

COPY NO. _____

**UNDERWOOD ROAD
DRAINAGE SYSTEM IMPROVEMENTS**

TOWN OF FALMOUTH, MAINE

**BIDDING AND CONTRACT REQUIREMENTS
AND SPECIFICATIONS**

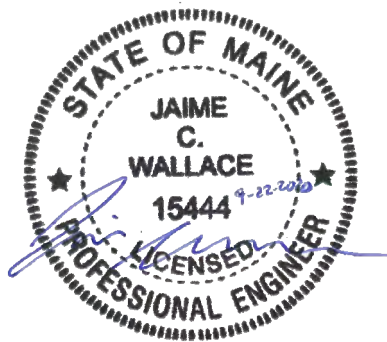
SEPTEMBER 2020

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TOWN OF FALMOUTH, MAINE
BIDDING AND CONTRACT REQUIREMENTS
AND SPECIFICATIONS
FOR
UNDERWOOD ROAD DRAINAGE SYSTEM IMPROVEMENTS

SEPTEMBER 2020



Prepared By:

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TOWN OF FALMOUTH, MAINE
UNDERWOOD ROAD DRAINAGE SYSTEM IMPROVEMENTS

Sealed Bids for the construction of the Underwood Road Right of Way Improvements will be received, by The Town of Falmouth, at the office of Public Works, 101 Woods Road, Falmouth, ME 04105, until 2:00 p.m. local time on October 14th, 2020, at which time the Bids received will be evaluated and a bid tab will be sent to all Contractors within 24 hours. All pre-bid correspondence shall be submitted electronically to Jaime Wallace, at jaime.wallace@wright-pierce.com. Questions regarding this bid/proposal shall be accepted until 3:00 P.M. on October 7th, 2020.

The Work involves improvements to the existing storm drain outfall located at the end of Underwood Road in Falmouth, Maine. The improvements are an extension of the existing outfall as well as stabilization of side slopes which have been failing over the years. The project is funded in part by the Town of Falmouth as well as the private property owner at 5 Sandy Cove Road. The awarded contractor will enter in an agreement solely with the Town of Falmouth.

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 may be viewed and/or obtained in PDF format on-line at <https://www.falmouthme.org/current-bids-rfps/pages/current-bids-rfps>.

A pre-bid conference will be held via Zoom September 30, 2020 at 10:00 A.M. Attendance is not mandatory, but participation is encouraged. Site visits by the Contractor may be coordinated with the Town at any time. Interested contractors will be required to request login information by contacting Jaime Wallace at Wright-Pierce via email at jaime.wallace@wright-pierce.com.

Bid security shall be furnished in accordance with the Instructions to Bidders.

The Town of Falmouth reserves the right to reject any or all Bids, to waive any technical or legal deficiencies, and to accept any Bid that it may deem to be in the best interests of the Town.

+ + END OF ADVERTISEMENT FOR BIDS + +

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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.

Town of Falmouth, ME

Public Works Department

101 Woods Road

Falmouth, ME

Telephone: 207-781-3919

e-mail: jearyl@falmouthme.org

Contact Name: Justin Early, PE – Town Engineer

Website to Download Bidding Documents: <https://www.falmouthme.org/current-bids-rfps/pages/current-bids-rfps>

B. *Engineer - Wright-Pierce* – The office from which bidding coordination and questions are to be directed to.

11 Bowdoin Mill Island, Suite 140

Topsham, ME

Telephone: 207-798-3744

e-mail: Jaime.wallace@wright-pierce.com

*Contact Name: **Jaime Wallace, PE***

ARTICLE 2 – COPIES OF BIDDING DOCUMENTS

2.01 Bidding Documents may be obtained from the Town of Falmouth's Current Bids & RFP's page at <https://www.falmouthme.org/current-bids-rfps/pages/current-bids-rfps>. Access and downloading of the Bidding Documents in pdf format is free to the contractor. However, printing of the Bidding Documents will be the responsibility of the Contractor.

2.02 Complete sets of Bidding Documents shall be used in preparing Bids; neither Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

2.03 Owner and Engineer, in making copies of Bidding Documents available on the above terms, do so only for the purpose of obtaining Bids for the Work and do not authorize or confer a license for any other use.

ARTICLE 3 – QUALIFICATIONS OF BIDDERS

- 3.01 To demonstrate Bidder's qualifications to perform the Work, each Bidder must provide an experience statement, including a list of relevant past projects, which demonstrates the contractor's ability to perform the work proposed in this RFP.
- 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 – SITE AND OTHER AREAS; EXISTING SITE CONDITIONS; EXAMINATION OF SITE; OWNER'S SAFETY PROGRAM; OTHER WORK AT THE SITE

4.01 *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.

4.02 *Existing Site Conditions*

- A. Subsurface and Physical Conditions; Hazardous Environmental Conditions
 - 1. The Supplementary Conditions identify:
 - a. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site.
 - b. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).
 - c. 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.
 - 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.

4.03 *Site Visit and Testing by Bidders*

- A. Bidder shall conduct any required site visits during normal working hours.
- 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 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.

- D. Bidder shall 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 shall fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies.

4.04 *Owner's Safety Program*

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

4.05 *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 5 – BIDDER'S REPRESENTATIONS

5.01 It is the responsibility of each Bidder before submitting a Bid to:

- A. examine and carefully study the Bidding Documents, and any data and reference items identified in the Bidding Documents;
- B. visit the Site, conduct a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfy itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work;
- C. become familiar with and satisfy itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work;
- D. carefully study all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings;
- E. consider 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 Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information,

observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder's safety precautions and programs;

- F. agree, based on the information and observations referred to in the preceding paragraph, that at the time of submitting its Bid no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents;
- G. become aware of the general nature of the work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents;
- H. promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by Engineer is acceptable to Bidder;
- I. determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work; and
- J. agree that the submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

ARTICLE 6 – PRE-BID CONFERENCE

- 6.01 A pre-Bid conference will be held via Zoom at the time stated in the invitation or advertisement to bid. Representatives of Owner and Engineer will be present to discuss the Project. Bidders are encouraged to attend and participate in the conference. All interested Bidders will be required to request login information from the Engineer prior to the pre-bid conference. Engineer will transmit to all prospective Bidders of record such Addenda as Engineer considers necessary in response to questions arising at the conference. Oral statements may not be relied upon and will not be binding or legally effective.

ARTICLE 7 – INTERPRETATIONS AND ADDENDA

- 7.01 All questions about the meaning or intent of the Bidding Documents are to be submitted to Engineer in writing. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda delivered to all parties recorded as having received the Bidding Documents. Questions received less than seven days prior to the date for opening of Bids may not be answered. Only questions answered by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.
- 7.02 Addenda may be issued to clarify, correct, supplement, or change the Bidding Documents. Addenda will be issued not later than three working days before the bid opening. Bidders are responsible for determining that they have received all Addenda issued.

ARTICLE 8 – BID SECURITY

- 8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of 5 percent of Bidder's maximum Bid price (determined by adding the base bid and all alternates) and in the

form of a certified check, bank money order, or a Bid bond (on the form included in the Bidding Documents) issued by a surety meeting the requirements of Paragraphs 6.01 and 6.02 of the General Conditions.

- 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 Documents, 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 Documents 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. Such forfeiture shall 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 seven days after the Effective Date of the Contract or 61 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 seven 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 substantially completed and ready for final payment are set forth in the Agreement.

ARTICLE 10 – LIQUIDATED DAMAGES

- 10.01 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 11 – SUBSTITUTE AND "OR-EQUAL" ITEMS

- 11.01 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.

ARTICLE 12 – SUBCONTRACTORS, SUPPLIERS, AND OTHERS

- 12.01 A Bidder shall be prepared to retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of the Work if required by the Bidding Documents (most commonly in the Specifications) to do so. If a prospective Bidder objects to retaining any such Subcontractor, Supplier, or other individual or entity, and the concern is not relieved by an Addendum, then the prospective Bidder should refrain from submitting a Bid.
- 12.02 Subsequent to the submittal of the Bid, Owner may not require the Successful Bidder or Contractor to retain any Subcontractor, Supplier, or other individual or entity against which Contractor has reasonable objection.

- 12.03 If required by the Bid Documents, the apparent Successful Bidder, and any other Bidder so requested, shall within five days after Bid opening, submit to Owner a list of the Subcontractors or Suppliers proposed for the Work.

If requested by Owner, such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, or other individual or entity. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, individual, or entity, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit an acceptable substitute, in which case apparent Successful Bidder shall submit a substitute, Bidder's Bid price will be increased (or decreased) by the difference in cost occasioned by such substitution, and Owner may consider such price adjustment in evaluating Bids and making the Contract award.

- 12.04 If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors, Suppliers, or other individuals or entities. Declining to make requested substitutions will constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor, Supplier, individual, or entity so listed and against which Owner or Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to subsequent revocation of such acceptance as provided in Paragraph 7.06 of the General Conditions.

ARTICLE 13 – PREPARATION OF BID

- 13.01 The Bid Form is included with the Bidding Documents.
- A. All blanks on the Bid Form shall be completed in ink and the Bid Form signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid Form. A Bid price shall 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."
- 13.02 A Bid by a corporation shall 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 shall be shown.
- 13.03 A Bid by a limited liability company shall 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 shall be shown.
- 13.04 A Bid by an individual shall show the Bidder's name and official address.
- 13.05 A Bid by a joint venture shall be executed by an authorized representative of each joint venturer in the manner indicated on the Bid Form. The official address of the joint venture shall be shown.
- 13.06 All names shall be printed in ink below the signatures.
- 13.07 The Bid shall contain an acknowledgment of all Addenda, the numbers of which shall be filled in on the Bid Form, including date issued. Bidder shall be responsible for obtaining and acknowledging any and all Addenda prior to submitting a Bid.

- 13.08 Postal and e-mail addresses and telephone number for communications regarding the Bid shall be shown.
- 13.09 The Bid shall contain evidence of Bidder's authority and qualification to do business in the state where the Project is located, or Bidder shall covenant in writing to obtain such authority and qualification prior to award of the Contract and attach such covenant to the Bid. Bidder's state contractor license number, if any, shall also be shown on the Bid Form.

ARTICLE 14 – BASIS OF BID

14.01 Lump Sum with Unit Prices and Alternates

- A. Bidders shall submit a Bid on a lump sum basis for each lump sum item, and on a unit price basis for each unit price item, described in the Bidding Documents and as provided for in the Bid Form.
- B. The "Bid Price" (sometimes referred to as the extended price) for each 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.

ARTICLE 15 – SUBMITTAL OF BID

- 15.01 Deleted.
- 15.02 A Bid shall be received no later than the date and time prescribed and at the place indicated in the advertisement or invitation to bid and shall 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 shall 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 shall be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED." A mailed Bid shall be addressed to 101 Woods Rd, Falmouth, ME, 04105.
- 15.03 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 16 – MODIFICATION AND WITHDRAWAL OF BID

- 16.01 A 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.

- 16.02 If a Bidder wishes to modify its Bid prior to Bid opening, Bidder must withdraw its initial Bid in the manner specified in Paragraph 16.01 and submit a new Bid prior to the date and time for the opening of Bids.

ARTICLE 17 – OPENING OF BIDS

- 17.01 Bids will be opened at the time and place indicated in the advertisement or invitation to bid and, unless obviously non-responsive, evaluated with the Town and Engineer. A bid tab will be distributed to all Bidders within 24 hours of the bid submission. 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 18 – BIDS TO REMAIN SUBJECT TO ACCEPTANCE

- 18.01 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 19 – EVALUATION OF BIDS AND AWARD OF CONTRACT

- 19.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner will reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible. 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, then the Owner will reject the Bid as nonresponsive; provided that Owner also reserves the right to waive all minor informalities not involving price, time, or changes in the Work.
- 19.02 Evaluation of Bids
- A. In evaluating Bids, Owner will consider whether or not 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. Bids will be evaluated on the sum of Base Bid 1 and Base Bid 2.
- 19.03 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.
- 19.04 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.
- 19.06 All protests arising from the Owner's procurement practices must be submitted to the Owner as soon as practical. Owner will investigate the basis for the protest, seek advice of legal counsel, document all meeting and actions, and attempt to resolve the protest promptly and equitably.

ARTICLE 20 – BONDS AND INSURANCE

- 20.01 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 and insurance. When the Successful Bidder delivers the Agreement (executed by Successful Bidder) to Owner, it shall be accompanied by required bonds and insurance documentation.

ARTICLE 21 – SIGNING OF AGREEMENT

21.01 When Owner issues a Notice of Award to the Successful Bidder, it shall 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 shall 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 ten days thereafter, Owner shall 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 22 – SALES AND USE TAXES

22.01 Owner is exempt from Maine state sales and use taxes on materials and equipment to be incorporated in the Work. Said taxes shall not be included in the Bid. Refer to Paragraph SC-7.09 of the Supplementary Conditions for additional information.

ARTICLE 23 – CONTRACTS TO BE ASSIGNED – NOT USED

ARTICLE 24 – PARTNERING – NOT USED

ARTICLE 25 – DELETION OF ITEMS – NOT USED

ARTICLE 26 – SPECIAL LEGAL REQUIREMENTS – NOT USED

END OF SECTION

SECTION 00310

BID FORM

PROJECT IDENTIFICATION: Underwood Road Drainage System Improvements

THIS BID IS SUBMITTED TO: Town of Falmouth
Public Works Department
101 Woods Road
Falmouth, Maine 04105

ARTICLE 1 – BID RECIPIENT

- 1.01 This Bid is submitted to the Owner, as identified above.
- 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 – BIDDER’S ACKNOWLEDGEMENTS

- 2.01 Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

ARTICLE 3 – BIDDER’S REPRESENTATIONS

- 3.01 In submitting this Bid, Bidder represents that:
- A. Bidder has examined and carefully studied the Bidding Documents, and any data and reference items identified in the Bidding Documents, and hereby acknowledges receipt of the following Addenda:

Addendum No.

Addendum, Date

_____	_____
_____	_____
_____	_____
_____	_____

- B. Bidder has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfied itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
- C. Bidder is familiar with and has satisfied itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work.
- D. 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 any Site-related reports and

drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder's safety precautions and programs.

- E. Bidder agrees, based on the information and observations referred to in the preceding paragraph, that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.
- F. 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.
- G. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and confirms that the written resolution thereof by Engineer is acceptable to Bidder.
- H. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work.
- I. The submission of this Bid constitutes an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, and that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

ARTICLE 4 – BIDDER'S CERTIFICATION

4.01 Bidder certifies that:

- A. 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;
- B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;
- C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and
- D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:
 - 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;
 - 2. "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;
 - 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.

ARTICLE 5 – BASIS OF BID

5.01 Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

BASE BID 1 – TOWN UNIT PRICE SCHEDULE

Item No.	Quantity	Brief Description of Item with Unit Bid Price in Words	Unit Bid In Figures	Amount In Figures
1T	Lump Sum	Mobilization/Demobilization (7.5% Max of Total Bid) The Sum of \$ _____ _____ Per Lump Sum	\$ _____	\$ _____
2T	Lump Sum	Excavation of Embankment - Town The Sum of \$ _____ _____ Per Lump Sum	\$ _____	\$ _____
3T	Lump Sum	Removal and Disposal of Brush, Vegetation, & Invasive Species The Sum of \$ _____ _____ Per Lump Sum	\$ _____	\$ _____
4T	500 SF	Removal and Disposal of Pavement The Sum of \$ _____ _____ Per Square Foot	\$ _____	\$ _____
5T	100 LF	Removal and Disposal of Existing 30" Transite Pipe The Sum of \$ _____ _____ Per Linear Foot	\$ _____	\$ _____

Item No.	Quantity	Brief Description of Item with Unit Bid Price in Words	Unit Bid In Figures	Amount In Figures
6T	30 LF	Removal and Disposal of Existing 12" RCP Pipe The Sum of \$ _____ _____	\$ _____	\$ _____
Per Linear Foot				
7T	Lump Sum	Site Grading The Sum of \$ _____ _____	\$ _____	\$ _____
Per Lump Sum				
8T	Lump Sum	Bypass Pumping The Sum of \$ _____ _____	\$ _____	\$ _____
Per Lump Sum				
9T	100 CY*	Removal & Replacement of Unsuitable Material Above Pipe Bedding and Initial Backfill The Sum of \$ _____ _____	\$ _____	\$ _____
Per Cubic Yard				
10T	1 EA	Furnish & Install 4' Dia. Catch Basin The Sum of \$ _____ _____	\$ _____	\$ _____
Per Each				
11T	1 EA	Furnish & Install 7' Dia. Catch Basin The Sum of \$ _____ _____	\$ _____	\$ _____
Per Each				

Item No.	Quantity	Brief Description of Item with Unit Bid Price in Words	Unit Bid In Figures	Amount In Figures
12T	2 EA	Furnish & Install 7' Dia. Drain Manhole The Sum of \$ _____ _____	\$ _____	\$ _____
Per Each				
13T	108 LF	Furnish & Install 48" Dia. HDPE Storm Drain The Sum of \$ _____ _____	\$ _____	\$ _____
Per Linear Foot				
14T	25 LF	Furnish & Install 18" Dia. HDPE Storm Drain The Sum of \$ _____ _____	\$ _____	\$ _____
Per Linear Foot				
15T	1,000 SF	Furnish & Install Revetment Mattress & Stone The Sum of \$ _____ _____	\$ _____	\$ _____
Per Square Foot				
16T	60 CY	Furnish & Install 2" Leveling Stone The Sum of \$ _____ _____	\$ _____	\$ _____
Per Cubic Yard				
17T	500 CY	Furnish & Place Rip-Rap (D50 = 24") The Sum of \$ _____ _____	\$ _____	\$ _____
Per Cubic Yard				

Item No.	Quantity	Brief Description of Item with Unit Bid Price in Words	Unit Bid In Figures	Amount In Figures
18T	10 CY	Furnish & Place Rip-Rap (D50 = 6")		
		The Sum of \$_____		
		_____	\$_____	\$_____
		Per Cubic Yard		
19T	30 CY	Furnish & Install Aggregate Subbase – Type D		
		The Sum of \$_____		
		_____	\$_____	\$_____
		Per Cubic Yard		
20T	15 CY	Furnish & Install Aggregate Subbase – Type A		
		The Sum of \$_____		
		_____	\$_____	\$_____
		Per Cubic Yard		
21T	60 SY	Furnish & Install Bituminous Paving – 19 mm Binder Course		
		The Sum of \$_____		
		_____	\$_____	\$_____
		Per Square Yard		
22T	60 SY	Furnish & Install Bituminous Paving – 12.5 mm Surface Course		
		The Sum of \$_____		
		_____	\$_____	\$_____
		Per Square Yard		
23T	Lump Sum	Loam, Seed & Mulch - Town		
		The Sum of \$_____		
		_____	\$_____	\$_____
		Per Lump Sum		

Item No.	Quantity	Brief Description of Item with Unit Bid Price in Words	Unit Bid In Figures	Amount In Figures
24T	Lump Sum	Furnish & Install Erosion & Sedimentation Control The Sum of \$ _____ _____	\$ _____	\$ _____
Per Lump Sum				
25T	Lump Sum	Dewatering The Sum of \$ _____ _____	\$ _____	\$ _____
Per Lump Sum				
26T	4,750 SF	Furnish & Install Geotextile Fabric - Town The Sum of \$ _____ _____	\$ _____	\$ _____
Per Square Foot				
27T	Lump Sum	Furnish & Install Structural Fill – Town The Sum of \$ _____ _____	\$ _____	\$ _____
Per Lump Sum				
28T	Lump Sum	Furnish & Install Plantings – Town The Sum of \$ _____ _____	\$ _____	\$ _____
Per Lump Sum				

* Indeterminate quantities assumed for comparison of bids. Quantities are not guaranteed. Payment will be based on actual quantities constructed.

SUBTOTAL BASE BID 1: Total of Items 1T through 28T.

_____ (\$_____)

(use figures)

(use words)

BASE BID 2 – COHEN UNIT PRICE SCHEDULE

Item No.	Quantity	Brief Description of Item with Unit Bid Price in Words	Unit Bid In Figures	Amount In Figures
2C	Lump Sum	Excavation of Embankment – Cohen The Sum of \$ _____ _____ Per Lump Sum	\$ _____	\$ _____
23C	Lump Sum	Loam, Seed & Mulch – Cohen The Sum of \$ _____ _____ Per Lump Sum	\$ _____	\$ _____
26C	1,920 SF	Furnish & Install Geotextile Fabric – Cohen The Sum of \$ _____ _____ Per Square Foot	\$ _____	\$ _____
27C	Lump Sum	Furnish & Install Structural Fill – Cohen The Sum of \$ _____ _____ Per Lump Sum	\$ _____	\$ _____

Item No.	Quantity	Brief Description of Item with Unit Bid Price in Words	Unit Bid In Figures	Amount In Figures
28C	Lump Sum	Furnish & Install Plantings – Cohen		
		The Sum of \$_____		
		_____	\$_____	\$_____
		Per Lump Sum		

* Indeterminate quantities assumed for comparison of bids. Quantities are not guaranteed. Payment will be based on actual quantities constructed.

SUBTOTAL BASE BID 2: Total of Items 2C through 28C.

_____ (\$_____)

(use figures)

(use words)

TOTAL BID: Base Bid 1 + Base Bid 2.

_____ (\$_____)

(use figures)

(use words)

ARTICLE 6 – TIME OF COMPLETION

6.01 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.

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

ARTICLE 7 – ATTACHMENTS TO THIS BID

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

- A. Required Bid security;
- B. List of Proposed Subcontractors;
- C. List of Proposed Suppliers;

- D. List of Project References;
- E. Evidence of authority to do business in the state of the Project; or a written covenant to obtain such license within the time for acceptance of Bids;

ARTICLE 8 – DEFINED TERMS

8.01 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 9 – BID SUBMITTAL

BIDDER: *[Indicate correct name of bidding entity]*

By:

[Signature] _____

[Printed name] _____

(If Bidder is a corporation, a limited liability company, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest:

[Signature] _____

[Printed name] _____

Title: _____

Submittal Date: _____

Address for giving notices:

Telephone Number: _____

Fax Number: _____

Contact Name and e-mail address: _____

Bidder's License No.: _____

(where applicable)

END OF SECTION

SECTION 00410

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*):

BID

Bid Due Date:

Description (*Project Name— Include Location*):

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

(Seal)

Bidder's Name and Corporate Seal

(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

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.

AGREEMENT

I. PARTIES

This contract (hereinafter referred to as "Agreement") is made and entered into on this _____ day of _____, 20__, by and between the Inhabitants of the Town of Falmouth with a mailing address of 271 Falmouth Road, Falmouth, Maine 04105 (hereinafter referred to as "Town"); and _____, with a mailing address of _____ (hereinafter referred to as "Contractor"). In consideration of the mutual promises contained herein, Contractor agrees to perform the following services for the Town.

II. SCOPE OF WORK

In consideration of the compensation set forth herein, the Contractor shall perform the services as outlined in Specification Section 01010 Summary of Work.

III. COMMENCEMENT AND COMPLETION

The Contractor will commence work on or before _____, 20__ and will complete work on or before June 30, 2021.

IV. PAYMENT TERMS

The Contractor shall submit an invoice on or about the first of each month reflecting services performed at the Contractor's normal professional billing rates, attached hereto as Exhibit C. The Contractor understands that the payment for completion of the services outlined in Section II shall not exceed _____ Dollars (\$_____), and the Contractor agrees to perform the services on that basis. Invoices shall list separately all out of pocket expenses being billed.

V. TERMINATION

Either party may terminate this Agreement for cause after giving the other party written notice and a reasonable opportunity to cure. The Town may terminate without

cause by giving the Contractor fourteen (14) days notice and compensating the Contractor equitably to the termination date.

VI. DISPUTE RESOLUTION

Any controversy or claim arising out of or related to this Agreement, which cannot be resolved between the parties shall be submitted to the Maine Superior Court (Cumberland County). This agreement shall be governed by Maine law.

VII. QUALIFICATIONS

The Contractor represents it holds and will continue to hold during the term hereof any and all qualifications, licenses and certifications required to perform its services in Maine. The contractor shall perform all services in accordance with professional standards.

VIII. SUBCONTRACTORS

The Contractor shall be fully responsible to the Town for the acts and omissions of any subcontractors, and of persons either directly or indirectly employed by it, and shall hold subcontractors to the same terms and conditions as Contractor is held under this Agreement. No subcontractors shall be retained on this Agreement without the specific prior written approval of the Town.

IX. INSURANCE

The Contractor shall purchase and maintain Workers' Compensation Insurance, General Public Liability and Property Damage Insurance including vehicle coverage and professional liability insurance, all with limits and terms satisfactory to the Town. The Town shall be named as an additional insured on the liability policy.

X. INDEMNIFICATION

The Contractor will indemnify and hold harmless the Town, its officers, agents and employees from and against all claims, damages, losses and expenses including

attorney's fees arising out of or resulting from the performance of the Agreement by the Contractor, its officials, employees, agents and subcontractors.

XI. LIQUIDATED DAMAGES

A. Contractor and Owner recognize that time is of the essence and that Owner will suffer financial and other losses if the Work is not completed and Milestones not achieved within the dates and times specified in Section III above, plus any extensions thereof allowed in accordance with the Contract. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty):

1. Completion: Contractor shall pay Owner \$250 for each day that expires after the time (as duly adjusted pursuant to the Contract) specified in Section III above until the work is completed and ready for final payment.

XII. PAYMENT PROCEDURES

A. 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.

B. Progress Payments; Retainage

- a. Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment on or about the 15th day of each month during performance of the Work, 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.

- b. 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 Engineer may determine or as Owner may withhold, including but not limited to liquidated damages in accordance with the Contract
 - i. 95 percent of the Work completed (with the balance being retainage).

XIII. ENTIRE AGREEMENT

This Agreement and its attachments represent and contain the entire agreement between the parties. Prior discussions or verbal representations by the parties that are not contained in this Agreement and its attachments are not a part of this Agreement. Where there is any conflict between the provisions of this Agreement and the provisions of any attachment, the provisions of this Agreement shall control.

Date: _____

By: _____

Title: _____

Date: _____

INHABITANTS OF THE
TOWN OF FALMOUTH, MAINE

By: _____
Nathan A. Poore, Town Manager

SECTION 00610

PERFORMANCE BOND

CONTRACTOR *(name and address)*:

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

OWNER *(name and address)*:

CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description *(name and location)*:

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

Surety's Name and Corporate Seal

By: _____
Signature

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

Print Name

Print Name

Title

Title

Attest: _____
Signature

Attest: _____
Signature

Title

Title

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:

SECTION 00620PAYMENT BONDCONTRACTOR *(name and address):*SURETY *(name and address of principal place of business):*OWNER *(name and address):*

CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description *(name and location):*

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 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)

Contractor's Name and Corporate Seal

(seal)

Surety's Name and Corporate Seal

By: _____
SignatureBy: _____
Signature *(attach power of attorney)*_____
Print Name_____
Print Name_____
Title_____
TitleAttest: _____
SignatureAttest: _____
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;
 - 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.
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
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:

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

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by



Issued and Published Jointly by



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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 form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
 4. *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, or both; 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, or both; 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; or (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. 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), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to (a) the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§9601 et seq. (“CERCLA”); (b) the Hazardous Materials Transportation Act, 49 U.S.C. §§5501 et seq.; (c) the Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq. (“RCRA”); (d) the Toxic Substances Control Act, 15 U.S.C. §§2601 et seq.; (e) the Clean Water Act, 33 U.S.C. §§1251 et seq.; (f) the Clean Air Act, 42 U.S.C. §§7401 et seq.; or (g) any other federal, state, or local statute, law, rule, regulation, ordinance, resolution, code, order, or decree 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 the 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. *Engineer*—The individual or entity named as such in the Agreement.
21. *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.
22. *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. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated in the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, does not establish a Hazardous Environmental Condition.
23. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

24. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.
25. *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.
26. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.
27. *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.
28. *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.
29. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.
30. *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.
31. *Project Manual*—The written documents prepared for, or made available for, procuring and constructing the Work, including but not limited to the Bidding Documents or other construction procurement documents, geotechnical and existing conditions information, the Agreement, bond forms, General Conditions, Supplementary Conditions, and Specifications. The contents of the Project Manual may be bound in one or more volumes.
32. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative or "RPR" includes any assistants or field staff of Resident Project Representative.
33. *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.
34. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer's review of the submittals and the performance of related construction activities.
35. *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.
36. *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.

