly operated, without continuous drilling, splitting and/or wedging, and boulders or portions thereof of one (1) cubic yard or more in volume.
- B. "Decomposed Rock" (Weathered Rock) includes rock in definite ledge formation, severed or fragmented that can be removed by means of a D6 Caterpillar tractor with ripper attachment for mass rock or Caterpillar 330 track excavator (or accepted substitution) for trench rock, adequately powered, properly equipped, in good condition and properly operated.

PART 2 PRODUCTS

(Not Used)

PART 3 EXECUTION

3.01 GENERAL

- A. Blasting is not permitted in this contract.
- B. Prior to undertaking removal of apparent rock, attempt to remove materials by use of mechanical equipment. Notify the Engineer, who will determine if the material is to be qualified as rock or otherwise.
- C. When rock is encountered, excavate the same as required for the construction of the Work. No projection of rock to remain closer than twelve (12) inches to the lines and grades of any pipe or structure, nor so as to interfere with proper construction. Except where pre-blasting is permitted, before rock is excavated strip it of earth and notify Engineer sufficiently in advance to measure the same; all rock and boulders removed before measurement by Engineer will not be paid for as rock excavation.
- D. In excavations for pipes or structures, if rock is encountered, remove it to twelve (12) inches below the pipe invert, footing, or base slab. Bring the area back to proper subgrade by placing select fill material, as ordered by the Engineer.

3.02 REMOVAL & DISPOSAL

- A. Dispose of all rocks and boulders off site in a legal manner unless otherwise directed by the Owner.

END OF SECTION

SECTION 31 23 19 - DEWATERING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Dewatering operations.

1.02 RELATED REQUIREMENTS

- A. Section 01 57 00 - Temporary Controls
- B. Section 31 10 00 - Site Preparation
- C. Section 31 23 16 - Excavation
- D. Section 31 23 23 - Backfilling
- E. Section 31 25 00 - Soil Erosion and Sediment Control
- F. Section 31 50 00 - Sheeting and Bracing
- G. Section 31 52 00 - Cofferdams

1.03 REGULATORY REQUIREMENTS

- A. Conform to all Federal, state, and local laws, ordinances and permits for the manner in which excavations and trenches are dewatered and water disposed.
- B. Ascertain the complete extent of all permits required governing dewatering operations and be bound by their conditions and provisions.

PART 2 PRODUCTS

2.01 GENERAL

- A. Provide the equipment and materials necessary to perform dewatering operations in accordance with this Specification.

PART 3 EXECUTION

3.01 PERFORMANCE

- A. Dispose of water removed from the trenches or excavations by pumping, bailing, siphoning, well-points, or other means in such a manner so as to avoid interference with business, pedestrian, and vehicular traffic, and to prevent damage to persons or property.
- B. Depress groundwater encountered within the limits of excavation to an elevation not less than six (6) inches below the limits of the excavation bottom before laying pipe or starting concrete work, unless otherwise permitted by Engineer. Maintain this groundwater's depressed elevation until concrete and joint material have attained adequate strength.
- C. Discharge water removed from the excavated areas through pipes, troughs, gutters, or other artificial means to a point of proper disposal.

- D. Filter water removed from trenches and excavations through a sediment removal system, approved by the Engineer, prior to discharging from the Project site.
- E. Remove mud, silt, debris, and other accumulations discharged to catch basins, sumps, ditches, or water courses. Leave catch basins, sumps, ditches, or water courses in a condition similar to that which existed prior to construction operations.
- F. Employ control measures to minimize siltation and erosion in and adjacent to the area of the Work.
- G. Locate dewatering pumps as far as possible from residential structures. House pumps in noise suppression enclosures if used during evening and night hours. Implement additional noise suppression measures to reduce operating noise levels to acceptable levels if the operation noise levels, as determined by the Engineer, are excessive. The acceptable level during the hours from 6 p.m. to 7:30 a.m. shall not exceed an average A-weighted sound pressure level of 60 dBA as measured at fifty (50) feet from the sound source or at the closest exterior wall of the nearest residence, whichever distance is less.
- H. Maintain trenches and excavations free of water, snow, ice, and other liquids.

END OF SECTION

SECTION 31 23 23 - BACKFILLING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Preparation and special requirements for backfilling.
- B. Site backfilling.
- C. Structure backfilling
- D. Riprap.
- E. Natural brook bottom material.
- F. Compaction requirements.
- G. Geotextile.

1.02 RELATED REQUIREMENTS

- A. Section 31 22 00 - Grading
- B. Section 31 23 16 - Excavation

1.03 MEASUREMENT AND PAYMENT

- A. Compensation for ADDITIONAL GRANULAR FILL (A.O.B.E.) shall be at the unit price established in the Bid for that item. Such compensation shall include all necessary dewatering, sheeting and bracing, granular fill, compaction, and all other work necessary and related thereto. Measurement for payment for this item will be in place, by the Engineer, after compaction.
- B. Compensation for ADDITIONAL 3/8" CRUSHED STONE (A.O.B.E.) shall be at the unit price established in the Bid for that item. Such compensation shall include all necessary dewatering, sheeting and bracing, crushed stone, compaction, and all other work necessary and related thereto. Measurement for payment for this item will be in place, by the Engineer, after compaction.
- C. Compensation for ADDITIONAL GEOTEXTILE (A.O.B.E.) shall be at the unit price established in the Bid for that item. Compensation includes dewatering, sheeting and bracing, geotextile and all other work necessary and related thereto. Measurement for payment for this item will be in place as measured by the Engineer, except that there will be no double allowance, as surface coverage will be paid for only once.
- D. No payment will be made for excavation of materials to subgrade elevations or for granular fill, crushed stone, or geotextile that is required by the Drawings or the Technical Specifications other than such Additional Granular Fill, Additional 3/8" Crushed Stone or Additional Geotextile as may be specifically ordered by the Engineer.

1.04 DEFINITIONS

- A. Broken or Crushed Stone - A product resulting from the artificial crushing of rocks, boulders, or large cobblestones, substantially all faces of which have resulted from crushing operations.

It shall consist of sound, tough, durable stone, reasonably free from soft, thin, elongated, laminated, friable, micaceous or disintegrated pieces, mud, dirt, or other deleterious material.

- B. Bank or Crushed Gravel - A product consisting of sound, tough, durable particles of crushed or uncrushed gravel, free from soft, thin elongated or laminated pieces and vegetable or other deleterious material. Crushed gravel shall be the manufactured product resulting from the deliberate mechanical crushing of gravel with at least 50% of the gravel retained on the No. 4 sieve having at least one fractured face.
- C. Reclaimed Miscellaneous Aggregate - A product consisting of sound, tough, durable particles of crushed reclaimed waste. It shall be free of soft disintegrated pieces, mud, dirt, glass, or other injurious materials and contain no more than 2% by weight (mass) of asphalt cement.

1.05 REFERENCE STANDARDS

- A. Standard Specification Sections:
 - 1. Section M.01 Gradation of Aggregate, Article M.01.01.
 - 2. Section M.02 Granular Fill Subbase Granular Base and Surfaces Stone Base Pervious Structure Backfill Free-Draining Material Crusher-Run Stone, Article M.02.06.
- B. ANSI/ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
- C. ANSI/ASTM D1557 - Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³).
- D. ASTM D4355 - Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon Arc Type Apparatus.
- E. ASTM D4491 - Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
- F. ASTM D4533 - Standard Test Method for Trapezoid Tearing Strength of Geotextiles.
- G. ASTM D4632 - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
- H. ASTM D4751 - Standard Test Method for Determining Apparent Opening Size of a Geotextile.
- I. ASTM D6241 - Standard Test Method for Static Puncture Strength of Geotextiles and Geotextile-Related Products Using a 50-mm Probe.
- J. ASTM D6938 - Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
- K. AASHTO T 90 - Standard Method of Test for Determining the Plastic Limit and Plasticity Index of Soils.
- L. AASHTO T 96 - Standard Method of Test for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
- M. AASHTO T 104 - Standard Method of Test for Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate.
- N. AASHTO T 146 - Standard Method of Test for Wet Preparation of Disturbed Soil Samples for Test.
- O. AASHTO T 180, Method D - Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in) Drop.

1.06 SUBMITTALS

- A. Samples - Submit a fifty (50) pound sample of each type of fill material to the testing laboratory in air-tight containers.
- B. Test Reports:
 1. Submit sieve analysis test results for the select fill materials and imported common fill performed in accordance with ASTM C136. Test date shall be within ninety (90) days of submittal date.
 2. Submit abrasion and soundness test results as specified for the select fill materials and plasticity test results as applicable.
 3. Submit field compaction test results performed by an independent testing laboratory.

1.07 QUALITY ASSURANCE

- A. Tests and analyze fill materials in accordance with the Reference Standards.
- B. Reclaimed miscellaneous aggregate material from off-site is not permitted for use.

PART 2 PRODUCTS

2.01 COMMON FILL MATERIALS

- A. Subsoil - Re-used or imported mineral soils, free of constituents of concern, organic and frozen materials, roots, topsoil, loam, trash, snow, ice, wood, and other objectionable materials which may be compressible or which cannot be compacted or specified. Common fill shall not contain stones with a largest dimension greater than ten (10) inches, nor shall have greater than thirty (30) percent by weight passing the No. 200 sieve and shall have the physical properties such that it can be readily placed and compacted as specified during backfilling.
- B. For common fill having greater than ten (10) percent passing the No. 200 sieve, the moisture content at the time of compaction shall not exceed three (3) percent above optimum, as determined by ASTM D1557.
- C. The natural inorganic soils excavated from the site may conform to the specified requirements for common fill. However, remove over-sized stones and render the natural material suitable for optimum compaction by adding water or aerating as required, prior to placing and compacting.
- D. Common fill shall have a maximum dry unit weight, determined by ASTM D1557, of not less than 100 pounds per cubic foot.

2.02 SELECT FILL MATERIALS

- A. Granular Fill
 1. Material shall consist of broken or crushed stone, bank or crushed gravel, reclaimed miscellaneous aggregate, or a mixture thereof.
 2. Gradation shall conform to the following when tested from the supply source and after delivered to the Work site:

<u>Square Mesh Sieves</u>	<u>Percent Passing by Weight</u>
3-1/2"	100
1-1/2"	55-100
1/4"	25-60

#10	15-45
#40	5-25
#100	0-10
#200	0-5

Source: Standard Specifications, Article M.02.06 Grading "A"

3. Plasticity
 - a. When the fraction of the dry sample passing the #100 mesh sieve is greater than four (4) percent and equal or less than eight (8) percent by weight, that fraction shall not have sufficient plasticity to permit the performing of the plastic limit test using AASHTO Method T 90.
 - b. When the fraction of the dry sample passing the #100 mesh sieve is greater than eight (8) percent by weight, the sample will be washed; and the additional material passing the #100 mesh sieve shall be determined by AASHTO Method T 146, except that the #100 mesh sieve will be substituted for the #40 mesh sieve where the latter is specified in AASHTO Method T 146. The combined materials that passed the #100 mesh sieve shall not have sufficient plasticity to permit the performing of the plastic limit test using AASHTO Method T 90.
4. Abrasion - Material shall show less than fifty (50) percent loss on abrasion from the AASHTO T 96 Test.
5. Soundness - Material shall be tested for soundness as directed by the Engineer. The AASHTO T 104 Test shall show less than fifteen (15) percent loss at the end of five (5) cycles for coarse aggregates.

B. Pervious Structure Backfill

1. Material shall consist of broken or crushed stone, bank or crushed gravel, or reclaimed miscellaneous aggregate or a mixture thereof.
2. Gradation shall conform to the following when tested from the supply source and after delivered to the Work site:

<u>Square Mesh Sieves</u>	<u>Percent Passing by Weight</u>
5"	100
3-1/2"	90-100
1-1/2"	55-95
1/4"	25-60
#10	15-45
#40	5-25
#100	0-10
#200	0-5

Source: Standard Specifications, Article M.02.06 Grading "B"

3. Wash the sample when the fraction of the dry sample passing the #100 mesh sieve is greater than eight (8) percent by weight (mass). Add the amount obtained from washing to that obtained by dry sieving, and the total amount passing each sieve shall meet the above gradation.
4. Bank or crushed gravel and reclaimed miscellaneous aggregate shall show less than fifty (50) percent loss on abrasion from the AASHTO T 96 Test.
5. Reclaimed miscellaneous aggregate shall be tested for soundness as directed by the Engineer. The AASHTO T 104 Test shall show less than fifteen (15) percent loss at the end of five (5) cycles.

C. Bagged Stone

1. The crushed stone or gravel shall comply with the gradation requirements of either 2" Crushed Stone or 1-1/2" Crushed Stone or a mixture of both.
2. The bag shall be of durable permeable material sized to contain one (1) cubic foot of the loosely packed granular material and securely tied at the neck with cord or wire.

D. Crushed Stone

1. Material shall be uniform in consistency and only contain clean, hard, tough, durable fragments.
2. Material shall comply with the following gradation when tested from the supply source and after delivered to the Work site:

<u>Square Mesh Sieves</u>	<u>Percent Passing by Weight</u>			
	<u>1 1/4" (No. 4)</u>	<u>3/4" (No. 6)</u>	<u>1/2" (No. 67)</u>	<u>3/8" (No. 8)</u>
2"	100	-	-	
1-1/2"	90-100	-	-	
1"	20-55	100	100	
3/4"	0-15	90-100	90-100	
1/2"	-	20-55	-	100
3/8"	0-5	0-15	20-55	85-100
#4	-	0-5	1-10	10-30
#8	-	-	0-5	0-10
#16	-	-	-	0-5

3. Source: Standard Specifications, Article M.01.02
4. Abrasion - Material shall show less than forty (40) percent loss on abrasion from the AASHTO T 96 Test.
5. Soundness - Material shall be tested for soundness as directed by the Engineer. The AASHTO T 104 Test shall show less than ten (10) percent loss at the end of five (5) cycles for coarse aggregates.

E. Sand

1. Material shall be free of silt, clay, loam, friable or soluble materials and organic matter.
2. Gradation shall conform to the following when tested from the supply source and after delivered to the Work site:

<u>Square Mesh Sieves</u>	<u>Percent Passing by Weight</u>
3/8"	100
#50	30 max.
#200	5 max.

F. Riprap

1. Shall consist of sound, tough, durable, and angular rock, free from decomposed stones or other defects impairing durability. The size of a stone as hereinafter specified shall be its least dimension. Broken concrete or rounded stones are not acceptable. The riprap designation as noted on the Drawings shall comply with the following gradation:

Modified Riprap:

<u>Stone Size</u>	<u>Percent of the weight</u>
10"	0
6" - 10"	20-50

4" - 6"	30-60
2" - 4"	30-40
1" - 2"	10-20
< 1"	0-10

Source: Standard Specifications, Article M.12.02, Modified Riprap

G. Natural Brook Bottom Material

1. Reused or imported sound durable stone consisting of rounded cobbles ranging in size from 1-inch to 6-inches. Imported material shall be clean and free from silt and other material that will discolor water flowing across the material.

2.03 GEOTEXTILE

- A. Nonwoven Geotextile - Polypropylene, stable fiber, needle punched geotextile, GEOTEX® 601 as manufactured by Geotextile Systems by Propex.

<u>Property</u>	<u>Test Method</u>	<u>Minimum Average Roll Value</u>
Grab Tensile Strength	ASTM D4632	160 lbs
Elongation	ASTM D4632	50%
CBR Puncture Strength	ASTM D6241	410 lbs
Trapezoidal Tear	ASTM D4533	60 lbs
UV Resistance @ 500 hrs	ASTM D4355	70%
Apparent Opening Size	ASTM D4751	70 US Sieve (max)
Permittivity	ASTM D4491	1.3 sec ⁻¹
Flow Rate	ASTM D4491	110 gal/ft ² /min

PART 3 EXECUTION

3.01 VERIFICATION OF CONDITIONS

- A. Verify stockpiled fill to be reused is approved.
- B. Verify areas to be backfilled are free of debris, snow, ice, and water, and that the ground surfaces are not frozen.

3.02 PREPARATION

- A. Compact subgrade surfaces to density requirements for backfill material.
- B. Do not disturb bottom of excavation for footings and foundations.
- C. Excavate by hand to final subgrade just before concrete reinforcement and formwork is placed. Trim bottoms to required lines and grades to leave solid base for other work.
- D. Test subgrade with a ten (10) ton vibratory roller or loaded dump truck (72,000 lb. GVW min.). The subgrade will be considered soft if subgrade moves, weaves, or quakes during the test.
- E. Unless otherwise indicated, cut out soft areas of subgrade that are not readily capable of in-situ compaction A.O.B.E. Backfill with additional granular fill, A.O.B.E. or additional crushed stone, A.O.B.E., as ordered by Engineer and compact to density equal to requirements for subsequent backfill material.

- F. Obtain Engineer's approval of subgrade prior to backfilling.
- G. Backfill unsuitable material excavations as ordered by the Engineer.
- H. Backfill materials shall be placed on approved subgrade that is free of water and has been re-compacted.
- I. Large stones (in excess of the greatest principal dimension defined for Common Fill Materials) may be used for backfill if approved by the Engineer. However, large stones shall not be placed in nests, but shall be distributed over the area.
- J. Provide respective utility representatives an opportunity to inspect all uncovered facilities. Coordinate the repair of damaged utilities prior to backfilling.

3.03 BACKFILLING

- A. Backfill areas to contours and elevations. Use unfrozen materials.
- B. Load, haul and place common fill material from on-site or off-site as required to meet final grades.
- C. Do not backfill against new concrete walls until the concrete has cured for the following periods:
 1. 7 Days - When backfill can be placed on both sides of walls so that the maximum differential in height of backfill does not exceed two feet.
 2. 14 Days - When backfill is placed on one side of wall only. Adequately brace wall as required.
 3. Should the results of concrete cylinder compressive testing reveal that concrete compressive strength has been achieved sooner than the time periods indicated above, backfilling can then commence. Be responsible for additional compressive testing specimens and early testing.
- D. Begin compaction of backfill at walls and work away from walls. Use hand guided power compaction equipment within five (5) feet of walls.
- E. Backfill systematically, as early as possible, to allow maximum time for natural settlement. Do not backfill over porous, wet, or spongy subgrade surfaces.
- F. Place and compact select fill materials in continuous layers not exceeding eight (10) inches (loose depth) in open areas, and eight (8) inches (loose depth) in areas where compacted by hand guided vibratory equipment, except as noted. Compact each individual layer uniformly to obtain the required minimum density of not less than 95% of the dry density achieved by the AASHTO T 180, Method D Test.
- G. Place and compact common fill material in continuous layers not exceeding twelve (12) inches loose depth.
- H. Employ a placement method so not to disturb or damage piping, foundation dampproofing, and utilities in trenches.
- I. Maintain optimum moisture content of backfill materials to attain required compaction density.
- J. Make changes in grade gradual. Blend slopes into level areas.
- K. Dispose of surplus backfill materials as specified in Section 31 23 16.
- L. Leave stockpile areas completely free of excess fill material.

M. Pervious Structure Backfill.

1. Place above a plane extending on a 1.5 horizontal to 1 vertical slope from the upper edge of the footing, or bottom edge of culvert barrel, to the top of the embankment, or as shown on the Drawings. Increase or decrease the amount of pervious structure backfill where the face of undisturbed material is above or beneath this slope plane as directed by the Engineer.
2. Place against undisturbed material or against compacted embankments having a length in a direction at right angles to the abutment wall or culvert not less than twice the height of the structure against which the fill is placed.
3. Plow deeply or cut steps into the slope of the embankment on which the pervious structure backfill is to be placed before and during placing so both types of material will be thoroughly bonded and compacted.
4. Spread each layer of pervious structure backfill to a thickness not exceeding six (6) inches in depth after compaction. Thoroughly compact using power rollers or other motorized vehicular equipment, by tamping with mechanical rammers or vibrators, by pneumatic tampers, or as directed by the Engineer. Any equipment not principally manufactured for compaction purposes and equipment which is not in proper working order in all respects shall not be used.
5. Special attention shall be given to compaction in places close to walls where motorized vehicular equipment cannot reach. Within three (3) feet of the back face of walls and within a greater distance at angle points of walls, compact each layer of pervious structure backfill by mechanical rammers, vibrators, or pneumatic tampers.
6. The dry density of each layer of pervious structure backfill formed from broken or crushed stone, broken or crushed gravel or reclaimed miscellaneous aggregate free of bituminous concrete shall have a dry density after compaction that is no less than 95% of the dry density for that material when tested in accordance with AASHTO T 180, Method D.
7. If a layer formed from reclaimed miscellaneous aggregate containing bituminous concrete is placed as pervious structure backfill, the wet density of this layer after compaction shall not be less than 95% of the wet density for that material when tested in accordance with AASHTO T 180, Method D. In this test, material retained on the 3/4-inch sieve shall be replaced with material retained on the No. 4 sieve, as noted as an option in the specifications for this test.
8. Compact each layer of the pervious structure backfill at optimum moisture content. No subsequent layer shall be placed until the specified compaction is obtained for the previous layer.

N. Bagged Stone - Place bagged stone around the inlet end of each weep hole, to prevent movement of the pervious material into the weep hole. Stack the filled bags at the weep holes to the dimensions shown on the Drawings or as directed by the Engineer. The bags shall be unbroken at the time the pervious material is placed around them. Replace bags which are broken or burst prior to or during the placing of the pervious material.

O. Riprap

1. Place riprap in the locations, lines and grades, and to the thicknesses shown on the Drawings or as directed by the Engineer.
2. Accurately shape the area to be protected by riprap prior to placing of any bedding material or riprap.
3. Place geotextile on surface and sides of area shaped for riprap. Stake as required to hold geotextile fabric in place for backfilling.
4. Where bedding material is called for, it shall be placed on the prepared area and compacted to the depth, lines, and grades indicated on the Drawings.
5. Place riprap to its full course thickness in one operation to produce a well-graded mass of rock without causing displacement or damage of the underlying material.

6. The finished surface shall be free from pockets of small stones and clusters of large stones. Placing of material by methods likely to cause segregation of the various sizes of stone will not be permitted. Rearrange individual stones mechanically or by hand to obtain a well-graded distribution of stone sizes.

P. Natural Brook Bottom Material - Spread material to the designated thickness. Shape to create the appearance of a natural brook bottom and low flow channel, if a low flow channel is required. Consult with Engineer on the appearance and shaping.

3.04 GEOTEXTILE

A. Follow manufacturer's directions.

B. Maintain integrity of wrapping, core and label until application by elevating off the ground on dunnage and covering to protect from ultraviolet radiation.

C. Place on prepared subgrade by rolling out flat and tight, with no wrinkles or folds, in the direction of travel.

D. Adjacent rolls should be overlapped along their sides and ends with a 24-inch overlap.

E. Hold material in place using pins, granular fill, staples, or sandbags so that it does not move during fill placement.

F. Track vehicles should not be driven on material.

G. Place granular fill or crushed stone in 8 to 12-inch loose lifts. A minimum thickness of 6-inches is required prior to operation of tracked vehicles.

H. When spreading material, turning of tracked vehicles should be kept to a minimum to prevent tracks from displacing fill and damaging material.

3.05 TOLERANCES

A. Top Surface of Backfilling - Plus or minus one (1) inch.

3.06 FIELD QUALITY CONTROL

A. Compaction tests on in-place materials shall be performed in accordance with ATSM D6938 or ASTM D1556.

B. Testing locations shall be established using ASTM D3665. Linear projects shall incorporate stratified random sampling methods.

C. The Owner may employ a laboratory for acceptance testing of backfill materials and compaction. Such testing does not relieve the Contractor of responsibility for quality control for the Work and delivering the Work in compliance with specification requirements.

D. Cooperate with and provide access to the Work for the testing laboratory.

E. Should testing of a material fail to meet the specification requirements, resolve the problem as appropriate. Reimburse the Owner for all testing charges incurred by the Owner after the second failure if repeated failures occur in the same material or the same lift.

3.07 SCHEDULE OF LOCATIONS AND BACKFILL REQUIREMENTS

A. The paragraphs below identify location, fill material to be used compacted thickness of each fill, and compaction expressed as a percentage of maximum density and optimum moisture in comparison with ANSI/ASTM D1557.

1. Common Fill

Fill under pavement (including but not necessarily limited to bituminous, concrete, brick, stone or other masonry paved surfaces): Compact to no less than 95% with a minimum of one (1) compaction test performed on each vertical lift per 6,000 square feet of fill or portion thereof.

Fill under vegetated areas: Compact to no less than 90%.

2. Granular Fill – Compact to no less than 95% with a minimum of one (1) compaction test performed on each vertical lift per 500 linear feet of fill or portion thereof.

3. Crushed Stone – Firmly compact crushed stone with multiple passes of a vibratory roller or vibratory plate compactor.

4. Pervious Structure Backfill at culvert and wingwalls – Compact to no less than 95% with a minimum of two (2) compaction tests performed on each vertical lift per each side of structure.

END OF SECTION

SECTION 31 25 00 - SOIL EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Geotextile silt fence.
- B. Temporary mulching.
- C. Sedimentation control at drainage structures.
- D. Filter Bag for dewatering pump discharge.
- E. Erosion control blanket.
- F. Other methods and measures required to control soil erosion and sedimentation on a continuous basis throughout the course of the Work.

1.02 RELATED REQUIREMENTS

- A. Section 01 57 00 - Temporary Controls
- B. Section 31 10 00 - Site Preparation
- C. Section 31 22 00 - Grading
- D. Section 31 23 16 - Excavation
- E. Section 31 23 19 - Dewatering
- F. Section 31 23 23 - Backfilling
- G. Section 31 52 00 - Cofferdams
- H. Section 32 92 00 - Turf Establishment
- I. Section 32 93 00 - Plants

1.03 SUBMITTALS

- A. Certifications that materials proposed for use meet the requirements of this specification, unless otherwise approved by the Engineer.

1.04 QUALITY ASSURANCE

- A. Parts 2 and 3 of this specification and the Contract Drawings set forth the minimum requirements for soil erosion and sediment control and do not include all methods and measures that may be required to control soil erosion and to prevent sediment from entering wetlands, water bodies and watercourses. It is the Contractor's responsibility to employ such additional methods and measures as may be necessary to fully comply with the guidelines and recommendations set forth in the "Connecticut Guidelines for Soil Erosion and Sediment Control", the Connecticut Council on Soil and Water Conservation, 2002, latest edition.

- B. Maintain a copy of the "Connecticut Guidelines for Soil Erosion and Sediment Control" on the Project site for continuous reference thereto.

1.05 REFERENCE STANDARDS

- A. ASTM D3776 - Standard Test Methods for Mass Per Unit Area (Weight) of Fabric
- B. ASTM D3786 - Standard Test Method for Bursting Strength of Textile Fabrics—Diaphragm Bursting Strength Tester Method
- C. ASTM D4355 - Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon Arc Type Apparatus
- D. ASTM D4491 - Standard Test Methods for Water Permeability of Geotextiles by Permittivity
- E. ASTM D4533 - Standard Test Method for Trapezoid Tearing Strength of Geotextiles
- F. ASTM D4632 - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles
- G. ASTM D4751 - Standard Test Method for Determining Apparent Opening Size of a Geotextile
- H. ASTM D4833 - Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products
- I. ASTM D4884 - Standard Test Method for Strength of Sewn or Bonded Seams of Geotextiles
- J. ASTM D5141 - Standard Test Method for Determining Filtering Efficiency and Flow Rate of the Filtration Component of a Sediment Retention Device

PART 2 PRODUCTS

2.01 MATERIALS

- A. Geotextile Silt Fence - Pervious sheet of polypropylene, nylon, polyester, ethylene, or similar filaments. The geotextile shall be non-rotting, acid and alkali resistant, and have sufficient strength and permeability for the purpose intended. Filaments in the geotextile shall be resistant to absorption. The filament network must be dimensionally stable and resistant to delamination. The geotextile shall be free of any chemical treatment or coating which will reduce the permeability. The geotextile shall be free of any flaws or defects which will alter its physical properties. Torn or punctured geotextiles shall not be used. The geotextile shall be certified by the manufacturer, or supplier, as conforming to the following requirements:

<u>Property</u>	<u>Test Method</u>	<u>Minimum Average Roll Value</u>
Filtering Efficiency	ASTM D5141	75% (min)
Grab Tensile Strength	ASTM D4632	100 lbs
Puncture Strength	ASTM D4833	50 lbs
Mullen Burst	ASTM D3786	250 psi
UV Resistance @ 500 hrs	ASTM D4355	70%
Apparent Opening Size	ASTM D4751	0.60 - 0.90 mm (max.)
Permittivity	ASTM D4491	0.05 sec ⁻¹
Flow Rate	ASTM D4491	10 gal/ft ² /min

B. Temporary Mulching - Hay, salt hay, straw, manufactured cellulose fiber or wood pulp mulch as set forth in the "Connecticut Guidelines for Soil Erosion and Sediment Control" as approved by Engineer.

C. Sedimentation Control at Drainage Structures - Catch basin insert shall be Siltsack as manufactured by ACF Environmental. "Regular Flow" model unless Drawings specify "High Flow" model. Siltsack shall be manufactured to fit the grate dimensions.

1. Regular Flow:

<u>Property</u>	<u>Test Method</u>	<u>Minimum Average Roll Value</u>
Grab Tensile Strength	ASTM D4632	167 x 345 lbs
Grab Tensile Elongation	ASTM D4632	10 x 15%
CBR Puncture Strength	ASTM D6241	900 lbs
Trapezoidal Tear	ASTM D4533	65 x 90 lbs
UV Resistance @ 500 hrs	ASTM D4355	96%
Apparent Opening Size	ASTM D4751	30 Sieve (max.)
Flow Rate	ASTM D4491	66.2 gal/ft ² /min
Permittivity	ASTM D4491	0.862 sec ⁻¹

D. Filter Bag for Dewatering Pump Discharge

1. Dirtbag[®] as manufactured by ACF Environmental. The filter bag shall be manufactured using a polypropylene nonwoven geotextile sewn into a bag with a double needle matching using a high strength thread.