37. *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 furnished by Owner which are designated for the use of Contractor.
38. *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.
39. *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.
40. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion thereof.
41. *Successful Bidder*—The Bidder whose Bid the Owner accepts, and to which the Owner makes an award of contract, subject to stated conditions.
42. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.
43. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.
44. *Technical Data*—Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (a) subsurface conditions at the Site, or physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) or (b) Hazardous Environmental Conditions at the Site. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then the data contained in boring logs, recorded measurements of subsurface water levels, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical or environmental report prepared for the Project and made available to Contractor are hereby defined as Technical Data with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06.
45. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including but not limited to those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, fiber optic transmissions, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
46. *Unit Price Work*—Work to be paid for on the basis of unit prices.
47. *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.

48. *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 the following paragraphs are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.
- B. *Intent of Certain Terms or Adjectives:*
1. The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.
- C. *Day:*
1. The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.
- D. *Defective:*
1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
 - a. does not conform to the Contract Documents; or
 - b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
 - c. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or 15.04).
- E. *Furnish, Install, Perform, Provide:*
1. The word “furnish,” when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
 2. The word “install,” when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.
 4. 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. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

- A. *Bonds*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.
- B. *Evidence of Contractor’s Insurance*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract), the certificates and other evidence of insurance required to be provided by Contractor in accordance with Article 6.
- C. *Evidence of Owner’s Insurance*: After receipt of the executed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or otherwise), 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 executed 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 specifically 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 *Initial Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.03.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.
 1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.
 2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
 3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.

2.06 *Electronic Transmittals*

- A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may transmit, and shall accept, Project-related correspondence, text, data, documents, drawings, information, and graphics, including but not limited to Shop Drawings and other submittals, in electronic media or digital format, either directly, or through access to a secure Project website.
- B. If the Contract does not establish protocols for electronic or digital transmittals, then Owner, Engineer, and Contractor shall jointly develop such protocols.
- C. When transmitting items in electronic media or digital format, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items 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 items, or from those established in applicable transmittal protocols.

ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

- A. The Contract Documents are complementary; what is required by one is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents.
- C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic or digital versions of the Contract Documents (including any printed copies derived from such electronic or digital versions) and the printed record version, the printed record version shall 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.

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, shall mean 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, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the 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 Documents 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 Documents 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 shall 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 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 thereunder.
- 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 give written notice to Owner and Contractor 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 editions, 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 shall preclude 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 thirtieth 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 sixtieth day after the day of Bid opening or the thirtieth 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 shall 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 shall 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 shall 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 the Contract Times and Contract Price. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- 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. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall 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 utility owners (other than those performing other work at or adjacent to the Site by arrangement with the Owner, as contemplated in Article 8); and
 4. acts of war or terrorism.
- D. 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.
- E. Paragraph 8.03 governs 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.
- F. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times 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.

- G. Contractor must submit any Change Proposal seeking an adjustment in Contract Price or Contract Times under this paragraph within 30 days of the commencement of the delaying, disrupting, or interfering event.

ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 *Availability of Lands*

- A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.
- 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; 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 7.12, 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 at law; 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 shall conform to applicable Laws and Regulations.
- C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site 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 known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site;
 - 2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities); 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 upon the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. 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; or
 - 2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
 - 3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

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 either:
1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate; or
 2. is of such a nature as to require a change in the Drawings or Specifications; or
 3. differs materially from that shown or indicated in the Contract Documents; or
 4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 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 the necessity of Owner's obtaining 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 above; 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. *Possible Price and Times Adjustments:*
1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, or both, 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 conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
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; or
 - 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 as 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, or both, then any such adjustment shall 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, or both, 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.

5.05 *Underground Facilities*

- A. *Contractor's Responsibilities:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or adjacent to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:
 1. Owner and Engineer do not warrant or guarantee the accuracy or completeness of any such information or data provided by others; and
 2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
 - a. reviewing and checking all information and data regarding existing Underground Facilities at the Site;
 - b. locating all Underground Facilities shown or indicated in the Contract Documents as being at the Site;
 - c. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and
 - d. 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 in the Contract Documents, or was not shown or indicated 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), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer.

- C. *Engineer's Review:* Engineer will promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the Underground Facility in question; 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 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. *Possible Price and Times Adjustments:*
 - 1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, or both, to the extent that any existing Underground Facility at the Site that was not shown or indicated in the Contract Documents, 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. Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated the existence or actual location of the Underground Facility in question;
 - 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;
 - c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times; and
 - d. 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, or both, then any such adjustment shall 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, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.

5.06 *Hazardous Environmental Conditions at Site*

- A. *Reports and Drawings:* The Supplementary Conditions identify:
1. those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and
 2. 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 Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. 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; or
 2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
 3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for 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, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, 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.
- 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 or 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.H shall obligate 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 shall obligate 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 all of Contractor's obligations under the Contract. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the Supplementary Conditions, or other specific provisions of the Contract. Contractor shall also furnish such other bonds as are required by the Supplementary Conditions or other specific provisions of the Contract.
- B. All bonds shall be in the form prescribed by the Contract except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (as amended and supplemented) by the Financial Management Service, Surety Bond Branch, 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 shall show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.
- C. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds in the required amounts.
- D. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or its right to do business is terminated in any state or jurisdiction where any part of the Project is located, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the bond and surety requirements above.
- E. 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.
- F. Upon request, Owner shall provide a copy of the payment bond to any Subcontractor, Supplier, or other person or entity claiming to have furnished labor or materials used in the performance of the Work.

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. Contractor shall deliver to Owner, with copies to each named insured and additional insured (as identified in this Article, in the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Contractor has obtained and is

maintaining the policies, coverages, and endorsements 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 and endorsements, and documentation of applicable self-insured retentions and deductibles. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

- D. Owner shall deliver to Contractor, with copies to each named insured and additional insured (as identified in this Article, the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Owner has obtained and is maintaining the policies, coverages, and endorsements 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 and endorsements, and documentation of applicable self-insured retentions and deductibles. Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.
- E. 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, shall not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.
- F. If either party does not purchase or maintain all of 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.
- G. If Contractor has failed to obtain and maintain required insurance, Owner may exclude the Contractor from the Site, impose an appropriate set-off against payment, and exercise Owner's termination rights under Article 16.
- H. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect 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 shall be adjusted accordingly.
- I. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests.
- J. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner and other individuals and entities in the Contract.

6.03 *Contractor's Insurance*

- A. *Workers' Compensation:* Contractor shall purchase and maintain workers' compensation and employer's liability insurance for:
 - 1. claims under workers' compensation, disability benefits, and other similar employee benefit acts.
 - 2. United States Longshoreman and Harbor Workers' Compensation Act and Jones Act coverage (if applicable).
 - 3. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees (by stop-gap endorsement in monopolist worker's compensation states).

4. Foreign voluntary worker compensation (if applicable).
- B. *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:
1. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees.
 2. claims for damages insured by reasonably available personal injury liability coverage.
 3. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.
- C. *Commercial General Liability—Form and Content:* Contractor's commercial liability policy shall be written on a 1996 (or later) ISO commercial general liability form (occurrence form) and include the following coverages and endorsements:
1. Products and completed operations coverage:
 - a. Such insurance shall 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, to the extent permitted by law, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.
 3. Broad form property damage coverage.
 4. Severability of interest.
 5. Underground, explosion, and collapse coverage.
 6. Personal injury coverage.
 7. 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); or CG 20 10 07 04 and CG 20 37 07 04 (together); or their equivalent.
 8. 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.
- D. *Automobile liability:* Contractor shall purchase and maintain automobile liability insurance against claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy shall be written on an occurrence basis.
- E. *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. Subject to industry-standard exclusions, the coverage afforded shall follow form as to each and every one of the underlying policies.
- F. *Contractor's pollution liability insurance:* Contractor shall purchase and maintain a policy covering third-party injury and property damage claims, including clean-up costs, as a result

of pollution conditions arising from Contractor's operations and completed operations. This insurance shall be maintained for no less than three years after final completion.

- G. *Additional insureds*: The Contractor's commercial general liability, automobile liability, umbrella or excess, and pollution liability policies shall include and list as additional insureds Owner and Engineer, and any individuals or entities identified in the Supplementary Conditions; include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds; and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby (including as applicable those arising from both ongoing and completed operations) on a non-contributory basis. Contractor shall obtain all necessary endorsements to support these requirements.
- H. *Contractor's professional liability insurance*: If Contractor will provide or furnish professional services under this Contract, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance shall provide protection against claims arising out of performance of professional design or related services, and caused by a negligent error, omission, or act for which the insured party is legally liable. It shall be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. If such professional design services are performed by a Subcontractor, and not by Contractor itself, then the requirements of this paragraph may be satisfied through the purchasing and maintenance of such insurance by such Subcontractor.
- I. *General provisions*: The policies of insurance required by this Paragraph 6.03 shall:
 - 1. include at least the specific coverages provided in this Article.
 - 2. be written for not less than the limits of liability provided in this Article and in the Supplementary Conditions, or required by Laws or Regulations, whichever is greater.
 - 3. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed, or renewal refused until at least 10 days prior written notice has been given to Contractor. Within three days of receipt of any such written notice, Contractor shall provide a copy of the notice to Owner, Engineer, and each other insured under the policy.
 - 4. remain in effect at least until final payment (and longer if expressly required in this Article) 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 Documents.
 - 5. be appropriate for the Work being performed and provide protection from claims that may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable.
- J. The coverage requirements for specific policies of insurance must be met by such policies, and not by reference to excess or umbrella insurance provided in other policies.

6.04 *Owner's Liability Insurance*

- A. In addition to the insurance required to be provided by Contractor under Paragraph 6.03, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.
- B. 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.

6.05 *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 full insurable replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:
 - 1. include the Owner and Contractor as named insureds, and all Subcontractors, and any individuals or entities required by the Supplementary Conditions to be insured under such builder's risk policy, as insureds or named insureds. For purposes of the remainder of this Paragraph 6.05, Paragraphs 6.06 and 6.07, and any corresponding Supplementary Conditions, the parties required to be insured shall collectively be referred to as "insureds."
 - 2. be written on a builder's risk "all risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire; lightning; windstorm; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; flood; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; water damage (other than that caused by flood); and such other perils or causes of loss as may be specifically required by the Supplementary Conditions. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance may be provided through other insurance policies acceptable to Owner and Contractor.
 - 3. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.
 - 4. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects).

5. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier).
 6. extend to cover damage or loss to insured property while in transit.
 7. allow for partial occupation or use of the Work by Owner, such that those portions of the Work that are not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
 8. allow for the waiver of the insurer's subrogation rights, as set forth below.
 9. provide primary coverage for all losses and damages caused by the perils or causes of loss covered.
 10. not include a co-insurance clause.
 11. include an exception for ensuing losses from physical damage or loss with respect to any defective workmanship, design, or materials exclusions.
 12. include performance/hot testing and start-up.
 13. be maintained in effect, subject to the provisions herein regarding Substantial Completion and partial occupancy or use of the Work by Owner, until the Work is complete.
- B. *Notice of Cancellation or Change:* All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 6.05 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed 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.
- C. *Deductibles:* The purchaser of any required builder's risk or property insurance shall pay for costs not covered because of the application of a policy deductible.
- 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 notice of such occupancy or use to the builder's risk insurer. The builder's risk insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy; rather, those portions of the Work that are occupied or used by Owner may come off the builder's risk policy, while those portions of the Work not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
- E. *Additional Insurance:* 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 6.05, it may do so at Contractor's expense.
- F. *Insurance of Other Property:* If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, such as tools, construction equipment, or other personal property owned by Contractor, a Subcontractor, or an employee of Contractor or a Subcontractor, then the entity or individual owning such property item will be responsible for deciding whether to insure it, and if so in what amount.

6.06 *Waiver of Rights*

- A. All policies purchased in accordance with Paragraph 6.05, expressly including the builder's risk policy, shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors. 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 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 Subcontractors, all individuals or entities identified in the Supplementary Conditions as 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. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.
- B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for:
 - 1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and
 - 2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial 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.
- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 6.06.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them.
- D. Contractor shall be responsible for assuring that the agreement under which a Subcontractor performs a portion of the Work 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 any of the perils or causes of loss covered by builder's risk insurance and any other property insurance applicable to the Work.

6.07 *Receipt and Application of Property Insurance Proceeds*

- A. Any insured loss under the builder's risk and other policies of insurance required by Paragraph 6.05 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 6.05 shall 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, the damaged Work shall be repaired or replaced, the money so received applied on account thereof, and the Work and the cost thereof covered by Change Order, if needed.

ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES

7.01 *Supervision and Superintendence*

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

7.02 *Labor; Working Hours*

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.
- B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, 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.

7.03 *Services, Materials, and Equipment*

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.
- B. All materials and equipment incorporated into the Work shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and

guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

- C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

7.04 "Or Equals"

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the 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 material or equipment, or items from other proposed suppliers under the circumstances described below.
 - 1. If Engineer in its sole discretion determines that an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer shall deem it an "or equal" item. For the purposes of this paragraph, a proposed item of material or equipment will be considered functionally equal to an item so named if:
 - a. in the exercise of reasonable judgment Engineer determines that:
 - 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
 - 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;
 - 3) it has a proven record of performance and availability of responsive service; and
 - 4) it is not objectionable to Owner.
 - b. Contractor certifies that, if approved and incorporated into the Work:
 - 1) there will be no increase in cost to the Owner or increase in Contract Times; and
 - 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.
- 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 shall result in any change in Contract Price. 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.
- E. *Treatment as a Substitution Request:* If Engineer determines that an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer consider the proposed item as a substitute pursuant to Paragraph 7.05.

7.05 *Substitutes*

- A. Unless the specification or description of an item of material or equipment 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 material or equipment under the circumstances described below. To the extent possible such requests shall 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 material or equipment from anyone other than Contractor.
 - 2. The requirements for review by Engineer will be as set forth in Paragraph 7.05.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 material or equipment that Contractor seeks to furnish or use. The application:
 - a. shall 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 that specified, and
 - 3) be suited to the same use as that 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 that specified, and

- 2) available engineering, sales, maintenance, repair, and replacement services.
- d. shall 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 shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.05.D, by timely submittal of a Change Proposal.

7.06 *Concerning Subcontractors, Suppliers, and Others*

- A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner.
- B. Contractor shall retain specific Subcontractors, Suppliers, or other individuals or entities 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, Supplier, or other individual or entity 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 five days.

- E. Owner may require the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work. 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, Suppliers, or other individuals or entities 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, Supplier, or other individual or entity so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity.
- F. If Owner requires the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, or both, 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, Supplier, or other individual or entity, whether initially or as a replacement, shall 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 fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions.
- J. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors, Suppliers, and all other individuals or entities performing or furnishing any of the Work.
- K. Contractor shall restrict all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed herein.
- L. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- M. All Work performed for Contractor by a Subcontractor or Supplier shall be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer.
- N. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor on account of Work performed for Contractor by the particular Subcontractor or Supplier.

O. Nothing in the Contract Documents:

1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier, or other individual or entity; nor
2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

7.07 *Patent Fees and Royalties*

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

7.08 *Permits*

- A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of 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

7.09 *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.

7.10 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work 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 shall not be Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.
- C. Owner or Contractor may give 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 notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.11 *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.

7.12 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:
 - 1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
 3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify Owner; the owners of adjacent property, Underground Facilities, and other utilities; and other contractors and utility owners performing work at or adjacent to the Site, when 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.
 - C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.
 - D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.
 - E. All damage, injury, or loss to any property referred to in Paragraph 7.12.A.2 or 7.12.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor 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).
 - F. Contractor's duties and responsibilities for safety and protection shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 15.06.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).
 - G. Contractor's duties and responsibilities for safety and protection shall 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.

7.13 *Safety Representative*

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

7.14 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or

exchanged between or among employers at the Site in accordance with Laws or Regulations.

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 threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

7.16 *Shop Drawings, Samples, and Other Submittals*

A. *Shop Drawing and Sample Submittal Requirements:*

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

- B. *Submittal Procedures for Shop Drawings and Samples:* Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals. Each submittal will be identified as Engineer may require.

1. *Shop Drawings:*

- a. Contractor shall submit the number of copies required in the Specifications.
- b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to

provide and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.D.

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.D.

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. *Other Submittals:* Contractor shall submit other submittals to Engineer in accordance with the accepted Schedule of Submittals, and pursuant to the applicable terms of the Specifications.

D. *Engineer's Review:*

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction 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 shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 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.
5. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 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, shall 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, Sample, or other submittal shall 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.D.4.

E. *Resubmittal Procedures:*

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.
2. Contractor shall furnish required submittals with sufficient information and accuracy to obtain required approval of an item with no more than three submittals. Engineer will record Engineer's time for reviewing a fourth or subsequent submittal of a Shop Drawings, sample, or other item requiring approval, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges.
3. If Contractor requests a change of a previously approved submittal item, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

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 and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on Contractor's warranty and guarantee.
- B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
 1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
 2. normal wear and tear under normal usage.
- C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:
 1. observations by Engineer;
 2. recommendation by Engineer or payment by Owner of any progress or final payment;
 3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
 4. use or occupancy of the Work or any part thereof by Owner;
 5. any review and approval of a Shop Drawing or Sample submittal;
 6. the issuance of a notice of acceptability by Engineer;
 7. any inspection, test, or approval by others; or
 8. any correction of defective Work by Owner.

- D. 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 shall 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 and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable.
- B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- C. The indemnification obligations of Contractor under Paragraph 7.18.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:
 - 1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
 - 2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

7.19 *Delegation of Professional Design Services*

- A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable Laws and Regulations.
- B. If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, and other submittals prepared by such professional. Shop

Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

- C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.
- D. Pursuant to this paragraph, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 7.16.D.1.
- E. Contractor shall not be responsible for the adequacy of the performance or design criteria specified by Owner or Engineer.

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 utility work at or adjacent to the Site, Owner shall provide such information to Contractor.
- C. Contractor shall afford each other contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work. 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.
- D. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 8, 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.

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 at or adjacent to the Site for Owner, the Owner's employees, any other contractor working for Owner, or any utility owner 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, or both. 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 shall 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. When applicable, any such equitable adjustment in Contract Price shall 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 is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- 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. 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 to 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.
- C. 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 to Contractor.

- D. 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 shall 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 Documents (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 10.08. 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 *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 Paragraph 10.08. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent, or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

10.04 *Rejecting Defective Work*

- A. Engineer has the authority to reject Work in accordance with Article 14.

10.05 *Shop Drawings, Change Orders and Payments*

- A. Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, are set forth in Paragraph 7.16.
- B. Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, are set forth in Paragraph 7.19.
- C. Engineer's authority as to Change Orders is set forth in Article 11.
- D. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.06 *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.

10.07 *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.

10.08 *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, shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

- B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 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 10.08 shall also apply to the Resident Project Representative, if any.

10.09 *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 (if any) of which Engineer has been informed.

ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK

11.01 *Amending and Supplementing Contract Documents*

- A. The Contract Documents may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.
 - 1. *Change Orders:*
 - a. If an amendment or supplement to the Contract Documents includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order. A Change Order also may be used to establish amendments and supplements of the Contract Documents that do not affect the Contract Price or Contract Times.
 - b. Owner and Contractor may amend those terms and conditions of the Contract Documents that do not 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, without the recommendation of the Engineer. Such an amendment shall be set forth in a Change Order.
 - 2. *Work Change Directives:* 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 11.04 regarding change of Contract Price. Contractor must submit any Change Proposal seeking an

adjustment of the Contract Price or the Contract Times, or both, no later than 30 days after the completion of the Work set out in the Work Change Directive. Owner must submit any Claim seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 60 days after issuance of the Work Change Directive.

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

11.02 *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. Such changes shall be supported by Engineer's recommendation, to the extent the change involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters. Such changes 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 shall be performed under the applicable conditions of the Contract Documents. Nothing in this paragraph shall obligate 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.

11.03 *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.

11.04 *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 shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment of Contract Price shall 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); or
 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 11.04.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 11.04.C).

- C. *Contractor's Fee*: When applicable, the Contractor's fee for overhead and profit shall be determined as follows:
1. a mutually acceptable fixed fee; or
 2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
 - a. for costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee shall be 15 percent;
 - b. for costs incurred under Paragraph 13.01.B.3, the Contractor's fee shall be five percent;
 - c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.01.C.2.a and 11.01.C.2.b is that the Contractor's fee shall be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.A.1 and 13.01.A.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 five 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 shall be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the work;
 - d. no fee shall 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 will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and
 - f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 11.04.C.2.a through 11.04.C.2.e, inclusive.

11.05 *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 shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment in the Contract Times shall comply with the provisions of Article 12.
- B. An adjustment of the Contract Times shall be subject to the limitations set forth in Paragraph 4.05, concerning delays in Contractor's progress.

11.06 *Change Proposals*

- A. Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; appeal an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; contest a set-off against payment due; or seek other relief under

the Contract. The Change Proposal shall specify any proposed change in Contract Times or Contract Price, or both, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents.

1. *Procedures:* Contractor shall submit each Change Proposal to Engineer promptly (but in no event later than 30 days) after the start of the event giving rise thereto, or after such initial decision. 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. The supporting data shall 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. Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal.
 2. *Engineer's Action:* Engineer will review each Change Proposal and, within 30 days after receipt of the Contractor's supporting data, either deny the Change Proposal in whole, approve it in whole, or deny it in part and approve it in part. Such actions shall 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.
 3. *Binding Decision:* Engineer's decision will be final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.
- B. *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 that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice shall be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

11.07 *Execution of Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders covering:
1. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;
 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 11.02, (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 in the Contract Price or Contract Times, or other changes, which embody the substance of any final and binding results under Paragraph 11.06, or Article 12.

- B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of this Paragraph 11.07, it shall be deemed to be of full force and effect, as if fully executed.

11.08 *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 shall be submitted 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; and
 - 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.
- 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 shall rest with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, or both, 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 shall 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 shall 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 shall 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 shall 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 shall 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 shall 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 shall be incorporated in a Change Order 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. 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 shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 13.01.C, and shall include only the following items:
 1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, and vacation and holiday pay applicable

thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.
3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.
4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
5. Supplemental costs including the following:
 - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
 - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
 - c. Rentals of all construction equipment and machinery, and the parts thereof, whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.
 - d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
 - e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
 - f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 6.05), provided such losses and damages have resulted from causes

other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.

- g. The cost of utilities, fuel, and sanitary facilities at the Site.
- h. Minor expenses such as 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 shall not include any of the following items:

- 1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 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. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
- 3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
- 4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
- 5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. *Contractor's Fee:* When the Work as a whole is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 11.04.C.

E. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

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 on account of any of the foregoing will be valid.
- C. *Contingency Allowance*: Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

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, subject to the provisions of the following paragraph.
- E. Within 30 days of Engineer's written decision under the preceding paragraph, Contractor may submit a Change Proposal, or Owner may file a Claim, seeking an adjustment in the Contract Price if:
 - 1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement;
 - 2. there is no corresponding adjustment with respect to any other item of Work; and
 - 3. Contractor believes that it is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price, and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 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 will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

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 shall 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 shall 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 shall 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 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 shall 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 special 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, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, 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 shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

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 rejected Work as required by Engineer, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, then Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 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 on account of 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. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens, and evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.
 - 2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
 - 3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.
- 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, or
 - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or
 - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or
 - d. to make any examination to ascertain how or for what purposes Contractor has used the money paid on account of the Contract Price, or
 - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 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 on account of Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages on account of 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 that would constitute a default by Contractor and therefore justify a termination for cause has occurred;
 - j. liquidated 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;
 - l. there are other items entitling 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 shall 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 shall be treated as an amount due as determined by Paragraph 15.01.C.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 seven 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 shall 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 seven 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 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 6.05 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 7.11), and other documents, Contractor may make application for final payment.

2. The final Application for Payment shall 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 disputes that Contractor believes are unsettled; 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 Application and Acceptance:*

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the Application for Payment to Owner for payment. Such recommendation shall 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. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to the provisions of Paragraph 15.07. 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. *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.
- D. *Payment Becomes Due:* Thirty days after the presentation to Owner of the final Application for Payment and accompanying documentation, the amount recommended by Engineer (less any further sum Owner is entitled to set off against Engineer's recommendation,

including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions above with respect to progress payments) will become due and shall be paid by Owner to Contractor.

15.07 *Waiver of Claims*

- A. The making of final payment will not constitute a waiver by Owner of claims or rights against Contractor. Owner expressly reserves claims and rights arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 15.05, from Contractor's failure to comply with the Contract Documents or the terms of any special guarantees specified therein, from outstanding Claims by Owner, or from Contractor's continuing obligations under the Contract Documents.
- 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 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 terms of any applicable special guarantee required by the Contract Documents, or by any specific provision of the Contract Documents), any Work is found to be defective, or if the repair of any damages to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas used by Contractor as permitted by Laws and Regulations, is found to be defective, then 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 other adjacent areas;
 - 2. correct such defective Work;
 - 3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
 - 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting therefrom.
- B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others).
- C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

- E. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph shall not 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, or both, directly attributable to any such suspension. Any Change Proposal seeking such adjustments shall 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) ten 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) 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 seven 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 shall govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *Owner May Terminate For Convenience*

- A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
 - 1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
 - 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; 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 on account of loss of anticipated overhead, profits, or revenue, 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 seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 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, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this paragraph 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; and
 - 2. Disputes between Owner and Contractor concerning the Work or obligations under the Contract Documents, and arising 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; or
 - 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 Documents requires the giving of written notice, it will be deemed to have been validly given if:
 - 1. delivered in person, by a commercial courier service or otherwise, to the individual or to a member of the firm or to an officer of the corporation for which it is intended; or
 - 2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the sender of the notice.

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 shall not constitute a waiver of that provision, nor shall 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 or completion of the Contract or termination 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 *Headings*

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

SECTION 00800

SUPPLEMENTARY CONDITIONS

Supplementary Conditions

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract Funding Agency Edition, EJCDC C-700 (2013 Edition). All provisions which are not so amended or supplemented remain in full force and effect.

The terms used in these Supplementary Conditions have the meanings stated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings stated below, which are applicable to both the singular and plural thereof. The address system used in these Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix "SC" added thereto.

Contents of Supplementary Conditions

<u>Section No.</u>	<u>Section Title</u>	<u>Page No.</u>
SC-1 to SC-19	Amendments to General Conditions	00800-1

SC-1 DEFINITIONS AND TERMINOLOGY

SC-1.01.A.3. APPLICATION FOR PAYMENT

Add the following language to the end of Paragraph 1.01.A.3:

The Application for Payment form to be used on this Project is EJCDC No. C-620 or similar approved format.

SC-1.01.A.8. CHANGE ORDER

Add the following language to the end of Paragraph 1.01.A.8:

The Change Order form to be used on this Project is EJCDC No. C-941.

SC-1.01.A.40 SUBSTANTIAL COMPLETION

Add the following to the end of the paragraph:

“Substantial Completion shall only be granted for Milestones identified in the Agreement.”

SC-1.01 A.49 NON-RESIDENT CONTRACTOR

Add the following paragraph immediately after Paragraph 1.01.A.48 of the General Conditions, which is to read as follows:

51. Non-Resident Contractor -
 - a. A person who is not a resident in the State where the proposed construction is to be located, or
 - b. Any partnership that has no member thereof resident in the State where the proposed construction is to be located.
 - c. Any corporation established under laws other than those of the State in which the proposed construction is located.