2. The filter bag shall have a spout large enough to accommodate a four (4) inch discharge hose.
3. The discharge hose shall be secured with straps which shall secure the hose and prevent pumped water from escaping without being filtered. The filter bag seams shall conform to the following ASTM test methods:

<u>Property</u>	<u>Test Method</u>	<u>Minimum Average Roll Value</u>
Seam Wide Width Strength	ASTM D4884	100 lbs/in
Weight	ASTM D3776	8 oz/yd ²
Grab Tensile Strength	ASTM D4632	205 lbs
Grab Tensile Elongation	ASTM D4632	15%
Puncture Strength	ASTM D4833	110 lbs
Mullen Burst	ASTM D3786	350 psi
Trapezoidal Tear	ASTM D4533	125 x 115 lbs
UV Resistance @ 500 hrs	ASTM D4355	70%
Apparent Opening Size	ASTM D4751	US 80 Sieve
Permittivity	ASTM D4491	1.5 sec ⁻¹
Flow Rate	ASTM D4491	100 gpm/ft ² /min

- E. Erosion Control Blanket – North American Green BioNet S75BN, or other blanket made of 100% biodegradable plant-based netting material of jute, sisal or coir fiber.
- F. Crushed Stone - Comply with Section 31 23 23 for the stone size shown on the Drawings.
- G. Non-woven Geotextile - Comply with Section 31 23 23.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Comply with Erosion and Sedimentation Control Notes and Details on the Drawings.
- B. Dispose of all retained sediment or off-site in a legal manner or in a stable upland area as approved by the Engineer.
- C. Install, maintain, replace, relocate, and remove specified materials in accordance with the manufacturer’s written instructions and details or as shown on Drawings.

END OF SECTION

SECTION 31 50 00 - SHEETING AND BRACING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Furnishing, installing, maintaining, and removing of all Sheeting and Bracing.

1.02 RELATED REQUIREMENTS

- A. Section 31 23 16 - Excavation
- B. Section 31 23 19 - Dewatering
- C. Section 31 23 23 - Backfilling
- D. Section 31 25 00 - Soil Erosion and Sediment Control
- E. Section 31 52 00 - Cofferdams

1.03 SUBMITTALS

- A. Certifications - Submit as required under Paragraphs 1.04.D and 1.04.E herein.
- B. Delegated Design Submittal
 1. Submit computations and substantiating data for sheeting and bracing, upon Engineer's request.
 2. Submit at least thirty (30) calendar days prior to constructing or installing sheeting and bracing.
 3. Computations and substantiating data shall be prepared by a civil or structural professional engineer that is both licensed in the state in which the Project is located and responsible for checking and approving the design and construction of the sheeting and bracing. Substantiating data shall include:
 - a. An outline plan showing the lines on which it is proposed to drive sheeting;
 - b. Bracing methods to support the loads imposed on the sheeting;
 - c. Bracing and sheeting material documentation;
 - d. Written directions of the order of installation and removal of the sheeting and bracing in relation to excavation, backfill and fill.
 4. The submitted computations and substantiating data is for informational purposes only. The Engineer or Owner may comment on the adequacy of such computations, data, or plans. The submittal of computations and substantiation data, and the review comments or lack thereof from the Engineer or Owner, shall not serve to relieve the Contractor's sole responsibility for the safety of the Work, success of the sheeting and bracing, or successful completion of the Work.
- C. Pre-Driving Requirements - Submit documents (including but not limited to pre-driving survey, pre-driving photographs and/or video recordings, and existing condition and water quality of wells) obtained and developed from complying with the Pre-Driving Requirements under Article 3.01 of this Specification.

1.04 QUALITY ASSURANCE

- A. Furnish and install tightly sealed sheeting and/or bracing: to comply with the applicable Federal and State Safety Codes and OSHA Regulations; to permit successful dewatering; to

accommodate traffic; to permit access to adjacent occupied properties; to protect adjacent buildings, pavements, structures, and all existing utilities; to provide an opening of proper depth and width in which to install the proposed pipes and other underground structures; and to protect workmen, employees of the Owner, Engineer, State, and County, and the public from death or injury from bank failure, earth collapse, or earth movement of any nature whatsoever.

- B. Be entirely and solely responsible for the adequacy and sufficiency of supports, sheeting, bracing, shoring, underpinning, cofferdamming, and components facilitating structural stability and safety. Assume responsibility for damages on account of injury to persons or damage to adjacent pavements and public and private property (including but not limited to, the Work under construction, existing buildings, underground pipes, conduits, and structures, and other aboveground and underground facilities) which injury or damage results directly from Contractor's failure to install or to leave in place adequate and sufficient supports, sheeting, bracing, underpinning, cofferdamming, and components facilitating structural stability and safety.
- C. Design sheeting and bracing safely, carry to adequate depths, and brace as necessary for proper performance of the Work. Construct to permit the required excavation. Provide interior dimensions to give sufficient clearance for construction of forms and their inspection. Correct movements of sheeting or bracing which prevent the proper completion of substructure. No part of sheeting or bracing shall be allowed to extend into the substructure without written permission of the Engineer.
- D. For excavations over five (5) feet deep or when the excavations or the sheeting method is outside the scope of governmental agencies having jurisdiction, certify to the Engineer that the sheeting and bracing design has been checked and approved as adequate and in accordance with existing laws and regulations, by a civil or structural licensed professional engineer, licensed in the state in which the Project is located, experienced in design of sheeting and bracing, and that the sheeting and bracing has been constructed in accordance with the design which was checked and approved by said engineer. A certification for design shall be submitted prior to placing any sheeting and bracing and a certification for construction shall be submitted immediately after sheeting and bracing has been constructed.
- E. Where relocation of bracing is required to permit the installation of work by the various trades, such relocation shall be approved by a civil or structural licensed professional engineer, licensed in the state in which the Project is located, responsible for checking and approving the design of the sheeting and bracing prior to such relocation, and certification of such approval shall be submitted to the Engineer.
- F. Provide necessary, required decking, guards, fences, planking and the like to maintain safe pedestrian and vehicular traffic. Within public highway rights-of-way, perform work, provide protection in manner approved by governmental agencies having jurisdiction.
- G. Do not prune or trim trees to facilitate installation of sheeting and bracing without obtaining written permission from the trees' owner(s). Adjust the sheeting and bracing to avoid damaging the trees when written permission is not obtained from the trees' owner(s). Any adjustments should be reflected in revised computations and substantiating data.

PART 2 PRODUCTS

2.01 MATERIALS

- A. As selected by the Contractor and shall be in conformance with the requirements of the applicable Safety Codes and ASTM Standards.

PART 3 EXECUTION

3.01 PRE-DRIVING REQUIREMENTS

- A. Prior to the commencement of driving or removal of sheet piling, arrange a meeting at the Project site with Engineer and representatives of any interested agencies and utilities with interests related to the method, manner, and procedure of driving and removing of all types of sheet piling, including soldier piles.
- B. Locate structures, underground utilities, and properties in the vicinity of the Project site and verify that the driving or removal of sheet piling will not disturb them.
- C. Notify all owners of structures and underground utilities, and other persons that own or reside in nearby properties that might be affected of the intention to drive or remove sheet piling, including soldier piles. Notice shall be provided sufficiently in advance to enable the agencies, companies, and persons and the Contractor to take such steps as may be necessary to protect life and property.
- D. Conduct pre-driving survey and obtain pre-driving photographs and/or video recordings taken within and adjoining the limits of the Work, including adjacent private residences within five-hundred (500) feet of the proposed driving area, prior to commencing sheet piling driving or removal operations. Document existing conditions including, but not limited to, such items as driveways, walks, curbs, foundation walls, building walls, windows, wells, swimming pools, and other similar items. Provide to the Engineer one annotated set of color digital copies of the images and/or recordings stamped with date and time.
- E. Determine the locations of structures and underground utilities, and verify that driving operations will not disturb them. Notify each public utility or others having structures in proximity to the site, and others who may be affected, of intention to use explosives. Give such notice sufficiently in advance to enable the involved agencies/companies/persons and the Contractor to take such steps as may be necessary to protect life and property. Such notice will not in any way relieve the Contractor of responsibility for any damage resulting from his driving operations.
- F. Document the existing condition and water quality of wells that may be affected by the driving or removal of sheet piling where owner of such wells permit. Where permission to document is denied, obtain such information as may be available on the wells from the firm that drilled the wells and/or the Local Department of Health, the Connecticut Department of Energy and Environmental Protection, or the Connecticut Well Drilling Board.

3.02 PERFORMANCE

- A. Prevent damage to adjacent structures from excessive vibration during driving operations. The maximum allowable peak particle velocity measured by seismograph at the closest structures shall be 2.0 inches per second. Monitor pile driving operations with seismograph equipment placed at nearby structures as directed by the Engineer.

- B. Drive sheeting plumb at least twelve (12) inches below the proposed work and to such deeper depths as may be required for safety and protection of the Work. Drive sheeting to the full depth before excavation is started where necessary.
- C. Sheeting may be left in-place at the option of the Contractor, to serve the Contractor's own interest; to protect existing facilities, the Work built, or to be built under this Contract; or for the safety of the public, etc., at no cost to the Owner. Sheeting left in place with the approval of the Engineer shall be cut off at an elevation as directed by the Engineer, and the cut-offs removed from the site and disposed of, at no cost to the Owner. It is expressly understood and agreed that removing or leaving in-place the sheeting and bracing shall not relieve the Contractor from any responsibility for any loss or damage whatever due to omission of or failure of said sheeting and bracing.
- D. Pull out sheeting if it is to be removed. Do not continuously vibrate sheeting out.
- E. Backfill and compact simultaneously with withdrawal of sheeting and as each layer is compacted. Fill and compact voids left by the removed sheeting. Disturbance to and loss of compaction density of the backfill is not permitted. Backfilling shall comply with Section 31 23 23 for excavations.
- F. Be responsible for and remedy all damages to persons and public and private properties caused by driving and removal of sheeting.

END OF SECTION

SECTION 31 52 00 - COFFERDAMS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Furnishing, installing, maintaining, and removing of a temporary cofferdam.

1.02 RELATED REQUIREMENTS

- A. Section 31 23 16 - Excavation
- B. Section 31 23 19 - Dewatering
- C. Section 31 23 23 - Backfilling
- D. Section 31 25 00 - Soil Erosion and Sediment Control
- E. Section 31 50 00 - Sheet piling and Bracing

1.03 SUBMITTALS

- A. Certifications - Submit as required under Paragraphs 1.04.D and 1.04.E in Section 31 50 00.

- B. Delegated Design Submittal

1. Submit computations and substantiating data for the cofferdam, upon Engineer's request.
2. Submit at least thirty (30) calendar days prior to the start of constructing or installing a cofferdam.
3. Computations and substantiating data shall be prepared by a civil or structural professional engineer that is both licensed in the state in which the Project is located and responsible for checking and approving the design and construction of the cofferdam. Substantiating data shall include:
 - a. An outline plan showing the lines on which it is proposed to locate the cofferdam.
 - b. Bracing methods, as required, to support the loads imposed on the cofferdam.
 - c. Material documentation for all cofferdam components.
 - d. Written directions of the order of installation and removal of the cofferdam in relation to dewatering, excavation, and backfilling.
4. The submitted computations and substantiating data is for informational purposes only. The Engineer or Owner may comment on the adequacy of such computations, data, or plans. The submittal of computations and substantiation data, and the review comments or lack thereof from the Engineer or Owner, shall not serve to relieve the Contractor's sole responsibility for the safety of the Work, success of the cofferdam, or successful completion of the Work.

- C. Pre-Driving Requirements - Comply with Section 31 50 00.

1.04 QUALITY ASSURANCE

- A. Comply with 31 50 00.

PART 2 PRODUCTS

2.01 MATERIALS

- A. As selected by the Contractor and shall be in conformance with the requirements of the applicable Safety Codes and ASTM Standards.

PART 3 EXECUTION

3.01 PRE-DRIVING REQUIREMENTS

- A. Comply with Section 31 50 00.

3.02 PERFORMANCE

- A. Comply with Section 31 50 00.
- B. Construct cofferdam such that the work can be safely carried to an elevation two (2) feet lower than the lowest elevation shown on the Drawings for required excavation within the cofferdam.
- C. The interior dimensions of the cofferdams shall be sufficient for the unobstructed and satisfactory completion of all necessary substructure work, such as pile driving, form building, inspection, and pumping.
- D. Cofferdams which become tilted or displaced prior to the completion of all work to be done within them, shall be righted, reset, or enlarged as may be necessary to provide the clearance for the unobstructed performance of all necessary work, and such corrections and adjustments of cofferdams shall be at the sole expense of the Contractor.
- E. Cofferdams shall be completely dewatered as required to complete the work entirely in the dry.
- F. Cofferdams must be constructed to protect uncured masonry and concrete against damage from a sudden rising of the water and prevent damage to structure foundations by erosion. No part of the cofferdam which extends into the substructure may be left in place without written permission from the Engineer.

3.03 DEWATERING

- A. Comply with Section 31 23 19.
- B. Pumping from the interior of any cofferdam shall be done in such a manner as to preclude the possibility of water moving through uncured masonry or concrete.
- C. During the placement of concrete or masonry, and for at least 24 hours thereafter, any pumping shall be done from a suitable sump located outside the horizontal limits and below the elevation of the work being placed or as directed by the Engineer.
- D. When conditions require underwater concrete, pumping to dewater a cofferdam shall not start until any underwater concrete has sufficiently set to withstand the hydrostatic pressure created by pumping.

3.04 REMOVAL

- A. Unless otherwise shown on the Drawings or directed by the Engineer, remove all parts of the cofferdam after completion of the required work.

- B. Do not disturb or otherwise damage any permanent construction.
- C. Sheet piling used in constructing a cofferdam may be left in-place for the Contractor's convenience with the approval of the Engineer, provided the sheeting is cut off at elevations approved in advance by the Engineer, and the cut off portions are removed from the site.

END OF SECTION

SECTION 32 05 00 - RESTORATION OF SURFACES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Requirements for completion and proper restoration of all surfaces damaged or disturbed under this Contract.

1.02 RELATED REQUIREMENTS

- A. Section 31 22 00 - Grading
- B. Section 31 23 16 - Excavation
- C. Section 31 23 23 - Backfilling
- D. Section 31 25 00 - Soil Erosion and Sediment Control
- E. Section 32 11 00 - Base Courses
- F. Section 32 12 00 - Flexible Paving
- G. Section 32 92 00 - Turf Establishment

1.03 QUALITY ASSURANCE

- A. Restore grades and surfaces to be equal or better than the conditions prior to being damaged or disturbed, except as otherwise specified or shown on the Drawings.
- B. Restore surfaces under the jurisdiction of public authorities or public utilities in accordance with the requirements of such authorities. Ascertain such requirements to procure necessary permits and inspections and pay required fees, deposits, and other charges.

PART 2 PRODUCTS

(Not Used)

PART 3 EXECUTION

3.01 GENERAL

- A. Reinstall, replace, and construct items removed, damaged, destroyed, or displaced.
- B. Replace items to their original locations or as designated on the Drawings.
- C. Replace items removed during construction operations as soon as possible with special attention directed at those which control traffic, protect property and lives, are essential to a person's livelihood, create hazards when not in place, or are otherwise deemed essential.
- D. Restore surfaces as soon as possible to cause the least amount of inconvenience to the public, to protect lives, to ensure safety, to avoid property damage, to provide for orderly and safe traffic conditions, and to provide an aesthetically pleasing construction site.

- E. Replace pavements as specified in Sections 32 11 00 and 32 12 00.
- F. Rough grade areas to be seeded or planted within 48 hours after installation of the Work. Finish grade within two (2) weeks after installation of the Work, topsoil within three (3) weeks after installation of the Work, and seed as soon as conditions are satisfactory. Outside of seeding seasons, provide a temporary heavy mulch cover until seeding can be accomplished. Replant trees, shrubs, and other vegetation as soon as possible.
- G. Replace traffic signs as soon as possible, but no later than 24 hours after installation of the Work.
- H. Replace guide rails as soon as possible, but no later than 72 hours after installation of the Work.
- I. The phrase "after installation of the Work" used above means after the installation of that portion of the Work which necessitated the removal of an item or items.

END OF SECTION

SECTION 32 11 00 - BASE COURSES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Subbase.
- B. Processed aggregate base.
- C. Compacted granular fill.

1.02 RELATED REQUIREMENTS

- A. Section 31 22 00 - Grading
- B. Section 31 23 16 - Excavation
- C. Section 31 23 23 - Backfilling
- D. Section 32 12 00 - Flexible Paving

1.03 DEFINITIONS

- A. See Section 31 23 23.

1.04 REFERENCE STANDARDS

- A. AASHTO T 90 - Standard Method of Test for Determining the Plastic Limit and Plasticity Index of Soils.
- B. AASHTO T 96 - Standard Method of Test for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
- C. AASHTO T 104 - Standard Method of Test for Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate.
- D. AASHTO T 146 - Standard Method of Test for Wet Preparation of Disturbed Soil Samples for Test.
- E. AASHTO T 180, Method D - Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.
- F. ANSI/ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
- G. ANSI/ASTM D1557 - Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³).
- H. ASTM D6938 - Standard Test Methods for In-Place Density of Soil and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

1.05 SUBMITTALS

- A. Samples - Submit fifty (50) pound sample of each type of base material to the testing laboratory in air-tight containers.

- B. Test Reports:
 1. Submit sieve analysis test results for the base materials performed in accordance with ASTM C136. Test date shall be within 90 days of submittal date.
 2. Submit abrasion and soundness test results as specified for each material and plasticity test results as applicable.
 3. Submit field compaction test results performed by an independent testing laboratory.

1.06 QUALITY ASSURANCE

- A. Provide at least one (1) person who shall be present at all times during the execution of this portion of the Work and who shall be thoroughly qualified and experienced in the placing of the types of bases specified and who shall direct the Work performed under this Section.
- B. Test materials in accordance with the Reference Standards.
- C. Reclaimed miscellaneous aggregate material from off-site is not permitted for use.

PART 2 PRODUCTS

2.01 BASE MATERIALS

- A. Subbase - Comply with Section 31 23 23 for Granular Fill.
- B. Processed Aggregate Base
 1. Gradation of coarse and fine aggregates, combined and mixed by Engineer approved methods, shall conform to the following when tested from the supply source and after delivered to construction site:

<u>Square Mesh Sieve</u>	<u>Percent Passing by Weight</u>
2-1/2"	100
2"	95-100
3/4"	50-75
1/4"	25-45
#40	5-20
#100	2-12

Source: Standard Specifications, Article M.05.01.

2. Coarse aggregate
 - a. Material, as defined in Section 31 23 23, shall be gravel, broken stone, or on-site reclaimed miscellaneous aggregate.
 - b. The AASHTO T 96 test shall show less than fifty (50) percent loss on abrasion.
 - c. The AASHTO T 104 test shall show less than fifteen (15) percent loss on coarse aggregate after five (5) cycles.
3. Fine Aggregate
 - a. Material shall be natural sand, stone sand, screenings, or any combination thereof. It shall be limited to material 95% of which passes a #4 sieve having square openings and not more than 8% of which passes a #200 sieve. The material shall be free from clay, loam, and deleterious materials.
 - b. Plasticity
 - 1) When natural sand is used the following applies:
 - a) When the fraction of the dry sample passing the #100 mesh sieve is greater than four (4) percent and equal or less than eight (8) percent by weight, that fraction shall not have sufficient plasticity to permit the performing of the

- plastic limit test using AASHTO Method T 90.
- b) When the fraction of the dry sample passing the #100 mesh sieve is greater than eight (8) percent by weight, the sample will be washed; and the additional material passing the #100 mesh sieve shall be determined by AASHTO Method T 146, except that the #100 mesh sieve will be substituted for the #40 mesh sieve where the latter is specified in AASHTO Method T 146. The combined materials that passed the #100 mesh sieve shall not have sufficient plasticity to permit the performing of the plastic limit test using AASHTO Method T 90.
- 2) When natural sand, screenings, or a combination of screenings and natural sand or combination of stone and natural sand are used the following applies:
- a) When the fraction of the dry sample passing the #100 mesh sieve is six (6) percent and equal or less than ten (10) percent by mass, that fraction shall not have sufficient plasticity to permit the performing of the plastic limit test using AASHTO Method T 90.
 - b) When the fraction of the dry sample passing the #100 mesh sieve is greater than ten (10) percent by weight, the sample shall be washed and additional material passing the #100 mesh sieve shall be substituted for the #40 mesh sieve where the latter is specified in AASHTO Method T 146. The combined materials that have passed the #100 mesh sieve shall not have sufficient plasticity to permit the performing of the plastic limit test using AASHTO T90.

PART 3 EXECUTION

3.01 PERFORMANCE

A. Subbase

1. Shape the prepared foundation to the required cross-section and compact uniformly to obtain the required minimum dry density of not less than 95% of the dry density achieved by the AASHTO T 180, Method D. Where underdrains and outlets are specified on the Drawings or ordered by the Engineer, they shall be in place and functioning before any subbase material is placed.
2. Spread Subbase uniformly upon the prepared foundation to such depth that this course will be of the specified depth after final compaction: bases eight (8) inches or less in specified depth may be constructed in one course; bases over eight (8) inches in specified depth shall be constructed in multiple courses with each course depth less than or equal to eight (8) inches.
3. Compact each individual layer uniformly to obtain the required minimum dry density of not less than 95% of the dry density achieved by the AASHTO T 180, Method D.
 - a. If the Subbase contains reclaimed miscellaneous aggregate containing bituminous concrete, the required wet density after compaction on this course shall not be less than 95% of the wet density when tested in accordance with AASHTO T 180, Method D.
4. Maintain optimum moisture content of each layer to attain required compaction density.
5. Remove and replace Subbase material that has been mixed or churned up with the foundation material. Compact replaced Subbase material to the required minimum density.

B. Processed Aggregate Base

1. Provide waterproofing membrane and protective bituminous layer on structure within structural in accordance with the plans and after approval of Engineer.
2. Shape the prepared foundation beyond structure limits to the required cross-section.
3. Compact uniformly to obtain the required minimum dry density of not less than 95% of

the dry density achieved by the AASHTO T 180, Method D.

4. Spread aggregate uniformly upon the prepared subbase to such depth that this course will be of the specified depth after final compaction. Each course shall have a depth of not more than four (4) inches after final compaction unless otherwise ordered.
5. Compact with a power roller weighing not less than ten (10) tons or an equivalent vibratory roller or compactor.
6. Apply water while compacting from an approved watering device by a vertical spray delivering a flushing stream.
7. Compact and bind in passes that are parallel with the centerline, begin at the outside or low edges, progressing towards the middle or high edge, and overlap each previous pass.
8. Continue compacting and binding operations until voids in the aggregates are reduced to provide a firm and uniform surface satisfactory to the Engineer.
9. Compact and bind placed Processed Aggregate Base at the end of each day's work when the road is open to traffic.
10. Compact each individual layer uniformly to obtain the required minimum dry density of not less than 95% of the dry density achieved by the AASHTO T 180, Method D.
11. Maintain optimum moisture content of each layer to attain required compaction density.
12. Remove and replace Processed Aggregate Base that has been mixed or churned up with the Subbase material. Compact replaced Processed Aggregate to the required minimum density.

C. Compacted Granular Fill

1. Comply with Section 31 23 23, Article 3.03.F.

3.02 TOLERANCES

- A. Subbase Top Surface - Plus or minus one (1) inch of the grade indicated on the Drawings.
- B. Processed Aggregate Base Top Surface - Plus or minus one half (1/2) inch of the grade indicated on the Drawings.

3.03 FIELD QUALITY CONTROL

- A. Compaction tests on in-place materials shall be performed in accordance with ASTM D6938 or ASTM D1556.
- B. Testing locations shall be established using ASTM D3665. Linear projects shall incorporate stratified random sampling methods.
- C. The Owner may employ a laboratory for acceptance testing of backfill materials and compaction. Such testing does not relieve the Contractor of responsibility for quality control for the Work and delivering the Work in compliance with specification requirements.
- D. Cooperate with and provide access to the Work for the testing laboratory.
- E. Should testing of a material fail to meet the specification requirements, resolve the problem as appropriate. Reimburse the Owner for all testing charges incurred by the Owner after the second failure if repeated failures occur in the same material or the same lift.

3.04 SCHEDULE OF TESTING LOCATIONS

- A. Subbase and Processed Aggregate Base – Compact to no less than 95%. No less than four (4) compaction test locations per 500 linear feet of road or sidewalk or portions thereof. Two-lane roads shall include sublots on each side of the centerline per each 500 linear feet or portion thereof, with two (2) compaction tests per subplot.

3.05 ADJUST AND CLEAN

- A. Correct deficiencies and unmet tolerances in a manner approved by the Engineer.
- B. Remedy irregularities on the select fill material surfaces that develop, during or after compaction by loosening the in-place material and removing or adding coarse aggregate as required. Compact, broom, and wet the area of remedy and surrounding areas. Continue to compact until the surface is satisfactorily uniform.
- C. Eliminate settlement in a manner approved by the Engineer.
- D. Clean base course surfaces of trash and other debris and remove and dispose of off-site in a legal manner.

END OF SECTION

SECTION 32 12 00 - FLEXIBLE PAVING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Hot Mix Asphalt (HMA) paving.

1.02 RELATED REQUIREMENTS

- A. Section 31 22 00 - Grading
- B. Section 31 23 16 - Excavation
- C. Section 31 23 23 - Backfilling
- D. Section 32 11 00 - Base Courses

1.03 DEFINITIONS

- A. See Section 4.06 - Bituminous Concrete, Article 4.06.01 of the Standard Specifications as attached.

1.04 REFERENCE STANDARDS

- A. See Sections 4.06 and M.04 of the Standard Specification as attached.
- B. ASTM D2950 - Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods

1.05 SUBMITTALS

- A. Comply with Section M.04, Article M.04.01 and Article M.04.03 of the Standard Specifications as attached.
- B. Asphalt Certifications - Submit the name, address and telephone number of the asphalt plant proposed for use and a certification that:
 - 1. The mixing plant used to produce the hot mix asphalt has been inspected and approved by the Chief, Materials Section of the Connecticut Department of Transportation and that such approval is current and effective throughout the period when the hot mix asphalt is manufactured for this Project.
 - 2. The hot mix asphalt delivered to the Project site conforms in all respects to the requirements of the Standard Specifications for the mixture class specified.

1.06 QUALITY ASSURANCE

- A. Provide at least one (1) person who shall be present at all times during the execution of this portion of the Work and who shall be thoroughly qualified and experienced in the placing of the type of pavements and overlays specified and who shall direct the Work performed under this Section.
- B. Use only personnel thoroughly trained and experienced in the skills required for installing and finishing hot mix asphalt pavements and in operating the required equipment.

- C. No finish surface pavement shall be started during the period of November 15 of any one year through April 15 the following year, unless otherwise approved by Engineer.
- D. Asphalt plants shall be available for inspections and tests by the Engineer.
- E. Reclaimed or recycled materials from off-site is not permitted for use.

1.07 DELIVERY, STORAGE AND HANDLING

- A. Hauling equipment shall conform to the Standard Specifications. The Contractor is advised that length of haul, manner of haul, temperature of asphalt, and similar criteria, have a direct bearing on the quality and acceptability of the finished pavements. These and all other criteria shall be properly controlled such that the hot mix asphalt when placed, is identical to that specified, approved, and as it left the asphalt plant. Segregation of aggregates, whether occasioned by hauling operations, improper mixing at the asphalt plant, or for other reasons, will result in rejection of the pavement. Clusters and pockets of aggregate in the finished pavement surface, with voids surrounding the aggregates, are unacceptable and will be rejected.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Hot Mix Asphalt (HMA)
 - 1. Conform to Section M.04 of the Standard Specifications as attached.
 - 2. Mixture shall be from one source of supply and originate from one plant unless otherwise authorized by Engineer.
- B. Joint Seal
 - 1. Joint seal material shall be a hot-poured rubber compound intended for use in sealing joints and cracks in bituminous concrete pavements. Joint seal material must meet the requirements of ASTM D 6690-Type 2.

PART 3 EXECUTION

3.01 PERFORMANCE

- A. Hot Mix Asphalt (HMA) Pavements:
 - 1. Conform to Section 4.06, Article 4.06.03 of the Standard Specifications as attached with the following exceptions:
 - a. Compaction: Contractor shall compact the mixture to obtain between 92.0% and 97.0% density in accordance with ASTM D2950 testing and eliminate all roller marks without displacement, shoving, cracking, or aggregate breakage.
 - b. Obtaining Bituminous Concrete Cores: Bituminous core samples are not required unless otherwise specified by the Engineer. Density testing for placed HMA shall be performed in accordance with ASTM D2950.
 - 2. Provide finished paved surfaces that are smooth, even, and free from surface defects and irregularities. Edges shall be straight and shall meet existing pavements smoothly. Pavement shall present a smooth, continuous, and workmanlike appearance, free from patch work, rough edges, spalling areas, potholes, depressions, bumps, and other defects. The complete finished installation shall meet with the complete approval of the Engineer with respect to appearance as well as structural integrity and other criteria.

3.02 FIELD QUALITY CONTROL

- A. Compaction tests on in-place materials shall be performed in accordance with ASTM D2950.
- B. Testing locations shall be established using ASTM D3665. Linear projects shall incorporate stratified random sampling methods.
- C. The Owner may employ a laboratory for acceptance testing of backfill materials and compaction. Such testing does not relieve the Contractor of responsibility for quality control for the Work and delivering the Work in compliance with specification requirements.
- D. Cooperate with and provide access to the Work for the testing laboratory.
- E. Should testing of a material fail to meet the specification requirements, resolve the problem as appropriate. Reimburse the Owner for all testing charges incurred by the Owner after the second failure, if repeated failures occur in the same material or the same lift.

3.03 SCHEDULE OF TESTING LOCATIONS

- A. Flexible Pavement – No less than four (4) compaction tests per 500 linear feet of road of portion thereof. Two-lane roads shall include sublots on each side of the centerline per 500 linear feet or portion thereof, with a minimum of two (2) compaction tests per sublot.

3.04 ADJUST AND CLEAN

- A. Correct deficiencies and unmet tolerances in a manner approved by the Engineer.
- B. Promptly remove areas of irregularities or defects which remain after compaction of the permanent pavement is completed and place sufficient new material to form a true and even surface. Roll all minor surface projections, joints, and minor honeycombed areas to a smooth finish. The final surface shall be of uniform texture conforming to the line, grade, and cross-section shown on the Drawings, existing, or as directed by the Engineer.
- C. Eliminate settlement in a manner approved by the Engineer.
- D. Clean paved surfaces of dirt, stones, and other debris. Remove and dispose of the discarded mix, trash, and other debris off-site in a legal manner.

3.05 ATTACHMENTS

- A. Section 4.06 - Bituminous Concrete of the Standard Specifications. Subsections 4.06.04 through 4.06.05 are not included and are not applicable to this Contract.
- B. Section M.04 - Bituminous Concrete of the Standard Specifications.

END OF SECTION

**SECTION 4.06
BITUMINOUS CONCRETE**

4.06.01—Description**4.06.02—Materials****4.06.03—Construction Methods**

- 1. Material Documentation**
- 2. Transportation of Mixture**
- 3. Paving Equipment**
- 4. Test Section**
- 5. Transitions for Roadway Surface**
- 6. Spreading and Finishing of Mixture**
- 7. Longitudinal Joint Construction Methods**
- 8. Contractor Quality Control (QC) Requirements**
- 9. Temperature and Seasonal Requirements**
- 10. Field Density**
- 11. Acceptance Sampling and Testing**
- 12. Density Dispute Resolution Process**
- 13. Corrective Work Procedure**
- 14. Protection of the Work**
- 15. Cut Bituminous Concrete Pavement**

4.06.04—Method of Measurement**4.06.05—Basis of Payment**

4.06.01—Description: Work under this Section shall include the production, delivery, placement and compaction of a uniform textured, non-segregated, smooth bituminous concrete pavement to the grade and cross section shown on the plans.

The following terms as used in this specification are defined as:

Bituminous Concrete: A composite material consisting of prescribed amounts of asphalt binder and aggregates. Asphalt binder may also contain additives engineered to modify specific properties and/or behavior of the composite material. References to bituminous concrete apply to all of its forms, such as those identified as hot-mix asphalt (HMA) or polymer-modified asphalt (PMA).

Bituminous Concrete Plant (Plant): A structure where aggregates and asphalt binder are combined in a controlled fashion into a bituminous concrete mixture suitable for forming pavements and other paved surfaces.

Course: A continuous layer (a lift or multiple lifts) of the same bituminous concrete mixture placed as part of the pavement structure.

Density Lot: The total tonnage of all bituminous concrete placed in a single lift which are:

1. PWL density lots = When the project total estimated quantity per mixture is larger than 3,500 tons
2. Simple Average density lots = When the project total estimated quantity per mixture is 3,500 tons or less

Disintegration: Erosion or fragmentation of the pavement surface which can be described as polishing, weathering-oxidizing, scaling, spalling, raveling, or formation of potholes.

Dispute Resolution: A procedure used to resolve conflicts between the Engineer and the Contractor's results that may affect payment.

Extended Season Paving Plan: Required to address operations when ambient temperature or pavement temperature is expected to be less than 50°F.

Hot Mix Asphalt (HMA): A bituminous concrete mixture typically produced at 325°F.

In-Season Paving: Operations when ambient temperature and pavement temperature is 50°F or greater.

Job Mix Formula (JMF): A recommended aggregate gradation and asphalt binder content to achieve the required mixture properties.

Leveling Course: A thin lift of HMA placed at an average consistent thickness, usually about an inch, as indicated on the plans to correct minor variations in the contour of the existing pavement surface.

Lift: An application of a bituminous concrete mixture placed and compacted to a specified thickness in a single paver pass.

Percent Within Limits (PWL): The percentage of the lot falling between the Upper Specification Limit (USL) and the Lower Specification Limit (LSL).

4.06

Polymer Modified Asphalt (PMA): A bituminous concrete mixture containing a polymer-modified asphalt binder and using a qualified warm mix technology.

Production Lot: The total tonnage of a bituminous concrete mixture from a single source that may receive an adjustment.

Production Sub Lot: Portion of the production lot typically represented by a single sample.

Quality Assurance (QA): All those planned and systematic actions necessary to provide CTDOT the confidence that a Contractor will perform the work as specified in the Contract.

Quality Control (QC): The sum total of activities performed by the vendor (Producer, Manufacturer, and Contractor) to ensure that a product meets contract specification requirements.

Superpave: A bituminous concrete mix design used in mixtures designated as "S*" Where "S" indicates Superpave and * indicates the sieve related to the nominal maximum aggregate size of the mix.

Segregation: A non-uniform distribution of a bituminous concrete mixture in terms of gradation, temperature, or volumetric properties.

Warm Mix Asphalt (WMA) Technology: A qualified additive or technology that may be used to produce a bituminous concrete at reduced temperatures and/or increase workability of the mixture.

Wedge Course: A lift or multiple lifts of HMA placed at a varying thickness as indicated on the plans to increase or decrease the cross slope of the existing pavement surface.

4.06.02—Materials: All materials shall meet the requirements of M.04.

1. Materials Supply: The bituminous concrete mixture must be from one source of supply and originate from one Plant unless authorized by the Engineer.

2. Recycled Materials: Reclaimed Asphalt Pavement (RAP), Crushed Recycled Container Glass (CRCG), Recycled Asphalt Shingles (RAS), or crumb rubber (CR) from recycled tires may be incorporated in bituminous concrete mixtures in accordance with Project Specifications.

3. Tack Coat: Tack coat used for all applications shall be Non-Tracking Asphalt Tack Coat, meeting the requirements of M.04.01-5. Use of alternate tack coats conforming to Material for Tack Coat requirements may be requested by the Contractor. The request shall be submitted in writing to the Engineer for review prior to use.

4.06.03—Construction Methods

1. Material Documentation: All vendors producing bituminous concrete must have Plants with automated vehicle-weighing scales, storage scales, and material feeds capable of producing a delivery ticket containing the information below.

- a. State of Connecticut printed on ticket.
- b. Name of Producer, identification of Plant, and specific storage silo if used.
- c. Date and time.
- d. Mixture Designation, mix type and level. Curb mixtures for machine-placed curbing must state "curb mix only."
- e. If WMA Technology is used, "-W" must be listed following the mixture designation.
- f. Net weight of mixture loaded into the vehicle. (When RAP and/or RAS is used, the moisture content shall be excluded from mixture net weight.)
- g. Gross weight (equal to the net weight plus the tare weight or the loaded scale weight).
- h. Tare weight of vehicle (daily scale weight of the empty vehicle).
- i. Project number, purchase order number, name of Contractor (if Contractor other than Producer).
- j. Vehicle number - unique means of identification of vehicle.
- k. For Batch Plants: individual aggregate, recycled materials, and virgin asphalt max/target/min weights when silos are not used.
- l. For every mixture designation: the running daily and project total delivered and sequential load number.

The net weight of mixture loaded into the vehicle must be equal to the cumulative measured weights of its components.

The Contractor must notify the Engineer immediately if, during production, there is a malfunction of the weight recording system in the automated Plant. Manually written tickets containing all required information will be allowed for no more than 1 hour.

The State reserves the right to have an Inspector present to monitor batching and/or weighing operations.

2. Transportation of Mixture: The mixture shall be transported in vehicles that are clean of all foreign material, excessive coating or cleaning agents, and that have no gaps through which material might spill.

Any material spilled during the loading or transportation process shall be quantified by re-weighing the vehicle. The Contractor shall load vehicles uniformly so that segregation is minimized. Loaded vehicles shall be tightly covered with waterproof covers acceptable to the Engineer. Mesh covers are prohibited. The cover must minimize air infiltration. Vehicles found not to be in conformance shall not be loaded. Vehicles with loads of bituminous concrete being delivered to State projects must not exceed the statutory or permitted load limits referred to as gross vehicle weight (GVW). The Contractor shall furnish a list and allowable weights of all vehicles transporting mixture. The State reserves the right to check the gross and tare weight of any vehicle. If the gross or tare weight varies from that shown on the delivery ticket by more than 0.4%, the Engineer will recalculate the net weight. The Contractor shall correct the discrepancy to the satisfaction of the Engineer.

If a vehicle delivers mixture to the Project and the delivery ticket indicates that the vehicle is overweight, the load may not be rejected but a "Measured Weight Adjustment" will be taken in accordance with 4.06.04.

Vehicle body coating and cleaning agents must not have a deleterious effect on the mixture. The use of solvents or fuel oil, in any concentration, is prohibited for the coating of vehicle bodies.

For each delivery, the Engineer shall be provided a clear, legible copy of the delivery ticket.

3. Paving Equipment: The Contractor shall have the necessary paving and compaction equipment at the Project Site to perform the work. All equipment shall be in good working order and any equipment that is worn, defective, or inadequate for performance of the work shall be repaired or replaced by the Contractor to the satisfaction of the Engineer. During the paving operation, the use of solvents or fuel oil, in any concentration, is strictly prohibited as a release agent or cleaner on any paving equipment (i.e., rollers, pavers, transfer devices, etc.).

Refueling or cleaning of equipment is prohibited in any location on the Project where fuel or solvents might come in contact with paved areas or areas to be paved. Solvents used in cleaning mechanical equipment or hand tools shall be stored clear of areas paved or to be paved. Before any such equipment and tools are cleaned, they shall be moved off of areas paved or to be paved.

Pavers: Each paver shall have a receiving hopper with sufficient capacity to provide for a uniform spreading operation and a distribution system that places the mix uniformly, without segregation. The paver shall be equipped with and use a vibratory screed system with heaters or burners. The screed system shall be capable of producing a finished surface of the required evenness and texture without tearing, shoving, or gouging the mixture. Pavers with extendible screed units as part of the system shall have auger extensions and tunnel extenders as necessary. Automatic screed controls for grade and slope shall be used at all times unless otherwise authorized by the Engineer. The controls shall automatically adjust the screed to compensate for irregularities in the preceding course or existing base. The controls shall maintain the proper transverse slope and be readily adjustable, and shall operate from a fixed or moving reference such as a grade wire or floating beam (minimum length 20 feet).

Rollers: All rollers shall be self-propelled and designed for compaction of bituminous concrete. Roller types shall include steel wheeled, pneumatic, or a combination thereof. Rollers that operate in a dynamic mode shall have drums that use a vibratory or oscillatory system or combination. Vibratory rollers shall be equipped with indicators for amplitude, frequency, and speed settings/readouts to measure the impacts per foot during the compaction process. Oscillatory rollers shall be equipped with frequency indicators. Rollers can operate in the dynamic mode using the oscillatory system on concrete structures such as bridges and catch basins if at the lowest frequency setting.

Pneumatic tire rollers shall be equipped with wide-tread compaction tires capable of exerting an average contact pressure from 60 to 90 psi uniformly over the surface. The Contractor shall furnish documentation to the Engineer regarding tire size, pressure and loading to confirm that the proper contact pressure is being developed and that the loading and contact pressure are uniform for all wheels.

Tack Distributor Vehicle: The Contractor shall provide a distributor vehicle capable of heating, circulating, and spraying the tack coat at the required application temperature range per the tack manufacturer's recommendations. The spray bar shall maintain a constant height above the pavement and distribute the material in an overlapping spray pattern out of the nozzles to ensure uniform coverage on the surface. The distributor vehicle shall include a tachometer, pressure gauges, and an accurate volume measuring device or a calibrated tank. Volume measuring devices shall meet all applicable state or federal sale requirements.

Lighting for Operations: As needed for paving operations, the Contractor shall provide sufficient artificial lighting to enable the Engineer to thoroughly inspect every phase of the work. The type and number of

lights to be used on each piece of equipment shall be documented by the Contractor in the Project Specific Quality Control Plan. A minimum of 10 foot candle (fc) (or approximately 108 lumens) within a twenty-five-foot radius from millers, pavers, and transfer vehicles shall be provided by the lighting at all times. A minimum of 1 fc (or approximately 11 lumens) within a sixty foot radius from rollers shall be provided at all times. Lighting shall be oriented to minimize glare to passing traffic. The Contractor shall furnish a light meter to the Engineer to verify illumination levels. The light meter shall be capable of measuring light illuminance from LED, Fluorescent, Halogen, and other lights being used at the levels specified with a rated accuracy of $\pm 3\%$ or better.

Material Transfer Vehicle (MTV): A MTV shall be used when placing bituminous concrete surface course (a lift or multiple lifts) as indicated in the Contract except as noted on the plans or as directed by the Engineer. In addition, continuous paving lengths of less than 500 feet may not require the use of a MTV as determined by the Engineer.

The MTV must be a vehicle specifically designed for the purpose of delivering the bituminous concrete mixture from the delivery vehicle to the paver. The MTV must continuously remix the bituminous concrete mixture throughout the placement process.

The use of a MTV will be subject to the requirements stated in 1.07.05 Load Restrictions. The Engineer may limit the use of the vehicle if it is determined that the use of the MTV may damage highway components, utilities, or bridges. The Contractor shall submit to the Engineer at time of pre-construction the following information:

1. The make and model of the MTV.
2. The individual axle weights and axle spacing for each piece of paving equipment (haul vehicle, MTV and paver).
3. A working drawing showing the axle spacing in combination with all pieces of equipment that will comprise the paving echelon.

4. Test Section: The Engineer may require the Contractor to place a test section whenever the requirements of this specification or M.04 are not met.

The Contractor shall submit the quantity of mixture to be placed and the location of the test section for review and approval by the Engineer. The same equipment used in the construction of a passing test section shall be used throughout production.

If a test section fails to meet specifications, the Contractor shall stop production, make necessary adjustments to the job mix formula, Plant operations, or procedures for placement and compaction. The Contractor shall construct test sections, as allowed by the Engineer, until all the required specifications are met. All test sections shall also be subject to removal as set forth in 1.06.04.

5. Transitions for Roadway Surface: Transitions shall be formed at any point on the roadway where the pavement surface deviates, vertically, from the uniform longitudinal profile as specified on the plans. Whether formed by milling or by bituminous concrete mixture, all transition lengths shall meet the criteria below unless otherwise specified.

Permanent Transitions: Defined as any gradual change in pavement elevation that remains as a permanent part of the work. A transition shall be constructed no closer than 75 feet from either side of a bridge expansion joint or parapet. All permanent transitions, leading and trailing ends shall meet the following length requirements:

Posted Speed Limit	Permanent Transition Length Required
> 35 mph	30 feet per inch of elevation change
35 mph or less	15 feet per inch of elevation change

In areas where it is impractical to use the above-described permanent transition lengths, the use of a shorter permanent transition length may be permitted when approved by the Engineer.

Temporary Transitions: Defined as a transition that does not remain a permanent part of the work.

All temporary transitions shall meet the following length requirements:

Posted Speed Limit	Temporary Transition Length Required
> 50 mph	Leading Transition: 15 feet per inch of vertical change (thickness) Trailing Transition: 6 feet per inch of vertical change (thickness)
40, 45 or 50 mph	Leading and Trailing: 4 feet per inch of vertical change (thickness)
35 mph or less	Leading and Trailing: 3 feet per inch of vertical change (thickness)

Note: Any temporary transition to be in place over the winter shutdown period or during extended periods of inactivity (more than 30 calendar days) shall meet the greater than 50 mph requirements shown above.

6. Spreading and Finishing of Mixture: Prior to the placement of the mixture, the underlying subbase and other courses shall be brought to the plan grade and cross section within the allowable tolerance. Subbase material shall be free of standing water prior to placement of the mixture,

Before placing a bituminous concrete lift on an existing pavement surface, a uniform coating of tack coat shall be applied to the underlying pavement surface and on the exposed surface of a wedge joint. Such pavement surfaces shall be clean and dry. Mechanical sweeping or other means acceptable to the Engineer shall be used to clean pavement surfaces.

Tack Coat Application: The Contractor shall protect appurtenances from tracking or splattering of tack coat material. All tack coat material shall be applied by pressurized spray that results in a uniform application rate over the entire surface being paved.

All tack coat material, as defined in M.04, shall be applied at an application rate of 0.04 to 0.06 gal./s.y. for a non-milled surface, and an application rate of 0.06 to 0.08 gal./s.y. for a milled surface.

The Engineer must approve the equipment and the method of measurement prior to use. The tack coat material shall be heated to 160°F ± 10°F and shall not be further diluted.

Tack coat shall be allowed sufficient time to break (cure) prior to any paving equipment or haul vehicles driving on it.

The Contractor may request to omit the tack coat application between bituminous concrete layers that have not been exposed to traffic and are placed during the same work shift. Requests to omit tack coat application on the upper and lower surfaces of a wedge joint will not be considered.

Placement: The mixture shall be placed and compacted to provide a smooth, dense surface with a uniform texture and no segregation at the specified thickness and dimensions indicated in the plans and specifications.

When unforeseen weather conditions prevent further placement of the mixture, the Engineer is not obligated to accept or place the bituminous concrete mixture that is in transit from the Plant.

In advance of paving, traffic control requirements shall be set up, maintained throughout placement, and shall not be removed until all associated work is completed, including quality control, sampling for density testing, and inspection activities.

The Contractor shall supply three infrared thermometers, acceptable to the Engineer, for mix delivery temperature verification by the inspector and quality control personnel. At the beginning of each shift, the Contractor shall verify that the thermometers:

- have a minimum accuracy value of ±1% of reading or ± 2°F, whichever is greater.
- are in agreement within 5°F when measuring ambient, base, and mix temperature.

The Contractor shall include the thermometer verification process in the QCP, as well as the replacement or repair timeframe of a thermometer not meeting the above criteria or not functioning.

The placement temperature range shall be listed in the Quality Control Placement Plan and shall meet the requirements of Table M.04.03-4. Any material that falls outside the specified temperature range as measured by two of the three thermometers may be rejected.

The Contractor shall inspect the newly placed pavement for defects in mixture or placement before rolling is started. Any deviation from standard crown or section shall be immediately remedied by placing additional mixture or removing surplus mixture. Such defects shall be corrected to the satisfaction of the Engineer.

Where it is impracticable due to physical limitations to operate the paving equipment, the Engineer may

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permit the use of other methods or equipment. Where hand spreading is permitted, the mixture shall be placed by means of suitable shovels and other tools, and in a uniformly loose layer at a thickness that will result in a completed pavement meeting the designed grade and elevation.

Placement Tolerances: Each lift of bituminous concrete placed at a specified thickness shall meet the following requirements for thickness and area. Any pavement exceeding these limits shall be subject to an adjustment or removal. Lift tolerances will not relieve the Contractor from meeting the final designed grade. Lifts of specified non-uniform thickness, i.e. wedge course, shall not be subject to thickness and area adjustments.

1. Thickness: Where the average thickness of the lift exceeds that shown on the plans beyond the tolerances shown in Table 4.06-3, the Engineer will calculate the thickness adjustment in accordance with 4.06.04.

TABLE 4.06-3: Thickness Tolerances

Mixture Designation	Lift Tolerance
S1	+/- 3/8 inch
S0.25, S0.375, S0.5	+/- 1/4 inch

Where the thickness of the lift of mixture is less than that shown on the plans beyond the tolerances shown in Table 4.06-3, the Contractor, with the approval of the Engineer, shall take corrective action in accordance with this Section.

2. Area: Where the width of the lift exceeds that shown on the plans by more than the specified thickness, the Engineer will calculate the area adjustment in 4.06.04.
3. Delivered Weight of Mixture: When the delivery ticket shows that the truck exceeds the allowable gross weight for the vehicle type, the Engineer will calculate the weight adjustment in accordance with 4.06.04.

Transverse Joints: All transverse joints shall be formed by saw-cutting to expose the full thickness of the lift. Tack coat shall be applied to the sawn face immediately prior to additional mixture being placed.

Compaction: The Contractor shall compact the mixture to meet the density requirements as stated in 4.06.04 for any lift placed with a thickness of 1 1/2 inches or greater, and eliminate all roller marks without displacement, shoving, cracking, or aggregate breakage. This shall include wedge courses when the wedge thickness is 1 1/2 inches or greater within a single paver pass.

When placing a lift with a specified thickness less than 1 1/2 inches the Contractor shall provide a minimum rolling pattern as determined by the development of a compaction curve. This shall include wedge courses when the wedge or any portion of the wedge thickness is less than 1 1/2 inches within a single paver pass. The procedure to be used shall be documented in the Contractor’s QCP for placement and demonstrated on the first day of placement.

The use of the vibratory system on concrete structures is prohibited. When approved by the Engineer, the Contractor may operate a roller using an oscillatory system at the lowest frequency setting.

If the Engineer determines that the use of compaction equipment in the dynamic mode may damage highway components, utilities or adjacent property, the Contractor shall provide alternate compaction equipment.

Rollers operating in the dynamic mode shall be shut off when changing directions.

These allowances will not relieve the Contractor from meeting pavement compaction requirements.

Surface Requirements:

Each lift of the surface course shall not vary more than 1/4 inch from a Contractor-supplied 10 foot straightedge. For all other lifts of bituminous concrete, the tolerance shall be 3/8 inch. Such tolerance will apply to all paved areas.

Any surface that exceeds these tolerances shall be corrected by the Contractor at its own expense.

7. Longitudinal Joint Construction Methods: The Contractor shall use Method I - Notched Wedge Joint (see Figure 4.06-1) when constructing longitudinal joints where lift thicknesses are 1 1/2 inches to 3 inches. S1.0 mixtures shall be excluded from using Method I. Method II - Butt Joint (see Figure 4.06-2) shall be used for lifts less than 1 1/2 inches or greater than 3 inches. Each longitudinal joint shall maintain a consistent offset from the centerline of the roadway along its entire length. The difference in elevation between the two faces of any completed longitudinal joint shall not exceed 1/4 inch at any location.

Method I - Notched Wedge Joint:

A notched wedge joint shall be constructed as shown in Figure 4.06-1 using a device that is attached to the paver screed and is capable of independently adjusting the top and bottom vertical notches. The device

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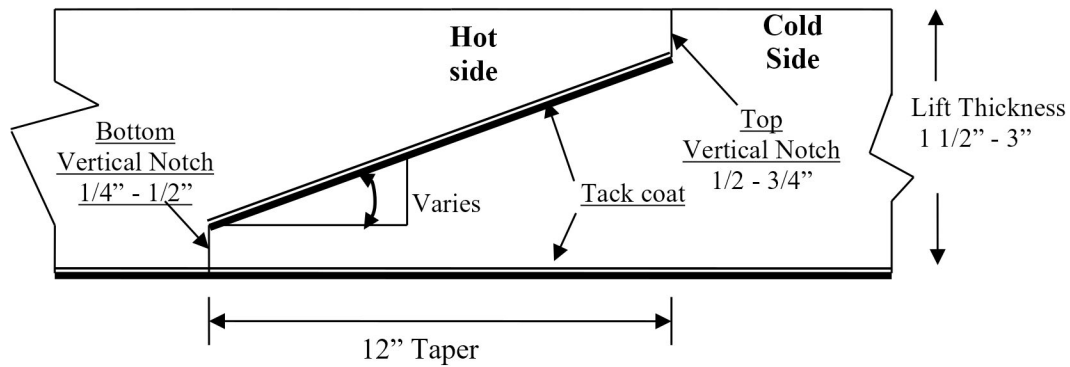
shall have an integrated vibratory system. The top vertical notch must be located at the centerline or lane line or as directed by the Engineer in the final lift. The requirement for paving full width “curb to curb” as described in Method II may be waived if addressed in the QC plan and approved by the Engineer.

The taper portion of the wedge joint shall be evenly compacted using equipment other than the paver or notch wedge joint device. The compaction device shall be the same width as the taper and not reduce the angle of the wedge or ravel the top notch of the joint during compaction.

When placed on paved surfaces, the area below the sloped section of the joint shall be treated with tack coat. The top surface of the sloped section of the joint shall be treated with tack coat prior to placing the completing pass.

The taper portion of the wedge joint shall not be exposed to traffic for more than 5 calendar days.

Figure 4.06-1: Method I, Notched Wedge Joint
(Not to Scale)



Any exposed wedge joint must be located to allow for the free draining of water from the road surface.

The Engineer reserves the right to define the paving limits when using a wedge joint that will be exposed to traffic.

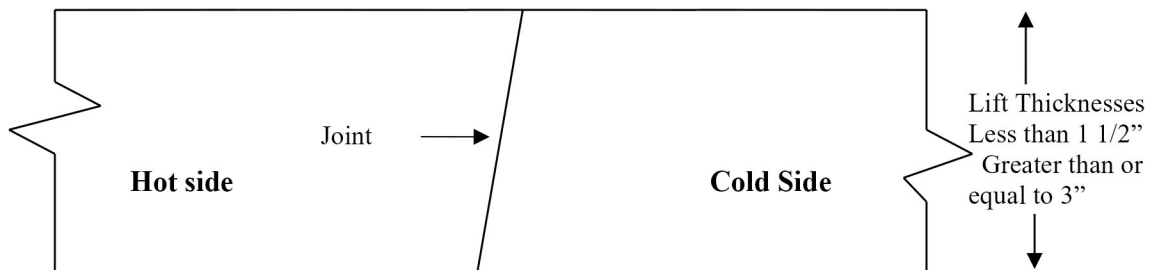
If Method I cannot be used on those lifts which are 1 1/2 inches to 3 inches, Method III may be substituted according to the requirements below for “Method III - Butt Joint with Hot Poured Rubberized Asphalt Treatment.”

Method II - Butt Joint:

When adjoining passes are placed, the Contractor shall use the end gate to create a near vertical edge (refer to Figure 4.06-2). The completing pass (hot side) shall have sufficient mixture so that the compacted thickness is not less than the previous pass (cold side). During placement of multiple lifts, the longitudinal joint shall be constructed in such a manner that it is located at least 6 inch from the joint in the lift immediately below. The joint in the final lift shall be at the centerline or at lane lines or as directed by the Engineer. The end gate on the paver should be set so there is an overlap onto the cold side of the joint.

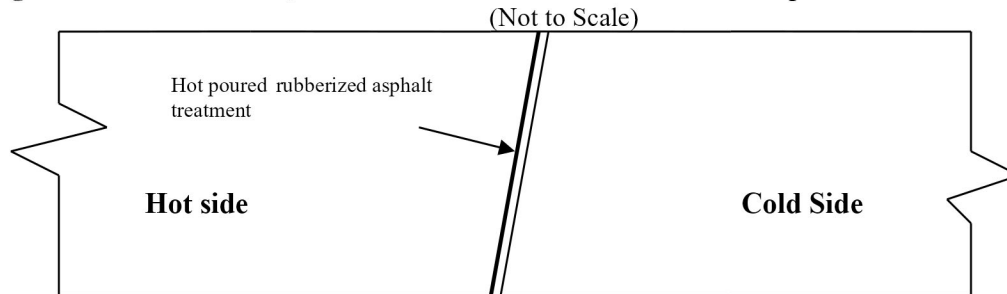
When using this method, the Contractor must complete full width “curb to curb” paving when the vertical edge exposed to traffic would be greater than one inch, unless otherwise allowed by the Engineer.

Figure 4.06-2: Method II, Butt Joint
(Not to Scale)



Method III - Butt Joint with Hot Poured Rubberized Asphalt Treatment:

If Method I cannot be used due to physical constraints in certain limited locations, the Contractor may submit a request in writing for approval by the Engineer to use Method III as a substitution in those locations. There shall be no additional measurement or payment made when Method III is substituted for Method I. When required by the Contract or approved by the Engineer, Method III (see Figure 4.06-3) shall be used.

Figure 4.06-3: Method III, Butt Joint with Hot Poured Rubberized Asphalt Treatment

All of the requirements of Method II must be met with Method III. In addition, the longitudinal vertical edge must be treated with a rubberized joint seal material meeting the requirements of ASTM D6690, Type 2. The joint sealant shall be placed on the face of the “cold side” of the butt joint as shown above prior to placing the “hot side” of the butt joint. The joint seal material shall be applied in accordance with the manufacturer’s recommendation so as to provide a uniform coverage and avoid excess bleeding onto the newly placed pavement.

8. Contractor Quality Control (QC) Requirements: The Contractor shall be responsible for maintaining adequate quality control procedures throughout the production and placement operations. Therefore, the Contractor must ensure that the materials, mixture, and work provided by Subcontractors, Suppliers, and Producers also meet Contract specification requirements.

This effort must be documented in Quality Control Plans (QCP) and must address the actions, inspection, or sampling and testing necessary to keep the production and placement operations in control, to determine when an operation has gone out of control and to respond to correct the situation in a timely fashion.

The QCP for production shall consist of the quality control program specific to the production facility.

There are 3 components to the QCP for placement: a Standard QCP that is applicable to all projects for the year, a Project Summary Sheet that supplements the standard QCP that details Project-specific information, and, if applicable, a separate Extended Season Paving Plan to address project specific operations expected to occur when ambient temperature or pavement temperature is less than 50°F.

QCPs shall be submitted to the Department for approval each calendar year and at a minimum of 30 days prior to production or placement. The Extended Season QCP shall be submitted no later than October 15, but prior to anticipated ambient temperature below 50°F.

Production or placement shall not occur until all QCP components have been approved by the Engineer.

Each QCP shall include the name and qualifications of a Quality Control Manager (QCM). The QCM shall be responsible for the administration of the QCP, and any modifications that may become necessary.

The QCM shall have the ability to direct all Contractor personnel on the Project during paving operations.

The QCPs shall also include the name and qualifications of any outside testing laboratory performing any QC functions on behalf of the Contractor. The QC Technician performing in-place density testing shall be NETTCP certified as a paving inspector.

Approval of any QCP does not relieve the Contractor of its responsibility to comply with the Project specifications. The Contractor may propose modifications to the QCPs as work progresses and must document the changes in writing prior to resuming operations. These modifications include changes in quality control procedures, equipment, or personnel.

QCP for Production: Refer to M.04.03-1.

QCP for Placement: The Standard QCP, Project Summary Sheet, and Extended Season Paving Plan shall conform to the format provided on the [Advisory Team web page](#).