SC-2.01 DELIVERY OF BONDS AND EVIDENCE OF INSURANCE

Add a new paragraph immediately after Paragraph 2.01.C of the General Conditions, which is to read as follows:

- D. *Non-Resident Contractor:* The Contractor, if a corporation established under laws other than the State in which the proposed construction is located, shall file with the Owner, notice of the name of its resident attorney, appointed as required by the laws of the State in which the proposed construction is located. The Contractor, if a resident of a State other than that in which the proposed construction is located and not a corporation, shall file, at the time of execution of the Agreement, with the Owner a written appointment of a resident of the State in which the construction is located, having an office or place of business therein, to be his true and lawful attorney upon whom all lawful processes in any actions or proceedings against him may be served; and in such writing, which shall set forth said attorney's place of residence, shall agree that any lawful process against him which is served on said attorney shall be of the same legal force and validity as if served on him and that the authority shall continue in force so long as any liability remains outstanding against him in said State. The power of attorney shall be filed in the office of the Secretary of State if required, and copies certified by the Secretary shall be sufficient evidence thereof. Such appointment shall continue in force until revoked by an instrument in writing, designating in a like manner some other person upon whom such processes may be served, which instrument shall be filed in the manner provided herein for the original appointment.

SC-2.06 ELECTRONIC SUBMITTALS

Add the following language to the end of 2.06.B:

"Refer to Section 01340 for additional information."

SC 3.01 INTENT

Add a new paragraph immediately after Paragraph 3.01.E of the General Conditions which is to read as follows:

- F. Each and every provision of law and clause required by law to be inserted in these Contract Documents shall be deemed to be inserted herein, and they shall be read and enforced as though it were included herein, and if through mistake or otherwise, any such provision is not inserted, or if not correctly inserted, then upon the application of either party, the Contract Documents shall forthwith be physically amended to make such insertion.

SC-4.01 COMMENCEMENT OF CONTRACT TIMES; NOTICE TO PROCEED

Delete Paragraph 4.01.A in its entirety and insert the following in its place:

- A. The Contract Times will commence to run on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Agreement.

SC-5.03 SUBSURFACE AND PHYSICAL CONDITIONS

Delete Paragraphs 5.03.A and 5.03.B in their entirety and insert the following:

- A. No reports of explorations or tests of subsurface conditions at or adjacent to the Site, or drawings of physical conditions relating to existing surface or subsurface structures at the Site, are known to Owner.

SC-5.06 HAZARDOUS ENVIRONMENTAL CONDITIONS

Delete Paragraphs 5.06.A and 5.06.B in their entirety and insert the following:

- A. No reports or drawings related to Hazardous Environmental Conditions at the Site are known to Owner.
- B. Not Used.

SC-6.03 CONTRACTOR'S LIABILITY INSURANCE

Add the following new paragraph immediately after Paragraph 6.03.J:

- K. The limits of liability for the insurance required by Paragraph 6.03 of the General Conditions shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:

1. Workers' Compensation, and related coverages under Paragraphs 6.03.A.1 and A.2 of the General Conditions:

State:	<u>Statutory</u>
Federal, if applicable (e.g., Longshoreman's):	<u>Statutory</u>

Employer's Liability	\$ <u>{ \$500,000 }</u>
Bodily injury by disease, each employee	\$ <u>\$2,000,000</u>
Bodily injury/disease aggregate	\$ <u>\$2,000,000</u>

2. Contractor's Commercial General Liability under Paragraphs 6.03.B and 6.03.C of the General Conditions:

General Aggregate	\$ <u>{ \$2,000,000 }</u>
Products - Completed Operations Aggregate	\$ <u>{ \$2,000,000 }</u>
Personal and Advertising Injury	\$ <u>{ \$2,000,000 }</u>
Each Occurrence (Bodily Injury and Property Damage)	\$ <u>{ \$2,000,000 }</u>

3. Automobile Liability under Paragraph 6.03.D. of the General Conditions:

Bodily Injury:	
Each person	\$ <u>{ \$1,000,000 }</u>

Each accident	\$ <u>{ \$1,000,000 }</u>
Property Damage:	
Each accident	\$ <u>{ \$1,000,000 }</u>
4. Excess or Umbrella Liability:	
Per Occurrence	\$ <u>{ \$5,000,000 }</u>
General Aggregate	\$ <u>{ \$5,000,000 }</u>

SC-7.02 LABOR; WORKING HOURS

Add the following sentence to the end of Paragraph 7.02.B.

"Regular working hours shall be 7:00 a.m. to 7:00 p.m., Monday through Friday."

Add the following new paragraph immediately after Paragraph 7.02.B:

- C. Contractor shall be responsible for the cost of any overtime pay or other expense incurred by the Owner for Engineer's services (including those of the Resident Project Representative, if any), Owner's representative, and construction observation services, occasioned by the performance of Work on Saturday, Sunday, any legal holiday, or as overtime on any regular work day. If Contractor is responsible but does not pay, or if the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under Article 15.

SC-7.04 "OR EQUALS"

Amend the third sentence of Paragraph 7.04A by striking out the following words: Unless the specifications or description contains or is followed by words reading that no like, equivalent, or 'or-equal' item is permitted.

Amend the last sentence of Paragraph 7.04.A.1.a.3 by striking out "and;" and adding a period at the end of Paragraph 7.04.A.1.a.3.

Delete Paragraph 7.04.A.1.a.4 in its entirety and insert the following in its place: [Deleted]

Add a new paragraph SC-7.04.B.1 immediately after paragraph 7.04.B of the General Conditions, which is to read as follows:

1. It shall be Contractor's responsibility to coordinate all submittals to Engineer for approval to eliminate any conflicts which might arise due to the use of "or equal" items. Any additional costs incidental to the use of "or equal" items shall be paid by Contractor.

SC-7.05 SUBSTITUTES

Add a new paragraph SC-7.05.E.1 immediately after paragraph 7.05.E of the General Conditions, which is to read as follows:

1. It shall be Contractor's responsibility to coordinate all submittals to Engineer for approval to eliminate any conflicts which might arise due to the use of "or equal" items. Any additional costs incidental to the use of "or equal" items shall be paid by

Contractor.

SC-7.08 PERMITS

Add the following paragraph immediately after Paragraph 7.08.A:

- B. The following permits/approvals have been or will be obtained by the Owner. Copies of the permits are or will be on file at the Owner's Offices. It is the responsibility of the Contractor to be familiar with the applicable provisions of each permit as they apply to the work:
1. *Army Corps of Engineers Programmatic General Permit, Category 2*
Granted By: Army Corps of Engineers
 2. *Natural Resource Protection Act, Individual Permit*
Granted By: Maine DEP

SC-7.09 TAXES

Add a new paragraph immediately after Paragraph 7.09.A:

- B. Owner is exempt from payment of sales and compensating use taxes of the State on all materials to be 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.

SC-7.17 CONTRACTOR'S GENERAL WARRANTY AND GUARANTEE

Add a new paragraph immediately after Paragraph 7.17.D of the General Conditions:

- E. CONTRACTOR shall guarantee all materials and equipment furnished and Work performed for a period of one (1) year from the date of Substantial Completion. CONTRACTOR warrants and guarantees for a period of one (1) year from the date of Substantial Completion of the systems that the completed systems are free from all defects due to faulty materials or workmanship and CONTRACTOR shall promptly make such corrections as may be necessary by reason of such defects including the repairs of any damage to other parts of the system resulting from such defects. OWNER will give notice of observed defects with reasonable promptness. In the event that CONTRACTOR should fail to make such repairs, adjustments, or other work that may be made necessary by such defects, OWNER may do so and charge CONTRACTOR the cost thereby incurred. The Performance Bond shall remain in full force and effect through the guarantee period."

SC-11.04 CHANGE OF CONTRACT PRICE

In subparagraph 11.04.C.2.c., the following changes shall be made:

- DELETE the phrase "Paragraphs 11.01.C.2.a and 11.01.C.2.b" and REPLACE with the phrase "Paragraphs 11.04.C.2.a and 11.04.C.2.b"
- DELETE the phrase "Paragraphs 13.01.A.1 and 13.01.A.2" and REPLACE with the phrase "Paragraphs 13.01.B.1 and 13.01.B.2"

SC 14.06 OWNER MAY STOP THE WORK

Add a new paragraph immediately after paragraph 14.06.A of the General Conditions to read as follows:

- B. If OWNER stops Work under Paragraph 14.06.A, CONTRACTOR shall be entitled to no extension of Contract Time or increase in Contract Price.

SC-15.03 SUBSTANTIAL COMPLETION

Add the following new subparagraph to Paragraph 15.03.B:

1. If some or all of the Work has been determined not to be at a point of Substantial Completion and will require re-inspection or re-testing by Engineer, the cost of such re-inspection or re-testing, including the cost of time, travel and living expenses, shall be paid by Contractor to Owner. If Contractor does not pay, or the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under Article 15.

SC-15.06 FINAL PAYMENT

Add the new paragraph immediately after paragraph 15.06.A.3 of the General Conditions, which is to read as follows:

4. Two (2) percent of the total contract amount as reflected on the final Application for Payment shall be retained by Owner during the Correction Period. This retainage shall be held by Owner in an account without interest accruing to Contractor. All amounts otherwise due Contractor will be paid as described in paragraph 15.06.D of the General Conditions. At the end of the correction period, Owner shall pay Contractor the retainage less any amounts deducted for failure of Contractor to perform as outlined in Article 14 of the General Conditions.

END OF SECTION



SECTION 00810

NOTICE OF AWARD

Date of Issuance:

Owner: Town of Falmouth

Owner's Contract No.:

Engineer: Wright-Pierce

Engineer's Project No.: 13042A

Project: Underwood Road Right of Way Improvements

Contract Name: Underwood Road Right of Way Improvements

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: \$ _____

[] 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.
[revise if multiple copies accompany the Notice of Award]

☐ a set of the Drawings will be delivered separately from the other Contract Documents.

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:

SECTION 00811

NOTICE TO PROCEED

Owner: Town of Falmouth, ME

Owner's Contract No.:

Contractor:

Contractor's Project No.:

Engineer: Wright-Pierce

Engineer's Project No.: 13042A

Project: Underwood Road Right of Way
Improvements

Contract Name: Underwood Road Right of Way
Improvements

Effective Date of Contract:

TO CONTRACTOR:

Owner hereby notifies Contractor that the Contract Times under the above Contract will commence to run on [_____, 20__]. *[see Paragraph 4.01 of the General Conditions]*

On that date, Contractor shall start performing its obligations under the Contract Documents. No Work shall be done at the Site prior to such date. In accordance with the Agreement, the number of days to achieve Substantial Completion is _____, and the number of days to achieve readiness for final payment is _____].

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

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

Owner:

Authorized Signature

By:

Title:

Date Issued:

Copy:

SECTION 00830

MAINE CONSTRUCTION GENERAL PERMIT (MCGP)

Construction activities to be performed under of this Project have been determined to require coverage under the Maine Construction General Permit (MCGP). The MCGP is based on the Federal National Pollutant Discharge Elimination System (NPDES) Stormwater program that applies nationwide. The Environmental Protection Agency (EPA) has delegated its authority to administer this program to the Maine Department of Environmental Protection (MEDEP). The program provides that certain discharges are not allowed unless they are licensed, and the MCGP authorizes the direct discharge of stormwater associated with construction activities to waters of the State.

Activity Under the MCGP, construction activities are defined as:

Construction involving one acre or more of disturbed area;

- Construction activity less than one acre that is part of a common plan of development (i.e. subdivision) of which is larger than one acre; or
- Any construction activity designated by the MEDEP based on the potential for contribution to a violation of a water quality standard or for significant contribution of pollutants to waters of the State.

Maine Regulations requires the Owner (or his/her authorized Applicant) to submit a Notice of Intent (NOI) and a Notice of Termination (NOT) to the appropriate MEDEP regional office listed on Section page 00830-2. For all Projects (other than Owner constructed projects) the Owner will authorize the Contractor, as Applicant, to submit the NOI, pay the NOI submittal fee and submit the NOT. The Authorized Representative for the Owner must be someone appointed by the Selectmen, Council or Trustees to sign and authorize the Applicant to submit the NOI.

1.1 NOTIFICATION PHASE:

A. Submit a Notice of Intent (NOI)

1. The Notice of Intent (NOI) for the MCGP is a one page form that is filed with the MEDEP. All construction activities, as defined in the General Permit, are required to submit an NOI (except for common plan of development projects that do not require a Site Law, Stormwater, or Land Use Regulation Commission (LURC) permit which instead are required to meet the Maine Erosion and Sedimentation Control Law).
2. The NOI must be filed and approved by MEDEP prior to any soil disturbance or construction. The NOI form provides information including, but not limited to:
 - a. Name, address, telephone number of the Owner and Applicant
 - b. Project location and detailed directions
 - c. Size of the proposed disturbed area
 - d. Brief description of the project and its purpose.
 - e. Name of the waterbodies to which the disturbed area drains or the name of the municipality, if it drains to an MS4.

By signing the NOI, the Applicant certifies that the information is true and agrees to meeting the requirements of the MCGP, including the Basic Standards for erosion and sedimentation control; inspection and maintenance of any stormwater control practices; and housekeeping (ex. preventing fuel spills and controlling dust on the construction site). The Basic Standards are found in the Appendices of the MCGP.

Note that Maine's water quality laws 38 M.R.S.A. § 349 and Section 309 of the Clean Water Act provides for significant penalties where information is false or the permittee violates, either knowingly or negligently, permit requirements. Refer to the Maine Construction General Permit requirements for further definition on submittal requirements.

3. All NOI forms must be accompanied by a fee and the following documentation:
 - a. A location map
 - i. The location must be a copy of a portion of a 7.5 minute USGS topographic map or a Delorme Atlas map showing the site location and approximate boundaries.
 - b. A site plan of the Project
 - i. The site plan must show the locations of structures and roads, the extent of the disturbed area(s), pre-construction site topography, post-construction site topography, on-site adjacent surface waterbodies, and all erosion and sedimentation control measures to be used on site. The site plan must identify the location of downgradient vegetated buffers. Vegetated buffers are to be preserved wherever possible; however, if buffers cannot be retained, a written narrative explaining why must be included. In addition, all protected natural resources, such as wetlands, streams, or high water line ponds or coastal wetlands must be identified on the site plan. The site plan does not need to be prepared by a professional; however it must be legible and drawn to scale.
 - c. An erosion and sedimentation (ESC) plan
 - i. The ESC plan must contain permanent stabilization measures, installation details of proposed erosion control measures, seeding and mulching rates, and a construction schedule. The ESC plan must be designed by a professional. This plan and its details may be included on the site plan instead of as a separate submission.
 - d. Photographs of the area to be developed
 - i. Photographs must show the existing character and topography of the area proposed for development.
 - e. Written approval from the Department of Inland Fisheries & Wildlife (IF&W), if the Project is located in an essential habitat area.
4. MEDEP has developed the attached form to be used by Applicant (Owner or Contractor) of construction activities when submitting an NOI. The form indicates all the information required and must be used in order for the NOI to

be processed correctly. The Applicant (Owner and/or Contractor) of construction activities must submit the completed NOI by certified mail or hand delivery to the MEDEP regional office serving the area where the project is located. The MEDEP regional office addresses are listed below:

Maine Department of Environmental Protection
Southern Maine Regional Office
312 Canco Road
Portland, ME 04103

Maine Department of Environmental Protection
Central Maine Regional Office
17 State House Station
Augusta, ME 04333-1107

Maine Department of Environmental Protection
Eastern Maine Regional Office
106 Hogan Road
Bangor, ME 04401

Maine Department of Environmental Protection
Northern Maine Regional Office
1235 Central Drive
Skyway Park
Presque Isle, ME 04769

5. The Application Fee required by the NOI shall be paid by the Applicant.
6. The NOI is deemed approved 14 calendar days after MEDEP receives the NOI and the Applicant can proceed unless notified by MEDEP to the contrary.

1.2 PERFORMANCE PHASE:

- A. The Applicant (Owner or Contractor) must continue to comply with the Basic Performance Standards stated in Appendix A through C of the MCGP conditions and the ESC Plan until: (1) they no longer meet the definition of the Applicant (Owner or Contractor) of a construction activity or (2) the construction activity is complete, all disturbed soils have been finally stabilized, and temporary erosion and sediment controls have been removed. The Applicant (Owner or Contractor) then needs to submit a Notice of Termination (NOT) to inform MEDEP that permanent erosion control measures have been installed and are functioning properly.

1.3 PERMANENT STABILIZATION AND TERMINATION PHASE:

- A. Submit Notice of Termination (NOT) - MEDEP has developed the attached form to be used by Applicant (Owner or Contractor) of construction activities when they submit a NOT. The NOT must be completed and submitted to MEDEP within 20 days of the completion of permanent stabilization. The NOT form provides information including, but not limited to:
 1. Name, address, telephone number of the Owner and Applicant

MAINE CONSTRUCTION GENERAL PERMIT (MCGP)

2. Name, location, and description of project
 3. Permit number
 4. Photographs of the completed site
 5. Signed certification statement
- B. The Applicant (Owner and/or Contractor) of construction activities must submit the completed NOI by certified mail or hand delivery to the MEDEP regional office serving the area where the project is located. The MEDEP regional office addresses are listed below:

Maine Department of Environmental Protection
Southern Maine Regional Office
312 Canco Road
Portland, ME 04103

Maine Department of Environmental Protection
Central Maine Regional Office
17 State House Station
Augusta, ME 04333-1107

Maine Department of Environmental Protection
Eastern Maine Regional Office
106 Hogan Road
Bangor, ME 04401

Maine Department of Environmental Protection
Northern Maine Regional Office
1235 Central Drive
Skyway Park
Presque Isle, ME 04769

- C. The Applicant's authorization to discharge under the MCGP terminates at midnight on the day the NOT is signed.
- D. Retention of Records - Following the termination of construction activities the Applicant (Owner or Contractor) must keep a copy of the Erosion and Sedimentation Control (ESC) Plan and any forms, submissions, reports or other materials required by the MCGP for a period of at least three years following permanent stabilization. The record retention period may be extended by request of the MEDEP.
- E. Accessibility - Employees and agents of the MEDEP may enter any property at reasonable hours to determine compliance. The permittee must retain a copy of the ESC and the General Permit at the construction site and make it accessible to the MEDEP other government officials for the duration of the project. In addition, the ESC and General Permit must be made available for use by any contractors on site undertaking work regulated in the General Permit.

END OF SECTION

SECTION 00835CONSENT OF SURETY TO FINAL PAYMENT

To: _____ (Owner)

From: _____ (Contractor)

CONTRACT TITLE: _____

BOND NUMBER: _____

In accordance with the provisions of the Contract between the Owner and the Contractor as indicated above, the _____ (Surety Company) on the bond of the Contractor hereby approves of the final payment to the Contractor, and agrees that final payment to the Contractor shall not relieve the Surety Company of any of its obligations to the Owner as set forth in the said Surety Company's Bond.

IN WITNESS WHEREOF, the Surety Company has hereunto set its hand this _____ day of _____, 20____.

Surety Company Name_____
Signature of Authorized Representative

Attest: (Seal)

Printed Name and Title

Note: Power of Attorney should be attached in instances where same applies.

END OF SECTION

SECTION 00836
CONTRACTOR'S AFFIDAVIT

STATE OF _____

COUNTY OF _____

Before me, the undersigned, a _____

(Notary Public, Justice of Peace, Alderman)

in and for said County and State personally appeared, _____

(Individual, Partner or duly

_____ who being duly sworn according to law

(Authorized Representative of Corporate Contractor)

deposes and says that the cost of all the Work, and outstanding claims and indebtedness of whatever nature arising out of the performance of the contract between

(Owner)

and _____ of _____

(Contractor)

dated _____ for the construction of the _____

(Agreement Date)

(Project)

_____ and necessary appurtenant installations have been paid in full.

(Individual, Partner, or duly authorized
representative of corporate contractor)

Sworn to and subscribed before me

This _____ day of _____, 20____

END OF SECTION

SECTION 00837CONTRACTOR'S RELEASE

KNOW ALL MEN BY THESE PRESENTS that _____
 _____ (Contractor)
 of _____, County of _____ and State of _____
 do hereby acknowledge that _____ has this day had, and received of
 _____ (Contractor)
 and from _____ the sum of One Dollar and other valuable considerations in
 _____ (Owner)
 full and complete satisfaction and payment of all sums of money owed, payable and belonging to
 _____ by any means whatsoever, for on account of a Contract
 _____ (Contractor)
 Agreement between _____ and _____
 _____ (Owner) _____ (Contractor)
 dated _____ for _____
 _____ (Agreement Date) _____ (Project)

NOW, THEREFORE, the said _____
 _____ (Contractor)

(for myself, my heirs, executors and administrators) (for itself, its successors and assigns)
 do/does, by these presents remise, release, quit-claim and forever discharge _____
 _____ (Owner)

, of and from all claims and demands, arising from or in connection
 with the said contract dated _____, and of and from all, and all manner of action
 _____ (Agreement Date)
 and actions, cause and causes of action and actions, suits, debts, dues, duties, sum and sums of
 money, accounts, reckonings, bonds, bills, specialties, covenants, contracts, agreements, promises,
 variances, damages, judgments, extents, executions, claims and demand, whatsoever in law or
 equity, or otherwise, against _____ its successors and assigns, which (I,
 _____ (Owner)
 my heirs, executors, or administrators) (it, its successors and assigns) ever had, now have or which
 (I, my heirs, executors, or administrators) (it, its successors and assigns) hereafter can, shall or
 may have, for, upon or by reason of any matter, cause, or thing whatsoever; from the beginning of
 recorded time to the date of these presents.

IN WITNESS WHEREOF, _____
(Contractor)

has caused these presents to be duly executed this _____ day of _____ 20_____

Signed, Sealed and Delivered in the presence of:

(Individual -Contractor) (seal)

(Partnership - Contractor) (seal)

By _____ (seal)
(Partner)

Attested:

(Corporation)

(Secretary) By _____
(President or Vice President)

(Corp. Seal)

END OF SECTION



SECTION 00838

CERTIFICATE OF SUBSTANTIAL COMPLETION

Owner: Town of Falmouth, ME

Contractor:

Engineer: Wright-Pierce

Project: Underwood Road Right of Way Improvements

Owner's Contract No.:

Contractor's Project No.:

Engineer's Project No.: 13042A

Contract Name: Underwood Road Right of Way Improvements

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: _____ (Authorized signature)	By: _____ Owner (Authorized Signature)	By: _____ Contractor (Authorized Signature)
Title: _____	Title: _____	Title: _____
Date: _____	Date: _____	Date: _____

SECTION 00839WAIVER OF LIEN - MATERIALS AND LABOR

STATE OF _____

COUNTY OF _____

To: _____ (Owner)

WHEREAS, _____ (the undersigned)
 have been employed by _____ (Contractor)
 on the _____ (Project Name) to furnish the following:

_____ (description of material and services).

NOW THEREFORE, the undersigned, for good and valuable considerations do hereby
 waive and release any and all lien, or right of lien, or claim to lien on said above project and
 premises under the Law, in relation to Mechanics' Liens Law, on account of labor and materials,
 or both, furnished by the undersigned to or on account of the said contract for the said project and
 premises only so far as that portion of work which has been included in our requisition dated
 _____ and all prior requisitions.

THIS WAIVER AND RELEASE is being made to the undersigned in the amount of
 \$ _____ which sum the undersigned certifies to be the balance due the
 undersigned for all labor, materials or both, furnished by the undersigned to or on account of the
 said contract as included on his requisition dated _____.

GIVEN UNDER our hand and seal, this _____ day of _____, 20 ____.

By: _____

Manufacturer, Supplier or Subcontractor Name

Signature of Authorized Representative_____
Printed Name and TitleEND OF SECTION

SECTION 00840

CERTIFICATE OF FINAL COMPLETION

Owner: Town of Falmouth, ME	Owner's Contract No.:
Contractor:	Contractor's Project No.:
Engineer: Wright-Pierce	Engineer's Project No.: 13042A
Project: Underwood Road Right of Way Improvements	Contract Name: Underwood Road Right of Way Improvements

The Work to which this Certificate applies has been inspected by authorized representatives of Owner, Contractor, Engineer and Agency, the punch list has been completed and the Work of the Contract is hereby declared to be Complete in accordance with the Contract Documents on the date noted below.

Date of Final Completion

This Certificate does not constitute an acceptance of any Work not in accordance with the Contract Documents nor is it a release of the Contractor's obligation to complete the Work in accordance with the Contract Documents. The Warranty for all Work completed subsequent to the date of Substantial Completion expires one year from the date of the date specified above.

Executed by Engineer on _____ [date]

By: _____

Accepted by Contractor on _____ [date]

By: _____

Accepted by Owner on _____ [date]

By: _____

Accepted by Agency on _____ [date]

By: _____

SECTION 00842

CHANGE ORDER

Change Order No. _____

Date of Issuance:	Effective Date:
Owner: Town of Falmouth, ME	Owner's Contract No.:
Contractor:	Contractor's Project No.:
Engineer: Wright-Pierce	Engineer's Project No.: 13042A
Project: Underwood Road Right of Way Improvements	Contract Name: Underwood Road Right of Way Improvements

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

Description:

Attachments: *[List documents supporting change]*

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

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

Contractor's Application for Payment No. _____

Application Period:		Application Date:
To (Owner):	From (Contractor):	Via (Engineer):
Project:	Contract:	
Owner's Contract No.:	Contractor's Project No.:	Engineer's Project No.:

Application For Payment

Change Order Summary

Approved Change Orders			1. ORIGINAL CONTRACT PRICE..... \$ _____
Number	Additions	Deductions	2. Net change by Change Orders..... \$ _____
			3. Current Contract Price (Line 1 ± 2)..... \$ _____
			4. TOTAL COMPLETED AND STORED TO DATE
			(Column F total on Progress Estimates)..... \$ _____
			5. RETAINAGE:
			a. X _____ Work Completed..... \$ _____
			b. X _____ Stored Material..... \$ _____
			c. Total Retainage (Line 5.a + Line 5.b)..... \$ _____
			6. AMOUNT ELIGIBLE TO DATE (Line 4 - Line 5.c)..... \$ _____
			7. LESS PREVIOUS PAYMENTS (Line 6 from prior Application)..... \$ _____
			8. AMOUNT DUE THIS APPLICATION..... \$ _____
			9. BALANCE TO FINISH, PLUS RETAINAGE
			(Column G total on Progress Estimates + Line 5.c above)..... \$ _____
TOTALS			
NET CHANGE BY			
CHANGE ORDERS			

Contractor's Certification

The undersigned Contractor certifies, to the best of its knowledge, the following:

(1) All previous progress payments received from Owner on account of Work done under the Contract have been applied on account to discharge Contractor's legitimate obligations incurred in connection with the Work covered by prior Applications for Payment;

(2) Title to all Work, materials and equipment incorporated in said Work, or otherwise listed in or covered by this Application for Payment, will pass to Owner at time of payment free and clear of all Liens, security interests, and encumbrances (except such as are covered by a bond acceptable to Owner indemnifying Owner against any such Liens, security interest, or encumbrances); and

(3) All the Work covered by this Application for Payment is in accordance with the Contract Documents and is not defective.