The Contractor shall perform all quality control sampling and testing, provide inspection, and exercise management control to ensure that bituminous concrete placement conforms to the requirements as outlined in its QCP during all phases of the work. The Contractor shall document these activities for each day of

placement.

The Contractor shall submit complete field density testing and inspection records to the Engineer within 48 hours in a manner acceptable to the Engineer.

The Contractor may obtain one mat core and one joint core per day for process control, provided this process is detailed in the QCP. The results of these process control cores shall not be used to dispute the Department's determinations from the acceptance cores. The Contractor shall submit the location of each process control core to the Engineer for approval prior to taking the core. The core holes shall be filled to the same requirements described in 4.06.03-10.

9. Temperature and Seasonal Requirements: Paving, including placement of temporary pavements, shall be divided into 2 seasons, "In-Season" and "Extended-Season." The following requirements shall apply unless otherwise authorized or directed by the Engineer:

1. Mixtures shall not be placed on subbase material that is frozen. Mixtures or tack coat shall not be placed when the air or pavement surface temperature is 35°F or less.
2. Should paving operations be scheduled during Extended Season temperatures, the Contractor must submit an Extended Season Paving Plan for the Project that addresses minimum delivered mix temperatures that meet the requirements of Table M.04.03-4. The Plan shall also include:
 - a. if WMA, PMA, or other additives are being used;
 - b. method of determining mix cooling rate after placement along with maximum paver speed;
 - c. enhanced rolling patterns;
 - d. and the method to balance mixture delivery and placement operations.

Paving during Extended Season shall not commence until the Engineer has approved the plan.

10. Field Density:

1. The Contractor shall obtain cores in accordance with AASHTO R 67 for the determination of mat and longitudinal joint density of bituminous concrete pavements. The Contractor's representative obtaining samples must be a certified NETTCP HMA Paving Inspector, NETTCP HMA Plant Technician, or has successfully completed the HMA Field Sampling Course administered by The Connecticut Advanced Pavement Laboratory (CAP Lab). Within three (3) calendar days of placement, mat and joint cores shall be extracted on each lift with a specified thickness of 1 1/2 inches or more. That time frame may be extended to a maximum of five (5) days due to inclement weather, State holidays or other access restrictions beyond the control of the Contractor. Joint cores shall not be extracted on HMA S1.0 lifts.

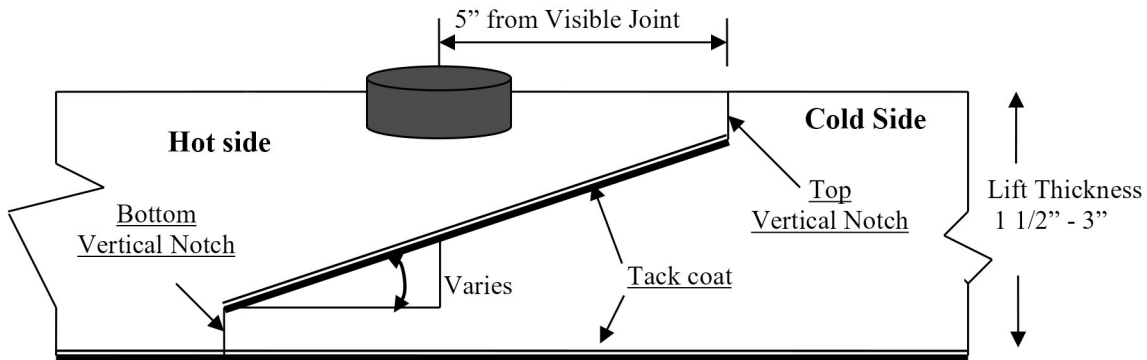
The Contractor shall extract cores from random locations determined by the Engineer in accordance with ASTM D3665. Six (6) inch diameter cores shall be extracted for all mixes. The number and location of the cores is specified in 4.06.03-10-2 Density Lots. The Contractor shall coordinate with the Engineer to witness the extraction, labeling of cores, and filling of the core holes. The size, shape, and weight of the cores shall not be modified, altered, or manipulated by the Contractor or its representative in any way after extraction from the pavement.

After the lift has been compacted and cooled, the Contractor shall cut cores to a depth equal to or greater than the lift thickness and shall remove them without damaging the lift(s) to be tested. Any core that is damaged or obviously defective while being obtained will be replaced with a new core from a location within 2 feet measured in a longitudinal direction. The size, shape, and weight of the cores shall not be modified, altered, or manipulated by the Contractor or its representative in any way after extraction from the pavement.

A mat core shall not be located any closer than 1 foot from the edge of a paver pass. If a random number locates a core less than 1 foot from any edge, the location will be adjusted by the Engineer so that the outer edge of the core is 1 foot from the edge of the paver pass.

Method I, Notched Wedge Joint cores shall be taken so that the center of the core is 5 inches from the visible joint on the hot mat side (Figure 4.06-4).

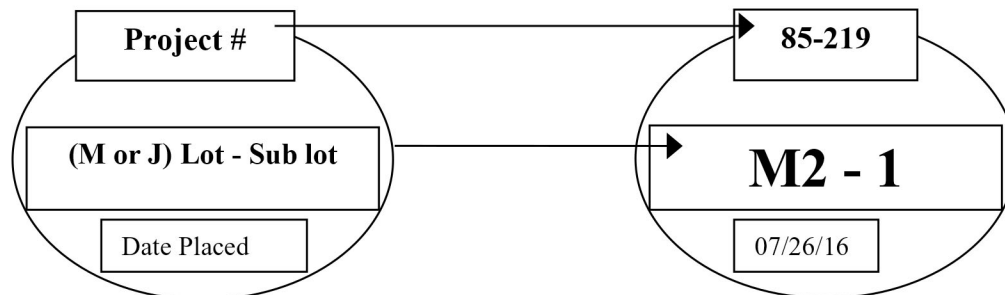
Figure 4.06-4: Notched Wedge Joint Cores (Not to Scale)



When Method II or Method III Butt Joint is used, cores shall be taken from the hot side so the edge of the core is within 1 inch of the longitudinal joint.

The cores shall be labeled by the Contractor with the Project number, date placed, lot number, and sub-lot number. The core's label shall include "M" for a mat core and "J" for a joint core. For example, a mat core from the first lot and the first sub-lot shall be labeled with "M1 - 1." A mat core from the second lot and first sub-lot shall be labeled "M2-1" (see Figure 4.06-5). The Engineer will fill out a MAT-109 to accompany the cores. The Contractor shall deliver the cores and MAT-109 to the Department's Central Lab. The Contractor shall use a container approved by the Engineer. The container shall have a lid capable of being locked shut and tamper proof. The Contractor shall use foam, bubble wrap, or another suitable material to prevent the cores from being damaged during handling and transportation. Once the cores and MAT-109 are in the container the Engineer will secure the lid using security seals at the removable hinges(s) and at the lid opening(s). The security seals' identification number must be documented on the MAT-109. All sealed containers shall be delivered to the Department's Central Lab within two working days from time of extraction. Central Lab personnel will break the security seal and take possession of the cores.

Figure 4.06-5: Labeling of Cores



Each core hole shall be filled within 4 hours upon core extraction. Prior to being filled, the hole shall be prepared by removing any free water and applying tack coat using a brush or other means to uniformly cover the cut surface. The core hole shall be filled using a bituminous concrete mixture at a minimum temperature of 240°F containing the same or smaller nominal maximum aggregate size and compacted with a hand compactor or other mechanical means to the maximum compaction possible. The bituminous concrete shall be compacted to 1/8 inch above the finished pavement.

2. Density Lots

a. Simple Average:

A standard simple average density lot evaluated using the Simple Average method is the quantity of material placed in a single lift within a defined area excluding any bridge decks less than 3500 tons. For total individual mix quantities estimated on the project below 2,000 tons, the lot will include all the material between the curb lines. For total individual mix quantities estimated on the project between 2,000 and 3,500 tons, the lift will be evaluated as two lots each consisting of half of the total tonnage of material placed between the curb lines.

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A combo simple average density lot is the quantity of material placed within a defined area including bridge decks that are less than or equal to 500 feet long.

A bridge simple average density lot is the quantity of material placed on a bridge deck longer than 500 feet.

Bridge density lots will always be analyzed as using the simple average lot methodology. The number of cores per lot shall be determined in accordance with Table 4.06-5. Multiple bridge decks can be combined into one lot if the paving and underlying conditions are comparable. If multiple bridge decks are combined into a single bridge lot, at least one mat and joint core shall be obtained on each bridge.

The number of cores per lot shall be determined in accordance with Table 4.06-4. For combo lots, if a randomly located mat or joint core location is on a bridge deck, the core is to be obtained on the bridge deck in addition to the core(s) required on the bridge deck.

The number of cores per lot shall be determined in accordance with Table 4.06-5. Multiple bridge decks can be combined into one lot if the paving and underlying conditions are comparable. If multiple bridge decks are combined into a single bridge lot, at least one mat and joint core shall be obtained on each bridge.

The longitudinal locations of mat cores within a standard, combo, or bridge lot containing multiple paving passes will be determined using the combined length of the paving passes within the lot.

TABLE 4.06-4: Number of Cores per Lot (Simple Average)

Lot Type	No. of Mat Cores		No. of Joint Cores	
Standard Lot < 500 Tons	3		3	
Standard Lot ≥ 500 Tons	4		4	
Combo Lot < 500 Tons	2 plus	1 per bridge (≤ 300')	2 plus	1 per bridge (≤ 300')
Combo Lot ≥ 500 Tons ⁽¹⁾	4 plus	2 per bridge (301' – 500')	4 plus	2 per bridge (301' – 500')

TABLE 4.06-5: Number of Core per Bridge Density Lot (Simple Average)

Length of Bridge(s) (Feet)	Minimum No. of Mat Cores	Minimum No. of Joint Cores
< 500	2	2
501 – 1,500	3	3
1,501 – 2,500	4	4
2,501 and greater	5	5

b. *PWL Density Lots:*

When total individual mix quantity estimated on the Project is 3,500 tons or more, the lot shall be evaluated by PWL method.

A PWL mat density lot is 3,500 tons of material placed within 30 calendar days excluding any bridges. One randomly located mat core will be obtained per every 500 tons subplot. Should the final subplot be less than 500 tons, a randomly located mat core is still required.

A PWL joint density lot consists of seven sublots defined by the linear feet of longitudinal joint excluding any joints on bridge decks. One randomly located joint core shall be obtained per every 1,500 linear feet when a lot includes one longitudinal joint. One randomly located joint core shall be obtained per every 2,000 linear feet of joint when a lot includes two or more longitudinal joints.

A partial PWL mat or joint lot is a lot with four to six samples due to completion of the course, or spanning past 30 calendar days.

11. Acceptance Sampling and Testing: Sampling shall be performed in accordance with ASTM D3665 or a statistically-based procedure of stratified random sampling approved by the Engineer.

Plant Material Acceptance: The Contractor shall provide the required sampling and testing during all phases of the work in accordance with M.04. The Department will verify the Contractor's acceptance test results. Should any test results exceed the specified tolerances in the Department's current QA Program for

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Materials, the Contractor's test results for a subject lot or sub lot may be replaced with the Department's results for the purpose of calculating adjustments. The verification procedure is included in the Department's current QA Program for Materials.

Density Acceptance: The Engineer will perform all acceptance testing in accordance with AASHTO T 331. Test specimens will be prepared from the cores by the Engineer. The density of each specimen will be determined using the daily production's average maximum theoretical specific gravity (Gmm) established during the testing of the parent material at the Plant. When there was no testing of the parent material or any Gmm exceeds the specified tolerances in the Department's current QA Program for Materials, the Engineer will determine the maximum theoretical density value to be used for density calculations.

12. Density Dispute Resolution Process: The Contractor and Engineer will work in partnership to avoid potential conflicts and to resolve any differences that may arise during quality control or acceptance testing for density. Both parties will review their sampling and testing procedures and results and share their findings. If the Contractor disputes the Engineer's test results, the Contractor must submit in writing a request to initiate the Dispute Resolution Process within five calendar days of the notification of the test results. No request for dispute resolution will be allowed unless the Contractor provides quality control results from samples taken prior to and after finish rolling, and within the timeframe described in 4.06.03-8 supporting its position. No request for dispute resolution will be allowed for a density lot in which any core was not taken in accordance with 4.06.03-10. Should the dispute not be resolved through evaluation of existing testing data or procedures, the Engineer may authorize the Contractor to obtain a new core or set of core samples per disputed lot. The core samples must be extracted no later than 7 calendar days from the date of the Engineer's authorization. All such core samples shall be extracted and the core hole filled using the procedure outlined in 4.06.03-10.

(a) **Simple Average Lots:** The Contractor may only dispute any simple average lot that is adjusted at or below 95 percent payment. The number and location (mat, joint, or structure) of the cores taken for dispute resolution must reflect the number and location of the original cores. The location of each core shall be randomly located within the respective original sub lot. The dispute resolution results shall be combined with the original results and averaged for determining the final in-place density value.

(b) **PWL Lots:** The Contractor may dispute any PWL subplot when the PWL falls below 50% calculated in accordance with 4.06.04-2b. An additional random core in the subplot may be taken to validate the accuracy of the core in question. The Department will verify the additional core test result and may average the original test result with the additional core result for purpose of calculating adjustments.

13. Corrective Work Procedure:

If pavement placed by the Contractor does not meet the specifications, and the Engineer requires its replacement or correction, the Contractor shall:

- (a) Propose a corrective procedure to the Engineer for review and approval prior to any corrective work commencing. The proposal shall include:
- Limits of pavement to be replaced or corrected, indicating stationing or other landmarks that are readily distinguishable.
 - Proposed work schedule.
 - Construction method and sequence of operations.
 - Methods of maintenance and protection of traffic.
 - Material sources.
 - Names and telephone numbers of supervising personnel.
- (b) Any corrective courses placed as the final wearing surface shall match the specified lift thickness after completion.

14. Protection of the Work: The Contractor shall protect all sections of the newly finished pavement from damage that may occur as a result of the Contractor's operations for the duration of the Project.

15. Cut Bituminous Concrete Pavement: Work under this item shall consist of making a straight-line cut in the bituminous concrete pavement to the lines delineated on the plans or as directed by the Engineer. The cut shall provide a straight, clean, vertical face with no cracking, tearing or breakage along the cut edge.

**SECTION M.04
BITUMINOUS CONCRETE MATERIALS**

M.04.01—Bituminous Concrete Materials and Facilities**M.04.02—Mix Design and Job Mix Formula (JMF)****M.04.03—Production Requirements**

M.04.01—Bituminous Concrete Materials and Facilities: Each source of asphalt binder, emulsion, aggregate, and production facility used to manufacture bituminous concrete mixture, and laboratory testing the mixture must be qualified on an annual basis by the Engineer.

The basis of qualification for asphalt binder sources is participation in AASHTO Product Evaluation and Audit Solutions (formerly NTPEP), Asphalt Binder Suppliers (ABS) program and review of the sources' Quality System Manual and on-site audit report from AASHTO Product Evaluation and Audit Solutions by the Department. In addition, each source must submit monthly split samples to the Department's Central Laboratory for each grade of binder currently or potentially supplied to Department projects.

The basis of qualification for emulsion sources is the submittal of a "Quality Control Plan for Emulsified Asphalt" (Tack Coat) formatted in accordance with AASHTO R 77 to the Engineer for review. In addition, a split sample per grade must be submitted to the Department's Central Laboratory on a monthly basis.

The basis of qualification for aggregates is indicated in M.01

The basis of qualification for production facilities is indicated in M.04.01-10.

The basis of testing laboratory qualification for mixture testing is all testing equipment, supplies, and safety equipment shall be capable of performing all the applicable tests in their entirety that are referenced in AASHTO R 35 and AASHTO M 323 and requirements indicated in M.04.01-11

AASHTO/ASTM Standards noted with an (M) have been modified and are detailed in Table M.04.03-5.

Aggregates from multiple sources of supply must not be blended or stored in the same stockpile.

1. Coarse Aggregate: All coarse aggregate shall meet the requirements listed in M.01.

2. Fine Aggregate: All fine aggregate shall meet the requirements listed in M.01.

3. Mineral Filler: Mineral filler shall conform to the requirements of AASHTO M 17.

4. Performance Graded (PG) Asphalt Binder:**(a) General:**

- i. PG asphalt binder shall be uniformly mixed and blended and be free of contaminants such as fuel oils and other solvents. Binder shall be properly heated and stored to prevent damage or separation.
- ii. The binder shall meet the requirements of AASHTO M 332 and shall be graded or verified in accordance with AASHTO R 29. The Contractor shall submit a Certified Test Report and bill of lading representing each delivery in accordance with AASHTO R 26(M). The Certified Test Report must also indicate the binder specific gravity at 77°F; rotational viscosity at 275°F and 329°F; and the mixing and compaction viscosity-temperature chart for each shipment.
- iii. The Contractor shall submit the name(s) of personnel responsible for receipt, inspection, and record keeping of PG binder. Contractor Plant personnel shall document specific storage tank(s) where binder will be transferred and stored until used and provide binder samples from the storage tank to the Engineer upon request. The person(s) shall assure that each shipment is accompanied by a statement certifying that the transport vehicle was inspected before loading was found acceptable for the material shipped and that the binder is free of contamination from any residual material, along with 2 copies of the bill of lading.
- iv. The blending or combining of PG binders in one storage tank at the Plant from different suppliers, grades, or additive percentages is prohibited.

(b) Standard Performance Grade (PG) Binder:

- i. Standard PG binder shall be defined as "Neat." Neat PG binders shall be free from modification with: fillers, extenders, reinforcing agents, adhesion promoters, thermoplastic polymers, acid modification and other additives such as re-refined motor oil, and shall indicate such information on each bill of lading and Certified Test Report.
- ii. The standard asphalt binder shall be PG 64S-22.

(c) Modified Performance Grade (PG) Binder: The modified asphalt binder shall be Performance Grade PG 64E-22 asphalt modified solely with a Styrene-Butadiene-Styrene (SBS) polymer. The polymer modifier shall be added at either the refinery or terminal and delivered to the bituminous

concrete production facility as homogenous blend. The stability of the modified binder shall be verified in accordance with ASTM D7173 using the Dynamic Shear Rheometer (DSR). The DSR $G^*/\sin(\delta)$ results from the top and bottom sections of the ASTM D7173 test shall not differ by more than 10%. The results of ASTM D7173 shall be included on the Certified Test Report. The binder shall meet the requirements of AASHTO M 332 (including Appendix X1) and AASHTO R 29.

(d) Warm Mix Additive or Technology:

- i. The warm mix additive or technology must be listed on the North East Asphalt User Producer Group (NEAUPG) Qualified Warm Mix Asphalt (WMA) Technologies List at the time of bid, which may be accessed online at <http://www.neaupg.uconn.edu>.
- ii. The warm mix additive shall be blended with the asphalt binder in accordance with the manufacturer’s recommendations.
- iii. The blended binder shall meet the requirements of AASHTO M 332 and shall be graded or verified in accordance with AASHTO R 29 for the specified binder grade. The Contractor shall submit a Certified Test Report showing the results of the testing demonstrating the binder grade. In addition, it must include the grade of the virgin binder, the brand name of the warm mix additive, the manufacturer’s suggested rate for the WMA additive, the water injection rate (when applicable), and the WMA Technology manufacturer’s recommended mixing and compaction temperature ranges.

5. Emulsified Asphalts:

(a) General:

- i. The emulsified asphalt shall meet the requirements of AASHTO M 140(M), AASHTO M 208, or as applicable herein.
- ii. The emulsified asphalts shall be free of contaminants such as fuel oils and other solvents.
- iii. The blending at mixing Plants of emulsified asphalts from different suppliers is prohibited.
- iv. Materials used for tack coat shall not be diluted.

(b) Basis of Approval:

- i. Each shipment of emulsified asphalt delivered to the Project site shall be accompanied with the corresponding Certified Test Report listing Saybolt viscosity, residue by evaporation, penetration of residue, and weight per gallon at 77°F or 60°F, and a Material Certificate.
- ii. Non-Tracking Asphalt Tack Coat
 - Emulsion for Non-Tracking Asphalt Tack Coat shall meet the requirements of Table M.04.01-1 below.

Table M.04.01-1: Asphalt Emulsion for Non-Tracking Tack Coat

Property	Specification	Test Procedure
Viscosity, SFS, 77°F	20-100	AASHTO T 72
Sieve, %	0.3 maximum	AASHTO T 59
Asphalt Residue, %	50 minimum	AASHTO T 59
Oil Distillate, %	1.0 maximum	AASHTO T 59
Residue Penetration, at 77°F	10-40	AASHTO T 49
Original Dynamic Shear ($G^*/\sin \delta$), kPa at 70°C (Base Asphalt)	1.0 minimum	AASHTO T 315
Ash, %	1.0 maximum	AASHTO T 111

- iii. Material for Tack Coat
 - Anionic emulsified asphalts shall meet the requirements of AASHTO M 140. Materials used for anionic tack coat shall meet grade RS-1 or RS-1h. When ambient temperatures are 80°F and rising, grade SS-1 or SS-1h may be substituted if permitted by the Engineer.
 - Cationic emulsified asphalt shall meet the requirements of AASHTO M 208. Materials used for cationic tack coat shall meet grade CRS-1. The settlement and demulsibility test will not be performed unless deemed necessary by the Engineer. When ambient temperatures are 80°F and rising, grade CSS-1 or CSS-1h may be substituted if permitted by the Engineer.

6. Reclaimed Asphalt Pavement (RAP):

(a) General: RAP is a material obtained from the cold milling or removal and processing of bituminous concrete pavement. RAP material shall be crushed to 100% passing the 1/2 inch sieve and free from contaminants such as joint compound, wood, plastic, and metals.

(b) Basis of Approval: The RAP material will be accepted on the basis of one of the following criteria:

- i. When the source of all RAP material is from pavements previously constructed on Department projects, the Contractor shall provide a Materials Certificate listing the detailed locations and lengths of those pavements and that the RAP is only from those locations listed.
- ii. When the RAP material source or quality is not known, the Contractor shall request approval from the Engineer at least 30 calendar days prior to the start of the paving operation. The request shall include a Material Certificate and applicable test results stating that the RAP consists of aggregates that meet the specification requirements of M.04.01-1 through M.04.01-3 and that the binder in the RAP is substantially free of solvents, tars and other contaminants. The Contractor is prohibited from using unapproved material on Department projects and shall take necessary action to prevent contamination of approved RAP stockpiles. Stockpiles of unapproved material shall remain separate from all other RAP materials at all times. The request for approval shall include the following:
 - 1. A 50-lb. sample of the RAP to be incorporated into the recycled mixture.
 - 2. A 25-lb. sample of the extracted aggregate from the RAP.

7. Crushed Recycled Container Glass (CRCG):

(a) Requirements: The Contractor may propose to use clean and environmentally-acceptable CRCG in an amount not greater than 5% by weight of total aggregate.

(b) Basis of Approval: The Contractor shall submit to the Engineer a request to use CRCG. The request shall state that the CRCG contains no more than 1% by weight of contaminants such as paper, plastic, and metal and conforms to the following gradation:

CRCG Grading Requirements	
<u>Sieve Size</u>	<u>Percent Passing</u>
3/8 inch	100
No. 4	35-100
No. 200	0.0-10.0

The Contractor shall submit a Material Certificate to the Engineer stating that the CRCG complies with all the applicable requirements in this Section.

8. Joint Seal Material: Joint seal material must meet the requirements of ASTM D6690 - Type 2. The Contractor shall submit a Material Certificate in accordance with 1.06.07 or 1.20-1.06.07 certifying that the joint seal material meets the requirements of this Section.

9. Recycled Asphalt Shingles (RAS): RAS shall consist of processed asphalt roofing shingles from post-consumer asphalt shingles or from manufactured shingle waste. The RAS under consideration for use in bituminous concrete mixtures must be certified as being asbestos-free and shall be entirely free of whole, intact nails. The RAS shall meet the requirements of AASHTO MP 23.

RAS shall be tested to determine the asphalt content and the gradation at a frequency acceptable to the Engineer. RAS stockpiles shall be maintained to prevent contamination.

The Contractor shall submit a Material Certificate to the Engineer stating that the RAS complies with all the applicable requirements.

10. Plant Requirements:

(a) General: The Plant producing bituminous concrete shall comply with AASHTO M 156.

(b) Storage Silos: The Contractor may use silos for short-term storage with the approval of the Engineer. A storage silo must have heated cones and an unheated silo cylinder if it does not contain a separate internal heating system. When multiple silos are filled, the Contractor shall discharge 1 silo at a time. Simultaneous discharge of multiple silos for the same Project is not permitted.

Type of silo cylinder	Maximum storage time for all classes (hr)	
	HMA	WMA/PMA
Open Surge	4	Mfg Recommendations*
Unheated - Non-insulated	8	Mfg Recommendations*
Unheated - Insulated	18	Mfg Recommendations*
Heated - No inert gas	TBD by the Engineer	TBD by the Engineer

*Not to exceed HMA limits

(c) **Documentation System:** The mixing Plant documentation system shall include equipment for accurately proportioning the components of the mixture by weight and in the proper order, controlling the cycle sequence, and timing the mixing operations. Recording equipment shall monitor the batching sequence of each component of the mixture and produce a printed record of these operations on each Plant ticket, as specified herein.

If recycled materials are used, the Plant tickets shall include their dry weight, percentage, and daily moisture content.

If a WMA Technology is added at the Plant, the Plant tickets shall include the actual dosage rate.

For drum Plants, the Plant ticket shall be produced at 5 minute intervals and maintained by the vendor for a period of 3 years after the completion of the Project.

For batch Plants, the Plant ticket shall be produced for each batch and maintained by the vendor for a period of 3 years after the completion of the Project. In addition, an asterisk (*) shall be automatically printed next to any individual batch weight(s) exceeding the following tolerances:

Each Aggregate Component	±1.5% of individual or cumulative target weight for each bin
Mineral Filler	±0.5% of the total batch
Bituminous Material	±0.1% of the total batch
Zero Return (Aggregate)	±0.5% of the total batch
Zero Return (Bituminous Material)	±0.1% of the total batch

The entire batching and mixing interlock cut-off circuits shall interrupt and stop the automatic batching operations when an error exceeding the acceptable tolerance occurs in proportioning.

The scales shall not be manually adjusted during the printing process. In addition, the system shall be interlocked to allow printing only when the scale has come to a complete rest. A unique printed character (m) shall automatically be printed on the truck and batch plant printout when the automatic batching sequence is interrupted or switched to auto-manual or full manual during proportioning.

(d) **Aggregates:** Aggregate stockpiles shall be managed to prevent segregation and cross contamination. For drum Plants only, the percent moisture content, at a minimum prior to production and half way through production, shall be determined.

(e) **Mixture:** The dry and wet mix times shall be sufficient to provide a uniform mixture and a minimum particle coating of 95% as determined by AASHTO T 195(M).

Bituminous concrete mixtures shall contain no more than 0.5% moisture when tested in accordance with AASHTO T 329.

(f) **RAP:** RAP moisture content shall be determined a minimum of twice daily (prior to production and halfway through production).

(g) **Asphalt Binder:** A binder log shall be submitted to the Department's Central Lab on a monthly basis.

(h) **Warm mix additive:** For mechanically foamed WMA, the water injection rate shall be monitored during production and not exceed 2.0% by total weight of binder. For additive added at the Plant, the

dosage rate shall be monitored during production.

11. Testing Laboratory: The laboratory shall be provided with functioning equipment and adequate supplies to test bituminous concrete mixtures during production. The laboratory shall have a minimum of 300 s.f., have a potable water source and drainage in accordance with the CT Department of Public Health Drinking Water Division. The laboratory shall have a PC with internet connection capable of submitting electronic test results to the Engineer.

The laboratory shall be equipped with a heating system capable of maintaining a minimum temperature of 65°F. It shall be clear and free of all materials and equipment not associated with the laboratory. Sufficient light and ventilation must be provided. During summer months adequate cooling or ventilation must be provided so the indoor air temperature shall not exceed the ambient outdoor temperature.

The laboratory shall maintain a list of equipment used in the acceptance testing processes including, but not limited to, balances, scales, manometer/vacuum gauge, thermometers, and gyratory compactor, clearly showing calibration and/or inspection dates, in accordance with AASHTO R 18.

M.04.02—Mix design and Job Mix Formula (JMF)

1. Curb Mix:

(a) Requirements: The Contractor shall use bituminous concrete that meets the requirements of Table M.04.02-1. RAP may be used in 5% increments by weight up to 30%.

(b) Basis of Approval: Annually, an approved JMF based on a mix design for curb mix must be on file with the Engineer prior to use.

The Contractor shall test the mixture for compliance with the submitted JMF and Table M.04.02-1. The maximum theoretical density (Gmm) will be determined by AASHTO T 209. If the mixture does not meet the requirements, the JMF shall be adjusted within the ranges shown in Table M.04.02-1 until an acceptable mixture is produced.

An accepted JMF from the previous operating season may be acceptable to the Engineer provided that there are no changes in the sources of supply for the coarse aggregate, fine aggregate, recycled material (if applicable) and the Plant operation had been consistently producing acceptable mixture.

Any change in component source of supply or consensus properties must be approved by the Engineer. A revised JMF shall be submitted prior to use.

**TABLE M.04.02-1:
Control Points for Curb Mix Mixtures**

Mix	Curb Mix	Production Tolerances from JMF Target
Grade of PG Binder content %	PG 64S-22 6.5 - 9.0	0.4
Sieve Size		
No. 200	3.0 - 8.0 (b)	2.0
No. 50	10 - 30	4
No. 30	20 - 40	5
No. 8	40 - 70	6
No. 4	65 - 87	7
1/4 inch		
3/8 inch	95 - 100	8
1/2 inch	100	8
3/4 inch		8
1 inch		
2 inch		
Additionally, the fraction of material retained between any 2 consecutive sieves shall not be less than 4%.		
Mixture Temperature		
Binder	325°F maximum	
Aggregate	280-350°F	
Mixtures	265-325°F	
Mixture Properties		
Air Voids (VA) %	0 – 4.0 (a)	
Notes: (a) Compaction Parameter 50 gyrations (N_{des}) (b) The percent passing the No. 200 sieve shall not exceed the percentage of bituminous asphalt binder.		