Contractor Signature

By:	Date:
-----	-------

Payment of: \$ _____
(Line 8 or other - attach explanation of the other amount)

is recommended by: _____
(Engineer) (Date)

Payment of: \$ _____
(Line 8 or other - attach explanation of the other amount)

is approved by: _____
(Owner) (Date)

Approved by: _____
Funding or Financing Entity (if applicable) (Date)

Progress Estimate - Lump Sum Work

Contractor's Application

[illegible]

Progress Estimate - Unit Price Work

Contractor's Application

[illegible]

Stored Material Summary

Contractor's Application

[illegible]

SECTION 01010A

SUMMARY OF WORK

PART 1 - GENERAL

1.1 LOCATION

- A. Work under this Contract includes but is not limited to locations within the downstream drainage ditch of the Underwood Road outfall, located off Underwood Road in Falmouth, ME., as shown on the contract plans.
- B. Work Included:
 - 1. The work to be performed under this Contract includes but is not limited to:
 - a. Construction and materials for temporary laydown area.
 - b. Coordination with adjacent property owners and the Town of Falmouth.
 - c. All material handling, storage, and protection.
 - d. All earthwork required to complete The Work.
 - e. Supply and installation of all paving and aggregate materials.
 - f. Supply and installation of precast stormwater structures and piping.
 - g. Supply and installation of all stone and revetment mattress.
 - h. Supply and installation of all materials for slope stabilization.
 - i. All erosion and sedimentation control provisions needed to comply with applicable permits and erosion control plans.
- C. Schedule Limitations:
 - 1. Schedule limitations are applicable on this project. Refer to Section 01310 Construction Schedules – Part 1.2 “Schedule Limitations.”
 - 2. Regular working hours will be Monday through Friday, from 7:00 A.M. to 7:00 P.M. No work will be allowed on Saturday, Sunday, or Holidays without prior written approval by the Town of Falmouth.
 - 3. Invasive Species Removal – Please refer to section 1.12 below for limitations regarding invasive species removal. No work shall begin prior to the 6-week period following spraying of the invasive species.
- D. Related Work Specified Elsewhere
 - 1. Coordination: Section 01050
 - 2. Construction Schedules: Section 01310
 - 3. Site work, piping, structures, testing requirements are specified in Division 2.
- E. Removals, Relocations and Rearrangements
 - 1. Except where noted on the plans, all existing private utility lines shall remain in service. In areas of new utility installation, the Contractor shall locate the expected location of existing private utilities to verify location and depth via test pits.
 - 2. Existing landscaping/fencing or site amenities disturbed during construction shall be replaced and established to preconstruction conditions. Prior coordination with property owners shall be made prior to removal, relocation, and replacement.
 - 3. Any removal of trees or shrubs shall be coordinated with the Owner and/or the Owner’s Representative prior to removal.

1.2 PROGRESS OF WORK

- A. The Contractor shall complete all work within the dates prescribed in the agreement. The Contractor will continue actual construction work under this contract with the necessary crews and equipment to properly execute and complete this contract in the specified time. No cessation of Contractor's operations will be allowed without the approval of the Owner. The rate of progress shall be satisfactory to the Owner and the Engineer. The Contractor shall furnish to the Engineer a progress schedule for the work at the preconstruction conference.

1.3 CHANGE IN AMOUNT OF WORK

- A. The Owner reserves the right to increase or decrease the amount of any item of the work listed as may be found desirable or necessary during the carrying out of this contract and the unit prices listed in the bid form shall apply without change to such variation in the quantity of each of the items.

1.4 SEQUENCE OF CONSTRUCTION

- A. The Contractor shall insure that no excavation be left open, unguarded, or water filled during any period of time when work is not actually in progress. Construction scheduling and methods will be discussed at the pre-construction conference.
- B. The Contractor is permitted to have multiple construction crews if required to meet the construction time frame.

1.5 VISIT TO THE SITE

- A. Before submitting a bid, the Contractor shall visit the project site, examine their conditions and thoroughly acquaint himself with the conditions for performing the work. He shall also study the drawings and compare the same with the information gathered during his examination of the sites, as no extra compensation will be authorized for extra work caused by his unfamiliarity with the sites and/or drawings or the conditions peculiar to this job.

1.6 TECHNICAL SPECIFICATIONS

- A. All technical specifications such as ASTM, AWWA, AASHTO, etc., referred to in these specifications refer to the latest revision of such technical specifications.

1.7 SPECIAL CONDITIONS

- A. The Contractor is advised that protection of the existing utilities in the vicinity of the project and the assurance of uninterrupted service during the contract period is of the essence.
- B. The location and size of existing utility poles, fencing, drains, culverts, cables, service pipes, etc., shown on the plans were obtained from the results of surveys and/or existing records, and are shown as approximately only to guide the Contractor in the preparation of his bid. The location and depth of existing utilities will be determined by the various utility companies by marking them out upon the ground and by test pit excavations by the Contractor prior to and as the work progresses. The plans do not show the exact location and depth of all utilities, nor do they show all utilities that may be encountered.
- C. This project is subject to all of the Safety and Health Regulations (CFR 29 Part

1926 and all subsequent amendments) as promulgated by the US Department of Labor on June 24, 1974. Contractors are urged to become familiar with the requirements of these regulations.

- D. Prior to commencing excavation work, as required by Maine law, DigSafe (888-DIG-SAFE) shall be called at least 72 hours prior to any excavation. The Contractor shall comply with any notification and other requirements of any local and state excavation permits.
- E. The Contractor is encouraged to use local subcontractors and suppliers to the extent practicable in undertaking the work.
- F. The Contractor shall cooperate with the various utility companies, public agencies, and the municipality, and provide access through the site as required for their work or to observe work in connection with this project that affects their respective properties.

1.8 PERMITS, FEES, AND BONDS

- A. The Contractor shall obtain and comply with all required permits, pay all fees and provide all bonds necessary to complete the work as specified.
- B. The Contractor shall maintain copies of permits on site during construction and shall place a copy of the permit in protective sleeve and post in prominent location for project identification.

1.9 WINTER WORK

- A. The Contractor is not prohibited from winter operations unless otherwise stated in the Contract Documents. In either event, prior to the winter season (November 15), the Contractor shall hold a meeting with the Engineer and the Owner to ensure the roadway and project site is in a condition satisfactory from a maintenance standpoint for the winter season, and which has met requirements of the specifications.

1.10 TWENTY-FOUR (24) HOUR EMERGENCY SERVICE

- A. The Contractor shall maintain a 24-hour, 7-day a week telephone service and a local facility to handle emergency requirements such as settled trenches, clogged drains, rain damage, etc. The Contractor's emergency personnel shall be able to respond to emergency calls within thirty minutes. A list of the personnel and their telephone numbers shall be submitted to the Owner and to the local Police and Fire Departments. This requirement shall apply during the entire length of the project.
- B. This list shall be submitted on the Contractor's letterhead and shall state that should an emergency arise during the implementation of this project; these people are to be contacted. The Contractor shall submit this letter at the pre-construction conference.
- C. If in the Owner's opinion, public health, safety or welfare is jeopardized by a condition of the work performed by the Contractor, every effort shall be made to reach the Contractor to correct said condition(s). However, where the Contractor is unable to be reached or unwilling or unresponsive to alerts made by the Engineer or Owner, the Owner reserves the right to access the work and if necessary, employ emergency forces not party to this contract for the correction of the hazards or defects in the work. All costs and charges for the performance of these corrections shall be deducted and paid out of monies due or to become due to the Contractor under this

agreement. The Owner shall not be held to the lowest figures for this work of completing the contract or any part thereof. All sums actually paid, therefore, shall be charges to the Contractor. In case the expense so charged exceeds the sum which would have been payable under this contract, the Contractor shall pay the amount in excess to the Owner

1.11 STORAGE OF EQUIPMENT AND MATERIALS

- A. Equipment and material storage areas shall be reviewed with and approved by the Owner at the pre-construction conference and shall be secured by the Contractor at his own expense.

1.12 INVASIVE SPECIES REMOVAL

- A. The Contractor will be required to remove all invasive species from the project site and dispose of at the Town of Falmouth Public Works Department located at 101 Woods Road, Falmouth, ME 04105.
- B. The Town of Falmouth plans to spray the project area with herbicides in the summer of 2020. The Contractor is required to wait a minimum of 6 weeks prior to excavation of the embankments.

PART 2 - PRODUCTS

Not Applicable.

PART 3 - EXECUTION

3.1 CONSTRUCTION SEQUENCE

- A. The Contractor shall submit to the Engineer for review and acceptance, a complete schedule of his proposed sequence of construction operations prior to commencing any work. Refer to Section 01310 Construction Schedules for milestone dates and schedule limitations.
- B. The Contractor shall conduct his operations in such a manner and sequence which shall neither result in a disruption of, nor interfere with the functional workings of any existing utilities.
- C. The Contractor shall furnish, install and operate any piping, equipment and appurtenances necessary to provide the temporary services required during construction including, but not limited to, bypass pumping, flow barriers, and diversions.

3.2 GENERAL CONSTRUCTION NOTES

- A. The Contractor's particular attention is called to the rules and regulations included in the Public Law 91-596, known as "The Occupational Safety and Health Act of 1970" (OSHA) as amended, or as may be amended. The Contractor agrees, as an essential part of this Contract, to furnish all labor, materials, and equipment so arranged and installed as to provide for safe access to the site and all areas of the work for the Owner's employees, agents, and authorized representatives. Failure to provide safe and acceptable access to any particular area of the work shall cause such areas of the work to be considered as unacceptable and not eligible for

payment under any applicable item of the work.

3.3 SCHEDULE LIMITATIONS AND WORK RESTRICTIONS/REQUIREMENTS

A. Work Hours:

1. Work hours are defined in the Section 00700 (General Conditions) and Section 00800 (Supplemental Conditions).
2. All Work shall be prohibited on Saturdays, Sundays, and legal holidays.
3. All Work on weekdays shall be performed between the hours of 7:00 AM and 7:00 PM, except during emergencies.
4. The Contractor shall request permission to work outside the work hours specified above at least 72-hours in advance of the proposed work. The Contractor shall not commence work outside of the work hours specified above unless or until granted such permission from the Owner and Engineer.

B. Maintain Services

1. Maintain all existing water, sewer and storm drain services.

C. Special Coordination Requirements

1. Portions of the work are located on private property. Easements have been obtained for this work and are included as Appendix B. The Contractor shall comply with all conditions outlined in the easements.
2. The project is funded by the Town of Falmouth as well as Jennifer Cohen (private property owner). Certain portions of the embankment, as shown on the plans, will be paid for by Jennifer Cohen. Payment requests shall be submitted to the Town of Falmouth for all work completed.

END OF SECTION

SECTION 01050COORDINATIONPART 1 - GENERAL1.1 DESCRIPTION

- A. Contractor is required to work in close proximity to Owner's existing facilities. The Contractor, under this Contract, will be responsible for coordinating construction activities with Owner to ensure that services, facilities, and safe working conditions are maintained.
- B. Any damage to existing structures, equipment and property, accepted equipment or structures, and property or work in progress by others; as a result of the Contractor's or his subcontractor's operations shall be made good by the Contractor at no additional cost to the Owner.

1.2 COORDINATION WITH OTHERS

- A. Town of Falmouth:
 - 1. Contractor shall coordinate access, egress, detours and traffic control, if required, at each site with the Town of Falmouth Police Department. The Contractor shall notify the Town of Falmouth Police, Fire Department and Rescue Squad at least 24 hours in advance of any street closings or detours.
 - 2. Contractor shall coordinate all work on Town property with the Town of Falmouth.
 - 3. The Contractor shall be responsible for coordinating and maintaining public services to all public and private properties.
- B. Central Maine Power Company (CMP):
 - 1. The Contractor shall be responsible for coordinating all work around CMP facilities with CMP and shall bear all costs of inspection requirements, temporary facilities relocation and other requirements.
- C. Consolidated Communications:
 - 1. The Contractor shall be responsible for coordinating all work around Consolidated Communications facilities with Consolidated Communications and shall bear all costs of inspection requirements, temporary facilities relocation and all other requirements.
- D. The Contractor shall provide the Town of Falmouth and the Engineer a construction schedule indicating the times to perform the work required. The Contractor shall update the schedule when required and give the Town of Falmouth and the Engineer one week notice before the start of any work. The Contractor shall daily communicate with the Town of Falmouth and the Engineer concerning updating the schedule, job progress, delays, etc.
- E. Weekly coordination meetings shall be held between the Contractor, the Owner, and the Engineer. This meeting shall cover the following:
 - 1. Work to be completed the following week
 - 2. Project Schedule
 - 3. Shop Drawing issues

4. Outstanding RFIs and Clarifications
5. Change Orders and Field Orders
6. Review of Record Drawing Information
7. Discussion/Resolution of any old issues
8. New issues discussion
9. Contractor's Safety and Health Plan Updates

1.3 CONTRACTOR'S USE OF PREMISES

- A. Contractor shall have use of the premises within the limits shown on the Drawings and as defined in the General Conditions for the performance of the Work.
- B. Contractor work hours will be limited to 7:00AM to 7:00PM, Monday through Friday. Any work outside these hours will require permission of the Owner and adequate notice.
- C. Contractor shall coordinate delivery schedules, site access, and other construction-related activities with any other contractors that may be hired by the Owner during the course of construction.
- D. Contractor shall assume full responsibility for security of all of their, and their subcontractors, materials and equipment stored on the site.
- E. If directed by the Owner, Contractor shall move any stored items which interfere with operations of Owner.
- F. Obtain and pay for use of additional storage or work areas if needed to perform the Work.

END OF SECTION

SECTION 01070ABBREVIATIONS & SYMBOLSPART 1 - GENERAL1.1 DESCRIPTION

- A. Where any of the following abbreviations are used in these Specifications, they shall have the meaning set forth opposite each.

AASHTO	American Association of State Highway and Transportation Officials
AC	Alternating Current
ACI	American Concrete Institute
ACP	Asbestos Cement Pipe
AGA	American Gas Association
AIC	Ampere Interrupting Capacity
AGMA	American Gear Manufacturers Association
AIEE(IEEE)	American Institute of Electrical Engineers (Institute of Electrical and Electronics Engineers, Inc.)
AISC	American Institute of Steel Construction
amp	Ampere 125-16
Amer. Std.	American Standard for Cast Iron Pipe Flanges and Flanged Fittings, Class 125 (ASA B16 11960)
ANSI	American National Standards Institute
API	American Petroleum Institute
ASA	American Standards Association
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWG	American or Brown and Sharpe Wire Gage
AWWA	American Water Works Association
BOD	Biochemical Oxygen Demand
c.f.	Cubic Foot
c.f.m.	Cubic Foot Per Minute
c.f.s.	Cubic Foot Per Second
CI	Cast Iron
CIPRA	Cast Iron Pipe Research Association
CSI	Construction Specifications Institute
c.y.	Cubic Yards
DC	Direct Current
DEP	Department of Environmental Protection
DI	Ductile Iron
DOT	Department of Transportation
EDR	Equivalent Directional Radiation

EPA	U.S. Environmental Protection Agency
fps	Feet Per Second
ft.	Feet
gal.	Gallons
gpd	Gallons Per Day
gpm	Gallons Per Minute
HP	Horsepower
IBR	Institute of Boiler and Radiator Manufacturers
in.	Inches
inter.	Interlock
ISA	Instrument Society of America
kva	Kilovolt-ampere
kw	Kilowatt
lb.	Pound
max.	Maximum
MCB	Master Car Builders
MGD	Million Gallons Per Day
Min.	Minimum
NBS	National Bureau of Standards
NEC	National Electrical Code, Latest Edition
NEMA	National Electrical Manufacturers Association
NEWWA	New England Water Works Association
NPT	National Pipe Thread
OS&Y	Outside Screw and Yoke
PCA	Portland Cement Association
ppm	Parts Per Million
%	Percent
psi	Pounds Per Square Inch
psig	Pounds Per Square Inch Gage
PVC	Polyvinyl Chloride
rpm	Revolutions Per Minute
RUS	Rural Utility Service
s.f.	Square Foot
STL. W.G.	U.S. Steel Wire, Washburn and Moen, American Steel and Wire Cos., or Roebling Gage
s.y.	Square yard
TDH	Total Dynamic Head
USAS	Standards of the United States of America Standards Institute (formerly American Standards Association)
USS GAGE	United States Standard Gage
VC	Vitrified Clay
WSP	Working Steam Pressure
Fed. Spec.	Federal Specifications issued by the Federal Supply Service of the General Service Administration, Washington, D.C.

END OF SECTION

SECTION 01150BMEASUREMENT AND PAYMENTPART 1 - GENERAL1.1 DESCRIPTION

- A. For lump sum items, payment shall be made to the contractor in accordance with an accepted progress schedule and schedule of values on the basis of actual work completed.
- B. For unit-price items, payment shall be based on the actual amount of work accepted and for the actual amount of materials in place, as shown by final measurements.
 - 1. All units of measurement shall be standard United States convention as applied to the specific items of work by tradition and as interpreted by the Engineer.
 - 2. At the end of each day's work, the Contractor's Superintendent or other authorized representative of the Contractor shall meet with the Owner's Representative and determine the quantities of unit price work accomplished and/or completed during the workday.
 - 3. After the work is completed and before final payment is made, the Engineer will make final measurements to determine the quantities of various items of work accepted as the basis for final settlement.

1.2 SCOPE OF PAYMENT

- A. Payments to the Contractor will be made for the actual quantities of the Contract items performed and accepted in accordance with the Contract Documents. Upon completion of construction, if these actual quantities show either an increase or decrease from the quantities given in the Bid Form, the Contract Unit Prices will still prevail.
- B. The Contractor shall accept in compensation, as herein provided, in full payment for furnishing all materials, labor, tools, equipment, and incidentals necessary to the completed work and for performing all work contemplated and embraced by the Contract; also for all loss or damage arising from the nature of the Work, or from the action of the elements, or from any unforeseen difficulties which may be encountered during the prosecution of the Work and until its final acceptance by the Engineer, and for all risks of every description connected with the prosecution of the work, except as provided herein, also for all expenses incurred in consequence of the suspension of the Work as herein authorized.
- C. The payment of any partial estimate or of any retained percentage except by and under the approved final invoice, in no way shall affect the obligation of the Contractor to repair or renew any defective parts of the construction or to be responsible for all damage due to such defects.

1.3 PAYMENT FOR INCREASED OR DECREASED QUANTITIES

- A. When alterations in the quantities of work not requiring supplemental agreements, as hereinbefore provided for, are ordered and performed, the Contractor shall accept payment in full at the Contract price for the actual quantities of work done. No

allowance will be made for anticipated profits. Increased or decreased work involving supplemental agreements will be paid for as stipulated in such agreements.

1.4 OMITTED ITEMS

- A. Should any items contained in the bid form be found unnecessary for the proper completion of the work contracted, the Engineer may eliminate such items from the Contract, and such action shall in no way invalidate the Contract, and no allowance will be made for items so eliminated in making final payment to the Contractor.

1.5 PARTIAL PAYMENTS

- A. Partial payments shall be made monthly as the work progresses. Partial payments shall be made subject to the provisions of the Supplemental and General Conditions.

1.6 PAYMENT FOR MATERIAL DELIVERED

- A. When requested by the Contractor and at the discretion of the Owner, payment may be made for all or part of the value of acceptable, non-perishable materials and equipment which are to be incorporated into bid items, have not been used and have been delivered to the construction site, or placed in storage places acceptable to the Owner. Payment shall be subject to the provisions of the General and Supplemental Conditions.
- B. No payment shall be made upon fuels, supplies, lumber, false work, or other materials, or on temporary structures of any kind which are not a permanent part of the Contract.

1.7 FINAL PAYMENT

- A. After final measurements are made by the Engineer, the Contractor will prepare a final quantity invoice of the amount of the Work performed and the value of such Work. Owner shall make final payments of the sum found due less retainages subject to provisions of the General and Supplemental Conditions.

1.8 INCIDENTAL WORK

- A. Incidental work items for which separate payment will not be made includes, but is not limited to, the following items:
 - 1. Pre-Construction photographs or videos.
 - 2. Project Record Documents
 - 3. Traffic control plan and traffic regulation.
 - 4. Construction layout and staking.
 - 5. Signs
 - 6. Clean-up and restoration of property.
 - 7. Restoration of fences and other structures.
 - 8. Cooperation and coordination with other Contractors and utility companies including related inspection costs and other costs (Refer to Section 01050).
 - 9. Utility crossings and relocations, unless otherwise paid for.
 - 10. Temporary utility services to buildings, as required to maintain service during construction.

11. Minor Items--such as relocation of signposts, guard rails, rock wall, mailboxes, curbs, traffic loop detectors, pavement markings, etc., damaged as a result of construction activities.
12. Trench boxes, steel and/or wood sheeting as required, including that left in place.
13. Dust control.
14. Quality assurance testing.
15. Final cleaning of storm drains.
16. Routine flagman services.
17. Construction schedules, bonds, insurance, shop drawings, warranties, guarantees, certifications and other submittals required by the Contract Documents.
18. Temporary construction necessary for construction sequencing and other facilities not permanently incorporated into the work.
19. Weather protection.
20. Permits not otherwise paid for or provided by the Owner.
21. Visits to the project site or elsewhere by personnel or agents of the Contractor, including manufacturer's representatives, as may be required.
22. Contract administration and insurance.
23. Test pits to establish in place field soils density, groundwater conditions, or requirements for dewatering.
24. Pipe markings.
25. Test Pits for the Contractor's Benefit
26. Raising and lowering of existing frames and covers of buried utilities to grade unless payment is otherwise provided for.
27. Horizontal adjustment of existing frames covers and grates to match final grades and curb faces.
28. Modifying, to include coring, patching and parging of existing drainage structures to accommodate new pipes as shown on plans.
29. Removal and subsequent delivery of replaced or obsolete frames, covers, grates, hydrants curbstones and signs to a location within the City limits designated by the Owner.
30. Flushing and final cleaning of storm drain system.
31. Temporary facilities required to access the site including temporary access roads, timber matting for access roads, or staging areas.

1.9 DESCRIPTION OF PAY ITEMS

- A. The following sections describe the measurement of and payment for the work to be done under the respective items listed in the Bid Form.
- B. Each unit or lump-sum price stated in the Bid Form shall constitute full compensation, as herein specified, for each item of the work completed.

(1T) – Mobilization/Demobilization

- A. Method of Measurement: Lump Sum. Total of bid item shall not exceed 7.5% of Total Amount of the Bid.
- B. Basis of Payment: Mobilization/demobilization costs are those costs of initiating and ending the contract. Payment for mobilization/demobilization shall be a lump sum at

the price as stated in the Bid Form. Seventy-Five percent (75%) of the lump sum will be payable when the Contractor is operational on the site and the remaining 25% of the lump sum will be payable when the Contractor leaves the site following the completion of all contract work, and the site is acceptable to the Owner and Engineer. For purposes of payment on this item, "Operational" shall mean the Contractor has provided all required and properly executed bonds and insurance certificates and the Owner has approved the following: Construction Schedule, Erosion Control Plan, and Pre-Construction photographs/videos. Only one lump sum payment divided into the two partial payments described herein shall be made to cover all mobilization/demobilization costs throughout the entire contract. Temporary construction access roads are considered incidental to this line item.

(2T & 2C) – Excavation of Embankment – Town & Cohen

- A. Method of Measurement: Excavation of Embankment shall be measured on a Lump Sum basis as stated in the Bid Form and as indicated by the drawings and specifications.
- B. Basis of Payment: Payment for Excavation of Embankment shall constitute full compensation for all labor, equipment, labor, materials, tools, and construction equipment necessary to complete the work. This work includes excavation of the embankment to the grades shown on the contract plans, removal of excess material to Owner designated area, transportation of excess material to Owner designated area, stripping of loam, and all else incidental thereto for which payment is not made under other items. The lump sum shall be paid in partial payments over the course of the project, where the percentage paid is equal to the percentage of embankment excavated as determined by the Engineer and Owner.

(3T) – Removal and Disposal of Brush, Vegetation & Invasive Species

- A. Method of Measurement: Removal and disposal of brush, vegetation, and invasive species shall be measured on a Lump Sum basis as stated in the Bid Form.
- B. Basis of Payment: The contract lump sum shall be full compensation for all labor, tools, materials, and construction equipment necessary to complete this work. Work includes proper removal and disposal of brush, trees, vegetation, and invasive species, transportation of removed materials to the Town of Falmouth Public Works Department, containment of invasive species, and all else incidental thereto for which payment is not made under other items. The lump sum shall be paid in partial payments over the course of the project, where the percentage paid is equal to the completed percentage of vegetation clearing as determined by the Engineer.

(4T) – Removal and Disposal of Pavement

- A. Method of Measurement: The quantity to be paid for under this item shall be the actual number of square feet of material removed and legally disposed of, as authorized by the Engineer and as measured in place as indicated by the drawings and specifications.
- B. Basis of Payment:
 - 1. Pavement removal shall be paid for at the unit price per square foot stated in the Bid Form. Said unit price shall be full compensation for supply of all materials, labor, tools, removal, legal disposal, and construction equipment to

complete the work as indicated by the drawings and specifications; and for all other work and expenses incidental thereto for which payment is not provided under other terms.

(5T) – Removal and Disposal of Existing 30” Transite Pipe

- A. Method of Measurement: Removal and disposal of transite pipe accepted for payment shall be the actual number of linear feet of transite pipe (all diameters) removed and disposed of in accordance with local, State, and Federal regulations.
- B. Basis of Payment: The contract unit price per linear foot for removal and disposal of transite pipe shall be full compensation for all labor, subcontractors, materials, tools and equipment necessary to complete this work including excavation, handling and removing of pipe, bagging of pipe and miscellaneous friable pieces of pipe and contaminated trench materials, transporting to a licensed disposal site, disposal fees, coordination with regulatory agencies and Owner, and all else incidental thereto for which payment is not provided under other items.

(6T) – Removal and Disposal of Existing 12” RCP Pipe

- A. Method of Measurement: Removal and disposal of RCP pipe accepted for payment shall be the actual number of linear feet of RCP pipe (all diameters) removed and disposed of in accordance with local, State, and Federal regulations
- B. Basis of Payment: The contract unit price per linear foot for removal and disposal of RCP pipe shall be full compensation for all labor, subcontractors, materials, tools and equipment necessary to complete this work including excavation, handling and removing pipe, transportation to disposal site, disposal fees, coordination with Owner, and all else incidental thereto for which payment is not provided under other items.

(7T) – Site Grading

- A. Method of Measurement: Site grading shall be measured on a Lump Sum basis as stated in the Bid Form.
- B. Basis of Payment: The contract unit price per lump sum shall be full compensation for all labor, materials, tools, and equipment necessary to complete this work, including grading of the entire site to the grades and elevations shown on the contract drawings, and all else incidental thereto for which payment is not provided under other items. . The lump sum shall be paid in partial payments over the course of the project, where the percentage paid is equal to the completed percentage of site grading as determined by the Engineer and Owner.

(8T) – Bypass Pumping

- A. Method of Measurement: Bypass pumping shall be measured on a Lump Sum basis as stated in the Bid Form.
- B. Basis of Payment: The contract unit price per lump sum shall be full compensation for all labor, materials, tools, and equipment necessary to complete this work, including furnishing and maintaining pump equipment, providing a 24-hour emergency contact, maintaining flows throughout construction, and all else incidental thereto for which payment is not provided under other items. . The lump sum shall be paid in partial payments over the course of the project, where the percentage paid is

equal to the completed percentage of the entire contract.

(9T) – Removal & Replacement of Unsuitable Material Above Pipe Bedding and Initial Backfill

- A. Method of Measurement: Replacement of unsuitable material above pipe bedding and initial backfill accepted for payment shall be the number of cubic yards of material removed and replaced with materials from off-site as authorized by the Engineer. The payment limit for this item shall be between vertical planes that are a distance apart equal to a maximum of 6-feet extending from the top of the initial backfill layer to the bottom of the aggregate subbase layer as called out in the contract drawings for the length of the excavation as directed by the Engineer.
- B. Basis of Payment:
 - 1. Excavated unsuitable materials shall be paid for at the unit price per cubic yard stated in the Bid Form. Said unit price shall be full compensation for furnishing all labor, equipment, and tools necessary for the excavation of unsuitable material including the disposal of materials; furnishing installing and compacting replacement suitable backfill, and for all other work and expenses incidental thereto for which payment is not provided under other items.
 - 2. Material excavated that could have, in the opinion of the Engineer, remained in place through the use of adequate dewatering efforts shall be replaced by the Contractor at no additional cost to the Owner.
 - 3. Excess backfill material may be available during the Contract. This item shall be used to pay for excavation of unsuitable materials above the initial backfill layer only if no suitable backfill material previously excavated under this Contract is available.

(10T) – Furnish & Install 4' Dia. Catch Basins

- A. Method of Measurement: 4-foot Diameter Catch Basins accepted for payment shall be the actual number of 4' Diameter Catch Basins installed and accepted as complete in place by the Owner and Engineer.
- B. Basis of Payment:
 - 1. The contract unit price per each shall be full compensation for all labor, materials, tools and equipment necessary to complete this work including excavation (excluding ledge excavation), bedding, backfill, compaction, coordination with precast concrete supplier, connection of existing pipes, furnishing and installing precast concrete sections, frames, and grates, concrete and masonry materials, and all else incidental thereto for which payment is not provided under other items.
 - 2. Payment for this item shall be as follows:
 - a. 90 percent of the unit price upon installation of catch basins.
 - b. 10 percent of the unit price upon successful completion of cleaning and visual inspection.