2. Superpave Design Method – S0.25, S0.375, S0.5, and S1:

(a) **Requirements:** All designated mixes shall be designed using the Superpave mix design method in accordance with AASHTO R 35. A JMF based on the mix design shall meet the requirements of Tables M.04.02-2 to M.04.02-5. Each JMF and component samples must be submitted no less than 7 days prior to production and must be approved by the Engineer prior to use. All JMFs expire at the end of the calendar year.

All aggregate component consensus properties and tensile strength ratio (TSR) specimens shall be tested at an AASHTO accredited laboratory AASHTO re:source by NETTCP Certified Technicians.

All bituminous concrete mixes shall be tested for stripping susceptibility by performing the TSR test procedure in accordance with AASHTO T 283(M) at a minimum every 36 months. The compacted specimens may be fabricated at the Plant and then tested at an AASHTO re:source accredited facility. A minimum of 45000 grams of laboratory or plant blended mixture and the corresponding complete Form MAT-412s shall be submitted to the Department’s Central Laboratory for design TSR testing verification. The mixture submitted shall be representative of the corresponding mix design as determined by the Engineer.

i. **Superpave Mixtures with RAP:** RAP may be used with the following conditions:

- RAP amounts up to 15% may be used with no binder grade modification.
- RAP amounts up to 20% may be used provided a new JMF is approved by the Engineer. The

JMF submittal shall include the grade of virgin binder added. The JMF shall be accompanied by a blending chart and supporting test results in accordance with AASHTO M 323 Appendix X1, or by testing that shows the combined binder (recovered binder from the RAP, virgin binder at the mix design proportions, warm mix asphalt additive and any other modifier if used) meets the requirements of the specified binder grade.

- Two (2) representative samples of RAP shall be obtained. Each sample shall be split, and 1 split sample shall be tested for binder content in accordance with AASHTO T 164 and the other in accordance with AASHTO T 308.
- RAP material shall not be used with any other recycling option.
- ii. Superpave Mixtures with RAS: RAS may be used solely in HMA S1 mixtures with the following conditions:
 - RAS amounts up to 3% may be used.
 - RAS total binder replacement up to 15% may be used with no binder grade modification.
 - RAS total binder replacement up to 20% may be used provided a new JMF is approved by the Engineer. The JMF submittal shall include the grade of virgin binder added. The JMF shall be accompanied by a blending chart and supporting test results in accordance with AASHTO M 323 Appendix X1, or by testing that shows the combined binder (recovered binder from the RAP, virgin binder at the mix design proportions, warm mix asphalt additive and any other modifier if used) meets the requirements of the specified binder grade.
 - Superpave Mixtures with RAS shall meet AASHTO PP 78 design considerations.
- iii. Superpave Mixtures with CRCG: CRCG may be used solely in HMA S1 mixtures. One percent (1%) of hydrated lime, or other accepted non-stripping agent, shall be added to all mixtures containing CRCG. CRCG material shall not be used with any other recycling option.
- (b) Basis of Approval: The following information must be included in the JMF submittal:
 - i. Gradation, consensus properties and specific gravities of the aggregate, RAP or RAS.
 - ii. Average asphalt content of the RAP or RAS by AASHTO T 164.
 - iii. Source of RAP or RAS and percentage to be used.
 - iv. Warm mix Technology, manufacturer's recommended additive rate and tolerances, and manufacturer recommended mixing and compaction temperatures.
 - v. TSR test report and anti-strip manufacturer and recommended dosage rate if applicable.
 - vi. Mixing and compaction temperature ranges for the mix with and without the warm-mix technology incorporated.
 - vii. JMF ignition oven correction factor by AASHTO T 308.

With each JMF submittal, the following samples shall be submitted to the Division of Materials Testing:

- 4 - one (1) quart cans of PG binder, with corresponding Safety Data Sheet (SDS)
- 1 - 50 lbs. bag of RAP
- 2 - 50 lbs. bags of Plant-blended virgin aggregate

A JMF may not be approved if any of the properties of the aggregate components or mix do not meet the verification tolerances as described in the Department's current QA Program for Materials, Acceptance and Assurance Testing Policies and Procedures.

Any material based on a JMF, once approved, shall only be acceptable for use when it is produced by the designated Plant, it utilizes the same components, and the production of material continues to meet all criteria as specified in Tables M.04.02-2, M.04.02-3 and M.04.02-4. A new JMF must be submitted to the Engineer for approval whenever a new component source is proposed.

Only 1 mix with 1 JMF will be approved for production at a time. Switching between approved JMF mixes with different component percentages or sources of supply is prohibited.

TABLE M.04.02-2: Superpave Master Range for Bituminous Concrete Mixture Design Criteria

	S0.25		S0.375		S0.5		S1	
Sieve	Control Points		Control Points		Control Points		Control Points	
inches	Min (%)	Max (%)	Min (%)	Max (%)	Min (%)	Max (%)	Min (%)	Max (%)
2.0	-	-	-	-	-	-	-	-
1.5	-	-	-	-	-	-	100	-
1.0	-	-	-	-	-	-	90	100
3/4	-	-	-	-	100	-	-	90
1/2	100	-	100	-	90	100	-	-
3/8	97	100	90	100	-	90	-	-
No. 4	72	90	-	72	-	-	-	-
No. 8	32	67	32	67	28	58	19	45
No. 16	-	-	-	-	-	-	-	-
No. 30	-	-	-	-	-	-	-	-
No. 50	-	-	-	-	-	-	-	-
No. 100	-	-	-	-	-	-	-	-
No. 200	2.0	10.0	2.0	10.0	2.0	10.0	1.0	7.0
VMA (%)	16.5 ± 1		16.0 ± 1		15.0 ± 1		13.0 ± 1	
VA (%)	4.0 ± 1		4.0 ± 1		4.0 ± 1		4.0 ± 1	
Gse	JMF value		JMF value		JMF value		JMF value	
Gmm	JMF ± 0.030		JMF ± 0.030		JMF ± 0.030		JMF ± 0.030	
Dust / effective binder	0.6 - 1.2		0.6 - 1.2		0.6 - 1.2		0.6 - 1.2	
TSR	≥ 80%		≥ 80%		≥ 80%		≥ 80%	
T-283 Stripping	Minimal as determined by the Engineer							

(c) **Mix Status:** Each facility will have each type of bituminous concrete mixture rated based on the results of the previous year of production. Mix status will be developed for each bituminous concrete facility prior to the beginning of the paving season.

The rating criteria are based on compliance with Air Voids and Voids in Mineral Aggregate (VMA) as indicated in Table M.04.03-4 and are calculated as follows:

Criteria A: Percentage of acceptance test results with compliant air voids.

Criteria B: The average of the percentage of acceptance results with compliant VMA and the percentage of acceptance results with compliant air voids.

The final rating assigned will be the lower of the rating obtained with Criteria A or Criteria B.

Mix status is defined as:

“A” – Approved: Assigned to each mixture type from a production facility with a current rating of 70% or greater, or to each mixture type completing a successful PPT.

“U” – Not Approved: Status assigned to a type of mixture that does not have an approved JMF. Bituminous concrete mixtures with a “U” status cannot be used on Department projects.
“PPT” – Pre-Production Trial: Temporarily assigned to each mixture type from a production facility when:

1. no compliant acceptance production test results have been submitted to the Department from the previous year;
2. there is a source change in one or more aggregate components;
3. there is a component percentage change of more than 5% by weight;
4. there is a change in RAP percentage;
5. the mixture has a rating of less than 70% from the previous season;
6. it is a new JMF not previously submitted; or
7. the average of 10 consecutive acceptance results for VFA, Density to N_{ini} or dust to effective binder ratio does not meet the criteria in tables M.04.02-2 and M.04.02-4.

Bituminous concrete mixtures rated with a “PPT” status cannot be used on Department projects until modifications are made at the facility. Sufficient testing by NETTCP certified personnel must confirm that specification requirements in Tables M.04.02-2 through M.04.02-4 are met and the binder content (Pb) meets the requirements in Table M.04.03-2 before material can be used. One of the following methods must be used to verify the test results:

- Option A:** Schedule a day when a Department Inspector can be at the facility to witness testing
Option B: When the Contractor or their representative performs testing without being witnessed by an Inspector, the Contractor shall submit the test results and a split sample including 2 gyratory molds, 5,000 grams of boxed bituminous concrete, and 5,000 grams of cooled loose bituminous concrete for verification testing and approval
Option C: When the Contractor or their representative performs testing without being witnessed by a Department Inspector, the Engineer may verify the mix in the Contractor’s laboratory.
 Department Witness or verification of compliant test results will change the mix’s status to “A”
 The differences between the Department’s test results and the Contractor’s must be within the “C” tolerances included in the Department’s QA Program for Materials in order to be verified.

TABLE M.04.02-3: Superpave Consensus Properties Requirements for Combined Aggregate

Traffic Level	Design ESALs (80kN) Millions	Coarse Aggregate Angularity ⁽¹⁾ ASTM D5821, Minimum %	Fine Aggregate Angularity AASHTO T 304, Method A Minimum %	Flat and Elongated Particles ⁽²⁾ ASTM D4791, Maximum %	Sand Equivalent AASHTO T 176, Minimum %
1	< 0.3	55/- -	40	10	40
2	0.3 to < 3.0	75/- -	40	10	40
3	≥ 3.0	95/90	45	10	45

Notes:
⁽¹⁾ 95/90 denotes that a minimum of 95% of the coarse aggregate, by mass, shall have one fractured face and that a minimum of 90% shall have two fractured faces.
⁽²⁾ Criteria presented as maximum Percent by mass of flat and elongated particles of materials retained on the No. 4 sieve, determined at 5:1 ratio.

TABLE M.04.02-4: Superpave Traffic Levels and Design Volumetric Properties

Traffic Level	Design ESALs (million)	Number of Gyration by Superpave Gyrotory Compactor			Percent Density of Gmm from HMA/WMA Specimen			Voids Filled with Asphalt (VFA) Based on Nominal Mix Size - Inch			
		N _{ini}	N _{des}	N _{max}	N _{ini}	N _{des}	N _{max}	0.25	0.375	0.5	1
1	<0.3	6	50	75	≤91.5	96.0	≤98.0	70-80	70-80	70-80	67-80
2	0.3 to <3.0	7	75	115	≤90.5	96.0	≤98.0	65-78	65-78	65-78	65-78
3	≥3.0	7	75	115	≤90.0	96.0	≤98.0	65-77	65-76	65-75	65-75

**TABLE M.04.02-5:
 Superpave Minimum Binder Content by Mix Type and Level**

Mix Type	Level	Binder Content Minimum
S0.25	1	5.80
S0.25	2	5.70
S0.25	3	5.70
S0.375	1	5.70
S0.375	2	5.60
S0.375	3	5.60
S0.5	1	5.10
S0.5	2	5.00
S0.5	3	5.00
S1	1	4.60
S1	2	4.50
S1	3	4.50

M.04.03—Production Requirements:

1. Standard Quality Control Plan (QCP) for Production: The QCP for production shall describe the organization and procedures, which the Contractor shall use to administer quality control. The QCP shall include the procedures used to control the production process, to determine when immediate changes to the processes are needed, and to implement the required changes. The QCP must detail the inspection, sampling and testing protocols to be used, and the frequency for each.

Control Chart(s) shall be developed and maintained for critical aspect(s) of the production process as determined by the Contractor. The control chart(s) shall identify the material property, applicable upper and lower control limits, and be updated with current test data. As a minimum, the following quality characteristics shall be included in the control charts:

- percent passing No. 4 sieve
- percent passing No. 200 sieve
- binder content
- air voids
- Gmm
- Gse

- VMA

The control chart(s) shall be used as part of the quality control system to document variability of the bituminous concrete production process. The control chart(s) shall be submitted to the Engineer the first day of each month.

The QCP shall also include the name and qualifications of a Quality Control Manager. The Quality Control Manager shall be responsible for the administration of the QCP, including compliance with the plan and any plan modifications.

The Contractor shall submit complete production testing records to the Engineer within 24 hours in a manner acceptable to the Engineer.

The QCP shall also include the name and qualifications of any outside testing laboratory performing any QC functions on behalf of the Contractor. The QCP must also include a list of sampling and testing methods and frequencies used during production, and the names of all Quality Control personnel and their duties.

Approval of the QCP does not imply any warranty by the Engineer that adherence to the plan will result in production of bituminous concrete that complies with these specifications. The Contractor shall submit any changes to the QCP as work progresses.

2. Acceptance Requirements:

(a) General:

For those mixes with a total estimated project tonnage over 500 tons, a Contractor representative shall obtain a field sample of the material placed at the project site in accordance with AASHTO R 97 or an alternate procedure approved by the Engineer. Sampling from the truck at the Plant in accordance with AASHTO R 97 will be allowed for those mixes with a total estimated project tonnage equal to or less than 500 tons. The Contractor's representative obtaining mix samples must be a certified NETTCP HMA Paving Inspector, NETTCP HMA Plant Technician, or has successfully completed the HMA Field Sampling Course administered by the Connecticut Advanced Pavement Laboratory. Regardless of sampling location, the sample shall be quartered by the Contractor in accordance with AASHTO R 47 and placed in an approved container. For samples obtained at the project site, a Type A Mechanical Splitter shall be used to quarter the sample in accordance with AASHTO R 47. The container shall be sealed with a security tape provided by the Department and labelled to include the project number, date of paving, mix type, lot and subplot numbers and daily tonnage. The minimum weight of each quartered sample shall be 14000 grams. The Contractor shall transport one of the containers to the Department's Central Laboratory in Rocky Hill, retain one of the sealed containers for potential use in dispute resolution and test the remaining samples for acceptance in accordance with past practice.

The Contractor shall submit all acceptance test results to the Engineer within 24 hours or prior to the next day's production. All acceptance test specimens and supporting documentation must be retained by the Contractor and may be disposed of with the approval of the Engineer. All quality control specimens shall be clearly labeled and separated from the acceptance specimens.

Contractor personnel performing QC and acceptance testing must be present at the facility prior to, during, and until completion of production, and be certified as a NETTCP HMA Plant Technician and be in good standing. Production of material for use on State projects must be suspended by the Contractor if such personnel are not present. Technicians found by the Engineer to be non-compliant with NETTCP policies and procedures or Department policies may be removed by the Engineer from participating in the acceptance testing process for Department projects until their actions can be reviewed.

Verification and dispute resolution testing will be performed by the Engineer in accordance with the Department's QA Program for Materials.

If the Contractor disputes the Engineer's test results, the Contractor must submit in writing a request to initiate the dispute resolution process within 24 hours of receiving the adjustment and must include supporting documentation or test results to justify the request. If the dispute resolution is granted by the Engineer, all sublots for the disputed lot(s) shall be transported by the Contractor to the Department's Central Laboratory for testing.

(b) Curb Mix Acceptance Sampling and Testing Procedures: Curb Mixes shall be tested by the Contractor at a frequency of 1 test per every 250 tons of cumulative production, regardless of the day of production. When these mix designs are specified, the following acceptance procedures and AASHTO test methods shall be used:

TABLE M.04.03-1: Curb Mix Acceptance Test Procedures

Protocol	Reference	Description
1	AASHTO T 30(M)	Mechanical Analysis of Extracted Aggregate
2	AASHTO R 97	Sampling of Bituminous Concrete
3	AASHTO T 308	Binder Content by Ignition Oven Method (adjusted for aggregate correction factor)
4	AASHTO T 209(M)⁽²⁾	Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
5	AASHTO T 312⁽²⁾	⁽¹⁾ Superpave Gyrotory Molds Compacted to N _{des}
6	AASHTO T 329	Moisture Content of Hot-Mix Asphalt (HMA) by Oven Method

Notes: ⁽¹⁾ One (1) set equals 2 each of 6 inch molds. Molds to be compacted to 50 gyrations.

⁽²⁾ Once per year or when requested by the Engineer.

i. Determination of Off-Test Status:

1. Curb Mix is considered “off test” when the test results indicate that any single value for bitumen content or gradation are not within the tolerances shown in Table M.04.02-1 for that mixture. If the mix is “off test,” the Contractor must take immediate actions to correct the deficiency and a new acceptance sample shall be tested on the same day or the following day of production.
2. When multiple silos are located at 1 site, mixture supplied to 1 project is considered as coming from 1 source for the purpose of applying the “off test” status.
3. The Engineer may cease supply from the Plant when test results from 3 consecutive samples are not within the JMF tolerances or the test results from 2 consecutive samples not within the control points indicated in Table M.04.02-1 regardless of production date.

ii. JMF Revisions

1. If a test indicates that the bitumen content or gradation are outside the tolerances, the Contractor may make a single JMF revision as allowed by the Engineer prior to any additional testing. Consecutive test results outside the requirements of Table M.04.02-1 JMF tolerances may result in rejection of the mixture.
2. Any modification to the JMF shall not exceed 50% of the JMF tolerances indicated in Table M.04.02-1 for any given component of the mixture without approval of the Engineer. When such an adjustment is made to the bitumen, the corresponding production percentage of bitumen shall be revised accordingly.

(c) Superpave Mix Acceptance:

i. Sampling and Testing Procedures

Production Lot: The lot will be defined as one of the following types:

- Non-PWL Production Lot for total estimated Project quantities per mixture less than 3500 tons: All mixture placed during a single continuous paving operation.
- PWL Production Lot for total estimated Project quantities per mixture of 3500 tons or more: Each 3500 tons of mixture produced within 30 calendar days.

Production Sub Lot:

- For Non-PWL: As defined in Table M.04.03-2
- For PWL: 500 tons (The last sub lot may be less than 500 tons.)

Partial Production Lots (For PWL only): A Lot with less than 3500 tons due to:

- completion of the course;
- a Job Mix Formula revision due to changes in:
 - o cold feed percentages over 5%,
 - o target combined gradation over 5%,
 - o target binder over 0.15%,
 - o any component specific gravity; or
- a lot spanning 30 calendar days.

The acceptance sample(s) location(s) shall be selected using stratified - random sampling in accordance with ASTM D3665 based on:

- the total daily estimated tons of production for non-PWL lots, or

- the total size for PWL lots.
- The payment adjustment will be calculated as described in 4.06.

**TABLE M.04.03-2:
Superpave Acceptance Testing Frequency per Mix Type/Level/Plant for Non-PWL Lots**

Daily Quantity Produced in Tons (Lot)	Number of Sub Lots/Tests
0 to 125	0, Unless requested by the Engineer
126 to 500	1
501 to 1,000	2 ⁽¹⁾
1,001 to 1,500	3 ⁽¹⁾
1,501 or greater	1 per 500 tons or portions thereof

Notes: ⁽¹⁾ For daily quantities produced over 500 tons, the final acceptance test shall always be performed with material from the last sub lot regardless of the predetermined random selections

The following test procedures shall be used for acceptance:

TABLE M.04.03-3: Superpave Acceptance Testing Procedures

Protocol	Procedure	Description
1	AASHTO R 97	Sampling of bituminous concrete
2	AASHTO R 47	Reducing samples to testing size
3	AASHTO T 308	Binder content by ignition oven method (adjusted for aggregate correction factor)
4	AASHTO T 30(M)	Gradation of extracted aggregate for bituminous concrete mixture
5	AASHTO T 312	⁽¹⁾ Superpave gyratory molds compacted to N_{des}
6	AASHTO T 166	⁽²⁾ Bulk specific gravity of bituminous concrete
7	AASHTO R 35	⁽²⁾ Air voids, VMA
8	AASHTO T 209(M)	Maximum specific gravity of bituminous concrete (average of 2 tests)
9	AASHTO T 329	Moisture content of bituminous concrete

Notes: ⁽¹⁾ One (1) set equals 2 each of 6 inch molds. Molds to be compacted to N_{max} for PPTs and to N_{des} for production testing. The first sub lot of the year shall be compacted to N_{max} .
⁽²⁾ Average value of 1 set of 6 inch molds.

If the average ignition oven corrected binder content differs by 0.3% or more from the average of the Plant ticket binder content in 5 consecutive tests regardless of the production date (moving average), the Contractor shall immediately investigate, determine an assignable cause, and correct the issue. When 2 consecutive moving average differences are 0.3% or more and no assignable cause has been established, the Engineer may require a new ignition oven aggregate correction factor to be performed or to adjust the current factor by the average of the differences between the corrected binder content and production Plant ticket for the last 5 acceptance results.

The Contractor shall perform TSR testing within 30 days after the start of production for all design levels of HMA- and PMA- S0.5 Plant-produced mixtures, in accordance with AASHTO T 283(M). The TSR test shall be performed at an AASHTO re:source certified laboratory by NETTCP certified technicians. The compacted specimens may be fabricated at the Plant and then tested at an AASHTO re:source accredited facility. A minimum of 45000 grams of plant blended mixture and the corresponding complete Form MAT-412s shall be submitted to the Department’s Central Laboratory for production TSR testing verification. The mixture submitted shall be representative of the corresponding mix design as determined by the Engineer. Additionally, the TSR test report and tested specimens shall be submitted to the Engineer for review. Superpave mixtures that require anti-strip additives (either liquid or mineral) shall continue to meet all requirements specified herein for binder and bituminous concrete. The Contractor shall submit the name, manufacturer, percent used, technical datasheet and SDS

for the anti-strip additive (if applicable) to the Engineer.

- i. Determination of Off-Test Status:
 1. Superpave mixes shall be considered “*off test*” when any control point sieve, binder content, VA, VMA, and Gmm value is outside of the limits specified in Table M.04.03-4 or the target binder content at the Plant is below the minimum binder content stated in Table M.04.02-5. Note that further testing of samples or portions of samples not initially tested for this purpose cannot be used to change the status.
 2. Any time the bituminous concrete mixture is considered off-test:
 - A. The Contractor shall notify the Engineer when the Plant is “*off test*” for any mix design that is delivered to the Project in any production day. When multiple silos are located at 1 site, mixture supplied to 1 project is considered as coming from 1 source for the purpose of applying the “*off test*” determination.
 - B. The Contractor must take immediate actions to correct the deficiency, minimize “*off test*” production to the Project, and obtain an additional Process Control (PC) test after any corrective action to verify production is in conformance with the specifications. A PC test will not be used for acceptance and is solely for the use of the Contractor in its quality control process.
- ii. Cessation of Supply for Superpave Mixtures in Non-PWL Lots:
A mixture **shall not be used** on Department projects when it is “*off test*” for:
 1. four (4) consecutive tests in any combination of VA, VMA or Gmm, regardless of date of production, or
 2. two (2) consecutive tests in the control point sieves in 1 production shift.
 As a result of cessation of supply, the mix status will be changed to PPT
- iii. JMF revisions:
JMF revisions are only permitted prior to or after a production shift. A JMF revision is effective from the time it was submitted and is not retroactive to the previous test(s).
JMF revisions shall be justified by a documented trend of test results.
Revisions to aggregate or RAP specific gravities are only permitted when testing is performed at an AASHTO re:source certified laboratory by NETTCP certified technicians.
A JMF revision is required when the Plant target RAP or bin percentage deviates by more than 5% or the Plant target binder content deviates by more than 0.15% from the active JMF.

TABLE M.04.03-4: Superpave Mixture Production Requirements

	S0.25		S0.375		S0.5		S1		Tolerances
Sieve	Control Points		Control Points		Control Points		Control Points		From JMF Targets ⁽²⁾
inches	Min (%)	Max (%)	Min (%)	Max (%)	Min (%)	Max (%)	Min (%)	Max (%)	+/- Tolerance
1.5	-	-	-	-	-	-	100	-	
1.0	-	-	-	-	-	-	90	100	
3/4	-	-	-	-	100	-	-	90	
1/2	100	-	100	-	90	100	-	-	
3/8	97	100	90	100	-	90	-	-	
No. 4	72	90	-	72	-	-	-	-	
No. 8	32	67	32	67	28	58	19	45	
No. 16	-	-	-	-	-	-	-	-	
No. 200	2.0	10.0	2.0	10.0	2.0	10.0	1.0	7.0	
Pb	JMF value		JMF value		JMF value		JMF value		0.3 ⁽³⁾
VMA (%)	16.5		16.0		15.0		13.0		1.0 ⁽⁴⁾
VA (%)	4.0		4.0		4.0		4.0		1.0 ⁽⁵⁾
Gmm	JMF value		JMF value		JMF value		JMF value		0.030
Mix Temp. – HMA ⁽⁶⁾	265-325°F ⁽¹⁾		265-325°F ⁽¹⁾		265-325°F ⁽¹⁾		265-325°F ⁽¹⁾		
Mix Temp. – PMA ⁽⁶⁾	285-335°F ⁽¹⁾		285-335°F ⁽¹⁾		285-335°F ⁽¹⁾		285-335°F ⁽¹⁾		
Prod. TSR	N/A		N/A		≥80%		N/A		
T 283 Stripping	N/A		N/A		Minimal TBD by the Engineer		N/A		

Notes: ⁽¹⁾ 300°F minimum after October 15.

⁽²⁾ JMF tolerances shall be defined as the limits for production compliance.

⁽³⁾ 0.4 for PWL lots

⁽⁴⁾ 1.3 for all PWL lots except S/P 0.25 mixes. 1.1 for S/P 0.25 Non-PWL lots. 1.4 for S/P 0.25 PWL lots

⁽⁵⁾ 1.2 for PWL lots

⁽⁶⁾ Also applies to placement

**Table M.04.03-5:
 Modifications to Standard AASHTO and ASTM Test Specifications and Procedures**

AASHTO Standard Method of Test	
Reference	Modification
T 30	Section 7.2 through 7.4 Samples are not routinely washed for production testing
T 209	Section 7.2 The average of 2 bowls is used proportionally in order to satisfy minimum mass requirements. 8.3 Omit Pycnometer method.
T 283	When foaming technology is used, the material used for the fabrication of the specimens shall be cooled to room temperature, and then reheated to the manufacturer’s recommended compaction temperature prior to fabrication of the specimens.
AASHTO Standard Recommended Practices	
Reference	Modification
R 26	All laboratory technician(s) responsible for testing PG binders shall be certified or Interim Qualified by NETTCP as a PG Asphalt Binder Lab Technician. All laboratories testing binders for the Department are required to be accredited by AASHTO re:source. Sources interested in being approved to supply PG binders to the Department by use of an “in-line blending system” must record properties of blended material and additives used. Each source of supply of PG binder must indicate that the binders contain no additives used to modify or enhance their performance properties. Binders that are manufactured using additives, modifiers, extenders, etc., shall disclose the type of additive, percentage and any handling specifications or limitations required. All AASHTO M 320 references shall be replaced with AASHTO M 332. Once a month, 1 split sample and test results for each asphalt binder grade and each lot shall be submitted by the PG binder supplier to the Department’s Central Lab. Material remaining in a certified lot shall be re-certified no later than 30 days after initial certification. Each April and September, the PG binder supplier shall submit test results for 2 BBR tests at 2 different temperatures in accordance with AASHTO R 29.

SECTION 32 16 13 - CURBS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Curbing

1.02 RELATED REQUIREMENTS

- A. Section 03 30 00 - Cast-in-Place Concrete
- B. Section 31 22 00 - Grading
- C. Section 31 23 16 - Excavation
- D. Section 31 23 23 - Backfilling
- E. Section 32 11 00 - Base Courses
- F. Section 32 12 00 - Flexible Paving

1.03 REFERENCE STANDARDS

- A. AASHTO M 213 - Standard Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).
- B. See Sections 4.06 and M.04 of the Standard Specifications as attached to Section 32 12 00.

1.04 SUBMITTALS

- A. Comply with Section 03 30 00 for cast-in-place concrete submittals.
- B. Asphalt Certifications - Submit the name, address and telephone number of the asphalt plant proposed for use and a certification that:
 1. The mixing plant used to produce the bituminous concrete materials has been inspected and approved by the Chief, Materials Section of the Connecticut Department of Transportation and that such approval is current and effective throughout the period when the bituminous concrete materials are manufactured for this Project.
 2. The bituminous concrete materials delivered to the Project site conforms in all respects to the requirements of the Standard Specifications for the mixture class specified.

1.05 QUALITY ASSURANCE

- A. Provide at least one (1) person who shall be present at all times during the execution of this portion of the Work and who shall be thoroughly qualified and experienced in the placing of the type of bases, pavements and overlays specified and who shall direct all work performed under this Section.
- B. Use only personnel thoroughly trained and experienced in the skills required for installing and finishing concrete curbing, and in operating the required equipment.
- C. Provide finished paved surfaces that are smooth, even, and free from surface defects and irregularities. Edges shall be straight, and shall meet existing pavements smoothly. Pavement shall present a smooth, continuous, and workmanlike appearance, free from patch work, rough

edges, spalling areas, potholes, depressions, bumps, and other defects. The complete finished installation shall meet with the complete approval of the Engineer with respect to appearance as well as structural integrity and other criteria.

- D. No finish surface pavement shall be started during the period of October 31 of any one year through April 1 the following year, unless otherwise approved by Engineer.
- E. All materials and the asphalt and concrete plants shall be available for inspections and tests by the Engineer.
- F. Reclaimed miscellaneous aggregate material from off-site is not permitted for use on this Project.
- G. Protect concrete from environmental conditions:
 - 1. Do not continue or commence concrete operations during rainy weather conditions.
 - 2. When the ambient air temperatures is 90°F (32°C), cool the forms that come in contact with the concrete mix to below 90°F (32°C) for a minimum of 1 hour prior to and 1 hour after the completion of the concrete placement by means of water spray or other methods satisfactory to the Engineer.
 - 3. When there is a potential for ambient air temperature below 40°F (5°C) during placement or curing operations, submit a Cold-Weather Concreting Plan to the Engineer.