(11T) – Furnish & Install 7' Dia. Catch Basins

- A. Method of Measurement: 7' Dia. Catch Basins accepted for payment shall be the actual number of 7' Dia. Catch Basins installed and accepted as complete in place by the Owner and Engineer.

- B. Basis of Payment:
1. The contract unit price per each shall be full compensation for all labor, materials, tools and equipment necessary to complete this work including excavation (excluding ledge excavation), bedding, backfill, compaction, furnishing and installing precast concrete sections, coordination with precast concrete supplier, connection of existing pipes, installation of frames, and grates, concrete and masonry materials, and all else incidental thereto for which payment is not provided under other items.
 2. Payment for this item shall be as follows:
 - a. 90 percent of the unit price upon installation of catch basins.
 - b. 10 percent of the unit price upon successful completion of cleaning and visual inspection.

(12T) – Furnish & Install 7' Dia. Drain Manhole

- A. Method of Measurement: 7' Dia. Drain Manholes accepted for payment shall be the actual number of 7' Dia. Drain Manholes installed and accepted as complete in place by the Owner and Engineer.
- B. Basis of Payment:
1. The contract unit price per vertical foot shall be full compensation for all labor, materials, tools and equipment necessary to complete this work including excavation (except ledge excavation), dewatering, bedding, furnishing and installing precast concrete sections, coordination with precast concrete supplier, connection of existing pipes, installation of frames, covers, frost protective wrap, masonry materials, waterproofing, constructing inverts, backfill (excluding aggregate base, subbase, and paving), compaction, cleaning, removal and disposal of existing drain manhole being replaced within the trench, and all else incidental thereto for which payment is not provided under other items.

(13T) – Furnish & Install 48" Dia. HDPE Storm Drain

- A. Method of Measurement: 48-inch HDPE Storm Drainpipe accepted for payment shall be the number of linear feet installed measured along the center line of the pipe as laid including fittings. Pipes shall be measured between centers of the manholes minus half the inside diameter of each manhole. Pipe installed into the manhole will not be measured for payment. These items shall be full payment for storm drainpipe installed as shown on the Drawings.
- B. Basis of Payment: The contract unit price per linear foot for HDPE storm drain pipe shall be full compensation of all labor, materials, and equipment necessary to complete this work including excavation (except ledge excavation), furnish and installation of crushed stone, bedding, furnishing and installing pipe and fittings, making connections to new structures, making connections to existing storm drains, backfill, excluding aggregate base material, compaction, cleaning, testing, maintaining existing flows during construction of new facilities and all else incidental thereto for which payment is not provided under other items.

(14T) – Furnish & Install 18” Dia. HDPE Storm Drain

- A. Method of Measurement: 18-inch HDPE Storm Drainpipe accepted for payment shall be the number of linear feet installed measured along the center line of the pipe as laid including fittings. Pipes shall be measured between centers of the manholes minus half the inside diameter of each manhole. Pipe installed into the manhole will not be measured for payment. These items shall be full payment for storm drainpipe installed as shown on the Drawings.
- B. Basis of Payment: The contract unit price per linear foot for HDPE storm drain pipe shall be full compensation of all labor, materials, and equipment necessary to complete this work including excavation (except ledge excavation), furnish and installation of crushed stone, bedding, furnishing and installing pipe and fittings, making connections to new structures, making connections to existing storm drains, backfill, excluding aggregate base material, compaction, cleaning, testing, maintaining existing flows during construction of new facilities and all else incidental thereto for which payment is not provided under other items.

(15T) – Furnish & Install Revetment Mattress & Stone

- A. Method of Measurement: The quantity to be paid for under this item shall be the actual number of square feet of material placed as authorized by the Engineer and as measured in place, and as indicated on the drawings and specifications.
- B. Basis of Payment: Revetment mattress and stone shall be paid for at the unit price per square foot stated in the Bid Form. Said unit price shall be full compensation for supply of all materials, labor, tools, and equipment necessary to complete the work as indicated on the drawings and specifications including: placing and installation of revetment mattress, filling of revetment mattress with stone, storage and handling of all materials, connection of revetment mattress, coordination with mattress supplier, and all else incidental thereto for which payment is not provided under other items.

(16T) – Furnish & Install 2” Leveling Stone

- A. Method of Measurement: The quantity to be paid for under this item shall be the actual number of cubic yards of material placed as authorized by the Engineer as measured in place, and as indicated on the drawings and specifications.
- B. Basis of Payment: Leveling stone shall be paid for at the unit price per cubic yard stated in the Bid Form. Said unit price shall be full compensation for supply of all materials, labor, tools, and construction equipment necessary to complete the work as indicated on the drawings and specifications; and for all other work and expenses incidental thereto for which payment is not provided under other items.

(17T) – Furnish & Place Rip-Rap (D50 = 24”)

- A. Method of Measurement: The quantity to be paid for under this item shall be the actual number of cubic yards of material placed as authorized by the Engineer and as measured in place, as indicated on the drawings and specifications.
- B. Basis of Payment: Rip rap shall be paid for at the unit price per cubic yard stated in the Bid Form. Said unit price shall be full compensation for supply of all materials, labor, tools, and construction equipment to complete the work as indicated on the drawings and specifications; and for all other work and expenses incidental thereto

for which payment is not provided under other items.

(18T) – Furnish & Place Rip-Rap (D50 = 6’')

- A. Method of Measurement: The quantity to be paid for under this item shall be the actual number of cubic yards of material placed as authorized by the Engineer and as measured in place, as indicated on the drawings and specifications.
- B. Basis of Payment: Rip rap shall be paid for at the unit price per cubic yard stated in the Bid Form. Said unit price shall be full compensation for supply of all materials, labor, tools, and construction equipment to complete the work as indicated on the drawings and specifications; and for all other work and expenses incidental thereto for which payment is not provided under other items.

(19T & 20T) – Furnish & Install Aggregate Subbase Type D & Type A

- A. Method of Measurement: The quantity to be paid for under these items shall be the actual number of cubic yards of material placed as authorized by the Engineer and as measured in place as indicated by the drawings and specifications.
- B. Basis of Payment: Aggregate material shall be paid for at the unit price per cubic yard stated in the Bid Form. Said unit price shall be full compensation for supply of all materials, labor, tools, and construction equipment to complete the work as indicated on the drawings and specifications; and for all other work and expenses incidental thereto for which payment is not provided under other terms.

(21T & 22T) – Furnish & Install Bituminous Paving – 19 mm & 12.5 mm

- A. Method of Measurement:
 - 1. The quantity of bituminous concrete pavement to be paid for under these items includes all hand-placed or machine-placed pavement in the roadway and driveways. The number of square yards of pavement placed at the direction of the Engineer, within the payment limits shown on the Drawings.
- B. Basis of Payment:
 - 1. Pavement shall be paid for at the Contract unit price per square yard stated in the Bid Form.
 - 2. Said unit price shall be full compensation for furnishing all materials, labor, tools, and equipment necessary for the placement and removal of pavement, including saw cutting, regrading of existing base material, grinding of existing pavement at all joints between new and existing pavement, application of tack coat, pavement markings, and all else incidental thereto for which payment is not provided under other items. No additional payment will be made to the contractor for repair work done by him in maintaining bituminous pavement prior to final acceptance by the Engineer and Client.

(23T & 23C) – Loam, Seed & Mulch – Town & Cohen

- A. Method of Measurement: Loam, Seed & Mulch shall be measured on a Lump Sum Basis as stated in the Bid Form.
- B. Basis of Payment: The contract price per lump sum shall be full compensation for all labor, material and equipment necessary to complete the installation including

excavation, preparing the bed, spreading and compacting loam, preparing the seed bed, erosion control, spreading the seed, installing fertilizer, lime and mulch, establishing a satisfactory growth of grass and all else incidental thereto for which payment is not provided under other items. No additional payment will be made for reseeded and mulching of areas as may be necessary to establish a uniform grown of grass.

- C. Payment shall be made with 80% at the completion of the installation of the loaming and seeding, upon acceptance by the Engineer. 20% upon final contract completion and consistent coverage and growth of the new turf.
- D. Work under these line items are associated with work within their respective project participation lines as shown on the Contract Drawings.

(24T) – Furnish & Install Erosion & Sedimentation Control

- A. Method of Measurement: Erosion and sedimentation control shall be paid for at the Lump Sum unit price as stated in the Bid Form.
- B. Basis of Payment: Payment for erosion and sedimentation control shall constitute full compensation for all erosion and sedimentation control measures installed and maintained throughout construction, including all labor, materials, tools, and equipment required to ensure sediment and pollutants are controlled and excessive amounts of sediment are not discharged from the construction site into the existing storm drainage system, including equipment tracking mud mat.

(25T) – Dewatering

- A. Method of Measurement: Dewatering shall be paid for at the Lump Sum unit price as stated in the Bid Form.
- B. Basis of Payment: Payment for dewatering shall constitute full compensation for all dewatering measures installed and maintained throughout construction, including all labor, materials, tools, and equipment required to ensure trenches and excavations are fully dewatered as shown on the contract drawings and as described in the contract specifications. The lump sum shall be paid in partial payments over the course of the project, where the percentage paid is equal to the completed percentage of the entire contract.

(26T & 26C) – Furnish & Install Geotextile Fabric – Town & Cohen

- A. Method of Measurement: Geotextile fabric shall be paid for at the unit price per square foot as stated in the Bid Form. The quantity to be paid for under this item shall be the actual quantity in square feet of material placed as authorized by the Engineer and as indicated on the drawings and specifications.
- B. Basis of Payment: Payment for geotextile fabric shall constitute full compensation for all labor, materials, and equipment necessary to complete the supply and installation of geotextile fabric including supply and handling of material, coordination for delivery of material, installation of geotextile fabric per manufacturer recommendations and as shown on the contract drawings and specifications; and for all other work and expenses incidental thereto for which payment is not provided under other terms.
- C. Work under these line items are associated with work within their respective project

participation lines as shown on the Contract Drawings.

(27T & 27C) – Furnish & Install Structural Fill – Town & Cohen

- A. Method of Measurement: Structural Fill shall be paid for on a Lump Sum basis as stated in the Bid Form as authorized by the Engineer and Owner as indicated by the drawings and specifications.
- B. Basis of Payment: Payment for structural fill shall constitute full compensation for all labor, materials, and equipment necessary to complete the supply and installation of structural fill including supply and handling of material, trucking of material, preparation of area for structural fill installation per the contract drawings, placement and compaction of structural fill per the contract specifications; and for all other work and expenses incidental thereto for which payment is not provided under other terms.
- C. Work under these line items are associated with work within their respective project participation lines as shown on the Contract Drawings.
- D. The lump sum shall be paid in partial payments over the course of the project, where the percentage paid is equal to the completed percentage of structural fill as determined by the Engineer and Owner.

(28T & 28C) – Furnish & Install Plantings – Town & Cohen

- A. Method of Measurement: Plantings shall be paid for at the Lump Sum unit price as stated in the Bid Form.
- B. Basis of Payment: Payment for plantings shall constitute full compensation for all labor, materials, and equipment necessary to complete the supply and installation of plantings along the embankment including supply and handling of plantings chosen from the Maine Audubon, preparation of area for installation of plantings including excavations of holes for plantings, altering geotextile fabric to install plantings; and for all other work and expenses incidental thereto for which payment is not provided under other terms.
- C. Payment shall be made with 80% at the completion of the installation of the plantings upon acceptance by the Engineer. 20% upon final contract completion.
- D. Work under these line items are associated with work within their respective project participation lines as shown on the Contract Drawings.

END OF SECTION

SECTION 01310

CONSTRUCTION SCHEDULES

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work Included: Within ten (10) days after the effective date of the Agreement between Owner and Contractor submit to the Engineer an estimated progress schedule as specified herein.
- B. Form of Schedules:
 - 1. Narrative: Completely describe the construction methods to be employed.
 - 2. Bar Chart:
 - a. Show start and finish dates for the various tasks involved.
- C. Content of Schedules:
 - 1. Provide complete sequence of construction by activity:
 - a. Shop Drawings, Project Data and Samples:
 - i. Submittal dates.
 - ii. Dates reviewed copies will be required.
 - b. Decision dates for:
 - i. Products specified by allowances.
 - ii. Selection of finishes.
 - c. Estimated product procurement and delivery dates.
 - d. Dates for beginning and completion of each element of construction.
 - 2. Identify work of separate phases and logically grouped activities.
 - 3. Show the projected percentage of completion for each item of work as of the first day of each month.
 - 4. Provide separate sub-schedules, if requested by the Engineer, showing submittals, review times, procurement schedules, and delivery dates.
- D. Updating:
 - 1. Show all changes occurring since previous submission.
 - 2. Indicate progress of each activity, show completion dates.
 - 3. Include:
 - a. Major changes in scope.
 - b. Activities modified since previous updating.
 - c. Revised projections due to changes.
 - d. Other identifiable changes.
 - 4. Provide narrative report, including:
 - a. Discussion of problem areas, including current and anticipated delay factors.
 - b. Corrective action taken or proposed.
 - c. Description of revisions that may affect schedules.

1.2 PROJECT MILESTONES

- A. Substantial Completion – January 29, 2021
- B. Final Completion – April 30, 2021

1.3 SUBMITTALS

- A. Submit updated schedules with each progress payment request.
- B. Submit electronic copies of initial and updated schedules to the Engineer.

END OF SECTION

SECTION 01340SUBMITTALSPART 1 - GENERAL1.1 DESCRIPTION

- A. Work Included:
 - 1. Submit all shop drawings, Manufacturers' certificates, project data, and samples required by the Specifications.
- B. Related Work Specified Elsewhere:
 - 1. Construction Schedules: Section 01310
 - 2. General Conditions: Section 00700.
- C. Submittals: This project shall utilize:
 - 1. Submittals – Electronic via Email
 - a. The Contractor shall submit to the Engineer an electronic submittal of shop drawings in portable document format (PDF) transmitted via email or file transfer protocol (FTP). The Engineer shall return an electronic PDF of the submittal review comments to the Contractor for distribution to subcontractors, suppliers and manufacturers. The electronic submittals shall serve as the electronic record of the project.

1.2 SHOP DRAWINGS

- A. Shop Drawings are required for each and every element of the work.
- B. Shop Drawings are generally defined as all fabrication and erection drawings, diagrams, brochures, schedules, bills of material, manufacturers data, spare parts lists, and other data prepared by the Contractor, his subcontractors, suppliers, or manufacturers which illustrate the manufacturer, fabrication, construction, and installation of the work, or a portion thereof.
- C. The Contractor shall provide a completed Contractor Submittal Certification Form (copy provided for Contractor's use at the end of this Specification Section) which shall be attached to every copy of every shop drawing and signed by the Contractor and Manufacturer (where applicable). Shop Drawings shall show the principal dimensions, weight, structural and operating features, space required, clearances, type and/or brand of finish or shop coat, grease fittings, etc., depending on the subject of the drawing. When it is customary to do so, when the dimensions are of particular importance, or when so specified, the drawings shall be certified by the manufacturer or fabricator as correct for the work.
- D. Shop Drawings shall be submitted as a complete package by specification section, unless otherwise reviewed and approved by the Engineer. It is the intent that all information, materials and samples associated with each specification section be included as a single submittal for the Engineer's review. Any deviation from this requirement, shall be requested in writing with an anticipated shop drawing breakdown/schedule prior to any associated submittal. An exception to this requirement are shop drawings for reinforcing steel, miscellaneous metals and structural steel, which shall be submitted separately for each structure unless otherwise permitted by the Engineer.
- E. The Contractor shall be responsible for the prompt and timely submittal of all shop and working drawings so that there shall be no delay to the work due to the absence of such drawings.

- F. No material or equipment shall be purchased or fabricated especially for the Contract until the required shop and working drawings have been submitted as hereinabove provided and reviewed for conformance to the Contract requirements. All such materials and equipment and the work involved in their installation or incorporation into the Work shall then be as shown in and represented by said drawings.
- G. Until the necessary review has been made, the Contractor shall not proceed with any portion of the work (such as the construction of foundations), the design or details of which are dependent upon the design or details of work, materials, equipment or other features for which review is required.
- H. All shop and working drawings shall be submitted to the Engineer by and/or through the Contractor, who shall be responsible for obtaining shop and working drawings from his subcontractors and returning reviewed drawings to them. Shop drawings shall be formatted to standard paper sizes to enable the Owner to maintain a permanent record of the submissions. Approved standard sizes shall be: (a) 24 inches by 36 inches; (b) 11 inches by 17 inches, and (c) 11 inches by 8-1/2 inches. Provision shall be made in preparing the shop drawings to provide a binding margin on the left hand side of the sheet. Shop drawings submitted other than as specified herein may be returned for resubmittal without being reviewed.
- I. Only drawings which have been checked and corrected by the fabricator should be submitted to the Contractor by his subcontractors and vendors. Prior to submitting drawings to the Engineer, the Contractor shall check thoroughly all such drawings to satisfy himself that the subject matter thereof conforms to the Drawings and Specifications in all respects. All drawings which are correct shall be marked with the date, checker's name, and indication of the Contractor's approval, and then shall be submitted to the Engineer.
- J. If a shop drawing shows any deviation from the Contract requirements, the Contractor shall make specific mention of the deviations in the transmittal. Shop Drawings that contain significant deviations that are not brought to the attention of the Engineer may be subject to rejection.
- K. Should the Contractor submit equipment that requires modifications to the structures, piping, electrical conduit, wires and appurtenances, layout, etc., detailed on the Drawings, he shall also submit details of the proposed modifications. If such equipment and modifications are accepted, the Contractor, at no additional cost to the Owner, shall do all work necessary to make such modifications.
- L. A maximum of two submissions of each Shop Drawing will be reviewed, checked, and commented upon without charge to the Contractor. Any additional submissions which are ordered by the Engineer to fulfill the stipulations of the Drawings and Specifications, and which are required by virtue of the Contractor's neglect or failure to comply with the requirements of the Drawings and Specifications, or to make those modifications and/or corrections ordered by the Engineer in the review of the first two submissions of each Shop Drawing, will be reviewed and checked as deemed necessary by the Engineer, and the cost of such review and checking, as determined by the Owner, and based upon Engineer's documentation of time and rates established for additional services in the Owner-Engineer Agreement for this Project, may be deducted from the Contractor to make all modifications and/or corrections as may be required by the Engineer in an accurate, complete, and timely fashion. Resubmittals for the sole purpose of providing written responses to review comments will not be

considered a resubmittal counting towards the two submission limit.

- M. Shop Drawings that include drawings or other material that is illegible or too small may be returned without review.

1.3 SAMPLES

- A. The Contractor shall submit samples when requested by the Engineer to establish conformance with the specifications, and as necessary to define color selections available. Submittals of “samples” shall be documented through the electronic submittal process by including a photograph of the item(s) and indicating the date the sample was mailed and/or delivered.

1.4 MANUFACTURER'S CERTIFICATES

- A. Prior to accepting the installation, the Contractor shall submit manufacturer's certificates for each item specified.
- B. Such manufacturer's certificates shall state that the equipment has been installed under either the continuous or periodic supervision of the manufacturer's authorized representative, that it has been adjusted and initially operated in the presence of the manufacturer's authorized representative, and that it is operating in accordance with the specified requirements, to the manufacturer's satisfaction. All costs for meeting this requirement shall be included in the Contractor's bid price.

1.5 SUBMISSION REQUIREMENTS

- A. Accompany submittals with a transmittal cover sheet, containing:
 - 1. Date.
 - 2. Project title and number.
 - 3. Contractor's name and address.
 - 4. The sequential shop drawing number for each shop drawing, project data and sample submitted shall be:
 - a. Specification Section number followed by a dash and then a sequential number beginning with 01 (e.g., 16000-01).
 - b. Under limited situations when additional different pieces of equipment are submitted under the same specification section, those submittals shall be numbered sequentially (e.g. 05500-01, 05500-02, 05500-03, etc.).
 - c. Resubmittals shall include decimal point and an alphabetic suffix after the corresponding sequential number (e.g., 16000-01A).
 - d. O&M submittals shall be numbered with the Specification Section number followed by a dash, the letters “OM”, another dash, and then a sequential number beginning with 01 (e.g. 16000-OM-01). Resubmittals of O&Ms shall include an alphabetic suffix after the corresponding sequential number (e.g. 16000-OM-01A).
 - 5. Notification of deviations from Contract Documents.
 - 6. Other pertinent data.
- B. A completed Contractor Submittal Certification Form shall be attached to each hardcopy and electronic PDF of each shop drawing and must include:
 - 1. Project name
 - 2. Specification Section and sequential number with alphabet suffix for resubmittal
 - 3. Description

4. Identification of deviations from Contract Documents.
 5. Contractor's stamp, initialed or signed, certifying review of the submittal, verification of field measurements and compliance with Contract Documents.
 6. Where specified or when requested by the Engineer, manufacturer's certification that equipment, accessories and shop painting meet or exceed the Specification requirements.
 7. Where specified, manufacturer's guarantee.
- C. Additional Requirements for Electronic Submittals:
1. Each individual shop drawing or O&M submittal shall be contained in one PDF.
 2. The first page of the PDF shall be the Contractor Submittal Certification Form as described above.
 3. The electronic PDF shall be **exactly** as submitted in the hardcopy.
 4. The electronic PDF shall include an electronic table of contents that is bookmarked for each section of the submittal.
 5. The electronic PDF shall be configured such that is fully searchable.
 6. PDF versions of 24x36 drawings shall be converted to 24 x 36 PDFs so as not to lose the clarity of the original drawing.
 7. Electronic PDF submittals that are not submitted in accordance with the requirements stated above will not be reviewed by the Engineer.
 8. Electronic submittals shall be transmitted via the protocol established in Part 1 above.

1.6 RESUBMISSION REQUIREMENTS

- A. Revise initial submittals as required and resubmit as specified for initial submittal.
- B. Indicate on submittals any changes which have been made other than those required by Engineer. All renumbering of shop drawings, relabeling of individual pieces or assemblies or relocating of pieces or assemblies to other Drawings within the submittal shall be clearly brought to the attention of the Engineer. If relabeling of individual pieces or assemblies has taken place, the labels from the previous submittal shall be indicated to assist in comparing the original and resubmitted shop drawing.
- C. All resubmittals shall include a summary of the previous submittal review comments with the vendors' written response as to how the previous comments were addressed.

1.7 ENGINEER'S REVIEW

- A. The review of shop and working drawings hereunder will be general only, and nothing contained in this specification shall relieve, diminish or alter in any respect the responsibilities of the Contractor under the Contract Documents and in particular, the specific responsibility of the Contractor for details of design and dimensions necessary for proper fitting and construction of the work as required by the Contract and for achieving the result and performance specified thereunder.
- B. The Engineer's review comments will be summarized on a Submittal Review Form, which includes an action code. A description of each action code is provided below.
 1. No Exceptions Taken (Status 0 on shop drawing log). The shop drawing complies with the Contract Document requirements. No changes or further information are required. Where appropriate, the submittal review form will be used to alert the Contractor, Owner and Field personnel of remaining items within that specification section that still needs to be submitted.

2. Make Corrections Indicated (Status 1 on shop drawing log). The shop drawing complies with the Contract Document requirements except for minor changes, as indicated. Engineer requires that all comments will be addressed by the Contractor, unless otherwise notified in writing prior to execution of the relevant work.
3. Conditional to Remarks (Status 2 on shop drawing log). The shop drawing potentially complies with the Contract Document requirements, contingent upon satisfactory resolution of review comments. Remarks will explicitly list what information needs to be resubmitted. Resubmittal from the Contractor should include a cover letter or summary which indicates how each review comment has been addressed. **This action code will not be used, or will be sparingly used, for electronic submittals.**
4. Revise and Resubmit (Status 3 on shop drawing log). The shop drawing does not comply with the Contract Document requirement as submitted, but may with changes indicated and/or submission of additional information. The entire package must be resubmitted with the necessary information and a cover letter which indicates how each review comment has been addressed and where to find the information in the resubmittal.
5. Rejected (Status 4 on shop drawing log). The shop drawing does not comply with the Contract Document requirements, for the reasons indicated in the remarks, and is unacceptable.
6. In Review (Status 5 on shop drawing log). The shop drawing is currently under review.
7. For Information Only (Status 6 on shop drawing log). The shop drawing review was for information only.

CONTRACTOR SUBMITTAL CERTIFICATION FORM

PROJECT: _____ CONTRACTOR'S PROJ. NO: _____

CONTRACTOR: _____ ENGINEER'S PROJ. NO: _____

ENGINEER: _____

SHOP
DRAWING
NUMBER:SPECIFICATION SECTION
OR DRAWING NO:SEQUENTIAL NUMBER
(& ALPHA SUFFIX FOR
RESUBMITTAL)

DESCRIPTION: _____

MANUFACTURER: _____

The above referenced submittal has been reviewed by the undersigned and I/we certify that the material and/or equipment meets or exceeds the project specification requirements with

☐ NO DEVIATIONS

or

☐ A COMPLETE LIST OF DEVIATIONS AS FOLLOWS^a:

By: _____

By: _____

Contractor^bManufacturer^c

Date: _____ Date: _____

a Any deviations not brought to the attention of the Engineer for review and concurrence shall be the responsibility of the Contractor to correct, if so directed.

b Required on all submittals

c When required by specifications

Page ____ of ____

END OF SECTION

SECTION 01370

SCHEDULE OF VALUESPART 1 - GENERAL1.1 DESCRIPTION

A. Extent of Work:

1. Provide a detailed breakdown of the agreed Contract Sum showing values allocated to each of the various parts of the Work, as specified herein and in other provisions of the Contract Documents. The breakdown shall divide the projects into its appropriate component parts together with a quantity and a unit price for each part such that the sum of the products of quantities and unit prices will equal the contract price for the item(s). Coordinate with the Engineer regarding the level of detailed warranted for the project.

B. Related Work Specified Elsewhere:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, and Sections of these Specifications.
2. Schedule of values is required under the General Conditions.
3. Schedule of values is required to be compatible with applications for progress payment.

1.2 QUALITY ASSURANCE

A. Use required means to assure arithmetical accuracy of the sums described.

B. When so required by the Engineer, provide copies of the subcontracts or other data acceptable to the Engineer substantiating the sums described.

1.3 SUBMITTALS

A. Prior to first application for payment, submit a proposed schedule of values to the Engineer.

1. Secure the Engineer's approval of the schedule of values prior to submitting first application for payment.

END OF SECTION

SECTION 01400QUALITY CONTROLPART 1 - GENERAL1.1 REQUIREMENTS INCLUDED

- A. General Quality Control.
- B. Workmanship.
- C. Manufacturer's Certificates.
- D. Testing Laboratory Services.

1.2 RELATED REQUIREMENTS

- A. Section 00700 - General Conditions: Inspection and testing required by governing authorities.
- B. Section 01340 - Submittals: Submittal of Manufacturer's Instructions.
- C. Section 02200 - Earthwork.
- D. Section 03420 – Precast Concrete Structures

1.3 QUALITY CONTROL

- A. Maintain quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.

1.4 WORKMANSHIP

- A. Comply with industry standards except when more restrictive tolerances or specified requirements indicate more rigid standards or more precise workmanship.
- B. Perform work by persons qualified to produce workmanship of specified quality.
- C. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, and racking.

1.5 MANUFACTURERS' INSTRUCTIONS

- A. Comply with instructions in full detail, including each step-in sequence. Should instructions conflict with Contract Documents, request clarification from Engineer before proceeding.

1.6 MANUFACTURERS' CERTIFICATES

- A. When required by individual Specifications Section, submit manufacturer's certificate that products meet or exceed specified requirements.