1.06 DELIVERY STORAGE AND HANDLING

- A. Hauling equipment shall conform to the Standard Specifications. The Contractor is advised that length of haul, manner of haul, temperature of asphalt, and similar criteria, have a direct bearing on the quality and acceptability of the finished pavements. These and all other criteria shall be properly controlled such that the job mix of bituminous concrete when placed, is identical to that specified, approved, and as it left the asphalt plant. Segregation of aggregates, whether occasioned by hauling operations, improper mixing at the asphalt plant, or for other reasons, will result in rejection of the pavement. Clusters and pockets of aggregate in the finished pavement surface, with voids surrounding the aggregates, are unacceptable and will be rejected.

PART 2 PRODUCTS

2.01 CONCRETE CURBING

- A. Concrete:
 - 1. Cast-in-place Concrete – PCC04460 concrete mix design in accordance with Section M.03 of the Standard Specifications as attached to Section 03 30 00.
 - 2. Precast Concrete:
 - a. Material shall conform to Section M.03 of the Standard Specifications as attached to Section 03 30 00, except the coarse aggregate gradation may be varied with approval by Engineer.
 - b. 4,000psi (28mPa) minimum 28-day design (not constructed) compressive strength.
 - c. Five (5) to seven (7) percent entrained air, unless approved by Engineer.
- B. Expansion joint filler - Preformed expansion joint filler shall be bituminous cellular type and shall conform to the requirements of AASHTO M 213.

2.02 BITUMINOUS CONCRETE CURBING

- A. Curb Mix - Conform to Section M.04 – Bituminous Concrete of the Standard Specifications as attached to Section 32 12 00 of these Specifications, except that the requirements pertaining to density do not apply.
- B. Tack Coat - Conform to Section M.04.5 – Bituminous Concrete of the Standard Specifications as attached to Section 32 12 00 of these Specifications.

PART 3 EXECUTION

3.01 PERFORMANCE

- A. Concrete Curbing:
 - 1. Excavation:
 - a. Excavate to the required depths below finished grades to provide the base upon which the curb is set and compacted to a firm and even surface.
 - 2. Subbase:
 - a. Place and compact granular fill to depths shown on drawings.
 - b. Layers shall not exceed six (6) inches depth prior to compaction.
 - c. Wet and roll or tamp each layer after spreading.
 - 3. Forms:
 - a. Securely stake, brace, and firmly hold forms to the required line and grade.
 - b. Place forms tightly to prevent mortar leakage.
 - c. Clean and oil or wet forms immediately before placing concrete against them.
 - d. Remove mortar from previous placements, debris, and foreign material from forms and prior to commencing concrete placement.
 - e. Remove ponded water from within forms prior to commencing placement.
 - f. Construct forms for exposed faces such that they can be removed before concrete has taken final set in order to permit correction of surface irregularities.
 - 4. Concrete Placement:
 - a. Maintain five (5) to seven (7) percent entrained air at time cast-in-place concrete is deposited into forms.
 - b. Place on moist base. Do not place on soft, muddy, or frozen base.
 - c. Slip form equipment conforming to the Drawings is acceptable for use.
 - d. Place precast curbing units in 6 foot or longer lengths for straight sections.
 - e. Where slip forms and precast is not used, place concrete in forms, strike off with a template, compact by approved methods, and finish to a smooth even surface.
 - f. Construct curbing in uniform lengths of approximately ten (10) feet, unless otherwise directed by the Engineer, and arranged such that the joint in the curbing is opposite a joint in the adjoining concrete pavement slab and be similar to it. No sections less than six (6) feet in length are permitted.
 - 5. Curing and protection:
 - a. Cast-in-place curbing shall be cured and protected in accordance with Section 6.01.03 of the Standard Specifications as attached to Section 03 30 00.
 - 6. Backfilling:
 - a. After concrete has set sufficiently, backfill and grade to the lines shown on the plans. Place and compact in lifts not exceeding six (6) inches in depth.
- B. Bituminous Concrete Curbing:
 - 1. Prepare the surface by cleaning it of loose and foreign material and drying it as required.
 - 2. Apply tack coat to surface immediately prior to installing curbing.
 - 3. Upon arrival on-site, transfer mixture from truck to hopper of curbing machine.

4. Keep mixture clean and free from dirt and foreign material.
5. Install compact using mechanical curbing machine.
 - a. Obtain approval from Engineer for hand laid curbing locations when the use of a mechanical curbing machine is not practical.
 - b. Obtain a smooth traveling surface for the curbing machine's wheels as necessary.
6. Keep traffic a safe distance from the curbing for 24 hours and until the curb has sufficiently set to prevent damage to work.

3.02 TOLERANCES

- A. Curbing - Final surface shall not vary more than plus or minus one quarter ($\pm \frac{1}{4}$) inch in ten (10) feet from the grades and cross slopes shown on the Drawings. The entire surface shall be checked by the Contractor in the presence of the Engineer with an acceptable ten (10) foot straightedge.

3.03 ADJUST AND CLEAN

- A. Correct deficiencies and unmet tolerances in a manner approved by the Engineer.
- B. Eliminate settlement in a manner approved by the Engineer.
- C. Clean all paved surfaces of dirt, stones and other debris and remove and dispose of off-site all discarded mix, trash, and all other debris.

END OF SECTION

SECTION 32 92 00 - TURF ESTABLISHMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Furnishing and placing topsoil.
- B. Establishment of grass turf on all disturbed surfaces not shown to be covered with other materials or structures.

1.02 RELATED REQUIREMENTS

- A. Section 31 22 00 - Grading
- B. Section 31 25 00 - Soil Erosion and Sediment Control

1.03 SUBMITTALS

- A. Product Data - Submit technical data for fertilizer, lime, seed mixtures, and related products, including labels, chemical analysis, purity, recommended application rates, percentage of weed seed, and related data.
- B. Samples - Submit sample of native and imported topsoil to the State Cooperative Extension System for analysis.
- C. Test Reports - Soil test recommendations from State Cooperative Extension System.

1.04 GUARANTEE

- A. Upon request with at least ten (10) days' notice, Engineer will inspect lawns, grass, and ground cover for vigorous and healthy condition to establish the date of turf establishment completion.
- B. Turf establishment guarantee period is one (1) year from the date of turf establishment completion contingent upon the lawns, grass, and ground cover remaining in vigorous and healthy condition.
- C. Final acceptance of this portion of the Work will be given after lawns, grass, and ground cover have been in a vigorous and healthy condition for the entire turf establishment guarantee period.

PART 2 PRODUCTS

2.01 TOPSOIL

- A. Topsoil - That portion of the soil profile defined technically as the "A" horizon by the Soil Science of America, containing not less than three (3) nor more than twenty (20) percent of organic matter as determined by loss-on-ignition of oven-dried samples.
- B. The following textural classes, as determined on the basis of material passing the 850 µm mesh sieve and subjected to partial mechanical analysis, are acceptable:
 - 1. Loamy sand, with not more than 80 percent sand.
 - 2. Sandy loam.
 - 3. Loam.

- 4. Sandy clay loam, with not more than 30 percent clay.
 - 5. Silt loam, with not more than 60 percent silt.
- C. Topsoil to be loose, friable, reasonably free of admixtures of subsoil, and free from refuse, stumps, roots, brush, weeds, rocks, and stones over one (1) inch in overall measurements. Topsoil to also be free from any material that will prevent the formation of a suitable seedbed or prevent seed germination and plant growth.
- 2.02 LIME
- A. Commercial grade ground limestone containing not less than fifty (50) percent of total oxides. Gradation as follows: Minimum seventy-five (75) percent passing the one-hundred (#100) mesh sieve and 100 percent passing the twenty (#20) mesh sieve.
- 2.03 FERTILIZER
- A. Ten (10) percent nitrogen, six (6) percent phosphorous and four (4) percent potassium. Granulated to pass through one-eighth (1/8) inch screen.
- 2.04 SEED
- A. Furnished to the site in unopened containers, fully labeled in accordance with U.S. Department of Agriculture Rules and Regulations under the Federal Seed Act. Seed mixture to be approximately as follows:

	<u>Mixture Percent</u>	<u>Minimum Percent Germination</u>
Blue Grass	30%	85%
Creeping Red Fescue	40%	85%
Perennial Rye	20%	85%
Annual Rye	10%	85%

- B. Wetland seed mix – New England Wetmix by New England Wetland Plants, Inc., or accepted substitution.
 - C. Use seed within one year of test date on label.
 - D. Percent Live Seed = Percent Minimum Purity x Percent Minimum Germination/100.
- 2.05 MULCH
- A. Salt hay, straw, manufactured cellulose fiber or wood pulp mulch as approved.

PART 3 EXECUTION

- 3.01 GENERAL
- A. Verify that all underground work in the area is completed, and all conditions are proper, prior to initiation of this portion of the Work.
 - B. Perform seeding only during the following dates:
 - 1. April 1 to June 15.
 - 2. September 1 to October 1.

- C. With the exception of Crown Vetch, the final fall seeding dates may be extended an additional 15 days in the coastal towns of New London, Middlesex, New Haven, and Fairfield counties.
- D. Follow recommendations of State Cooperative Extension Agency lab report for application rates of lime and fertilizer.

3.02 TOPSOILING

- A. Spread topsoil evenly and compact lightly to a thickness of not less than six (6) inches. Do not spread topsoil in a frozen or muddy condition. Make allowance for settlement.
- B. Import additional topsoil if insufficient quantity is available from stripping the Project site.
- C. Surplus topsoil - Comply with Section 31 23 16.

3.03 SEEDING METHODS

- A. Apply lime evenly, prior to fertilizing and seeding, and work lime into the top three (3) inches of soil. Redress the surface. Apply fertilizer after liming and before seeding. (Fertilizer may be sown with seed by hydroseeding if water soluble fertilizer is utilized.)
- B. If topsoil in the areas to be seeded has become hard or crusted before seeding, make topsoil friable and receptive to seeding by approved methods which will not disrupt the line and grade of the areas to be seeded.
- C. Apply seed uniformly by any agronomically acceptable and feasible method approved. Apply seed at a rate recommended by the seed vendor, but not less than four (4) pounds of live seed per 1,000 square feet, as determined by Article 2.04.C of this Specification.
- D. Apply mulch as specified under Section 31 25 00.
- E. When spreading straw mulch by hand, divide the area to be mulched into sections of approximately 1,000 square feet and place at least 70-90 pounds (1-1/2 to 2 bales) of straw in each section to ensure uniform distribution and obtain at least 80% coverage of the surface of the seedbed. Anchor mulches immediately after spreading to prevent wind-blowing by applying an approved binder or erosion control netting.
- F. In areas where slopes to be vegetated are steeper than three (3) horizontal to one (1) vertical, install four (4) inches of straw mulch covered with approved erosion control netting, as soon as the seed is placed, unless otherwise shown on the Drawings or specified herein. Install netting in accordance with the manufacturer's instructions immediately after the mulch has been placed.

3.04 OUT-OF-SEASON SEEDINGS

- A. Perform out-of-season seeding in the same manner as in-season seeding. Since acceptable turf establishment is less likely, be responsible for in-season reseeding until the turf conforms to Paragraph 1.04.B.

3.05 MAINTENANCE DURING TURF ESTABLISHMENT GUARANTEE PERIOD

- A. Mow turfed area to an average height of two and one-half (2-1/2) inches whenever average height of grass becomes three and one-half (3-1/2) inches.
- B. Mow, eradicate weeds, water, fertilize, overseed, and perform other operations necessary to promote turf growth.

- C. Repair lawns, grass, and ground cover areas not found acceptable by the Engineer during the turf establishment guarantee period, and reset the turf establishment date of completion as specified in 1.04.A of this Section.

END OF SECTION

SECTION 32 93 00 - PLANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Furnishing trees.
- B. Preparation of planting areas, plant layout, planting, staking, and guying.
- C. Caring for living plants and replacement of dead and unsatisfactory plants and materials before final acceptance in Contract.

1.02 RELATED REQUIREMENTS

- A. Section 31 22 00 - Grading
- B. Section 31 25 00 - Soil Erosion and Sediment Control
- C. Section 32 92 00 - Turf Establishment

1.03 REFERENCE STANDARDS

- A. See Sections M.13 of the Standard Specifications as attached.
- B. ANSI Z-60.1 - American Nursery Stock Standard

1.04 SUBMITTALS

- A. Product Data - Submit source of supply and technical data for each product type.
- B. Samples - Submit sample of mulch.
- C. Certificates - Submit product certificates and certificate of warranty.
- D. Maintenance Data - Submit recommended procedures to be established by Owner for maintenance of plants during the calendar year.

1.05 QUALITY ASSURANCE

- A. Maintain an experienced, at the opinion of the Engineer, full-time supervisor on-site while planting is in progress.
- B. Provide quality, size, genus, species, and variety of plants complying with applicable requirements in ANSI Z-60.1.
- C. Do not plant in frozen ground, snow covered ground, or if the soil is in an unsatisfactory condition determined by the Engineer regardless of planting season. Planting season is as indicated below.
 - 1. Deciduous Material:
 - a. Spring: March 1st to May 31st (inclusive), except for balled and burlapped material. Balled and burlapped material may be planted any time from March 1st to June 15th (inclusive).
 - b. Fall: October 15th until ground freezes.
 - 2. Evergreen Material:

- a. Spring: March 1st to May 31st (inclusive).
- b. Fall: August 15th to October 31st (inclusive).

1.06 DELIVERY AND STORAGE

- A. Furnish plants to the project site undamaged.
- B. Provide mulch and water as necessary to keep moist and fresh.
- C. Protect against overexposure to sun, wind, and freezing temperatures.
- D. Separate bare-root plants upon delivery, if not planted immediately upon receipt, and stored in an area where their roots are kept covered to keep air away until they are ready for planting.
- E. Store balled and burlapped plants with their earth balls covered by soil, wood chips, cloth, straw, or other suitable material and kept moist until planting.
- F. Store all plants in a shady location until planted, unless specified otherwise.

1.07 WARRANTY

- A. Guarantee period for plants is one (1) year from the date of completion and Engineer acceptance. A percentage of the Contract's retainage which is the equivalent of \$5,000 or 20% of the cost of all plants, whichever greater, shall be held for this guarantee period.
- B. A final inspection of all plantings will be conducted by the Owner and Engineer one (1) year from the date of completion. Engineer will determine corrective measures. Once corrective measures are complete, remainder of retainage may be released.

PART 2 PRODUCTS

2.01 PLANTING SOIL

- A. Conform to Section M.13.01.2 of the Standard Specifications, as attached.

2.02 FERTILIZER FOR PLANTS

- A. Conform to Section M.13.03 of the Standard Specifications, as attached.

2.03 MULCH FOR PLANTS

- A. Conform to Section M.13.05 of the Standard Specifications, as attached.

2.04 PLANTING MATERIALS

- A. Conform to Section M.13.07 of the Standard Specifications, as attached.

PART 3 EXECUTION

3.01 PREPARATION

- A. Provide Engineer with source of supply for planting materials to initiate the inspection and approval of materials.
- B. Inspect site conditions and inform Engineer of conflicts.

- C. Coordinate planting layout with Engineer for approval no less than 48 hours prior to planting. Stake planting locations in the field in the presence of the Engineer prior to excavating pits.
- D. Installing paving and structural items within the contract that may damage plants prior to installing plant materials.
- E. Remove undesirable vegetation, roots, unsuitable materials, and obstructions from planting areas.
- F. If backfill is required due to the removal of obstructions, backfill shall meet the planting soil requirements of Section M.13.01-2 of the Standard Specifications, as attached.
- G. Spraying planting areas with Glyphosate or an approved equal to remove remaining turf grasses and unwanted vegetation is an option available to the Contractor, unless otherwise specified by the Engineer. Spraying shall not occur less than 14 days before the installation of plant materials.

3.02 INSTALLATION

- A. Perform planting in accordance with the drawings.
- B. Excavate pits for plantings so that the horizontal dimension of the hole is twice the diameter of the root ball, container, or bare root spread as shown on the plans. The depth of the pit shall be 2 inches less than the distance between the bottom of the root ball, container, or bare root mass and the location of the root flare or top of the root structure. Do not loosen soil within the roots inside the ball. Suitable excavated soil may be set aside to be incorporated into the planting mix.
- C. Remove any rock or underground obstruction to the depth necessary for planting as specified unless other locations for the planting are approved by the Engineer. If removal of obstructions results in a deeper hole than needed for planting, or if the pit is over excavated, backfill shall be added, and must be thoroughly compacted to the proper depth prior to setting plants. If backfill is required, it shall meet the planting soil requirements of M.13.01-2.
- D. Move plants from storage to the planting location, retie burlap as needed to prevent shifting while placing the plant into the planting pit. Carefully place the plant into the center of the pit. Ensure that the root flare or the top of the root system is 2 inches above finished grade. Correct pit depth if the plant is less than 2 inches, or more than 4 inches above finished grade. All plants shall be set plumb. Backfill with planting soil to 1/2 the depth of the planting pit and thoroughly tamp around the ball. Fill the remaining area of the pit with water. Once water has completely drained, fill the remainder of the pit with planting soil. Water the planting area, re-tamp, and add additional planting soil to correct any low spots. Saucers shall be formed outside of individual plants (exclusive of plant beds) by placing ridges of planting soil around each, or as directed by the Engineer. In addition, the following shall be completed for each respective type of plant:
 1. Balled and Burlapped Plants (B&B): If wire baskets are used, cut all the horizontal wires in the top 2/3 of the root ball and bend down or remove the top 1/3 of the wire basket. Remove excess soil from the top of the root ball to expose the root structure and cut away any small feeder or girdling roots. Roots that have been wrapped around the ball within the burlap shall be straightened.
 2. Container Grown Plants (CG): Carefully remove the plant from the container over the prepared pits. Gently loosen the soil and straighten all roots as naturally as possible. It may be required to cut and remove excessive amounts of root mass if roots are tightly wrapped or bound.

3. Bare-roots Plants (BR): Carefully spread roots as naturally as possible and place into the bottom of the pit. All broken or frayed roots shall be cleanly cut off.
 - E. Apply fertilizer to the surface of the plant beds and work into the upper 2 inches of the soil at the rate of 3lbs/100 sf of surface area (broadcast). For trees, apply at a rate of 2 lbs./in of trunk diameter.
 - F. Water plants upon setting and as warranted thereafter. Apply water at a controlled rate to ensure water reaches the root zone of each plant and does not run off to adjacent areas. Apply in a manner to not dislodge plants, erode soil or mulch, or cause damage to saucer. Slow-release, drip irrigations bags are acceptable to use per manufacturer's instructions. The following is guide for minimum watering requirements:
 1. Trees:
 - a. 2 1/2-inch Caliper and less - 15 gal. each
 - b. 3 inches to 5-inch Caliper - 20 gal. each.
 - c. 5 1/2-inch Caliper and above - 25 gal. each.
 2. Shrubs:
 - a. 24 inches and less - 6 gal. each.
 - b. More than 24 inches - 10 gal. each.
 3. Vines, Perennials, and Ornamental Grasses - 3 gal. each.
 4. Groundcovers and Bulbs - 2 gal. per s.f.
 - G. Guy or stake immediately after planting trees. Guy wires, hose, and tree support stakes shall be removed after the initial establishment period.
 - H. Prune plants before or immediately after planting, as directed by the Engineer. No leader shall be cut unless directed by the Engineer. Clean cut and remove broken, or badly bruised branches, sucker growth, etc.
 - I. Spraying with antidesiccant is at the discretion of the Contractor as approved by the Engineer.
 - J. Hand place mulch and spread to a depth of 3 inches and rake to an even surface over the saucer areas for individual trees and shrubs and over the entire area of shrub beds and elsewhere.
 - K. Restore surrounding turf grasses and other vegetation damaged by the Contractor.
- 3.03 ATTACHMENTS
- A. Section M.13 - Roadside Development of the Standard Specifications.

END OF SECTION

**SECTION M.13
ROADSIDE DEVELOPMENT**

M.13.01—Topsoil and Planting Soil**M.13.02—Agricultural Ground Dolomitic Limestone****M.13.03—Fertilizer****M.13.04—Seed Mixtures****M.13.05—Mulch Materials****M.13.06—Compost****M.13.07—Plant Materials****M.13.08—Sod****M.13.09—Erosion Control Matting****M.13.01—Topsoil and Planting Soil:**

1. Topsoil: The term topsoil used herein shall mean a soil meeting the soil textural classes established by the USDA Classification System based upon the proportion of sand, silt, and clay size particles after passing a No. 10 sieve and subjected to a particle size analysis. The topsoil shall contain 5% to 20% organic matter as determined by loss on ignition of oven-dried samples dried at 221°F. The pH range of the topsoil shall be 5.5 to 7.0.

The following textural classes shall be acceptable:

1. Loamy sand, including coarse, loamy fine, and loamy very fine sand, with not more than 80% sand
2. Sandy loam, including coarse, fine and very fine sandy loam
3. Loam
4. Clay loam, with not more than 30% clay
5. Silt loam, with not more than 60% silt
6. Sandy clay loam, with not more than 30% clay

All textural classes of topsoil with greater than 80% sand content will be rejected.

The topsoil furnished by the Contractor shall be a natural, workable soil that is screened and free of subsoil, refuse, stumps, roots, brush, weeds, rocks and stones over 1 1/4 inches diameter, and any other foreign matter that would be detrimental to the proper development of plant growth.

The Contractor shall notify the Engineer of the location of the topsoil at least 15 calendar days prior to delivery. The topsoil and its source shall be inspected and approved by the Engineer before the material is delivered to the Project. Material delivered to the Project which does not meet specifications or which has become mixed with undue amounts of subsoil during any operation at the source or during placing and spreading, will be rejected and shall be replaced by the Contractor with acceptable material.

When topsoil is not furnished by the Contractor, it shall be material taken from the Site in accordance with 2.02 or will be furnished by the State.

2. Planting Soil: Soil Material to be used for plant backfill shall be one of the following textural classes:

1. Loamy sand, with not more than 80% sand
2. Sandy loam
3. Loam
4. Clay loam, with not more than 30% clay
5. Silt loam, with not more than 60% silt
6. Sandy clay loam, with not more than 30% clay

Planting soil shall be premixed, consisting of approximately 15% compost, 10% peat, with topsoil and/or native soil. Planting soil shall be loose, friable, and free from refuse, stumps, roots, brush, weeds, rocks and stones 2 inches diameter. In addition, the material shall be free from any material that will prevent proper development and plant growth.

- (a) For ericaceous plants and broad-leaved evergreens requiring an acid soil, planting soil shall have a true pH of 4.5 to 5.5. If it has not, it shall be amended by the Contractor at its expense to the proper pH range by mixing with sulphur.
- (b) Planting soil for general planting of nonacid-loving plants shall have a true pH value of 5.6 to 6.5. If it has not, it shall be amended by the Contractor at its expense to the proper pH range by mixing with dolomitic limestone.

The Engineer reserves the right to draw such samples and to perform such tests as deemed necessary to ensure that these specifications are met.

M.13

The amount of sulphur or limestone required to adjust the planting soil to the proper pH range appropriate for its use (above) shall be determined by the Contractor based on the physical testing of a representative sample of the material. Testing must be documented in accordance with the Department’s “Minimum Schedule for Acceptance Testing,” found in Chapter 8 in the Department’s Materials Testing Manual. Limestone shall meet the requirements of M.13.02. Sulphur shall be intended for agricultural use and packaged in containers with the manufacturer’s name, chemical analysis and net weight clearly shown on the container. The Contractor shall follow the manufacturer’s recommended procedures for application of the sulphur to the soil.

M.13.02—Agricultural Ground Dolomitic Limestone: Agricultural ground dolomitic limestone shall conform to the standards of the Association of Official Agricultural Chemists (AOAC), and must comply with all existing State and Federal regulations.

The material must comply with the following gradation:

Square Mesh Sieves	Percent Passing By Weight
Pass No. 10	100
Pass No. 20	95
Pass No. 100	50
The minimum calcium carbonate equivalent shall be	90

The Engineer reserves the right to draw such samples and perform such tests as he deems necessary to assure that these specifications are met.

M.13.03—Fertilizer: Fertilizer shall be slow release and commercial grade granular 10-10-10 fertilizer. At least 40% of the nitrogen content shall be slow release, phosphorus shall be available phosphoric acid, and potassium shall be water soluble potash. The fertilizer shall be delivered to the Project in new, clean, sealed containers which bear a label fully describing the contents, the chemical analysis of each nutrient, the fertilizer grade, the net bulk, the brand, and the name and address of the manufacturer. The fertilizer and labels shall conform to all existing State and Federal regulations, and shall meet the standards of the AOAC.

The delivery of each shipment of fertilizer to the Project shall be accompanied by a properly executed and acceptable affidavit of the form shown herein. The affidavit shall be submitted to the Engineer. The Engineer reserves the right to draw such samples and perform such tests as may be deemed necessary to ensure compliance with these specifications.

Form for Affidavit - Fertilizers (Official Stationery of Supplier)

Date _____
To Whom It May Concern:
I hereby certify that I have sold and delivered _____ tons of commercial fertilizer of _____ grade. This material is designated as our batch number(s) _____ and was delivered to _____ for _____ (Contractor’s Name)
Connecticut Department of Transportation Project Number(s): _____ at _____, Connecticut. The material was delivered on _____. The labels and contents meet all State and Federal regulations. The mixture consists of: (List analyses of each major plant nutrient as percent by weight)
Signature _____ (Company Official)

Should the material fail to meet these specifications, the Contractor shall supply additional acceptable material and perform such work necessary to rectify the deficiencies without cost to the State.

M.13.04—Seed Mixtures:

(a) The grass seed mixture shall conform to the following:

<u>Species</u>	<u>Proportion By Weight Pounds</u>	<u>Minimum Purity (Percent)</u>	<u>Minimum Germination (Percent)</u>
VELVET BENTGRASS, (<u>AGROSTIS CANINA</u>) CERTIFIED VARIETY: OR EQUAL CERTIFIED VARIETY;	25	96	85
RED FESCUE (<u>FESTUCA RUBRA L. SSP. RUBRA</u>) CERTIFIED VARIETY: OR EQUAL CERTIFIED VARIETY	35	97	80
PARTRIDGE PEA (<u>CHAMAECRISTA FASCICULATA</u>) CERTIFIED VARIETY:	10	95	90
INDIAN GRASS (<u>SORGHASTRUM NUTANS</u>) CERTIFIED VARIETY:	15	95	90
CANADA WILDRYE (<u>ELYMUS CANADENSIS</u>) CERTIFIED VARIETY:	5	95	90
KENTUCKY BLUE GRASS (<u>POA PRATENSIS</u>) CERTIFIED VARIETY:	10	95	90

Under no circumstances shall annual Ryegrass, Italian Rye, or any other seed be added to the seed mixture.

(b) The "temporary" grass seed shall be perennial ryegrass (*Lolium perenne*) or an improved variety thereof, such as Manhattan, having a minimum purity of 98% and a minimum germination of 90%.

The seed mixture shall be delivered in new, clean, sealed containers. Labels and contents shall conform to all State and Federal regulations. Seed shall be subject to the testing provisions of the Association of Official Seed Analysts.

The seed shall be delivered to the Project accompanied by a properly executed affidavit for each type and shipment of seed. The affidavit shall be of the form shown herein.

The Engineer reserves the right to take such samples and to make such tests as they deem necessary to ensure compliance with these specifications. The Contractor shall supply such additional acceptable material and perform such work as required to rectify any deficiencies without cost to the State.

Form for Affidavit - Seed (Official Stationery of Supplier)

Date _____
To Whom It May Concern:
I hereby certify that _____ pounds of seed mixture, lot of commercial fertilizer of _____ grade. This material is designated as our number _____, (Label attached) has been sold and delivered to _____ for _____ (Contractor's Name)
Connecticut Department of Transportation Project Number(s): _____
at _____, Connecticut. The material was delivered on _____ . The labels and contents meet all State and Federal regulations. The mixture consists of: (List component parts, proportions, minimum purity, minimum germination)
Signature _____ (Company Official)

M.13.05—Mulch Materials:

1. Wood Chips: Wood chip mulch shall be sound, green wood, and shall be 1/8 inch nominal thickness with not less than 50% of the chips having an area of not less than 1 square inch, nor more than 6 square inches. The material shall be free from rot, leaves, twigs, shavings, debris, and any material injurious to plant growth.

2. Hay and Straw:

- a. Hay shall be from properly cured grass or legume mowings, free from weeds, reeds, twigs, debris or other objectionable material. It shall be free from rot or mold, and shall have a moisture content of not more than 15% when delivered to the Project. No salt hay shall be used.
- b. Straw shall be derived from threshed stalks of oat, wheat, rye or barley and shall be free of rot, seeds, noxious weeds and other foreign material.

3. Wood Fiber Mulch: Wood fiber mulch or wood cellulose fiber mulch shall be material manufactured for mulching seeded areas. The material shall be produced from clean wood, uniform in texture and free of shavings, rot and mold. Wood fiber mulch shall be commercially pre-packaged bearing the brand, name and address of the manufacturer.

4. Shredded Bark Mulch: This shall consist of the outer bark of pine or hardwood trees. The material shall be aged for a minimum of 6 months and be dark brown in color, free of chunks and pieces of wood thicker than 1/4 inch, and shall not contain, in the judgement of the Engineer, an excess of fine particles. Mulch must be free of long stringy material and dyed wood chips.

M.13.06—Compost: Compost shall be a stable, humus-like organic material produced by the aerobic, biological and biochemical decomposition of source-separated organic waste, that may include leaves and yard trimmings, food scraps, food processing residuals, manure and/or other agricultural residuals, forest residues and bark. Compost may be either commercially packaged or from a bulk source. Compost shall not be altered by the addition of materials such as sand, soil and glass. Compost shall not contain substances toxic to plants and shall not contain less than 0.1% by dry weight of man-made foreign matter. Compost shall pose no objectionable odor and shall not closely resemble the raw material from which it

was derived. Compost shall be suitable for use as a soil amendment or mulch and shall support the growth of nursery stock or seeding. All compost material must be accompanied by a Materials Certificate and Certified Test Report in accordance with Section 1.06.07 or 1.20-1.06.07.

Compost shall have the following properties:

1. A minimum organic content of 50% dry weight basis as determined by loss on ignition in accordance with ASTM D2974.
2. Carbon: Nitrogen ratio range of 11:1 to 25:1.
3. Carbon: Phosphorus ratio of 120:1 to 240:1.
4. A moisture content of 35 to 60% in accordance with ASTM D2974.
5. Particle size less than 1/2 inch for Planting Backfill, and 1 inch for Erosion Control in accordance with AASHTO T27.
6. The pH of compost shall be in the range of 6 to 7.8.
7. The soluble salt content of compost shall not exceed 4.0 mmhos/cm (dS/m) as determined by using a dilution of 1 part compost to 1 part distilled water.
8. The maturity or stability of the compost shall be Stable or Very Stable, meeting either of the following criteria:
 - (a) > 6 using the Solvita Compost Maturity Test, or
 - (b) < 10°C above ambient temperature (Dewar self-heating test)
9. Maximum foreign matter 1%.

M.13.07—Plant Materials: The materials for this work shall conform to the following requirements:

1. General: For the most part, the latest revised version of "Standardized Plant Names," prepared by the Editorial Committee of the American Joint Committee on Horticultural Nomenclature, shall be the authority for all botanical plant names.

All plants shall be first-class representatives of their normal species or varieties in accordance with the ANSI American Standards for Nursery Stock and as specified on the plans. They shall have well-furnished branch systems together with vigorous fibrous root systems.

Plants shall be free from all insect pests, plant diseases, disfiguring knots, stubs, sun-scalds, abrasions of the bark or any other form of injury or objectionable disfigurements. All plant material shall comply with the State and Federal laws with respect to inspection for plant diseases and insect infestations.

Plants shall not be pruned before delivery and no plants shall be cut back from larger sizes to meet the sizes specified.

Plants shall be nursery grown unless otherwise specified and bear evidence of proper nursery care, including adequate transplanting and root pruning.

No plant will be considered to be nursery grown unless it has been growing in a nursery for at least 2 years and unless it has been root pruned or transplanted no more than 5 years prior to digging.

2. Balled & Burlapped (B & B) Material: Nursery-grown trees shall meet the requirements as specified in the current edition of "U.S. American Standards for Nursery Stock," or as further specified in the plans. Nursery-grown trees shall have no cuts which are not healing, no cuts over 3/4 inch diameter which have not completely calloused over and no abrasions of the bark. They must have good fibrous root systems characteristic of the kind.

Trees shall have straight trunks, well-balanced tops and a single leader or as may be characteristic of the species.

Trees in which the leader or branches have been cut back or otherwise topped or de-horned will not be accepted. The caliper of shade trees up to and including 4 inches diameter shall be measured above the root collar (or swelling at the ground) 6 inches above ground level. Caliper shall be the determining measurement in grading. Height measurements shall be given in single feet in sizes up to and including 6 feet.

Small deciduous trees shall be completely natural. Tree "clumps" shall have 3 or more main stems starting from the ground. Bush from trees shall be those with branches which start from the main trunk close to the ground.

3. Container Grown (CG): Container grown shrubs shall possess the minimum number of stems and root mass for the height or container size specified.

Vines and groundcover plants shall be well-furnished with vigorous root systems. They shall be field-grown unless otherwise specified. Plants grown in pots or bands shall have sufficient roots to retain the soil in which they are growing when such plants are removed from their containers. Such plants shall not be

root-bound.

4. Inspections: All plants shall be subject to inspection by the Engineer. The Contractor shall designate its wholesale plant material source(s) of supply to the Engineer in writing at least 1 month in advance of each planting season to facilitate an orderly and timely inspection of the items to be installed. Based on the Project schedule, material procured in the spring for fall installation must be approved before digging occurs. The Contractor shall be represented during such inspection. Inspection may be made at the nursery, on Site or via photos at the discretion of the Engineer.

All tagged samples shall be delivered to the Project for which they were sampled. All deliveries to the planting site shall be accompanied by both the vendor's invoice (designating kind, size, quantity and sources of supply) and Certificates of Inspection issued by Federal or State authorities or both. Such certificates shall attest to the freedom of the plant material from diseases and insect infestations. The State reserves the right to inspect all plant materials at the growing sites. Further inspections will be made when the materials are delivered to the Project site or storage area.

5. Substitutions: No change in size, kind or quality of plants from those specified will be permitted without written approval of the Engineer. The Contractor shall submit a written request for permission to make a substitution along with documentation from 3 nursery vendor source suppliers proving that the proposed plants are unavailable. Upon receipt of such request, the Engineer will suggest plants meeting the requirements of the Contract as to function, size and type and indicate the reduced cost to the State as the result of said substitution. In no case shall the price for substitutions exceed the bid price of those replaced.

6. Digging Plants: Plants shall be dug immediately before shipment unless otherwise approved. Special precaution shall be taken to avoid any unnecessary injury to or removal of fibrous roots. Damaged roots shall be cut off clean.

- (a) After deciduous bare-root plants are dug, their roots shall be protected from exposure to sun, wind and freezing temperatures. All bare roots of trees, shrubs and vines, unless otherwise directed, shall be puddled in a wet clay mixture which will cover and adhere to the entire root system. Bare roots shall be further protected by wrapping them in wet straw, moss, burlap or other suitable material, or by heeling them in and watering them in order to keep them fresh and viable.
- (b) B & B plants shall be lifted so as to retain as many fibrous roots as possible. Excess soil and feeder roots shall be removed prior to digging. All B & B plants must come from soil which will hold a firm ball. The State reserves the right to reject plants grown in excessively sandy or clayey soil if the plant is to be installed in a dissimilar soil type. The plants shall be wrapped with burlap, or similar approved material, and tightly laced with bio-degradable twine in such a manner as to hold the balls firm and intact. All B & B material arriving with broken or loose balls, or with manufactured balls, will be rejected.

7. Transportation and Labeling: Plants transported by open vehicles shall be covered by tarpaulins or other suitable covers securely tied to the body of the vehicle. Closed vehicles shall be adequately ventilated to prevent overheating of the plants. The heads of trees shall be tied in carefully to prevent breakage of the leaders and the branches. Trunks and branches shall be adequately supported on padding to prevent their being scraped or bruised.

Legible labels shall be attached to all separate plants, boxes, bundles, bales or other plant containers, indicating the name, size, and quantity of units in each container and other information necessary for inspection.

8. Delivery: Notice of delivery of plants shall be given to the Engineer by the Contractor at least 48 hours in advance of the anticipated delivery date, unless otherwise authorized. The Engineer shall be furnished a legible copy of the invoice for each shipment showing kind, sizes and quantities of materials.

All plant materials which are delivered in such a stage as to reasonably endanger their survival will not be accepted.

All plant materials shall be produced in a latitude north of Washington, D.C. and in a longitude east of the Mississippi River.

(a) Spring Dug: All deciduous plants shall be received with buds unopened and intact; evergreen plants with the new growth retarded.

(b) Fall Dug: Deciduous plants shall not be dug before the plants have hardened off.

9. Water: Water shall be free from oil, acid, alkalis, salts and any other substances harmful to plants. Water from streams shall not be used unless authorized by the Engineer.

10. Peat: Peat shall be commercially packaged peat from sedge, sphagnum or reed sources. Material shall be in such physical condition that it may be rubbed through a 1/2 inch mesh screen, and may be

readily mixed with soil material. It shall be free from sticks, roots, stones and other objectionable material. It shall be delivered to the Project in clean, new, sealed containers bearing the brand, net bulk, and name and address of the packer. The material shall have an acidity that falls in the pH range of 3.0 to 7.0. It shall have a minimum organic content of 90% and a minimum water-absorbing capacity of 1000%.

11. Miscellaneous:

- (a) Anchor stakes for guying trees shall be of sound hardwood with a minimum length of 2 feet and minimum diameter of 2 inches at the smaller end. Stakes made from lumber shall measure no less than 2 inches × 2 inches throughout their lengths. Trees over 3 1/2 inch caliper shall require either stakes or dead-men for support as approved by the Engineer. The type of stake used shall be uniform throughout the Site.
- (b) Tree support posts shall be sawed posts cut to a uniform square cross-section of 2 inches × 2 inches throughout their lengths. They shall be cut from sound, hard, clean, straight wood free from crooks, 8 feet long for major trees and 4 - 5 feet long for minor trees or as approved by the Engineer.
- (c) Hose for protecting the bark of major and minor trees from guy wires shall be of good quality rubber or plastic hose acceptable to the Engineer, with a minimum inside diameter of 3/8 inch and a maximum inside diameter of 3/4 inch.
- (d) Wire shall be pliable, new, annealed, galvanized, 12-gage, for staking support and 10-gage for guying to trees. Alternate staking and guying systems shall be submitted to the Engineer for approval.
- (e) Flags shall be white cotton cloth or white plastic ribbon, 2 inches wide and 18 inches long. Gauze is not acceptable.
- (f) Anti-desiccant shall be an emulsion such as will provide a film over plant surfaces, permeable enough to permit transpiration. Anti-desiccant shall be delivered in containers of the manufacturer and shall be mixed according to the manufacturer's instructions.

M.13.08—Sod: Sod shall be living sod procured from areas where the soil is reasonably fertile and from areas similar in the degree of moisture to the area to be planted. It shall be cut or stripped, by approved methods, from turf areas relatively free of large stones, roots or other materials which might be detrimental to the sodding operation or to future maintenance. The sod shall contain a sufficient proportion of pasture grasses to ensure a good mat of roots and a reasonably dense turf unless Type No. 1, which is a superior quality, is specified on the plans.

Any growth more than 3 inches high shall be mowed to a height of 3 inches not more than 5 days before the sod is lifted.

Sources of sod shall be made known to the Engineer at least 5 days before cutting and shall be approved before mowing. The sod shall be cut into squares or rectangular portions which shall be 12 inches wide and may vary in length, but must be of a size which will permit them to be lifted without breaking. The sod shall be sufficiently moist so the soil will adhere firmly to the roots when it is handled and may require watering before lifting. Field grown sod shall be cut to a minimum depth of 1 1/2 to 2 inches. Where Type No. 1 Sod is specified, it shall be cut to a minimum depth of 1 to 1 1/2 inches.

Type No. 1 Sod shall be obtained from inspected and approved commercial sod farm sources of supply and shall be free from noxious weeds, insect infestations, and fungus and bacterial diseases.

M.13.09—Erosion Control Matting: Erosion control matting shall be from the Department's Qualified Products List. Staples shall meet the Manufacturer's requirements. Material which shows signs of degradation shall not be used and shall be removed from the Project.

SECTION 33 42 00 - PRECAST CONCRETE RIGID FRAME

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Furnishing and installing a precast concrete rigid frame.
- B. Furnishing, and installing other precast concrete components such as cut-off walls, return walls and wingwalls should the Contractor choose to precast these elements.

1.02 RELATED REQUIREMENTS

- A. Section 03 30 00 - Cast-In-Place Concrete
- B. Section 31 23 16 - Excavation
- C. Section 31 23 19 - Dewatering
- D. Section 31 23 23 - Backfilling
- E. Section 31 50 00 - Sheeting and Bracing
- F. Section 31 52 00 - Cofferdams
- G. Section 32 12 00 - Flexible Paving

1.03 REFERENCE STANDARDS

- A. See Sections 6.01, M.01 and M.03 of the Standard Specifications, as attached to Section 03 30 00.
- B. See Sections 6.02 and M.06.01 of the Standard Specifications as attached to Section 03 30 00.
- C. See Owned Special Provisions Item #0707009A - Membrane Waterproofing (Cold Liquid Elastomeric) as attached.
- D. ACI 318 - Building Code Requirements for Structural Concrete.
- E. AASHTO LRFD Bridge Design Specifications.
- F. AASHTO Manual for Bridge Evaluation.
- G. AASHTO M 259 - Standard Specification for Precast Reinforced Concrete Box Sections for Culverts, Storm Drains, and Sewers.
- H. AASHTO M 273 - Standard Specification for Precast Reinforced Concrete Box Sections for Culverts, Storm Drains, and Sewers with Less Than 2 ft of Cover Subjected to Highway Loadings.
- I. AASHTO T 358 - Standard Method of Test for Surface Resistivity Indication of Concrete's Ability to Resist Chloride Ion Penetration.
- J. ASTM A615 - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.

- K. ASTM A767 - Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement.
 - L. ASTM C1433 - Standard Specification for Precast Reinforced Concrete Monolithic Box Sections for Culverts, Storm Drains, and Sewers.
 - M. ASTM C1577 - Precast Reinforced Concrete Monolithic Box Sections for Culverts, Storm Drains, and Sewers Designed According to AASHTO LRFD.
 - N. ASTM D41 - Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.
 - O. ASTM D449 - Standard Specification for Asphalt Used in Dampproofing and Waterproofing.
 - P. ASTM D2822 - Standard Specification for Asphalt Roof Cement, Asbestos-Containing.
 - Q. ASTM F2329 - Standard Specification for Zinc Coating, Hot-Dip, Requirements for Application to Carbon and Alloy Steel Bolts, Screws, Washers, Nuts, and Special Threaded Fasteners.
- 1.04 SUBMITTALS
- A. An Affidavit of Compliance that the product(s) to be provided comply with the requirements of this Specification including any and all guarantees.
 - B. Shop Drawing Submittal
 - 1. The drawings (provided in PDF using full scale sheet including border, title block, rectangular box, 3 ¼ inch wide x 3 ¼ inch high, for reviewer stamp; with upper case text having a minimum height of 1/8 inch) shall include complete details of the precast concrete components and connections for the headwall and closure pours where shown on the Drawings. The drawings shall include, but not be limited to, the following:
 - a. Project number, town, and crossing.
 - b. Bridge number, when shown on the Drawings.
 - c. Layout plan of the precast concrete components, including the dimensions of each component. The Contractor shall determine that the length of each component, including all tolerances, satisfies the stages of construction, sequence of construction, and construction methodology shown on the Drawings.
 - d. Plan indicating sequence of erection and stage construction of precast concrete components.
 - e. Plans and cross-sections of the components detailing the length, width, height and thickness of wall and roof slabs.
 - f. Type, size, location and spacing of steel reinforcing, mechanical connectors, and concrete inserts for anchoring threaded deformed steel bars, bending diagrams, material lists and catalog cuts for mechanical connectors and inserts as applicable.
 - g. Type, size, and location of fixtures and lifting holes.
 - h. Location and size of all holes to be cast and additional reinforcement as required.
 - i. Type, size and location of joints, gaskets, and additional steel reinforcement.
 - j. Material specification designations for all components.
 - k. Stamp of a professional civil or structural engineer registered in the state in which the Project is located.
 - C. Five (5) business day prior notice of casting of precast components so that Engineer may schedule observation of reinforcing steel, and casting and testing processes at the place of precast manufacture.

- D. Manufacturer's quality control test results verifying that the precast components were manufactured in accordance with these Specifications.

1.05 SOURCE QUALITY CONTROL

- A. The quality of materials, the process of manufacture, and the finished precast concrete components shall be subject to inspection and approval of the Engineer. Cold joints, or cracked, chipped, or misshapen precast components shall be cause for rejection as determined by the Engineer.
- B. Do not ship precast components before their compressive design strength is achieved.

1.06 GUARANTEE

- A. The design of the precast concrete components shall be guaranteed. The quality of workmanship of the precast concrete components shall be guaranteed for ten (10) years, minimum.

PART 2 PRODUCTS

2.01 PRECAST CONCRETE COMPONENTS

- A. Precast concrete components shall be of the size and configuration as shown on the Drawings and shall include weepholes, lifting rungs, inserts and other items incidental thereto in the quantities, sizes, lengths, types, and configurations necessary or indicated on the Drawings for a complete installation.
- B. Each section shall be a three (3) sided rigid frame section, with open ends, to be monolithically cast of reinforced concrete. The inside surfaces shall be smooth so as not to restrict flow through the completed installation. Forty-five (45) degree fillets shall be monolithically cast in the two (2) inside corners. Each joint shall have a male and a female end with not less than one and one-half (1-1/2) inch concrete overlap. Each section shall have one (1) preplaced one (1) inch diameter neoprene gasket cemented to joint surface. Assembly hardware shall be supplied to lift and draw sections together to assure an adequate seal. No more than four (4) lifting holes or fixtures shall be located in each rigid frame section. Permanent joint bolting hardware is not required.
- C. Parapet/headwall may be precast or may be cast-in-place as shown on the Drawings and in accordance with Section 03 30 00.
- D. Concrete:
 - 1. The concrete for the members shall be air-entrained concrete composed of Portland cement, fine and coarse aggregates, admixtures, and water. The air-entraining feature may be obtained by the use of either air-entraining Portland cement or an approved air-entraining admixture. The entrained air content shall be not less than 4% nor more than 6%.
 - 2. Design and submit to the Engineer a concrete mix design which shall attain a minimum 28-day strength (f'c) per 2.01.E.
 - 3. Provide a certificate stating that the mix design submitted shall meet the requirements. Its ultimate strength at 28 days (f'c) shall have the minimum value per 2.01.E.
 - 4. Coarse Aggregate shall consist of broken stone, having a maximum size of 3/4 inch, meeting the requirements of Article M.03.01 of the Standard Specifications, as attached to Section 03 30 00.

5. Fine Aggregate, Water, Air-Entraining Admixture and Retarder Admixture shall meet the requirements of Article M.03.01 of the Standard Specifications, as attached to Section 03 30 00.
 6. Portland Cement shall meet the requirements of Article M.03.01 of the Standard Specifications, as attached to Section 03 30 00, except that Type III or Type IIIA Portland cement may be used at no additional cost.
 7. Water-Reducing Admixture: The Contractor may submit, for the approval of the Engineer, water-reducing admixture for the purpose of increasing workability and reducing the water requirement for the concrete. When the Engineer has previously approved the use of a high range water reducer in the concrete mix, the entrained air content shall be not less than 5% nor more than 8%.
 8. Calcium Chloride: The addition to the mix of calcium chloride or admixture containing calcium chloride will not be permitted.
- E. The concrete mix design shall be submitted to the Engineer and shall attain a minimum compressive strength ($f'c$) of 5,000 psi and a minimum electrical resistivity of 29 k Ω -cm in accordance with AASHTO T 358 at 28 days or prior to shipping, whichever is sooner.
- F. Minimum concrete cover over reinforcing steel shall be two (2) inches for precast concrete rigid frame section(s). Minimum concrete cover over reinforcing steel shall be as shown on the Drawings for other precast concrete components.
- 2.02 REINFORCEMENT
- A. Reinforcing steel including dowel bar mechanical connectors shall be Grade 60, hot-dipped galvanized conforming to ASTM A767, class 1, including supplemental requirements, and as shown on the Drawings and shall conform to the requirements of Article M.06.01 of the Standard Specifications, as attached to Section 03 30 00.
- B. Threaded reinforcing steel shall be compatible with the threaded inserts. Threads shall be long enough to fully engage the inserts.
- C. Threaded concrete inserts, lifting fixtures, and miscellaneous hardware cast into precast concrete components shall be hot-dipped galvanized after fabrication in accordance with ASTM F2329 as shown on the Drawings.
- 2.03 DAMPPROOFING - Comply with Section 03 30 00.
- 2.04 GASKETS - Flexible, expanded rubber meeting the requirements of ASTM D1056. Silicone Joint Sealant shall meet the requirements of M.03.08-5(b) as attached to Section 03 30 00.
- 2.05 MORTAR - Comply with Section 03 30 00.
- 2.06 GROUT - Comply with Section 03 30 00, except that the non-shrink grout shall attain a minimum compressive strength of 3,000 psi prior to the passage of flowing water over the grout.
- 2.07 MEMBRANE WATERPROOFING
- A. The Contractor shall select a waterproofing membrane system from the Department's current Qualified Products List (QPL) for Spray-Applied Membrane Waterproofing System. All materials incorporated in the works shall meet the Manufacturer's specification for the chosen system. The Engineer will reject any system that is not on the QPL.

- 2.08 PROTECTIVE COURSE - As shown on the Drawings and in accordance with Section 32 12 00.
- 2.09 JOINT SEAL - As shown on the Drawings and in accordance with Section 03 30 00.
- 2.10 BAGGED STONE - As shown on the Drawings and in accordance with Section 31 23 23.
- 2.11 BEDDING AND BACKFILL MATERIALS - As shown on the Drawings and in accordance with Section 31 23 23.

PART 3 EXECUTION

3.01 MANUFACTURE

- A. The quality of materials, the process of manufacture and the finished precast concrete components shall be subject to inspection and approval of the Engineer. Cold joints, cracked, chipped or misshapen precast concrete components shall be cause for rejection as determined by the Engineer.

3.02 FABRICATION

- A. During the casting of sections, make a minimum of four 4 inch x 6 inch test cylinders during each production run. Cure cylinders under the requirements of ASTM C31 and determine the 28 day compressive strength ($f'c$).
- B. Fabrication Tolerances
 1. Internal Dimensions: The internal dimensions shall be within 1% of the design dimensions or within 1-1/2 inches, whichever is less.
 2. Slab and Wall Thickness: The slab and wall thickness shall be within 1/4 inch of the thicknesses shown in the design.
 3. Laying Length of Opposite Surfaces: Variations in laying lengths of two opposite surfaces of the components shall be less than 1/8 inch/ft of internal span.
 4. Length of Section: The length of a section shall not vary from the designed length by more than 1/2 inch in any component.
 5. Position of Reinforcement: The maximum variation in position of the reinforcement shall be $\pm 1/2$ inch.

- 3.03 Area of Reinforcement: The areas of steel reinforcement shall be the design steel areas as shown in the manufacturer's working drawings.

3.04 HANDLING AND STORAGE

- A. Provide handling devices in each precast concrete component for the purpose of handling and placing. Take care during storage, transportation, hoisting and handling of all units to prevent cracking or damage. Replace units damaged by improper storing, transportation or handling, at no additional expense to the Owner. If damage occurs, submit to the Engineer, for review, the proposed methods, and materials to be used in the repair operation.

3.05 INSTALLATION

- A. Handle and install each precast concrete components only by methods and equipment recommended by the manufacturer. Take up and reinstall or otherwise correct as directed by the Engineer any unit which is not in true alignment, or which shows settlement, displacement, misfit, or distortion after installation.

- B. Install precast concrete components level, unless otherwise shown on the Drawings, and plumb on bedding material in conformance with manufacturer's instructions to meet lines, grades and elevations shown.
 - C. Provide and utilize assembly hardware for pulling precast concrete component sections against the prior completed section in place to assure an adequate seal.
 - D. After the precast concrete components have been set in place, parge all inserts and holes cast into precast sections for the sole purpose of handling and setting the components (comply with Section 03 30 00). Remove all fins, runs, or mortar from the concrete surfaces which will remain exposed. Grind smooth form marks on exposed surfaces. Provide a grout clean-down finish (comply with Section 03 30 00) to all exposed, outside concrete surfaces.
 - E. Patching - No patching of the completed precast concrete components unless permitted by the Engineer. If patching is permitted, submit proposed methods and materials to be used in the patching operation, to the Engineer for approval.
 - F. Installation Tolerance: The Contractor shall be responsible for ensuring the overall length of the precast concrete rigid frame section(s) meets the layout requirements of the Drawings.
 - G. Dampproofing, Mortar, and Grout - Comply with Section 03 30 00.
 - H. Membrane Waterproofing:
 - 1. Conform to Owned Special Provisions Item #0707009A - Membrane Waterproofing (Cold Liquid Elastomeric) as attached.
 - I. Protective Course - As shown on the Drawings and in accordance with Section 32 12 00.
 - J. Joint Seal - As shown on the Drawings and in accordance with Section 03 30 00.
 - K. Bagged Stone - As shown on the Drawings and in accordance with Section 31 23 23.
 - L. Bedding and Backfill Materials - As shown on the Drawings and in accordance with Section 31 23 23.
- 3.06 ATTACHMENTS
- A. Owned Special Provisions Item #0707009A - Membrane Waterproofing (Cold Liquid Elastomeric). Method of Measurement and Basis of Payment are not applicable to this Contract.

END OF SECTION

ITEM #0707009A - MEMBRANE WATERPROOFING (COLD LIQUID ELASTOMERIC)

Description: Work under this item consists of furnishing and installing a seamless elastomeric waterproofing membrane system applied to a concrete or steel surface as shown on the plans, in accordance with this specification and as directed by the Engineer. Work shall also include conditioning of the surface to be coated and all quality-control testing noted herein.

The completed membrane system shall be comprised of a primer coat followed by the membrane coating which is applied in one or two layers for a minimum total thickness of 80 mil, an additional 40 mil membrane layer with aggregate broadcast into the material while still wet, and a bond coat of bitumen-based adhesive material.

Materials: The Contractor shall select a waterproofing membrane system from the Department's current Qualified Product List (QPL) for Spray-Applied Membrane Waterproofing System. All materials incorporated in the works shall meet the Manufacturer's specification for the chosen system. The Engineer will reject any system that is not on the QPL.

Materials Certificate: The Contractor shall submit to the Engineer a Materials Certificate for the primer and membrane and bond coat material in accordance with the requirements of Article 1.06.07.

Construction Methods: At least ten days prior to installation of the membrane system, the Contractor shall submit to the Engineer, the manufacturer's recommended procedure for preparing the deck surface, pre-treatment or preparing at cracks and gaps, treatment at curbs, vertical surfaces or discontinuities, applying the primer and membrane, and placing of aggregated coat. Procedures shall also include recommended repairs of system non-compliant issues identified during application. The system shall be applied to the prepared area(s) as defined in the plans strictly in accordance with the Manufacturer's recommendations.

A technical representative, in the direct employ of the manufacturer, shall be present on-site immediately prior to and during application of the membrane. The representative shall inspect and approve the surface prior to priming, and provide guidance on the handling, mixing and addition of components and observe application of the primer and membrane. The representative shall perform all required quality-control testing and remain on the Project site until the membrane has fully cured.

All quality-control testing, including verbal direction or observations on the day of the installation, shall be recorded and submitted to the Engineer for inclusion in the Project's records. A submittal of the quality-control testing data shall be received by project personnel prior to any paving over the finished membrane or within 24 hours following completion of any staged portion of the work.

1. **Applicator Approval:** The Contractor's membrane Applicator shall be fully trained and licensed by the membrane manufacturer and shall have successfully completed at least three spray membrane projects in the past five years. The Contractor shall furnish references from those projects, including names of contact persons and the names, addresses and phone numbers of persons who supervised the projects. This information shall be submitted to the Engineer prior to the start of construction. The Engineer shall have sole authority to determine the adequacy and compliance of the submitted information. Inadequate proof of ability to perform the work will be grounds to reject proposed applicators.

2. **Job Conditions:**

(a) **Environmental Requirements:** Air and substrate temperatures shall be between 32°F and 104°F providing the substrate is above the dew point. Outside of this range, the Manufacturer shall be consulted.

The Applicator shall be provided with adequate disposal facilities for non hazardous waste generated during installation of the membrane system. The applicator shall follow safety instructions regarding respirators and safety equipment.

(b) **Safety Requirements:** All open flames and spark producing equipment shall be removed from the work area prior to commencement of application.

"No Smoking" signs shall be visibly posted at the job site during application of the membrane waterproofing.

Personnel not involved in membrane application shall be kept out of the work area.

3. **Delivery, Storage and Handling:**

(a) **Packaging and Shipping:** All components of the membrane system shall be delivered to the site in the Manufacturer's packaging, clearly identified with the products type and batch number.

(b) **Storage and Protection:** The Applicator shall be provided with a storage area for all components. The area shall be cool, dry and out of direct sunlight and shall be in accordance with the Manufacturer's recommendations and relevant health and safety regulations.

Copies of Material Safety Data Sheets (MSDS) for all components shall be kept on site for review by the Engineer or other personnel.

(c) **Shelf Life - Membrane Components:** Packaging of all membrane components shall include a shelf life date sealed by the Manufacturer. No membrane components whose shelf life has expired shall be used.

4. Surface Preparation:

- (a) Protection: The Applicator shall be responsible for the protection of equipment and adjacent areas from over spray or other contamination. Parapets and bridge joints shall be masked prior to application of the materials.
- (b) Surface Preparation: Sharp peaks and discontinuities shall be ground smooth. The surface profile of the prepared substrate is not to exceed 1/4 inch (peak to valley) and areas of minor surface deterioration of 1/2 inch and greater in depth shall also be repaired. The extent and location of the surface patches require the approval of the Engineer before the membrane system is applied.

Surfaces shall be free of oil, grease, curing compounds, loose particles, moss, algae, growth, laitance, friable matter, dirt, bituminous products, and previous waterproofing materials. If required, degreasing shall be done by detergent washing in accordance with ASTM D4258.

The surface shall be abrasively cleaned, in accordance with ASTM D4259, to provide a sound substrate free from laitance.

Voids, honeycombed areas, and blow holes on vertical surfaces shall be repaired in the same manner.

All steel components to receive membrane waterproofing shall be blast cleaned in accordance with SSPC SP6 and coated with the membrane waterproofing system within the same work shift.

5. Inspection and Testing: Prior to priming of the surface, the Engineer, Applicator and Manufacturer's technical representative shall inspect and approve the prepared substrate.

- (a) Random tests for deck moisture content shall be conducted on the substrate by the Applicator at the job site using a "Sovereign Portable Electronic Moisture Master Meter," a "Tramex CMEXpertII Concrete Moisture Meter" or approved equal. The minimum frequency shall be one test per 1000 s.f. but not less than three tests per day per bridge. Additional tests may be required if atmospheric conditions change and retest of the substrate moisture content is warranted.

The membrane system shall not be installed on substrate with a moisture content greater than that recommended by the system's manufacturer, but shall not be greater than 6%, whichever is less.

- (b) Random tests for adequate tensile bond strength shall be conducted on the substrate using an adhesion tester in accordance with the requirements of ASTM D4541. The minimum frequency shall be one test per 5,000 s.f. but not less than three adhesion tests per bridge.

Adequate surface preparation will be indicated by tensile bond strengths of primer to the substrate greater than or equal to 150 psi or failure in a concrete surface and greater than or equal to 300 psi for steel surfaces.

If the tensile bond strength is lower than the minimum specified, the Engineer may request additional substrate preparation. Any primer not adequately applied shall be removed and a new primer applied at the Contractor's expense, as directed by Engineer.