1.7 TESTING LABORATORY SERVICES

- A. Owner will employ and pay for services of an Independent Testing Laboratory to perform inspections, tests, and other services wherever an Independent Testing Laboratory is required by individual specification sections listed in paragraph 1.2 above, unless otherwise indicated.
- B. Services will be performed in accordance with requirements of governing authorities and with specified standards.
- C. Reports will present observations and test results and indicate compliance or non-

compliance with specified standards and with Contract Documents. Independent Testing Laboratory will submit one copy of each report directly to each of the following: Engineer, Resident Project Representative, Contractor. Reports will be mailed within 5 days of obtaining test results. If test results indicate deficiencies, Independent Testing Laboratory shall telephone or FAX results to Engineer, Resident Project Representative and Contractor within 24 hours.

- D. Contractor shall cooperate with Independent Testing Laboratory personnel; furnish tools, samples of materials, design mix, equipment, storage and assistance as requested.
- E. Contractor shall coordinate all testing work and shall notify Engineer and Independent Testing Laboratory at least 24 hours prior to performing work requiring testing services. If scheduled tests or sampling cannot be performed because the work is not ready as scheduled, testing costs associated with the delay will be determined by Engineer and invoiced by Owner to Contractor. If unpaid after 60 days, the invoice amount will be deducted from the Contract Price. If adequate notice is not provided, Contractor shall suspend work on that portion of the Project until testing can be performed. Such suspension will not be grounds for a claim against the Owner for delay, nor will it be an acceptable basis for an extension of time.
- F. Payment for Independent Testing Laboratory services shall be as follows:
 - 1. General: Where testing is the Owner's responsibility, payment will be made as stated below unless other requirements are given in Specification Sections. Testing which is the responsibility of the Contractor will be considered an incidental item unless otherwise indicated in Section 01150, Measurement and Payment.
 - 2. Initial Testing: Owner will pay for initial tests.
 - 3. Retesting: Costs of retesting due to non-compliance will be paid by Owner. The cost of retesting will be determined by Engineer and Owner will invoice Contractor for this cost. If unpaid after 60 days, the invoice amount will be deducted from the Contract Price.
 - 4. Contractor's Convenience Testing: Inspections and tests performed for Contractor's convenience will be paid for by Contractor.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01562DUST CONTROLPART 1 - GENERAL1.1 DESCRIPTIONS

A. Work Included:

1. Furnish and apply water or calcium chloride on the road surfaces within the construction site, when required to control dust and when directed by the Engineer.
2. When dust control is not included as a separate item in the Contract, the work shall be considered incidental to the appropriate items of the Contract.

PART 2 - PRODUCTS2.1 MATERIALS

A. Water for Sprinkling:

B. Clean, free of salt, oil, and other injurious matter.

C. Calcium Chloride:

1. Meet the requirements of AASHTO M144.

PART 3 - EXECUTION3.1 APPLICATION

A. Water:

1. Apply water by methods approved by the Engineer.
2. Use approved equipment including a tank with gauge equipped pump and spray bar.

B. Calcium Chloride:

1. Apply at a rate sufficient to maintain a damp surface but low enough to assure non-contamination of water courses.
2. Apply water prior to calcium chloride addition.

END OF SECTION

SECTION 01720PROJECT RECORD DOCUMENTSPART 1 - GENERAL1.1 DESCRIPTION

A. Work Included:

1. Keep accurate record documents for all additions, demolition, changes of material or equipment (from that shown on the Drawings), variations in work, and any other additions or revisions to the Contract (via Change Order, Work Change Directive, Field Order or Clarification).

B. Related Work Specified Elsewhere:

1. Shop Drawings, Project Data, and Samples are specified in "General Conditions" and Section 01340, Submittals.

1.2 MAINTENANCE OF DOCUMENTS

A. Maintain at job site, one copy of:

1. Contract Drawings
2. Specifications
3. Addenda
4. Reviewed Shop Drawings
5. Change Orders
6. Any other modifications to the Contract
7. Field Test Reports

B. Store documents in files and racks specifically identified for Record Drawing use, that are apart from documents used for construction.

C. File documents in a logical manner indexed for easy reference.

D. Maintain documents in clean, dry, legible condition.

E. Do not use record documents for construction purposes.

F. Make documents available at all times for inspection by the Engineer and Owner, and by the end of the project, transmit these documents to the Engineer.

G. Failure to maintain current records, as specified herein, shall be grounds for withholding additional retainage from monthly partial payment requests.1.3 RECORDING

A. Label each document "PROJECT RECORD" in large high printed letters.

B. Keep record documents current and do not permanently conceal any work until required information has been recorded.

C. General Field Recording Issues:

1. All swing ties shall be taken from existing, permanent features such as utility poles, corners of buildings and hydrants. Porches, sheds or other house additions shall be avoided as they could be torn down. A minimum of two swing ties shall be taken. Survey grade GPS coordinates are also acceptable.
2. Stations shall be recorded to the nearest foot.
3. Inverts shall be recorded to the nearest hundredth of a foot.

4. Elevations shall be recorded to the nearest hundredth of a foot.
 5. Building dimensions shall be recorded to the nearest 1/4".
 6. Equipment and Piping shall be recorded to the nearest tenth of a foot, and the overall dimensions and layout of the equipment shall be adjusted to reflect the equipment provided.
- D. Project Record Drawings - Legibly mark Contract Drawings to record existing utilities and actual construction of all work, including but not limited to the following (where applicable):
1. Existing Utilities
 - a. Water mains and services, water main gate valves, sewer mains and services, storm drains, culverts, steam lines, gas lines, tanks and other existing utilities encountered during construction must be accurately located and shown on the Drawings. In congested areas supplemental drawings or enlargements may be required.
 - b. Show any existing utilities encountered in plan and profile and properly labeled showing size, material and type of utility. Ties shall be shown on plan. Utility shall be drawn to scale in section (horizontally and vertically) and an elevation shall be called out to the nearest hundredth of a foot.
 - c. When existing utility lines are broken and repaired, ties shall be taken to these locations.
 - d. If existing water lines are replaced or relocated, document the area involved and pipe materials, size, etc. in a note, and with ties.
 2. Manholes, Catch Basins, Valve Pits and other structures.
 - a. Renumber structure stationing to reflect changes.
 - b. Show ties to center of structure covers or hatches.
 - c. In general, show inverts at center of structures. However, for manholes with drop structures, or steep channels (greater than 0.2' change on slope), show inverts at face of manhole.
 - d. Show inverts for other structures at the face of the structure.
 - e. Draw any new structures that are added on plan and profile.
 - f. Show any field or office redesigns.
 - g. Redraw plan if the structure's location is moved more than 5 feet in any direction. Note: It is important to show existing utilities, as outlined in Paragraph 1 above, especially if they were one reason for relocating the sewer, manholes and other structures.
 - h. Redraw profile if inverts changed by more than 6 inches.
 3. Ledge
 - a. Ledge profiles shall be shown. Note whether the plotted ledge profile reflects undisturbed or expanded conditions.
 4. Yard Piping and Buried Electrical Conduit
 - a. Site piping and utilities shall be drawn to reflect the installed locations, with ties and elevation of all bends (horizontal and vertical).
 - b. Show routing for electrical conduits and pull boxes, especially in close proximity to buildings and when the conduits change direction or cross process piping.

5. Utilities
 - a. When encountered, additional utilities (e.g., gas, cable, telephone, fiber optic, etc.) shall be indicated on the Record Drawings.
- E. Specifications and Addenda - Legibly mark up each section to record:
 1. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.
 2. Changes made by Change Order, Field Order, or other method.

1.4 SUBMITTALS

- A. At the completion of the project, and prior to the release of retainage, deliver record documents to the Engineer.
 1. Record drawings shall be provided as a bound, red-line paper set.
 2. Record drawings shall be provided as a bound, red-line paper set and an electronic file (pdf format) consisting of a full scan of the bound paper set.
 3. Record drawings shall be provided as a bound paper set of computer-generated drawings, an electronic file (pdf format) of the bound paper set, and electronic files in AutoCAD format. Ownership of the drawings and files shall pass to the Owner at the time of submittal.
 4. Record drawings shall be provided as electronic files in ESRI GIS format. Ownership of the drawings and files shall pass to the Owner at the time of submittal.
 5. If the Contractor provides alternate or substitute equipment that requires revised arrangements from the Bidding Documents, the Contractor shall provide supplemental record drawings of these items in AutoCAD format.
- B. Accompany submittal with transmittal letter, in duplicate, containing:
 1. Date, project title and number.
 2. Contractor's name and address.
 3. Title and number of each record document with certification that each document is completed and accurate.
 4. Signature of Contractor, or his authorized representative.
- C. Failure to supply all information on the Project Record Drawings as specified in Part 1.3 may result in withholding final completion and in non-approval of final payments of the Contract. If Contract Time has elapsed, this shall be grounds for imposing liquidated damages.

1.5 QUALITY ASSURANCE

- A. All horizontal and vertical dimensions, swing-ties, and elevations shall be accurate to within one-tenth of a foot, unless greater accuracy is specified elsewhere in the Specifications (e.g., concrete elevations, weir elevations, etc.).

PART 2 - PRODUCTS – NOT APPLICABLE

PART 3 - EXECUTION

3.1 MAINTAINING AND PROVIDING RECORDS

- A. Records shall be kept current as the work progresses.
- B. Records shall be made available for review by the Owner, Engineer, Resident Project

Representative and/or Funding Agency(s) upon request.

- C. Records shall be kept current as the work progresses. Failure to maintain current records, as specified herein, shall be grounds for withholding additional retainage from monthly partial payment requests. Failure to provide records shall also be grounds for withholding of final payment and, if beyond contract time, shall be grounds for imposing liquidated damages.

3.2 AS-BUILT SURVEY PERFORMANCE

- A. From established survey control, and construction baseline as shown on the drawings, conduct surveys of the project area during construction as needed to obtain information of buried and above ground items. Surveys shall include information outlined in Section 1.3.
- B. Actual road alignments; walls; fence and guardrail; existing, new and relocated utility poles; traffic and warning sign locations; crosswalks, parking space and stop bar locations; retaining walls and foundations drains; all underground and overhead utility poles and lines within the project limits, including those installed on private property; all other new features and appurtenances and those existing features and appurtenances changed as a result of this project shall be included in the survey.

3.3 FORMAT FOR ELECTRONIC DELIVERABLES

- A. AutoCAD digital survey data for the as-built survey shall include:
 - 1. Copy of field notes and sketches of the survey.
 - 2. Paper copy of description of layers.
 - 3. Paper copy of base map.
 - 4. Provide digital information on compact disk with paper copy printout; information shall be provided in .DWG format (AutoCAD 2011 or earlier). Data shall be provided in 3D format (northing, easting, elevation, or Y, X, Z).
 - 5. Drawing scale: Minimum one inch = twenty feet.
 - 6. Layering:
 - a. Repetitive symbols made into blocks and defined on layer 0.
 - b. All entities shall be drawn “by layer” as opposed to individual properties.
 - c. Use one linetype and one color per layer as opposed to numerous colors/linetypes on a single layer.
 - d. Preface each layer with the initials of the Survey company or Contractor (example, Survey Company: SC “layername”).
 - e. Database text annotation will be coordinated so the text will be right-reading.
 - f. Place text on separate layers.

END OF SECTION

SECTION 02076

ASBESTOS-CEMENT (TRANSITE) PIPE REMOVAL AND DISPOSAL

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work Included: Remove and dispose of Asbestos-Cement (AC) storm drain according to all applicable Federal, State, and local laws, regulations, and ordinances.

1.2 SCHEDULING

- A. Prior to initiating AC pipe removal, the Contractor shall prepare an abatement plan and provide a copy for record purposes to the Engineer. Refer to section 1.5 SUBMITTALS for more information.
- B. The Contractor shall update the abatement schedule as requested by the Engineer.

1.3 CODES, REGULATIONS, AND STANDARDS

- A. General Applicability
 - 1. Contractor shall perform all work in accordance with these specifications: U.S. Environmental Protection Agency (U.S. EPA) and Occupational Safety & Health Administration (OSHA) regulations, NIOSH recommendations, Maine Department of Environmental Protection (Maine DEP) rules and regulations, and any other applicable Federal, State and local government regulations and guidelines
 - 2. The most recent edition of any relevant regulation, standard, document, code or policy statement shall be in effect. Where conflict among the requirements or with these specifications exists, the most stringent requirement(s) shall be utilized.
- B. Contractor Responsibility
 - 1. The Contractor shall assume full responsibility and liability for compliance with all applicable Federal, State and local regulations related to all aspects of the abatement project. The Contractor is responsible for providing and maintaining training, accreditation, medical exams, medical records, and personal protective equipment as required by applicable Federal, State and local regulations. The Contractor shall hold the Owner and Owner's Representative harmless for any failure to comply with any applicable work, packaging, transporting, disposal, safety, health, or environmental requirement on the part of the Contractor, Contractor's employees, or subcontractors of the Contractor.
- C. The publications listed below form a part of this specification to the extent referenced. The publications listed below are not intended to be a comprehensive list of all regulations, applicable to this work.
 - 1. Environmental Protection Agency (EPA):
 - a. National Emission Standards for Hazardous Air Pollutants (NESHAP) Title 40, Part 61).
 - b. A Guide to Respiratory Protection for the Asbestos Abatement Industry.
 - 2. Occupational Safety and Health Administration (OSHA):

ASBESTOS-CEMENT (TRANSITE) PIPE REMOVAL AND DISPOSAL

- a. Asbestos Construction Standard 29 CFR Part 1926.1101
- b. Asbestos General Industry Standard 29 CFR 1910.1001
- c. Respiratory Protection, 29 CFR 1910.134
- d. Construction Industry Standards, 29 CFR 1926
3. U.S. Department of Transportation
 - a. 49 CFR 100 - 185, Transportation
4. National Institute for Occupational Safety and Health (NIOSH):
 - a. "Respiratory Protection A Guide for the Employee."
5. American National Standards Institute (ANSI):
 - a. Z86.1-1973 - Commodity Specification for Air
 - b. Z9.2 - HEPA Filter Specifications
 - c. Z88.2-1980-Respiratory Protective Equipment
6. Maine Department of Environmental Protection (Maine DEP):
 - a. Chapter 425 - Asbestos Management Regulations
 - b. Chapter 401 - Landfill Siting, Design, and Operation
 - c. Chapter 411 - Non-Hazardous Waste Transporter Licenses

1.4 PERSONNEL QUALIFICATIONS

- A. All personnel of the Contractor or any approved subcontractors involved with asbestos abatement work shall meet the following minimum qualifications:
 1. Medical examination within the past year in accordance with OSHA 1926.134 with a physician's written opinion that the worker has no condition that would preclude him/her from working with asbestos or wearing a respirator.
- B. The Contractor shall employ a competent person to oversee all aspects of AC pipe removal.
- C. There shall be a sufficient number of trained and qualified workers, foremen and superintendents to accomplish the work within the required schedule. No untrained or unqualified person shall be employed to speed up completion of the abatement work.

1.5 SUBMITTALS

- A. Submittals shall be in accordance with Specification Section 01300 - Submittals.
- B. At a minimum, the following submittals shall be submitted to the Engineer.
 1. Certification of compliance with OSHA requirements including but not limited to medical surveillance, record keeping and personnel exposure monitoring.
 2. Respiratory Protection Program. Include site specific exposure assessment for respirator selection.
 3. A written project schedule. The schedule shall be date specific and include all phases of the project.
 4. Emergency Action Plan.
 5. Proposed waste disposal site and waste transporter. Include name, address, telephone number and operating permits, etc.
 6. Material safety data sheets (MSDS) for all materials and products to be used by the Contractor on this project.
 7. A work plan outlining the methods to be used during the removal of AC pipe. The work plan shall include the use of the Best Management Practices

pertaining to the qualifications of field personnel and methods for dust control, packaging, transportation, and decontamination of equipment.

- C. During Abatement
 - 1. Results of personnel exposure monitoring.
 - 2. Project schedule.
- D. Post Abatement Submittals
 - 1. Disposal receipts (within timeframes regulated by EPA) signed by the landfill operator demonstrating that the AC pipe removed from the project has been packaged, transported and disposed of properly.
 - 2. Provide the Engineer with copies of on-site job logs, notifications, permits, accident reports, personnel exposure air monitoring results, waivers of lien.
 - 3. Copies of any notices of non-compliance issued by governmental authorities.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Polyethylene sheeting: shall be at least 6-mil thickness.
- B. Disposable bags and/or drums: shall be of 6-mil polyethylene, on which labels are directly printed, as required by EPA, OSHA and DOT regulations.
- C. Surfactant (wetting agent): shall be a 50/50 mixture of polyoxyethylene ether and polyoxyethylene ester, or equivalent, mixed in a proportion of 1 fluid ounce to 5 gallons of water or as specified by manufacturer.

PART 3 - EXECUTION

3.1 TOOLS AND EQUIPMENT

- A. Transportation Equipment: Transportation equipment, as required, shall be suitable for loading, temporary storage, transport, and unloading of contaminated waste without exposure to persons or property. The equipment shall be secured at all times and access limited to authorized personnel only.
- B. The Contractor shall provide approved respirators and protective clothing to all Contractor personnel. The Contractor shall also provide approved protective clothing to representatives of the Owner, and to representatives of the State or other governmental entity who may inspect the job site.
- C. Protective clothing requirements must include, but may not be limited to:
 - 1. One-time use, disposable, full-body coveralls made of Tyvek® fabric or approved equal.
 - 2. Hard Hats
 - 3. Eye protection
 - 4. Gloves
 - 5. Respiratory protective equipment as required by State law
 - 6. Other as appropriate for site conditions
- D. The Contractor shall have sufficient equipment to mix and spray wetting agents.
- E. The Contractor shall have a sufficient quantity of, ladders, hand tools and materials to conduct the abatement project in an efficient and workmanlike manner.

3.2 INSPECTION AND PREPARATION

- A. Before any work commences, post danger signs in and around the work area to comply with Federal, State, and local law.

3.3 WORK AREA PREPARATION:

- A. Regulated area access is to be restricted to authorized trained/accredited and protected personnel. The Contractor shall control site security during abatement operations in order to isolate work in progress and protect adjacent personnel.
- B. Prior to any asbestos related work in an area, restrict access to all persons other than trained personnel and authorized visitors. The Contractor shall erect signs around the perimeter in accordance with EPA, OSHA and this specification. Maintain a log of all people entering and exiting the workplace during abatement work.
- C. The Contractor shall be responsible for taking whatever steps are necessary to prevent a release to the environment and additional contamination of the areas beneath the AC pipe.

3.4 AC PIPE CONNECTION AND REMOVAL PROCEDURES

- A. Cutting of existing AC pipe shall be minimized. Cutting of AC pipe shall be performed in accordance with all applicable OSHA standards and shall minimize release of AC fibers.
- B. AC pipe shall be secured, wrapped, and disposed of in a timely manner. Stockpiling of removed pipe in an unsecured area shall not be allowed.
- C. AC pipe shall be transported to a licensed facility for proper disposal.
- D. Crushing of pipe in-place shall not be allowed.

3.5 GENERAL PROCEDURES

- A. Install polyethylene sheeting beneath the AC pipe to minimize contamination of adjacent soil.
- B. All surfaces shall be wetted during removal activities.
- C. If AC pipe is found to be friable or will be rendered friable, abatement shall be conducted in containment.
- D. AC pipe shall be removed from the trench in an "intact" condition in sizes such that the piping may be handled without breakage.
- E. If AC pipe sections can be separated without cutting, the removal may be conducted without containment.
- F. Separated non-friable AC pipe sections may be removed without containment.
- G. If AC pipe sections require breaking/cutting to separate, all breaking/cutting activities shall be conducted within a glove bag or negative pressure regulated work area (containment).
- H. In the event of breakage of AC pipe during removal which results in pieces contacting soil, then the Contractor shall remove all debris and soil located adjacent to and beneath the debris as well as six inches of soil from beneath and surrounding the debris. All resultant debris and soils shall be properly handled, packaged and disposed of as friable, regulated asbestos waste.
- I. The Engineer and Owner shall be notified immediately in the event of breakage.
- J. AC pipe shall be double wrapped in 6-mil polyethylene sheeting and labeled prior to transport as required.

3.6 DISPOSAL ACTIVITIES

- A. It is the responsibility of the Contractor to determine current waste handling, transportation, and disposal regulations and or requirements for AC pipe and for each waste disposal facility. The Contractor must comply fully with these regulations and all U. S. Department of Transportation and EPA requirements.
- B. The Contractor will document actual disposal of the waste at the designated landfill by completing a Waste Shipment Record and forwarding a copy of it along with a copy of the Bill of Lading to the Engineer.
- C. All waste load-out and disposal activities shall be the responsibility of the Contractor.
- D. Contractor shall insure that transport vehicles do not leak water or other material while being loaded, transported or while on site partially loaded. At minimum, transport vehicles shall be lined with two layers of 6-mil thick polyethylene sheeting installed to form a watertight barrier within the vehicle. If water is observed leaking from any transport or storage container, contractor shall immediately stop work, unload the container (including dumpsters and semi-trailers) find and correct the source of the leak, and place waste material back into the container. This process will be repeated each time any water is observed leaking from a storage or transport vehicle that contains asbestos waste. Contractor shall also take all steps necessary, to decontaminate the ground or other surfaces that became wet due to water leaking from a container that holds asbestos waste.

3.7 CLEANING AND FINAL DECONTAMINATION

- A. After the removal of the AC pipe has been completed and before removal of barriers (as applicable), the entire area shall be thoroughly cleaned. All plastic barriers, tapes and disposable contaminated equipment shall also be disposed of as asbestos waste. All reusable contaminated equipment such as masks, hard hats, etc., shall be thoroughly decontaminated through wet cleaning or sealed within 6-mil polyethylene bags before removal from the work area.

END OF SECTION

SECTION 02110CLEARING AND GRUBBINGPART 1 - GENERAL1.1 DESCRIPTION

A. Work Included:

1. Clearing and grubbing includes, but is not limited to, removal of trees, brush, stumps, wooded growth, grass, shrubs, poles, posts, signs, fences, culverts and other vegetation and minor structures; the protection of designated wooded growth; the storage and protection of minor structures and materials which are to be replaced; and the disposal of non-salvageable structures and materials, and necessary preliminary grading.

B. Limits of Work:

1. Perform clearing and grubbing work within the areas required for construction, or as shown on the Drawings, to a depth of 12 inches below the existing grade.
2. Perform additional clearing and grubbing work within areas and to depths which, in the opinion of the Engineer, interfere with excavation and/or construction, or are otherwise objectionable.

C. Work Not Included:

1. Clearing and grubbing work performed for the convenience of the Contractor will not be considered for payment.

1.2 QUALITY ASSURANCE

A. Requirements of Regulatory Agencies:

1. Dispose of combustible material by burning only when permitted by and in accordance with all applicable local and state laws, ordinances and code requirements.

B. Remove and dispose of nonsalvageable structures and material in accordance with all applicable local and state laws, ordinances and code requirements.

PART 2 - PRODUCTS2.1 MATERIALS

A. Provide all materials required to complete the work.

B. All timber and wood shall become the property of the Contractor unless other agreements are made between the Owner and the Contractor.

C. Repair any damage to structures to the complete satisfaction of the Owner and Engineer.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Carefully preserve and protect from injury all trees and/or shrubs not to be removed.
- B. Right-of-way:
 - 1. Where excavation is required on public or private rights-of-way containing trees, shrubs, other growth, or any structure or construction, obtain the Engineer's direction concerning the extent to which such obstacles can be cleared or stripped prior to performing the Work.
 - 2. In all rights-of-way, remove only those particular growths or structures which are, in the opinion of the Engineer, essential for construction operations.
 - 3. All other removals or damage shall be replaced or restored at the Contractor's expense.

3.2 PERFORMANCE

- A. Clearing:
 - 1. Remove and dispose of all trees, brush, slash, stubs, bushes, shrubs, plants, debris and obstructions within the area to be cleared, except any areas that may be designated as "Selective Clearing", and except as otherwise shown on the Drawings or as directed by the Engineer.
 - 2. Remove all stumps unless otherwise directed by the Engineer.
 - 3. Dispose of material to be removed daily as it accumulates.
 - 4. Take special care to completely dispose of all elm trees and branches immediately after cutting either by burial in approved locations or, when permitted, by burning in areas well removed from standing elm growth.
- B. Protection of Wooded Growth:
 - 1. Fell trees toward the center of the area being cleared to protect trees and shrubs to be left standing.
 - 2. Cut up, remove and dispose of trees unavoidably falling outside the area to be cleared.
 - 3. Employ skilled workmen or tree surgeons to trim and repair all trees that are damaged but are to be left standing.
- C. Selective Clearing:
 - 1. When shown on the Drawings and when directed by the Engineer, perform selective clearing work to preserve natural tree cover.
 - 2. Perform selective clearing work only under the direction and supervision of the Engineer.
 - 3. Remove all dead and uprooted trees, brush, roots and other material which, in the opinion of the Engineer, are objectionable.
 - 4. Cut flush with the ground and remove only those trees indicated by the Engineer.
 - 5. Employ skilled workmen or tree surgeons to carefully trim all branches requiring cutting on trees to be left standing. Wood exposed as the result of removal of branches is to be left exposed to air and sunlight.
 - 6. Bituminous paint shall not be used on wood exposed as a result of branch removal, excavation around roots, or damage to tree bark.

- D. Grubbing:
 - 1. Perform grubbing work beneath new roads, driveways, walks, seeded areas and other areas and as directed by the Engineer.
 - 2. Grub out all sod, vegetation and other objectionable material to a minimum depth of 12 inches below the existing grade.
 - 3. Completely remove all stumps, including major root systems.
- E. Disposal:
 - 1. Remove from the site and dispose of material not being burned.
 - 2. Provide an approved disposal area unless otherwise specified.
- F. Burning:
 - 1. Dispose of combustible materials by burning, only if approved by local and state officials.
 - 2. Employ competent workmen to perform burning work in such a manner and at such locations that adjacent properties, trees and growth to remain, overhead cables, wires and utilities will not be jeopardized.
 - 3. Do not leave fires unguarded.
 - 4. Do not burn poison oak, poison ivy or other plants of similar nature.
 - 5. Do not use tires or other combustible waste material to augment burning.
 - 6. Burn combustible materials daily as the work progresses.
 - 7. The Contractor shall be responsible for all damage caused by burning and shall be responsible for obtaining all necessary permits for burning.

3.3 REPLACEMENT OF MATERIALS

- A. Paving, Curbing and Miscellaneous Material:
 - 1. Remove all paving, subpaving, curbing, gutters, brick, paving block, granite curbing, flagging and minor structures that are over the area to be filled or excavated.
 - 2. Remove and replace bituminous asphaltic and portland cement concrete in accordance with the appropriate sections of these Specifications.
 - 3. Properly store and preserve all material to be replaced in a location approved by the Engineer.
- B. Shrubs and Bushes:
 - 1. Remove, store, and replace ornamental shrubs and bushes to be preserved in accordance with accepted horticultural practices.
- C. Topsoil:
 - 1. When applicable, carefully remove, store, and protect topsoil in accordance with the appropriate section of this division.
- D. Responsibility:
 - 1. Replace, at no additional cost to the Owner, materials lost or damaged because of careless removal or neglectful or wasteful storage, disposal or use of these materials.

END OF SECTION

SECTION 02115STRIPPING AND STOCKPILING TOPSOILPART 1 - GENERAL1.1 DESCRIPTION

A. Work Included:

1. Segregate topsoil approved by the Engineer prior to excavation, trenching and grading operations and stockpile it for use in the work.

B. Related Work Specified Elsewhere (When Applicable):

1. Demolition, clearing, grading, embankment, excavation and landscaping are specified in the appropriate sections in this division.

PART 2 - PRODUCTS2.1 MATERIALS

- A. Topsoil shall consist of friable loam of at least two percent decayed organic matter (humus), free of subsoil, and reasonably free of clay lumps, brush, roots, weeds, and other objectionable vegetation, stones and similar objects larger than one (1) inch in any dimension, litter and other materials unsuitable or harmful to plant growth. It shall contain no toxic materials.

- B. The quality of the topsoil material to be used shall be subject to approval by the Engineer.

PART 3 - EXECUTION3.1 PERFORMANCE

- A. Remove topsoil from the areas that are likely to be disturbed as a result of construction operations to a depth based on the soil profile, as approved by the Engineer.
- B. Remove topsoil from all designated areas prior to the performance of normal excavation.

3.2 STORAGE

- A. Transport topsoil and deposit in storage piles convenient to the areas which are subsequently to receive the application of topsoil.
- B. Stockpile topsoil separate from other excavated materials in areas approved by the Engineer.
- C. Take all necessary precautions to prevent other excavated material and objectionable material from becoming intermixed with the topsoil before, during and after stripping and stockpiling operations.
- D. Neatly trim and grade stockpiles to provide drainage from surfaces and to prevent depressions where water may become impounded.
- E. Construct temporary erosion control devices for all stockpiled material, subject to the Engineer's approval.

- F. All loam stripped and stockpiled shall be immediately seeded with 70% Domestic/30% Perennial Rye Grass.

END OF SECTION

SECTION 02200EARTHWORKPART 1 - GENERAL1.1 DESCRIPTION

- A. The Work described by this Section consists of all earthwork encountered and necessary for construction of the project as indicated in the Contract Documents, and includes but is not limited to the following:
 - 1. Excavation
 - 2. Backfilling and Filling
 - 3. Compaction
 - 4. Embankment Construction
 - 5. Grading
 - 6. Providing soil material as necessary
 - 7. Disposal of unsuitable materials
 - 8. Disposal of excess suitable material
- B. Related Work Specified Elsewhere: (When Applicable)
 - 1. Traffic Regulation is specified in Division 1.
 - 2. Filter Fabric, Temporary Erosion Control, and Stripping and Stockpiling of Topsoil are specified in the appropriate sections of this Division.
 - 3. Section 01400 - Quality Control.

1.2 QUALITY ASSURANCE

- A. Requirements of Regulatory Agencies:
 - 1. All work shall be performed and completed in accordance with all local, state and federal regulations.
 - 2. The General Contractor shall secure all other necessary permits unless otherwise indicated from, and furnish proof of acceptance by, the municipal and state departments having jurisdiction and shall pay for all such permits, except as specifically stated elsewhere in the Contract Documents.
- B. Line and Grade:
 - 1. The Contractor shall establish the lines and grades in conformity with the Drawings and maintain same to properly perform the work.
- C. Testing Methods:
 - 1. Gradation Analysis: Where a gradation is specified the testing shall be in accordance with ASTM C-117-90 and ASTM C-136-93 (or latest revision).
 - 2. Compaction Control:
 - a. Unless otherwise indicated, wherever a percentage of compaction for backfill is indicated or specified, it shall be the in-place density divided by the maximum density and multiplied by 100. The maximum density shall be the density at optimum moisture as determined by ASTM Standard Methods of Test for Moisture-Density Relations of Soil Using 10-lb. Hammer and 18-in. Drop, Designation D-1557-78 (Modified Proctor), or latest revision, unless otherwise indicated.

- b. The in-place density shall be determined in accordance with ASTM Standard Method of Test for Density of Soil in Place by the Sand Cone method, Designation D 1556-90, (or latest revision) or Nuclear method Designation D6938.
- c. Wherever specifically indicated, maximum density at optimum moisture may be determined by ASTM Standard Methods of Test for Moisture Density Relations of Soils, ASTM D-698-91 (Standard Proctor).

1.3 TEST AND SUBMITTALS

- A. Submit test results in accordance with the procedure specified in the General and Supplementary Conditions.
- B. Submit test results (including gradation analysis) and source location for all borrow material to be used at least 10 working days prior to its use on the site. Contractor shall identify and provide access to borrow sites.
- C. Submit moisture density curve for each type of soil (on site or borrow material) to be used for embankment construction or fill beneath structures or pavement.
- D. Field density tests on embankments (where applicable), shall be taken on every 1,000 cubic yards of embankment material. In order to determine optimum water content, maximum allowable lift, and number of equipment passes required, one test section shall be constructed, and thoroughly tested. The section shall be a minimum of 1,000 cubic yards in volume. To avoid conflicts the Contractor shall allow a minimum of one working day for testing to be conducted on the test section. The test section may be part of the embankment.
- E. Trenches: Field density test in trenches shall be taken at 75 linear foot intervals on every third lift.
- F. All testing shall be performed by a qualified testing laboratory approved by the Engineer and at the Contractor's expense unless otherwise indicated.
- G. In addition to the above tests the Contractor will be responsible for 20 additional density tests at locations and times requested by the Engineer.
- H. Additional density testing will be required by the Engineer if the Engineer is not satisfied with the apparent results of the Contractor's compaction operation.
 - 1. If the test results fail to meet the requirements of these specifications, the Contractor shall undertake whatever action is necessary, at no additional cost to the Owner, to obtain the required compaction. The cost of the retesting will be borne by the Contractor and no allowance will be considered for delays in the performance of the work.
 - 2. If the test results pass and meet the requirements of the Specifications, the direct invoice cost of the testing laboratory to the Contractor will be borne by the Owner, but no allowance will be considered for delays in the performance of the work.
- I. In addition to the above tests the Independent Testing Laboratory will perform additional density tests at locations and times requested by the Engineer.
- J. Additional density testing will be required by the Engineer if the Engineer is not satisfied with the apparent results of the Contractor's compaction operation.
 - 1. If the test results fail to meet the requirements of these specifications, the Contractor shall undertake whatever action is necessary, at no additional cost to the Owner, to obtain the required compaction. The cost of retesting will be

paid by Owner. The cost of retesting will be determined by Engineer and Owner will invoice Contractor for this cost. If unpaid after 60 days, the invoice amount for retesting will be deducted from the Contract Price. No allowance will be considered for delays in the performance of the work.

2. If the test results pass and meet the requirements of these Specifications, the cost of the testing service will be borne by the Owner, but no allowance will be considered for delays in the performance of the work.

1.4 JOB CONDITIONS

A. Site Information:

1. Data on indicated subsurface conditions are not intended as representations or warranties of accuracy or continuity between soil borings. It is expressly understood that Owner and Engineer will not be responsible for interpretations or conclusions drawn there from by the Contractor. Data are made available for the convenience of Contractor.
2. Additional test borings and other exploratory operations may be made by Contractor at no additional cost to Owner.

B. Existing Utilities and Structures:

1. The locations of utilities and structures shown on the Drawings are approximate as determined from physical evidence on or above the surface of the ground and from information supplied by the utilities. The Engineer in no way warrants that these locations are correct. It shall be the responsibility of the Contractor to determine the actual locations of any utilities or structures within the project area.

PART 2 - PRODUCTS

2.1 SOIL MATERIAL

- A. Rip Rap: Stone used for riprap shall be hard, durable, angular in shape; resistant to weathering and to water action; free from overburden, spoil, shale and organic material; and shall meet the gradation requirements specified below. Neither breadth nor thickness of a single stone should be less than one-third its length. Rounded stone or boulders shall not be accepted without written permission of the Engineer. Broken concrete may be substituted for stone with written authorization of the Engineer. Shale and stone with shale seams are not acceptable. The minimum weight of the stone shall be 155 pounds per cubic foot as computed by multiplying the specific gravity (bulksaturated-surface-dry basis, AASHTO Test T 85) times 62.3 pounds per cubic foot.
 - a. Each load of riprap shall be reasonably well graded from the smallest to the maximum size specified. Stones smaller than the specified 10 percent size and spalls shall not be permitted in an amount exceeding 10 percent by weight of each load.

b. Gradation of Riprap Stone:

<u>Size of Stone</u>	<u>% of Total Weight Smaller Than The Given Size</u>
	24" D50 Riprap
2000 lb.	100
1400 lb.	75
700 lb.	50
40 lb.	10

<u>Size of Stone</u>	<u>% of Total Weight Smaller Than The Given Size</u>
	6" D50 Riprap
700 lb.	100
500 lb.	75
200 lb.	50
20 lb.	10

<u>Size of Stone</u>	<u>% of Total Weight Smaller Than The Given Size</u>
	4" D50 Riprap
100 lb.	100
60 lb.	75
25 lb.	50
2 lb.	10

- B. 2" Leveling Stone: Shall be obtained from rock of uniform quality and shall consist of clean, angular fragments of quarried rock, free from soft disintegrated pieces or other objectionable matter. 2" levelling stone shall be in conformance to MEDOT Standard Specification 703.31. The stone, which shall be similar to railroad ballast, shall meet the following gradation requirements:

<u>Sieve Designation</u>	<u>Percent by Weight Passing Square Mesh Sieve</u>
2-1/2 inch	100
2 inch	95-100
1 inch	0-30
3/4 inch	0-5

- C. Aggregate Subbase: Shall be sand or gravel of hard durable particles free from vegetable matter, lumps or balls of clay, frozen material, and other deleterious substances. Material shall be in conformance to MEDOT Standard Specification Section 703.06. The gradation of the part that passes a 3-inch sieve shall meet the

grading requirements of the following table:

<u>Sieve Designation</u>	<u>Percent by Weight Passing Square Mesh Sieve</u>
MEDOT Type D	
1/2 inch	35-80
1/4 inch	25-65
No. 40	0-30
No. 200	0-7.0

- D. Aggregate Base: Shall be screened or crushed gravel of hard durable particles free from vegetable matter, lumps or balls of clay and other deleterious substances. Material shall be in conformance to MEDOT Standard Specification Section 703.06. Type A Aggregate for base shall not contain particles of rock that will not pass the 4-inch square mesh sieve. The gradation of the part that passes a 3-inch sieve shall meet the following grading requirements:

<u>Sieve Designation</u>	<u>Percent by Weight Passing Square Mesh Sieve</u>
MEDOT Type A	
1/2 inch	45-70
1/4 inch	30-55
No. 40	0-20
No. 200	0-6.0

- E. Common Borrow: Shall consist of approved material required for the construction of the work where designated. Common borrow shall be free from frozen material, perishable rubbish, peat, organic, and other unsuitable material.

<u>Sieve Designation</u>	<u>Percentage by Weight Passing Square Mesh Sieves</u>
6-inch	100
No. 200	0-5

Common borrow may be used for embankments unless otherwise indicated and provided that the material is at a moisture content suitable for compaction to the specified density. No rocks shall exceed 3/4 of the depth of the specified lift thickness.

- F. Screened Stone: Shall be a well graded stone consisting of clean, hard, and durable particles or fragments, free from vegetable or other objectionable matter, meeting the following gradation requirements:

<u>Sieve Designation</u>	<u>Percent by Weight Passing Square Mesh Sieve</u>
1 inch	100
3/4 inch	90-100
3/8 inch	20-55
No. 4	0-10
No. 8	0-5

- G. Structural Fill: Shall consist of sand or gravel of hard durable particles free from vegetable matter, lumps or balls of clay, frozen material and other deleterious substances. Structural fill shall be in conformance with MEDOT Standard Specification 703.19. The gradation of the portion passing a 3-inch sieve shall meet the gradation requirements of the following table:

<u>Sieve Designation</u>	<u>Percent by Weight Passing Square Mesh Sieve</u>
No. 40	0-70
No. 200	0-20.0

2.2 FILTER FABRIC

- A. If filter fabric is required, refer to Section 02260.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions under which excavating, backfilling, filling, compaction and grading are to be performed and notify the Engineer in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.

3.2 EXCAVATION

- A. General:
1. Excavation consists of removal and disposal of all material encountered when establishing line and grade elevations required for execution of the work.
 2. The Contractor shall make excavations in such manner and to such widths as will give suitable room for building the structures or laying and jointing the piping; shall furnish and place all sheeting, bracing, and supports; shall do all

cofferdamming, pumping, and draining; and shall render the bottom of the excavations firm, dry and acceptable in all respects.

3. All excavation shall be classified as either earth or ledge.
 - a. Earth Excavation shall consist of the removal, hauling and disposal of all earth materials encountered during excavation including but not limited to native soil or fill, pavement (bituminous or concrete), existing sewers and manholes, ashes, loam, clay, swamp muck, debris, soft or disintegrated rock or hard pan which can be removed with a backhoe, or a combination of such materials, and boulders that do not meet the definition of "Ledge" below.
 - b. Ledge Excavation: Shall consist of the removal, hauling, and disposal of all ledge or rock encountered during excavation. "Ledge" and "rock" shall be defined as any natural compound, natural mixture that in the opinion of the Engineer can be removed from its existing position and state only by drilling and blasting, wedging, sledging, boring or breaking up with power operated tools. No boulder, ledge, slab, or other single piece of excavated material less than two cubic yards in total volume shall be considered to be rock unless, in the opinion of the Engineer it must be removed from its existing position by one of the methods mentioned above.
 4. The Contractor shall not have any right of property in any materials taken from any excavation. Do not remove any such materials from the construction site without the approval of the Engineer. This provision shall in no way relieve the Contractor of his obligations to remove and dispose of any material determined by the Engineer to be unsuitable for backfilling. The Contractor shall dispose of unsuitable and excess material in accordance with the applicable sections of the Contract Documents.
- B. Additional Excavation: When excavation has reached required subgrade elevations, notify the Engineer who will observe the conditions.
1. If material unsuitable for the structure or paved area or pipeline (in the opinion of the Engineer) is found at or below the grade to which excavation would normally be carried in accordance with the Drawings and/or Specifications, the Contractor shall remove such material to the required width and depth and replace it with thoroughly compacted select fill, screened stone, crushed stone, or concrete as directed by the Engineer.
 2. All excavated materials designated by the Engineer as unsuitable shall become the property of the Contractor and disposed of at locations in accordance with all State and local laws and the provisions of the Contract Documents.
- C. Unauthorized Excavation: Shall consist of removal of materials beyond indicated subgrade elevations or dimensions without specific authorization of Engineer. Unauthorized excavation, as well as remedial work required by the Engineer shall be at the Contractor's expense. Remedial work required is as follows:
1. Under footings, foundation bases, or retaining walls, fill unauthorized excavation with select fill or screened stone compacted to 95%. Provide 12" minimum select fill or screened stone directly under footings. Concrete fill may be used to bring elevations to proper position, when acceptable to Engineer.

2. If the bottom of a trench is excavated beyond the limits indicated, backfill the resulting void with thoroughly compacted screened stone, unless otherwise indicated.
3. Elsewhere, backfill and compact unauthorized excavations as specified for authorized excavations of same classification, unless otherwise directed by Engineer.

D. Structural Excavation:

1. Shall consist of the removal, hauling, disposal, of all material encountered in the excavation to permit proper installation of structures.
2. Excavations for structures shall be carried to the lines and subgrades shown on the Drawings.
3. Excavate areas large enough to provide suitable room for building the structures.
4. The extent of open excavation shall be controlled by prevailing conditions subject to any limits designated by the Engineer.
5. Provide, install, and maintain sheeting and bracing as necessary to support the sides of the excavation and to prevent any movement of earth which could diminish the width of the excavation or otherwise injure the work, adjacent structures, or persons and property in accordance with all state and OSHA safety standards.
6. Erect suitable fences around structure excavation and other dangerous locations created by the work, at no additional cost to the Owner.
7. Exposed subgrade surfaces shall remain undisturbed, protected, and maintained as uniform, plane areas and shape to receive the foundation components of the structure.
 - a. Conform to elevations and dimensions shown within a tolerance of plus or minus 0.10', and extending a sufficient distance from footings and foundations to permit placing and removal of concrete formwork, installation of services, other construction, and for inspection.
 - b. In excavating for footings and foundations, take care not to disturb bottom of excavation. Excavate by hand to final grade and trim bottoms to required lines and grades to leave solid base to receive the structure.
 - c. If a structure is to be constructed within the embankment, the fill shall first be brought to a minimum of 3 feet above the base of the footing. A suitable excavation shall then be made as though the fill were undisturbed earth.

E. Trench Excavation: Shall consist of removal, hauling and disposal of all material encountered in the excavation to the widths and depths shown on the Drawings to permit proper installation of underground utilities.

1. Excavate trenches to the uniform width shown on the Drawings sufficiently wide to provide sufficient space for installation, backfilling, and compaction. Every effort should be made to keep the sides of the trenches firm and undisturbed until backfilling has been completed and consolidated.
2. Trenches shall be excavated with approximately vertical sides between the elevation of the center of the pipe and an elevation one foot above the top of the pipe.

3. Grade bottoms of trenches as indicated for pipe and bedding to establish the indicated slopes and invert elevations, notching under pipe joints to provide solid bearing for the entire body of the pipe, where applicable.
 4. If pipe is to be laid in embankments or other recently filled material, the material shall first be placed to the top of the fill or to a height of at least two feet above the top of the pipe, whichever is the lesser. Particular care shall be taken to ensure maximum consolidation of material under the pipe location. The pipe trench shall be excavated as though in undisturbed material.
 5. Unless otherwise specifically directed or permitted by the Engineer, begin excavation at the low end of sewer and storm lines and proceed up grade.
 6. Perform excavation for force mains and water mains in a logical sequence.
 7. The extent of open excavation shall be controlled by prevailing conditions subject to any limits prescribed by the Engineer.
 8. As the excavation progresses, install such shoring and bracing necessary to prevent caving and sliding and to meet the requirements of the state and OSHA safety standards, as outlined in the appropriate section of this Specification.
- F. Protection of Persons, Property and Utilities:
1. Barricade open excavations occurring as part of this work and post with warning lights in compliance with local and State regulations.
 2. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations. Exercise extreme caution and utilize sheeting, bracing, and whatever other precautionary measures that may be required.
 3. Rules and regulations governing the respective utilities shall be observed in execution of all work. Active utilities and structures shall be adequately protected from damage, and removed or relocated only as indicated or specified. Inactive and abandoned utilities encountered in excavation and grading operations shall be removed, plugged or capped only with written authorization of the utility owner. Report in writing to the Engineer, the locations of such abandoned utilities. Extreme care shall be taken when performing work in the vicinity of existing utility lines, utilizing hand excavation in such areas, as far as practicable.
 4. Repair, or have repaired, all damage to existing utilities, structures, lawns, other public and private property which results from construction operations, at no additional expense to the Owner, to the complete satisfaction of the Engineer, the utility, the property owner, and the Owner.
- G. Stability of Excavations:
1. Slope sides of excavations to comply with all codes and ordinances having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated.
 2. Maintain sides and slopes of excavations in a safe condition until completion of backfilling.
- H. Shoring and Bracing:
1. Provide materials for shoring and bracing, such as sheet piling, uprights, stringers and cross-braces, in good serviceable condition.

2. Provide trench shoring and bracing to comply with local codes and authorities having jurisdiction. Refer to Specification Section 02156.
 3. Maintain shoring and bracing in excavations regardless of time period excavations will be open. Install shoring and bracing as excavation progresses.
- I. Material Storage:
1. Stockpile excavated materials which are satisfactory for use on the work until required for backfill or fill. Place, grade and shape stockpiles for proper drainage and protect with temporary seeding or other acceptable methods to control erosion.
 2. Locate and retain soil materials away from edge of excavations.
 3. Dispose of excess soil material and waste materials as herein specified.
- J. Dewatering:
1. To ensure proper conditions at all times during construction, the Contractor shall provide and maintain ample means and devices (including spare units kept ready for immediate use in case of breakdowns) with which to intercept and/or remove promptly and dispose properly of all water entering trenches and other excavations (including surface and subsurface waters).
 2. Excavations shall be kept dry until the structures, pipes, and appurtenances to be built therein have been completed to such extent that they will not be floated or otherwise damaged. Refer to Specification Section 02401.
- K. Cold Weather Protection:
1. Protect excavation bottoms against freezing when atmospheric temperature is less than 35°F.
 2. No frozen material shall be used as backfill or fill and no backfill shall be placed on frozen material.
- L. Separation of Surface Material:
1. The Contractor shall remove only as much of any existing pavement as is necessary for the prosecution of the work.
 2. Prior to excavation, existing pavement shall be cut where in the opinion of the Engineer it is necessary to prevent damage to the remaining road surface.
 3. Where pavement is removed in large pieces, it shall be disposed of before proceeding with the excavation.
 4. From areas within which excavations are to be made, loam and topsoil shall be carefully removed and separately stored to be used again as directed; or, if the Contractor prefers not to separate surface materials, he shall furnish, as directed, loam and topsoil at least equal in quantity and quality to that excavated.
- M. Dust Control:
1. During the progress of the work, the Contractor shall conduct his operations and maintain the area of his activities, including sweeping and sprinkling of streets as necessary, so as to minimize the creation and dispersion of dust.
 2. If the Engineer decides that it is necessary to use calcium chloride for more effective dust control, the contractor shall furnish and spread the material, as directed.

3.3 BACKFILL AND FILL

A. General:

1. Backfilling shall consist of replacing material removed to permit installation of structures or utilities, as indicated in the Contract Documents.
2. Filling shall consist of placing material in areas to bring them up to grades indicated on the Drawings.
3. The Contractor shall provide and place all necessary backfill and fill material, in layers to the required grade elevations.
4. Backfill excavations as promptly as work permits, but not until completion of the following:
 - a. Inspection, approval, and recording locations of underground utilities.
 - b. Removal of shoring and bracing, and backfilling of voids with satisfactory materials. Temporary sheet piling driven below bottom of structures shall be removed in manner to prevent settlement of the structure or utilities, or cut off and left in place if required.
 - c. Removal of trash and debris.
 - d. Permanent or temporary horizontal bracing is in place on horizontally supported walls.
 - e. Density testing having results meeting requirements specified herein.
5. In general, and unless otherwise indicated, material used for backfill of trenches and excavations around structures shall be suitable excavated material which was removed in the course of making the construction excavation. Unless otherwise specified or allowed by the Engineer the backfill and fill shall be placed in layers not to exceed 8 inches in thickness.
6. All fill and backfill under structures, and adjacent to structures, shall be compacted crushed stone or select fill as specified or as indicated on the Drawings. The fill and backfill materials shall be placed in layers not exceeding 8 inches in thickness.
7. All structures (including manholes) shall be placed on a 6-inch mat of screened stone unless otherwise indicated.
8. Suitable excavated material shall meet the following requirements:
 - a. Free from large clods, silt lumps or balls of clay.
 - b. Free from stones and rock fragments with larger than 12 inch max. dimension.
 - c. Free from organics, peat, etc.
 - d. Free from frozen material.
9. If sufficient suitable excavated material is not available from the excavations, and where indicated on the Drawings, the backfill material shall be select fill or common borrow, unless otherwise indicated, as required and as directed by the Engineer.
10. Do not backfill with, or on, frozen materials.
11. Remove, or otherwise treat as necessary, previously placed material that has frozen prior to placing backfill.
12. Do not mechanically or hand compact material that is, in the opinion of the Engineer, too wet.

13. Do not continue backfilling until the previously placed and new materials have dried sufficiently to permit proper compaction.
 14. The nature of the backfill materials will govern the methods best suited for their placement and compaction. Compaction methods and required percent compaction is covered in Compaction section.
 15. Before compaction, moisten or aerate each layer as necessary to provide a water content necessary to meet the required percentage of maximum dry density for each area classification specified.
 16. Do not allow large masses of backfill material to be dropped into the excavation in such a manner that may damage pipes and structures.
 17. Place material in a manner that will prevent stones and lumps from becoming nested.
 18. Completely fill all voids between stones with fine material.
 19. Do not place backfill on or against new concrete until it has attained sufficient strength to support loads without distortion, cracking, and other damage.
 20. Deposit backfill and fill material evenly on all sides of structures to avoid unequal soil pressures.
 21. Keep stones or rock fragments with a dimension greater than two inches at least one foot away from the pipe or structure during backfilling.
 22. Leave sheeting in place when damage is likely to result from its withdrawal.
 23. Completely fill voids left by the removal of sheeting with screened stone which is compacted thoroughly.
- B. Pipe Bedding, Initial Backfill and Trench Backfill
1. Place bedding and backfill in layers of uniform thickness specified herein, and as shown on the Drawings.
 2. Thoroughly compact each layer by means of a suitable vibrator or mechanical tamper.
 3. Install pipe bedding and initial backfill in layers of uniform thickness not greater than eight (8) inches.
 4. Deposit the remainder of the backfill in uniform layers not greater than eight inches.
 5. Provide underground utility marking tape for new utility trenches as shown on the Drawings. Refer to Section 02650 – Buried Utility Markings.
 6. Where soft silt and clay soils are encountered the trench shall be excavated six inches below the normal bedding and backfilled with 6-inches of compacted sand.
 7. Backfill trenches with concrete where trench excavations pass within 18 inches of column or wall footings and which are carried below the bottom of such footings, or which pass under wall footings. Place concrete to the level of the bottom of adjacent footings.
 8. The following schedule lists the bedding materials for various types of pipe. Refer to the pipe trench detail for dimensional requirements.

BEDDING REQUIREMENTS

DI or Concrete Pipe screened stone or select fill.

PVC or PE Pipe screened stone.

9. The following schedule lists the initial backfill requirements for various types of pipes. Refer to the pipe trench detail for dimensional requirements.

INITIAL BACKFILL REQUIREMENTS

DI or Concrete, Screened stone or select fill
Pipe

PVC or PE Screened stone
Pipe

10. Special bedding and backfill requirements shown on the Drawings supersede requirements of this section.
11. Where pipes or structures pass through or under the impervious core of the lagoon embankments, bedding and backfill material shall consist of the impervious embankment material. Extra care should be given to properly and thoroughly compact the bedding material around the pipe.
- C. Improper Backfill:
1. When excavation and trenches have been improperly backfilled, and when settlement occurs, reopen the excavation to the depth required, as directed by the Engineer.
 2. Refill and compact the excavation or trench with suitable material and restore the surface to the required grade and condition.
 3. Excavation, backfilling, and compacting work performed to correct improper backfilling shall be performed at no additional cost to the Owner.
- D. Ground Surface Preparation:
1. Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placement of fills. Plow, strip, scarify or break-up sloped surface steeper than 1 vertical to 4 horizontal.
 2. When existing ground surface has a density less than that specified under "compaction" for the particular area classification, break up the ground surface, pulverize, moisture-condition to the optimum moisture content, and compact to required depth and percentage of maximum density.

3.4 COMPACTION

A. General:

1. Control soil compaction during construction to provide not less than the minimum percentage of density specified for each area classification.

- B. Percentage of Maximum Density Requirements:
1. Compact soil to not less than the following percentages of maximum dry density determined in accordance with ASTM D1557 as indicated.
 - a. Structures: Compact each layer of backfill or fill material below or adjacent to structures to at least 95% of maximum dry density (ASTM D1557).
 - b. Off Traveled Way Areas: Compact each layer of backfill or fill material to at least 90% of maximum dry density (ASTM D1557).
 - c. Pipes: Compact bedding material and each layer of backfill to at least 90% maximum dry density (ASTM D1557). Where backfilling with excavated material, compact to native field density.
 - d. Embankments: Compact each layer of embankment material to at least 95% of maximum dry density (ASTM D1557).
- C. Moisture Control:
1. Where subgrade or a layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade, or layer of soil material, in quantities controlled to prevent free water appearing on surface during or subsequent to compaction operations.
 2. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.
 3. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing or pulverizing until moisture content is reduced to a satisfactory level.
- D. Embankment Compaction:
1. After each embankment layer has been spread to the required maximum 8-inch thickness and its moisture content has been adjusted as necessary, it shall be rolled with a sufficient number of passes to obtain the required compaction. One pass is defined as the required number of successive trips which by means of sufficient overlap will insure complete coverage and uniform compaction of an entire lift. Additional passes shall not be made until the previous pass has been completed.
 2. When any section of an embankment sinks or weaves excessively under the roller or under hauling units and other equipment, it will be evident that the required degree of compaction is not being obtained and that a reduction in the moisture content is required. If at any place or time such sinking and weaving produces surface cracks which, in the judgment of the Engineer are of such character, amount, or extent to indicate an unfavorable condition, he will recommend operations on that part of the embankment to be suspended until such time as it shall have become sufficiently stabilized. The ideal condition of the embankment is that attained when the entire embankment below the surface being rolled is so firm and hard as to show only the slightest weaving and deflection as the roller passes.
 3. If the moisture content is insufficient to obtain the required compaction, the rolling shall not proceed except with the written approval of the Engineer, and in that event, additional rolling shall be done to obtain the required compaction.