- (c) Cracks and grouted joints shall be treated in accordance with the Manufacturer's recommendations, as approved or directed by the Engineer.

6. Application:

- (a) The System shall be applied in four distinct steps as follows:
 - 1) Substrate preparation and gap/joint bridging preparation
 - 2) Priming
 - 3) Membrane application
 - 4) Membrane with aggregate
- (b) Immediately prior to the application of any components of the System, the surface shall be dry (see Section 5a of this specification) and any remaining dust or loose particles shall be removed using clean, dry oil-free compressed air or industrial vacuum.
- (c) Where the area to be treated is bound by a vertical surface (e.g. curb or wall), the membrane system may be continued up the vertical, as shown on the plans or as directed by the Engineer.
- (d) The handling, mixing and addition of components shall be performed in a safe manner to achieve the desired results, in accordance with the Manufacturer's recommendations or as approved or directed by the Engineer.
- (e) A neat finish with well defined boundaries and straight edges shall be provided by the Applicator.
- (f) Primer: The primer shall consist of one coat with an overall coverage rate of 125 to 175 s.f./gal unless otherwise recommended in the manufacturer's written instructions.

All components shall be measured and mixed in accordance with the Manufacturer's recommendations.

The primer shall be spray applied using a single component spray system approved for use by the Manufacturer. If required by site conditions and allowed by the manufacturer, brush or roller application will be allowed.

The primer shall be allowed to cure tack-free for a minimum of 30 minutes or as required by the Manufacturer's instructions, whichever time is greater, prior to application of the first lift of waterproofing membrane.

Porous concrete (brick) may require a second coat of primer should the first coat be absorbed.

- (g) Membrane: The waterproofing membrane shall consist of one or two coats for a total dry film thickness of 80 mils. If applied in two coats, the second coat shall be of a contrasting color to aid in quality assurance and inspection.

The membrane shall be comprised of Components A and B and a hardener powder which is to be added to Component B in accordance with the Manufacturer's recommendations.

The substrate shall be coated in a methodical manner.

Thickness checks: For each layer, checks for wet film thickness using a gauge pin or standard comb-type thickness gauge shall be carried out typically once every 100 s.f. Where rapid set time of the membrane does not allow for wet film thickness checks, ultrasonic testing (steel surfaces only), calibrated point-penetrating (destructive) testing, in-situ sampling (cutout of small sections for measuring thicknesses), or other methods approved by the Engineer shall be employed for determination of dry film thickness. The measured thickness of each and every individual test of the membrane shall be greater than or equal to the required thickness.

Bond Strength: Random tests for adequate tensile bond strength shall be conducted on the membrane in accordance with the requirements of ASTM D4541. The minimum test frequency shall be one test per 5,000 s.f. but no less than three adhesion tests per bridge. Adequate adhesion will be indicated by tensile bond strengths of the membrane to the substrate of greater than or equal to 150 psi or failure in a concrete surface and greater than or equal to 300 psi for steel surfaces.

Spark Testing: Following application of the membrane, test for pin holes in the cured membrane system over the entire application area in accordance with ASTM D4787- "Continuity Verification of Liquid or Sheet Linings Applied to Concrete Substrates." Conduct the test at voltages recommended by the manufacturer to prevent damage to the membrane.

Repair the membrane system following destructive testing and correct any deficiencies in the membrane system or substrate noted during quality-control testing in accordance with the manufacturer's recommendations to the satisfaction of the Engineer at no additional cost to the State.

- (h) Repairs: If an area is left untreated or the membrane becomes damaged, a patch repair shall be carried out to restore the integrity of the system. The damaged areas shall be cut back to sound materials and wiped with solvent (e.g. acetone) up to a width of at least four inches on the periphery, removing any contaminants unless otherwise recommended by the manufacturer. The substrate shall be primed as necessary, followed by the membrane. A continuous layer shall be obtained over the substrate with a four inches overlap onto existing membrane.

Where the membrane is to be joined to existing cured material, the new application shall overlap the existing by at least four inches. Cleaning and surface preparation on areas to be lapped shall be as recommended in the manufacturer’s written instructions.

- (i) Aggregated Finish:
 - 1) Apply an additional 40 mil thick layer of the membrane material immediately followed by an aggregate coating, before the membrane cures, at a rate to fully cover the exposed area. The membrane and aggregate shall be fully integrated after the aggregate has been applied and the membrane cured.
 - 2) Localized areas not fully coated shall be touched-up with additional membrane and aggregate as needed.
 - 3) Remove loose and excess aggregate from the surface to the satisfaction of the Engineer and dispose of properly after application prior to allowing traffic onto finished surface or application of tack coat.
 - (j) Bond Coat:

Prior to application of a bituminous concrete overlay, the aggregated finish shall be coated with a bonding material. The bonding material shall be per the membrane waterproofing manufacturer’s recommendations.
7. Final Review: The Engineer and the Applicator shall jointly review the area(s) over which the completed System has been installed. Any irregularities or other items that do not meet the requirements of the Engineer shall be addressed at this time.

Method of Measurement: The quantity to be paid for under this item shall be the number of square yards of waterproofed surface completed and accepted.

Basis of Payment: This item will be paid for at the contract unit price per square yard of “Membrane Waterproofing (Cold Liquid Elastomeric),” complete in place, which price shall include all surface preparation, furnishing, storing and applying the system, technical representative and quality control tests, and any necessary repairs and remediation work as well as all materials, equipment, tools, labor incidental to this work.

<u>Pay Item</u>	<u>Pay Unit</u>
Membrane Waterproofing (Cold Liquid Elastomeric)	s.y.

SECTION 34 71 13 - GUIDERAIL

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Metal Beam Rail.
- B. Metal Beam End Anchorage.

1.02 RELATED REQUIREMENTS

- A. Section 03 30 00 - Cast-In-Place Concrete
- B. Section 31 23 16 - Excavation
- C. Section 31 23 17 - Rock Excavation
- D. Section 31 23 23 - Backfilling

1.03 REFERENCE STANDARDS

- A. See Section M.03 of the Standard Specifications as attached to Section 03 30 00.
- B. ASTM A6 - Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling.
- C. ASTM A36 - Standard Specification for Carbon Structural Steel.
- D. ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- E. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- F. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 PSI Tensile Strength.
- G. ASTM A449 - Standard Specification for Hex Cap Screws, Bolts and Studs, Steel, Heat Treated, 120/105/90 ksi Minimum Tensile Strength, General Use.
- H. ASTM A588 - Standard Specification for High-Strength Low-Alloy Structural Steel, up to 50 ksi [345 MPa] Minimum Yield Point, with Atmospheric Corrosion Resistance.
- I. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts.
- J. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- K. ASTM B449 - Standard Specification for Chromates on Aluminum.
- L. ASTM D4956 - Standard Specification for Retroreflective Sheeting for Traffic Control.
- M. ANSI/AASHTO/AWS D1.5 - Bridge Welding Code.
- N. ANSI/ASME B18.5 - Round Head Bolts (Inch Series).
- O. AASHTO M 168 - Standard Specifications for Wood Products.

P. AASHTO M 180 - Standard Specification for Corrugated Sheet Steel Beams for Highway Guardrail.

Q. AASHTO M 314 - Standard Specification for Steel Anchor Bolts.

1.04 SUBMITTALS

A. Certifications, Shop Drawings, catalog cuts, manufacturer's literature, and technical data for all products and materials appurtenant to the construction specified herein.

1.05 PROTECTION

A. Be aware of any underground utilities which may interfere with post locations.

PART 2 PRODUCTS

2.01 METAL BEAM GUIDERAIL

A. Metal Beam Rail and Metal Beam Rail Attachments and delineators, type as indicated on the Drawings - Conform to Section 9.10, Article 9.10.02 of the Standard Specifications as attached.

B. Metal Beam End Anchorages for type of rail as indicated on the Drawings - Conform to Section 9.11, Article 9.11.02 of the Standard Specifications as attached.

PART 3 EXECUTION

3.01 METAL BEAM GUIDERAIL

A. Metal Beam Rail and Metal Beam Rail Attachments and delineators, type as indicated on the Drawings - Conform to Section 9.10, Article 9.10.03 of the Standard Specifications as attached.

B. Metal Beam End Anchorages for type of rail as indicated on the Drawings - Conform to Section 9.11, Article 9.11.03 of the Standard Specifications as attached.

3.02 ATTACHMENTS

A. Section 9.10 - Metal Beam Rail of the Standard Specifications. Subsection 9.10.04 through 9.10.05 are not included and are not applicable to this Contract.

B. Section 9.11 - Metal Beam Rail Anchorages of the Standard Specifications. Subsection 9.11.04 through 9.11.05 are not included and are not applicable to this Contract.

C. Section M.10.02 - Metal Beam-Type Rail and Anchorages of the Standard Specifications.

END OF SECTION

**SECTION 9.10
METAL BEAM RAIL**

9.10.01—Description**9.10.02—Materials****9.10.03—Construction Methods****9.10.04—Method of Measurement****9.10.05—Basis of Payment**

9.10.01—Description: Work under this item shall consist of the installation of or conversion to a single or double line of steel rail elements and terminal sections fastened to wood or steel posts with or without rubrail, and the appropriate treatment at bridge parapets, barriers, or other fixed objects as shown on the plans. This item shall include metal beam rail types: w-beam, thrie-beam and box-beam. It shall be installed or converted in the locations indicated and fabricated in accordance with the lines, designations, dimensions, and details on the plans or as ordered by the Engineer.

9.10.02—Materials: The material for metal beam rail shall meet the requirements of M.10.02 and the following:

1. Adhesive bonding material shall meet the requirements of 6.10.02.
2. Metal beam rail delineators shall meet the requirements of M.18.09 and M.18.13.
3. When converting rail, the Contractor shall reuse any undamaged existing rail elements, appropriate posts, delineators, and lap bolts within the Project limits as approved by the Engineer to construct the converted rail. The Contractor shall use new materials when any components of the existing railing are damaged or missing and cannot be obtained from other rail systems being removed or converted within the Project limits.

9.10.03—Construction Methods: Steel posts shall be driven. The Contractor shall use suitable driving caps and equipment to prevent damage to the posts during driving. Where rock, boulders or debris are encountered while driving the posts, the obstruction shall be removed to make each hole large enough to permit driving of the posts. Each hole shall then be backfilled with suitable material and thoroughly compacted before driving the posts. Any surplus or unsuitable material remaining after the completed installation shall be removed and disposed of by the Contractor.

Wood posts shall be set in holes, and the area adjacent to the posts shall be backfilled with suitable material and thoroughly compacted. Any surplus or unsuitable material remaining after the completed installation shall be removed and disposed of by the Contractor.

The Contractor is cautioned that underground utilities, which may be energized, may be present within the Project limits.

The posts shall be located as shown on the plans, set plumb and in alignment with the rail or rail treatments. Where required, the blockouts, brackets, rubrails, back-up rails and rail elements shall then be erected to produce a smooth continuous rail as shown on the plans. The terminal connectors, rubrails, and rail elements shall be lapped in the direction of traffic.

Whenever metal beam rail or rail treatments are being constructed adjacent to areas open to traffic, the Contractor shall complete the installation up to and including the designated terminal treatment at the close of each day's work.

On long runs or other locations when it is not practical to complete the installation up to and including the designated terminal treatment by the end of the workday, the Contractor shall use temporary methods to terminate the metal beam rail.

Prior to any rail installations, the Contractor shall submit to the Engineer for review its proposed methods for temporarily terminating the end section.

The Contractor shall furnish posts of sufficient length where field conditions warrant to obtain the depth in the ground shown on the plans.

Rail attachment to concrete bridge parapets, barriers, or other fixed objects shall be made using through bolts as shown on the plans. When anchor bolts for rail attachments are shown on the plans to be installed into existing concrete, drilling and bonding shall be as specified in Article 6.10.03. A minimum of 3 anchors, or 5% of the total number of anchors, whichever is greater, shall be tested in accordance with 6.10.03-C.

When existing metal beam rail is being converted, the Contractor may punch or drill a hole in the flange of the existing post to facilitate attachment of the blockout and rail element to the post. No other methods shall be used to create this hole.

End anchorages not needed for the converted rail shall be removed in their entirety.

In the welding of steel plates to the steel posts, the welds shall be of the size and type shown on the plans and shall meet the applicable requirements of the AWS.

Before final erection, all galvanized elements which have been cut or worked so as to damage the zinc coating and cause the base metal to be exposed shall have the exposed base metal thoroughly cleaned and brush coated with 2 coats of zinc-rich touch-up material.

SECTION 9.11
METAL BEAM RAIL ANCHORAGES

9.11.01—Description: This work shall consist of installing metal beam rail end anchorages of the type shown on the plans or as ordered by the Engineer. Object markers shall be provided at the specific end anchorage types as shown on the plans.

9.11.02—Materials: The materials for this work shall meet the requirements of M.10.02-7.
Non-shrink grout associated with rail anchored to rock shall meet the requirements of M.03.05.
The material for object markers shall be as specified in 9.30.02

9.11.03—Construction Methods: Anchorages, channels, rails, w-beam terminal elements, and fittings shall be installed as indicated on the plans. The excavated area for the anchorages shall be backfilled with suitable material and compacted in 6 inch layers. Any surplus material remaining after the completed installation shall be removed by the Contractor.

When the rail is anchored to rock, preparation of the rock including rock removal and the drilling of holes shall be as shown on the plans. The diameter of the holes shall be sufficient to permit the placement of the bolts and the non-shrink grout, but shall not exceed twice the diameter of the bolts. The bolt holes shall be blown clean with an air jet prior to installing the bolts and non-shrink grout. Spalled areas behind the steel plate shall be filled with non-shrink grout.

The rail elements shall be lapped in the direction of traffic.

Before final erection, all galvanized elements which have been cut or worked so as to damage the zinc coating and cause the base metal to be exposed shall have the exposed base metal thoroughly cleaned and brush coated with zinc-rich touch-up material in accordance with M.10.02-8.

An object marker shall be installed adjacent to all Type I and Type II end anchors as shown on the plans and as specified in 9.30.03

**SECTION M.10
RAILING AND FENCE**

M.10.01—Cable Guide Railing and Anchorages**M.10.02—Metal Beam-Type Rail and Anchorages****M.10.03—Vacant****M.10.04—Wire Fence****M.10.05—Chain Link Fence****M.10.06—Vacant****M.10.07—Vacant****M.10.08—Three-Cable Guide Railing (I-Beam Posts) and Anchorages**

M.10.01—Cable Guide Railing and Anchorages: The materials for this work shall meet the following requirements:

1. Wire Rope: Wire rope shall be Class A, 3/4 inch diameter, meeting the requirements of AASHTO M 30.

2. Fittings: All fittings shall meet the details as shown on the plans. Fittings subject to the direct action of the wire rope shall be sufficiently strong to develop the full-specified tensile strength of the rope. Fittings used in the attachment of 2 ropes shall be sufficiently strong to develop the full-specified tensile strength of both ropes. Other fittings shall be in accordance with standard commercial specifications, and shall be free from flaws or defects that would tend to impair their use or durability.

All metal fittings shall be galvanized, after fabrication, to meet the requirements of ASTM A153.

3. Steel Posts: All steel posts shall meet the requirements of ASTM A36.

Steel posts shall meet the details shown on the plans as to size, shape and weight; and they shall be punched or drilled as indicated on the plans. After fabrication, all posts shall be galvanized to meet the requirements of ASTM A123.

4. Anchorages: Anchorages shall be as shown on the plans.

5. Wood Posts: Wood posts shall meet the requirements of M.10.04-2 except that the diameter shall be as shown on the plans

6. Steel Eyebolt and Standard Turnbuckle: The steel eyebolt and standard turnbuckle shall meet the requirements of ASTM A237 and shall be galvanized to meet the requirements of ASTM F2329.

7. Connector Plate Bolts: The connector plate bolts shall meet the requirements of ASTM F3125 Grade A325 and shall be galvanized to meet the requirements of ASTM F2329.

8. Cast Steel Connector Plate: The cast steel connector plate shall meet the requirements of ASTM A27, Grade 65-35 and shall be galvanized to meet the requirements of ASTM A123.

9. Malleable Iron Connector Plate: The malleable iron connector plate shall meet the requirements of ASTM A47, Grade No. 32510 and shall be galvanized to meet the requirements of ASTM A123.

M.10.02—Metal Beam-Type Rail and Anchorages: The materials for this work shall comply with the plans as to size, shape and weight.

1. Steel Posts, Welded-Soil Plates, Brackets, Back-Up Rails and Channel Rubrails:

(a) Steel posts, welded-soil plates, brackets, back-up rails and channel rubrails shall meet the requirements of ASTM A36. After fabrication, all steel posts, welded-soil plates, brackets, back-up rails and channel rubrails shall be galvanized to meet the requirements of ASTM A123.

(b) All welding shall meet ANSI/AASHTO/AWS D1.5.

2. Wood Posts: Wood posts shall be commercial lumber Grade No. 1 or better and shall meet AASHTO M 168. The posts shall be either rough sawn (non-planed) or S4S (surface four sides) southern yellow pine or douglas fir, or western larch with nominal dimensions as indicated on the plans. Actual dimensions of the posts shall not vary by more than 1/4 inch from the dimensions shown on the plans.

After all end cuts are made and all holes are drilled the wood shall be treated in accordance with AASHTO M 133 and the AWPA Standards.

3. Rail Elements (W-Beam, Thrie-Beam) and Terminal Sections: Rail elements and terminal sections shall meet the requirements of AASHTO M 180 and the following:

(a) **Class A (12 gauge):** Base metal nominal thickness, 0.105 inch

(b) **Class B (10 gauge):** Base metal nominal thickness, 0.135 inch

(c) Galvanizing shall be Type II.

(d) Acceptance shall be based on AASHTO M 180 Article 5.3 "Acceptance by Brand Registration and

Guarantee."

- (e) Rail elements with radii less than or equal to 150 feet, as shown on the plans, shall be shop fabricated and then permanently stamped or embossed with the designated radius ($R = \underline{\hspace{1cm}}$) on the element near the brand registration stamp.

4. Box Beam Rail Elements: Elements shall be either structural tubing 8 inches \times 6 inches \times 1/4 inch or structural tubing 6 inches \times 6 inches \times 3/16 inch manufactured from either ASTM A500 Grade B cold-rolled tubing, ASTM A501 hot-rolled tubing or Automatic Rollover Protective Steel. When ASTM A500 Grade B steel is used, the DROP-Weight-Tear Test in conformance with ASTM E436 shall be performed. All plates shall meet ASTM A36. All material for box beam rail elements and splices shall be galvanized after fabrication in accordance with ASTM A123.

5. Steel Plates, Steel Washer Plates and Square Steel Washers: These components shall meet the requirements of ASTM A36 and shall be galvanized to meet the requirements of ASTM A123 unless otherwise noted on the plans.

6. Bolts, Rods, Washers, and Nuts: Anchor bolts and rods for attachment to barriers and parapets shall meet ASTM A449. The nuts for anchor bolts and rods shall meet ASTM A563, Grade B. The washers for anchor bolts or rods shall meet the requirements of ASTM F436. All other bolts and nuts, unless otherwise noted on the plans, shall meet the requirements of ASTM A307.

Bolts, nuts and washers, unless otherwise noted on the plans, shall be galvanized after fabrication to meet the requirements of ASTM F2329.

7. End Anchorages: The bar reinforcement shall meet the requirements of M.06.01-1. The Class PCC03340 Concrete shall meet the requirements of M.03. Anchor bolts and rods for end anchorages shall meet the requirements of AASHTO M 314.

8. Galvanized Coating Touch-up: The zinc dust-zinc oxide paint for galvanized coating touchup shall meet the requirements of AASHTO M 180.

9. Plastic Blockouts: Plastic blockouts shall be made with a minimum of 50% recyclable polyethylene plastic comprised of low-density and high-density polyethylene with a specific gravity less than or equal to 1.0 in accordance with ASTM D792 and be recyclable. They shall also have a minimum compressive stress of 450 psi in accordance with ASTM D695, meet the dimensions indicated on the plans, and be a shade of gray or black. Blockouts must have been crash-tested and have approval in writing by the FHWA in compliance with MASH, Test Level 3 requirements. Each blockout shall be stamped at the factory with the manufacturer's identification and lot number. The Contractor shall furnish to the Engineer prior to construction a Certified Test Report and a Materials Certificate for the blockouts in conformance with 1.06.07 or 1.20-1.06.07.

M.10.03—Vacant

M.10.04—Wire Fence:

1. Wire Fence: The wire fence shall be 9 gauge woven wire fence and shall be hot-dip galvanized in accordance with ASTM A116.

Staples shall be No. 9 galvanized wire staples 1 1/2 inches long. Nails shall be 16d galvanized.

Vertical stays, securely welded to the horizontal wires, shall be provided at equal intervals and shall run from top to bottom of the fence.

2. Treated Wood Posts: Wood posts and wood braces for wire fence shall meet the requirements of AASHTO M 168 and shall be cut from one of the following species: Norway (red) pine, southern yellow pine, scotch pine, pitch pine, oak, red maple, black birch or yellow birch.

All posts shall be straight of the size and length shown on the plans. The wood bracing shall be 4 inches \times 4 inches as shown on the plans.

Conditioning, treatment and wood preservative shall meet the requirements of AASHTO M 133 and AWPA Standards U1 and T1 for UC4B Commodity Specification B (Posts). All posts and braces shall be treated for their full length.

3. Metal Post: Metal posts shall be of the length shown on the plans, straight and true to section, and shall be of a standard commercial type. Hot-dip galvanizing shall be in accordance with ASTM A116, Class 2.

All posts, braces, anchors, plates, hardware and other devices shall be galvanized on all inner and outer surfaces by an approved method.

All end posts shall have 1 brace; all corner and intermediate braces or pull posts shall have 2 braces.

- (a) Line posts shall be of the following types and shall meet the minimum requirements stated for each:
- Quadruple Ribbed Tee Post with minimum weight of 1.32 lb./l.f.
 - Channel or U Post with minimum weight or 1.12 lb./l.f.
 - Standard Tee Post with minimum weight of 1.22 lb./l.f.
 - Tubular Post with minimum outside diameter 1 3/4 inches minimum gauge No. 15 (U.S. Standard)
 - Angle Post with minimum section 2 inches × 2 inches × 1/4 inch
- (b) End posts, corner posts, brace posts and braces shall be of the following types and shall meet the minimum requirements stated for each:
- Tubular Section Post and Brace with minimum outside diameter 2 1/2 inches, minimum gauge No. 8 (U.S. Standard)
 - Standard Pipe Section Post and Brace with minimum weight of 3.65 lb./l.f.
 - Angle Post and Brace with minimum section of post 2 1/2 inches × 2 1/2 inches 1/4 inch, minimum section of brace 2 inches × 2 inches × 1/4 inch

The minimum weights stated for the several types of posts do not include anchors, plates or other devices. Intermediate or line posts shall be provided with a plate or anchor or other satisfactory means to hold the posts in proper alignment and plumb. Plates or anchors shall be securely fastened to the post by welding or by a minimum of 2 rivets per plate.

All posts having a tubular or pipe section shall be provided with a suitable cap at the top.

M.10.05—Chain Link Fence: All gauge measurements of finished wire shall be United States Steel Wire Gauge or equivalent. Tolerance for wire sizes shall be as specified in AASHTO M 181. When aluminized (aluminum-coated) steel fabric is used, the posts and hardware shall be galvanized. When aluminum fabric is used, the posts and hardware shall be aluminum. When polyvinyl chloride-coated steel fabric is used, the posts and hardware shall be polyvinyl chloride-coated.

Materials for this work shall meet the following requirements:

1. Fabric: Wire Fencing shall be composed of chain link woven wire. It shall be the height specified on the plans and shall be constructed of 9 gauge wire. The wire shall be woven to form a continuous fabric having 2 inch mesh. The chain link fabric shall have a knuckled finish on both top and bottom edges.

- (a) Aluminized Steel Fabric: The base metal of the fabric shall be of steel wire having a minimum tensile strength of 80,000 psi, coated with aluminum alloy applied at the rate of not less than 0.40 ounces/square foot of uncoated wire surface.
- (b) Polyvinyl chloride-coated steel fabric shall meet the requirements of ASTM D1785, and shall be the color black or as noted on the plans.
- (c) Aluminum Alloy Fabric shall meet the requirements of ASTM B211, Alloy 6061 wire having a minimum tensile strength of 50,000 psi.

2. Metal Posts and Rails: Metal posts shall be straight, true to section and of sufficient length to enable the post to be encased for a depth of 3 feet deep into a concrete footing which shall have a depth 3 feet 6 inches below ground.

The Contractor shall provide a Materials Certificate in accordance with 1.06.07 or 1.20-1.06.07 for all posts, rails, braces, anchors, plates and other devices with coating of the following types, which shall meet the minimum requirements for each:

- (a) Galvanized material shall be made of steel of a standard commercial type meeting the requirements of ASTM F1083 High Strength Grade Schedule 40 and ASTM F1043 Group 1A. It shall be hot-dip galvanized with a zinc coating weighing not less than 2.0 ounces/square foot when tested in accordance with AASHTO T 65 and shall be in accordance with AASHTO M 181, Grade 2.
- (b) Aluminized steel posts and rails shall meet ASTM F1043, minimum yield strength 50,000 psi, for industrial chain link fence. The posts and rails shall be manufactured by roll forming aluminum coated steel strip and electric resistance welding into tubular form. The outside of the weld area shall be metallized with commercially pure aluminum to a thickness sufficient to provide resistance to corrosion equal to that of the remainder of the outside of the tube. The aluminum coating weight on the outer and inner surfaces shall be a minimum of 0.75 ounces/square foot, Triple spot test, 0.70 ounces/square foot, single spot test, as measured in accordance with ASTM A428 and shall meet the requirements of ASTM F1043 Group 1C.
- (c) Polyvinyl chloride-coated material shall be made of steel of a standard commercial type coated inside and outside with the same polyvinyl chloride coating as the chain link mesh or shall have all

surfaces galvanized with the outside galvanized surface coated with the same polyvinyl chloride coating as the chain link mesh.

(d) Aluminum alloy shall meet the requirements of ASTM B211.

3. Fittings: These shall be malleable iron, pressed steel, or aluminum alloy. The fittings shall be either hot-dip galvanized, polyvinyl chloride-coated, or aluminum alloy.

(a) Hot-dip galvanizing shall meet the requirements of ASTM A153.

(b) Polyvinyl chloride-coated material shall have the same polyvinyl chloride coating as the chain link mesh.

(c) Aluminum alloy shall meet the requirements of ASTM B211.

4. Tension Wire, Tie Wire and Hog Rings:

(a) Tension wire for steel fence shall be coil spring steel and shall be 7 gauge. The base material shall have a minimum tensile strength of 80,000 psi with an aluminum coating applied at a rate of 0.40 ounces/square foot of surface area.

Aluminum tension wire shall be 7 gauge ATSM B211 Alloy 6061-T6 or 5052-H38 Aluminum Alloy.

(b) Tie wire for fastening fabric to line posts shall be 6 gauge. Tie wires or hog rings used to fasten the fabric to the top rail or tension wire shall be 9 gauge aluminum for aluminized or aluminum fabric fence, and 9 gauge polyvinyl chloride coated steel wire for polyvinyl chloride fence.

(c) Aluminized steel hog rings for aluminized fabric shall be 9 gauge.

5. Gates: Gates shall be of the same type of materials used for the chain link fence.

M.10.06—Vacant

M.10.07—Vacant

M.10.08—Three-Cable Guide Railing (I-Beam Posts) and Anchorages:

1. Wire Rope: Wire rope shall be Class A coating, 3/4 inch diameter, Type 1 construction conforming to AASHTO M 30.

2. Fittings:

(a) Material indicated on the plan as "Cast Steel" shall meet the requirements of ASTM A27 Grade 70-40 Class 1.

(b) Material indicated on the plan as "Malleable Iron" shall meet the requirements of ASTM A47, Grade 32510.

(c) The cable wedge for splices and cable fittings shall be malleable iron casting conforming to ASTM A47 Grade 32510. The cable wedge shall be uncoated (black).

(d) The cable splice shall meet the requirements of ASTM A536 Ductile Iron Grade 65-45-12. All cable ends and splices shall meet the details on the plans and have the properties necessary to develop the full tensile strength (25,000 lb.) of 3/4 inch wire rope.

(e) The spring cable end assembly (compensating device) casting shall meet the requirements of ASTM A47 Grade 32510 and must have a spring rate of 450-500 lb./inch and a total available throw of 6 inches minimum.

(f) Hook bolts, as installed, shall develop an ultimate pull-open strength from 500 lb. to 1,000 lb. applied in a direction normal to the longitudinal axis of the post.

(g) Steel turnbuckle cable end assembly shall be pearlitic malleable iron casting conforming to ASTM A220 Grade 50005.

(h) Standard hex nuts and lock nuts shall meet the requirements of ASTM A563 Grade B.

(i) After fabrication, all metal fittings and forged cast fittings required by the plans to be galvanized shall be galvanized to meet the requirements of ASTM A153.

3. Steel Posts and Welded-Soil Plates: All steel posts and welded-soil plates shall meet the requirements of ASTM A36. All required holes shall be punched or drilled. After fabrication, all posts and welded soil-plates shall be galvanized to meet the requirements of ASTM A123. All welding shall meet ANSI/AASHTO/AWS D1.5.

4. Anchorages: Class PCC03340 Concrete shall meet the requirements of M.03. Bar reinforcement shall meet the requirements of M.06.01-1.

Breakaway anchor angles, washers and anchorage plates shall meet the requirements of ASTM A36. Anchor bolts and rods for end anchorages shall meet the requirements of AASHTO M 314. Hex nuts shall meet the requirements of ASTM A563 Grade B. Breakaway anchor-angle tiepin shall be 3/16 inch diameter meeting the requirements of ANSI CR1018 and galvanized after fabrication to meet the requirements of ASTM A123. The angles shall be galvanized after fabrication to meet the requirements of ASTM A123. Rods, top nuts and washers shall be galvanized in accordance with the requirements of ASTM F2329.