If the moisture content is greater than the limit specified, the material of such water content may be removed and stockpiled for later use or the rolling shall be delayed until such time as the material has dried sufficiently so that the moisture content is within the specified limits. No adjustment in price will be made on account of any operation of the Contractor in removing and stockpiling, or in drying the materials or on account of delays occasioned thereby.

4. If because of insufficient overlap, too much or too little water, or other cause attributable to defective work, the compaction obtained over any area is less than that required, the condition shall be remedied, and if additional rollings are ordered, they will be done at no cost to the Owner. If the material itself is unsatisfactory or if additional rolling or other means fails to produce satisfactory results, the area in question shall be removed down to material of satisfactory density and the removal, replacement, and re-rolling shall be done by the Contractor, without additional compensation.
 5. Material compaction by hand-operated equipment or power-driven tampers shall be spread in layers not more than 6 inches thick. The degree of compaction obtained by these tamping operations shall be equal in every respect to that secured by the rolling operation.
- E. Compaction Methods: The Contractor may select any method of compaction that is suitable to compact the material to the required density.
1. General: Whatever method of compacting backfill is used, care shall be taken that stones and lumps shall not become nested and that all voids between stones shall be completely filled with fine material. All voids left by the removal of sheeting shall be completely backfilled with suitable materials and thoroughly compacted.
 2. Tamping or Rolling: If the material is to be compacted by tamping or rolling, the material shall be deposited and spread in uniform, parallel layers not exceeding the uncompacted thicknesses specified. Before the next layer is placed, each layer shall be tamped as required so as to obtain a thoroughly compacted mass. Care shall be taken that the material close to the excavation side slopes, as well as in all other portions of the fill area, is thoroughly compacted. When the excavation width and the depth to which backfill has been placed are sufficient to make it feasible, and it can be done effectively and without damage to the pipe or structure, backfill may, on approval, be compacted by the use of suitable rollers, tractors, or similar powered equipment instead of by tamping. For compaction by tamping or rolling, the rate at which backfilling material is deposited shall not exceed that permitted by the facilities for its spreading, leveling, and compacting as furnished by the Contractor.
- F. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, re-shape, and compact to required density prior to further construction.

3.5 GRADING

A. General:

1. Grading shall consist of that work necessary to bring all areas to the final grades.

2. Uniformly grade areas within limits of work requiring grading, including adjacent transition areas.
 3. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades.
- B. Grading Outside Building Lines:
1. Grade areas adjacent to building to drain away from structures and to prevent ponding.
 2. Grade surfaces to be free from irregular surface changes, and as follows:
 - a. Lawn or Unpaved Areas: Finish grade areas to receive topsoil to within not more than 1" above or below the required subgrade elevations.
- C. Compaction:
1. After grading, compact subgrade surfaces to the depth and percentage of maximum density for each area classification.
- D. Protection of Graded Areas:
1. Protect newly graded areas from traffic and erosion. Keep free of trash and debris.
 2. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.

END OF SECTION

SECTION 02260
GEOTEXTILE FABRIC

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work Included:

1. Furnish all materials and install geotextile fabric of the types, dimensions and in the location(s) shown on the Drawings and specified herein.

1.2 QUALITY ASSURANCE

- A. A competent laboratory must be maintained by the manufacturer of the fabric at the point of manufacture to ensure quality control.
- B. During all periods of shipment and storage, the fabric shall be wrapped in a heavy duty protective covering to protect the fabric from direct sunlight, ultraviolet rays, temperatures greater than 140°F, mud, dirt, dust and debris.

1.3 SUBMITTALS

- A. Contractor shall submit to the Engineer, product data for geotextile fabric prior to use on site.
- B. Manufacturer shall furnish certified test reports with each shipment of material attesting that the fabric meets the requirements of this Specification.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Woven Geotextile Fabric: Woven Geotextile for use shall be formed in widths of not less than six (6) feet and shall meet the requirements of Table 2.

Table 2

<u>Geotextile Mechanical Property</u>	<u>Test Method</u>	<u>Minimum Permissible Value</u>
Grab Tensile Strength (both directions)	ASTM 4632	315 pounds
Grab Elongation	ASTM D4632	15 percent
Trapezoid Tear Strength	ASTM D4533	120 pounds
CBR Puncture Strength	ASTM D6241	900 pounds
Apparent Opening Size (AOS)	ASTM D4751	U.S. Std. Sieve #40

The geotextile shall meet or exceed the "typical" values stated above as determined by the most recent test methods specified above.

- B. For geotextiles to be used with Silt Fence applications, refer to 02270 Temporary Erosion Control.

PART 3 - EXECUTION

Install geotextile fabric as shown on the drawings or as directed in appropriate specifications in this division or in accordance with manufacturer's instructions or as directed by the Engineer.

END OF SECTION

SECTION 02270TEMPORARY EROSION CONTROLPART 1 - GENERAL1.1 DESCRIPTION

A. Work Included:

1. The work under this section shall include provision of all labor, equipment, materials and maintenance of temporary erosion control devices, as specified herein, as shown on the Drawings and as directed by the Engineer.
2. Erosion control measures shall be provided as necessary to correct conditions that develop prior to the completion of permanent erosion control devices, or as required to control erosion that occurs during normal construction operations.
3. Construction operations shall comply with all federal, state and local regulations pertaining to erosion control.
4. After awarding of or after being awarded the Contract, prior to commencement of construction activities, the Contractor will meet with the Engineer to discuss erosion control requirements and develop a mutual understanding relative to details of erosion control.

B. Related Work Specified Elsewhere:

1. Site work is specified in appropriate sections of this Division.

C. Design Criteria:

1. Conduct all construction in a manner and sequence that causes the least practical disturbance of the physical environment.
2. Stabilize disturbed earth surfaces in the shortest time and employ such temporary erosion control devices, as may be necessary, until such time as adequate soil stabilization has been achieved.

1.2 SUBMITTALS

- A. The Contractor shall furnish the Engineer, in writing, his work plan giving proposed locations for storage of topsoil and excavated material, before beginning construction. A schedule of work shall accompany the work plan. Acceptance of this plan will not relieve the Contractor of his responsibility for completion of the work as specified.

PART 2 - PRODUCTS2.1 MATERIALS

A. Baled Hay:

1. At least 14" by 18" by 30" securely tied to form a firm bale, staked as necessary to hold the bale in place.

B. Sand Bags:

1. Heavy cloth bags of approximately one cubic foot capacity filled with sand or gravel.

- C. Mulches:
 - 1. Loose hay, straw, peat moss, wood chips, bark mulch, crushed stone, wood excelsior, or wood fiber cellulose.
 - 2. Type and use shall be as specified by the "Maine Erosion and Sedimentation Control Best Management Practices" prepared by the Maine DEP, herein after referred to as the BMP.
- D. Mats and Nettings:
 - 1. Twisted Craft paper, yarn, jute, excelsior wood fiber mats, glass fiber and plastic film.
 - 2. Type and use shall be as specified in the BMP.
- E. Permanent Seed:
 - 1. Conservation mix appropriate to the predominant soil conditions as specified in the BMP and subject to approval by the Engineer.
- F. Temporary Seeding:
 - 1. Use species appropriate for soil conditions and season as specified in the BMP and subject to approval by the Engineer.
- G. Water:
 - 1. The Contractor shall provide water and equipment to control dust, as directed by the Engineer.
- H. Silt Fence:
 - 1. Silt Fence shall be one of the commercially available brands, meeting the following requirements:

<u>Geotextile Mechanical Property</u>	<u>Test Method</u>	<u>Minimum Permissible Value</u>
Grab Tensile Strength (both directions)	ASTM D-4632	124 pounds
Puncture Strength	ASTM D-4833	60 pounds
Apparent Opening Size	ASTM D-4751	#30
Flow Rate	ASTM D-4491	8 gal/min/ft ²

2.2 CONSTRUCTION REQUIREMENTS

- A. Temporary Erosion Checks:
 - 1. Temporary erosion checks shall be constructed in ditches and other locations as necessary.
 - 2. Baled hay, sand bags or siltation fence may be used in an arrangement to fit local conditions.
- B. Temporary Berms:
 - 1. Temporary barriers shall be constructed along the toe of embankments when necessary to prevent erosion and sedimentation.

- C. Temporary Seeding:
1. Areas to remain exposed for a time exceeding 3 weeks shall receive temporary seeding as indicated below:
- | <u>Season</u> | <u>Seed</u> | <u>Rate</u> |
|---|----------------------|--------------|
| Summer (5/15 - 8/15) | Sudangrass | 40 lbs/acre |
| Late Summer/Early Fall
(8/15 - 9/15) | Oats | 80 lbs/acre |
| Fall (9/15 - 10/1) | Annual Ryegrass | 40 lbs/acre |
| Winter (10/1 - 4/1) | Winter Rye | 112 lbs/acre |
| Spring (4/1 - 7/1) | Mulch w/Dormant Seed | 80 lbs/acre* |
| | Oats | 80 lbs/acre |
| | Annual Ryegrass | 40 lbs/acre |
- * seed rate only
- D. Silt Fence shall be supported by posts and installed per the manufacturer's recommendations.
- E. Mulch All Areas Receiving Seeding:
1. Use either wood cellulose fiber mulch (750 lbs/acre); or straw mulch with chemical tack (as per manufacturer's specifications). Wetting for small areas may be permitted. Biodegradable netting is recommended in areas to be exposed to drainage flow.
- F. Erosion control matting for slopes and ditches shall be anchored with pegs and/or staples per manufacturer's recommendations. Contractor shall provide matting along the flowline of all ditches and swales having a longitudinal slope in excess of 0.01 ft/ft, and on all slopes in excess of 3(H) to 1(V).

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Temporary Erosion Checks:
1. Temporary erosion checks shall be constructed in ditches and at other locations designated by the Engineer. The Engineer may modify the Contractor's arrangement of silt fences, bales and bags to fit local conditions.
 2. Baled hay, silt fences, or sandbags, or some combination, may be used in other areas, as necessary, to inhibit soil erosion.
 3. Siltation fence shall be located and installed as shown on plans or as required to comply with all Federal, State and Local Regulations.
 4. Sedimentation ponds shall be sited and constructed to the grades and dimensions as shown on the Drawings and will include drainage pipe and an emergency spillway.
- B. Erosion control matting for slopes and ditches shall be installed where indicated on the Drawings and as required to stabilize the soil until permanent vegetative stabilization is established.
- C. Maintenance:
1. Erosion control features shall be installed prior to excavation wherever appropriate. Temporary erosion control features shall remain in place and shall be maintained until a satisfactory growth of grass is established. The Contractor shall be responsible for maintaining erosion control features throughout the life

of the construction contract. Maintenance will include periodic inspections by the Owner or Engineer for effectiveness of location, installation and condition with corrective action taken by the Contractor, as appropriate.

D. Removing and Disposing of Materials:

1. When no longer needed, material and devices for temporary erosion control shall be removed and disposed of upon approval by Engineer.
2. When removed, such devices may be reused in other locations, provided they are in good condition and suitable to perform the erosion control for which they are intended.
3. When dispersed over adjacent areas, the material shall be scattered to the extent that it causes no unsightly conditions nor creates future maintenance problems.
4. Sedimentation basins, if no longer required, will be filled in, the pipe removed, the surface loamed and grass cover shall be established.

END OF SECTION

SECTION 02431CATCH BASINS, GRATES AND FRAMESPART 1 - GENERAL1.1 DESCRIPTION

- A. Work Included: Construct catch basins, grates, frames and brick masonry in conformance with the dimensions and locations shown on the Drawings.
- B. Related Work Specified Elsewhere: (Where applicable)
 - 1. Pipe, trench excavation and backfill, paving and dewatering are specified in the appropriate Sections in this Division.

1.2 QUALITY ASSURANCE

- A. Precast Catch Basin Base, Barrel and Top Sections:
 - 1. Conform to ASTM C478-97 except as modified herein, on the Drawings, or as directed by the Engineer.
 - 2. Minimum strength of 4,000 psi at 28 days
 - 3. Testing:
 - a. Determine concrete strength by tests on 6 inch by 12 inch vibrated test cylinders cured in the same manner as the bases, barrels and tops.
 - b. Have tests conducted at manufacturer's plant or at an approved testing laboratory.
 - c. Have not less than 2 tests made for each 100 vertical feet of precast catch basin sections.
- B. Frames and Covers:
 - 1. Acceptable Manufacturers:
 - a. EJ Group, Inc.
 - b. Neenah Foundry Company
 - c. Or equivalent.
- C. Masonry:
 - 1. Brick: Shall comply with the ASTM Standard Specifications for Sewer Brick (made from clay or shale), Designation C32, for Grade SS, hard brick.
 - 2. Cement: ASTM C-150.
 - 3. Hydrated Lime: ASTM C-207.
 - 4. Sand: ASTM C144.

1.3 SUBMITTALS TO THE ENGINEER

- A. Submit shop Drawings and manufacturer's literature in conformance with the Standard General Conditions of the Construction Contract.
- B. Bases, Barrel Sections and Tops: Submit test results and receive approval from the Engineer prior to delivery to the site.

PART 2 - PRODUCTS2.1 PRECAST CATCH BASIN SECTIONS

- A. Dimensions, as shown on the Drawings.

- B. Use flat tops or eccentric cones as appropriate. Exterior face of cone sections shall not flare out beyond the vertical.
- C. Joints: Bell-and-spigot or tongue-and-groove formed on machine rings to insure accurate joint surfaces.
- D. Constructed to support an HS-20 wheel loading.
- E. Openings:
 - 1. Provide openings in the risers to receive pipes entering the catch basin of the types and materials approved by the Engineer.
 - 2. Make openings at the manufacturing plant or cut openings in the field.
 - 3. Size: To provide a uniform annular space between the outside wall of pipe and the riser.
 - 4. Location: To permit setting of the entering pipes at the correct elevations.
- F. Joints:
 - 1. Joint gaskets to be flexible self seating butyl rubber joint sealant installed according to manufacturer's recommendations. For cold weather applications, use adhesive with joint sealant as recommended by manufacturer.
 - 2. Acceptable Materials:
 - a. Kent-Seal No. 2
 - b. Ram-Nek
 - c. Or equivalent.
 - 3. Joints between precast sections shall conform to related standards and manufacturer's instructions.

2.2 FRAMES AND GRATES

- A. All essential details of design shall conform to the Drawings. Standard castings differing in non-essential details may be approved by the Engineer.
- B. All frames and grates shall be made of cast iron and shall have machined bearing surfaces to prevent rocking under traffic.
- C. Grate castings will be smooth with no sharp edges.
- D. Constructed to support an HS-20 wheel loading.

2.3 MASONRY

- A. Brick:
 - 1. Sound, hard, uniformly burned, regular and uniform in shape and size, compact texture, and satisfactory to the Engineer.
 - 2. Immediately remove rejected brick from the work.
- B. Mortar:
 - 1. Composition (by volume):
 - a. 1 part portland cement.
 - b. 1/2 part hydrated lime.
 - c. 4-1/2 parts sand.
 - 2. The proportion of cement to lime may vary from 1:1/4 for hard brick to 1:3/4 for softer brick, but in no case shall the volume of sand exceed 3 times the sum of the volume of cement and lime.
- C. Cement:
 - 1. Shall be Type II portland cement.

- D. Hydrated Lime:
 - 1. Shall be Type S.
- E. Sand:
 - 1. Shall consist of inert natural sand.
- F. Grading:

<u>Sieve</u>	<u>Percent Passing</u>
No. 4	100
No. 8	95-100
No. 16	70-100
No. 30	40-75
No. 50	10-35
No. 100	2-15
No. 200	0-5

PART 3 - EXECUTION

3.1 PERFORMANCE

- A. Precast Catch Basin Sections:
 - 1. Perform jointing in accordance with manufacturer's recommendations and as approved by the Engineer.
 - 2. Install barrels and tops level and plumb.
 - 3. Make all joints watertight.
 - 4. Solidly fill annular spaces around pipes entering the catch basin with non-shrink grout or other material approved by the Engineer.
 - 5. Cut openings (as required) carefully to prevent damage to barrel sections and tops. Damaged barrel sections and tops shall be replaced by the Contractor at no additional expense to the Owner.
- B. Pipe Connections to Catch Basins: Connect pipes to catch basins with joint design and materials approved by the Engineer.
- C. Masonry:
 - 1. Laying Brick:
 - a. Use only clean bricks in brickwork for catch basins.
 - b. Moisten the brick by suitable means until they are neither so dry as to absorb water from the mortar or so wet as to be slippery when laid.
 - c. Lay each brick in a full bed and joint of mortar without requiring subsequent grouting, flushing, or filling, and thoroughly bond as directed.
 - d. Construct all joints in a neat workmanlike manner, construct the brick surfaces inside the manholes so they are smooth with no mortar extending beyond the bricks and no voids in the joints. Maximum mortar joints shall be 1/2 inch.
 - 2. Curing:
 - a. Protect brick masonry from drying too rapidly by using burlaps which are kept moist, or by other approved means.
 - b. Protect brick masonry from the weather and frost as required.

- D. Frames and Grates:
 - 1. Set all frames in a full bed of mortar, true to grade and concentric with the catch basin opening.
 - 2. Completely fill all voids beneath the bottom flange to make a watertight fit.
 - 3. Place a ring of mortar at least one inch thick around the outside of the bottom flange, extending to the outer edge of the catch basin all around its circumference.
 - 4. Clean the frame seats before setting the covers in place.
- E. Bedding and Backfilling:
 - 1. Bedding material of catch basin shall be 6 inches of screened stone (see Section 02200).
 - 2. Backfill 18 inches all around catch basin with gravel borrow.

END OF SECTION

SECTION 02435CULVERTS AND STORM DRAINSPART 1 - GENERAL1.1 DESCRIPTION

- A. Work Included:
 - 1. Provide and install culvert or storm drain pipe and sections of the type(s), size(s) and in the location(s) shown on the Drawings and as specified herein.
- B. Related Work Specified Elsewhere:
 - 1. Excavation and backfill, dewatering, catch basins, pavement, borrow and bedding material are specified in the appropriate sections in this division.

1.2 SUBMITTALS

- A. Submit, in duplicate, sworn certificates of inspections and tests performed at the location of manufacturers.
- B. Submit shop drawings in accordance with the General Conditions of the Construction Contract.

1.3 DELIVERY, STORAGE AND HANDLING

- A. Exercise care when handling pipe to prevent damage of any nature to pipe and finish.
- B. Immediately remove damaged materials and replace at no additional cost to the Owner.
- C. Store materials above ground on platforms, skids or other adequate supports.

1.4 FIELD QUALITY CONTROL

- A. Acceptance will be on the basis of tests of materials and inspection of the complete product.
- B. Inspection may be made at the place of manufacture or on the construction site after delivery, or both, and the pipe shall be subject to rejection at any time due to failure to meet all of the specification requirements, even though sample pipe units may have been accepted as satisfactory at the place of manufacture.
- C. Immediately remove from the project site all rejected pipe.

PART 2 - PRODUCTS2.1 MATERIALS

- A. Pipe shall be one of the following as specified on the Drawings or at the option of the Contractor and with the approval of the Engineer.
 - 1. Corrugated Polyethylene (PE) Pipe
- B. Materials for pipes shall conform to Standards listed as follows:
 - 1. Corrugated polyethylene pipe (smooth interior). This pipe and fittings shall have a smooth interior and corrugated exterior and conform to the requirements of AASHTO M252 and AASHTO M294 or ASTM F2648. The pipe joint system shall be watertight (WT) and shall meet or exceed the current ASTM

D3212 Lab Test Requirements and the current ASTM F1417 Watertight Field Test Requirements. Coiled pipe will not be accepted.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine areas to receive piping for the following:
 - 1. Obstructions that adversely affect the installation and quality of the work.
 - 2. Deviations beyond allowable tolerances for clearances.
- B. Examine pipe and fittings before installation to assure no defective materials are incorporated.
- C. Start the work only when conditions are satisfactory.
- D. Remove and replace all defective materials at no additional cost to the Owner.

3.2 INSTALLATION

- A. Do not install pipe, nor backfill, between December 15 and April 1 without the written permission of the Engineer.
- B. Begin laying the pipe at the downstream end.
- C. Place metal pipe with the longitudinal laps of seams at the sides and the outside laps of circumferential joints pointing up grade.
- D. Lay paved or partially lined pipe with the lining on the bottom.
- E. Join flexible pipe sections and metal end sections by coupling bands.
- F. Assemble the plates for structural plate arches according to the manufacturer's assembly instructions and as shown on the Drawings.

END OF SECTION

SECTION 02480LANDSCAPINGPART 1 - GENERAL1.1 DESCRIPTIONA. Work Included:

1. Perform the following items of work as required to complete the work of this section as shown on the Drawings and as specified hereunder:
 - a. Spread stockpiled topsoil and furnish and spread any additional topsoil, required to meet the requirements of this section.
 - b. Furnish and sow grass seed/or sod in all areas within the work area to the extent indicated on the Drawings, and in existing grass areas which have been damaged or disturbed by the work of this Contract.
 - c. Furnish and install plant materials in all areas within the work area as indicated on the Drawings.
 - d. Provide maintenance services as specified hereunder.
- B. Examine all other sections of the Specifications and all Drawings for the relationship of the work under this section and the work of other trades. Cooperate with all trades in performing the work under this section.

1.2 SUBMITTALS AND TESTINGA. Seed:

1. Furnish the Engineer with duplicate signed copies of a statement from the vendor, certifying that each container of seed delivered to the project site is fully labeled in accordance with the Federal Seed Act and is at least equal to the specification requirements.
2. This certification shall appear in, or with, all copies of invoices for the seed.
3. Each lot of seed shall be subject to sampling and testing, at the discretion of the Engineer, in accordance with the latest rules and regulations under the Federal Seed Act.

1.3 DELIVERY, STORAGE AND HANDLINGA. Seed:

1. Furnish all seed in sealed standard containers, unless exception is granted in writing by the Engineer.
2. Containers shall be labeled in accordance with the United States Department of Agriculture's rules and regulations under the Federal Seed Act in effect at the time of purchase.

B. Fertilizer:

1. Furnish all fertilizer in unopened original containers.
2. Containers shall be labeled with the manufacturer's statement of analysis.

1.4 JOB CONDITIONS

A. Topsoil:

1. Do not place or spread topsoil when the subgrade is frozen, excessively wet or dry, or in any condition otherwise detrimental, in the opinion of the Engineer, to the proposed planting or to proper grading.

B. Seeding and Planting:

1. Work Seasons - Perform seeding and planting work only between the dates of 1 May to 20 June and 15 August to 1 October, except as otherwise directed in writing by the Engineer.
2. Weather Conditions:
 - a. Do not perform seeding work when weather conditions are such that beneficial results are not likely to be obtained, such as drought, excessive moisture, or high winds.
 - b. Stop the seeding work when, in the opinion of the Engineer, weather conditions are not favorable.
 - c. Resume the work only when, in the opinion of the Engineer, conditions become favorable, or when approved alternate or corrective measures and procedures are placed into effect.

PART 2 - PRODUCTS

2.1 MATERIALS FOR GRADING AND SEEDING

A. Topsoil:

1. Fertile, friable, natural topsoil typical of the locality, without admixture of subsoil, refuse or other foreign materials and obtained from a well-drained site. Mixture of sand, silt, and clay particles in equal proportions.
2. Free of stumps, roots, heavy or stiff clay, stones larger than 1-inch in diameter, lumps, coarse sand, weeds, sticks, brush or other deleterious matter.
3. Not less than 4 percent nor more than 20 percent organic matter.
4. Topsoil depth shall be 4-inches, unless otherwise indicated.

B. Fertilizer:

1. Fertilizer shall be used to counteract soil deficiencies as indicated by the soil analysis and as approved by the Engineer. It should be a complete fertilizer, a standard product complying with the state and federal fertilizer laws, part of the elements of which are derived from organic sources, containing the following percentages by weight:

Nitrogen	10N - Minimum 75 percent organic
Phosphorus	6 P -
Potash	4 K -

The fertilizer shall be delivered to the site in the original unopened containers bearing the manufacturer's guaranteed statement of analysis, or a manufacturer's certificate of compliance covering analysis shall be furnished to the Engineer. The fertilizer shall be spread at the rate of 17 to 20 lbs/1000 sq-ft.

- C. Lime:
 - 1. Provide lime which is ground limestone containing not less than 85 percent of total carbonate and of such fineness that 90 percent will pass a No. 20 sieve and 50 percent will pass a No. 100 sieve.
 - 2. Coarser materials will be acceptable provided the specified rates of application are increased proportionately on the basis of quantities passing a No. 100 sieve. No additional payment will be made to the Contractor for the increased quantity.
- D. Soil Enrichers:
 - 1. They shall be one of the following materials:
 - a. Peat Moss - Finely shredded and consisting of not less than 90 percent organic matter.
 - b. Sawdust - rotten.
 - 2. They shall be natural and suited to horticultural use. They shall not contain lumps, roots or other foreign matter over two inches in diameter. They shall be free from noxious weeds, seeds and other elements harmful to lawns. They shall be subject to inspection approval by the Engineer at the source and upon delivery and shall contain not more than 35 percent moisture by weight at the time of incorporation into the soil.
- E. Mulch for Hydro Seeding:
 - 1. Mulch material shall meet the following requirements:
 - a. Hay or straw - Hay or straw mulch shall consist of long fibered hay or straw, reasonably free from noxious weeds or other undesirable material. No material shall be used which is so wet, decayed, or compacted as to inhibit even and uniform spreading. No chopped hay, grass clippings or other short fibered material shall be used unless directed.
 - b. Wood cellulose fiber - Wood cellulose fiber mulch shall consist of natural wood cellulose fiber containing no materials which will inhibit seed germination or plant growth. Sufficient non-toxic water soluble green dye shall be added to provide a definite color contrast to the ground surface to aid in even distribution. Wood fiber mulch shall be supplied in uniform packages not exceeding 100 pounds each. Each package shall be marked to show the air dry weight.
- F. Mulch Binder for Hydroseeding:
 - 1. Material for mulch binder shall be emulsified asphalt.
 - a. Emulsified asphalt mulch binder shall be a type acceptable to the Engineer and may be diluted with water to assure even distribution.
- G. Grass Seed Mixture
 - 1. Fresh, clean, new crop seed. Seed may be mixed by an approved method on the site, or may be mixed by the dealer. If the seed is mixed on the site, each variety shall be delivered in the original containers which shall bear the dealer's guaranteed statement of the composition of the mixture and the percentage of purity of each variety. The Dealers Guarantee Statement shall be delivered to the Engineer.

2. Grass seed shall be composed of the following varieties which shall be mixed in the proportions and shall test to 80 percent minimum purity, and 80 percent germination.

Percent Proportion by Weight:

- a. MDOT Park Mixture:
 - i. Creeping red fescue 50 percent
 - ii. Kentucky Bluegrass 30 percent
 - iii. Annual Rye Grass 20 percent

H. Sod:

1. Preferable two-year growth, at least 85 percent weed-free, solid landscaping sod composed of perennial fescues, Kentucky bluegrasses. Submit one 12 by 12-inch piece of sod, with source location, for approval of the Engineer, before ordering sod for the work.

2.2 MATERIALS FOR PLANTING

A. Water:

1. The Contractor shall arrange and pay for water required for the planting. Water shall be clean and suitable for domestic consumption.

B. Manure:

1. Manure shall be well rotted, unleached, horse or cow manure or a combination of both. It shall be free from any chemicals used to hasten decomposition artificially, or any other injurious substance.
2. Manure shall be at least nine months old and not more than two years old, free from sawdust, hay, tanbark or wood shavings, or refuse of any kind. Manure shall consist of not more than 25 percent straw or other acceptable material.

C. Stakes shall be white cedar or approved equal, of size and length as shown on the Drawings.

D. Hose for guying shall be new black or green two-ply fiber garden hose, not less than 1/2 inch inside diameter. Seconds rejected by the factory are acceptable.

E. Burlap for wrapping shall be first quality burlap at least eight ounces in weight and six inches in width.

F. Wire for tree guys shall be galvanized annealed steel wire, No. 14 gauge, as detailed.

G. Tree paint shall be waterproof, adhesive and elastic, free from kerosene, coal tar creosote or any other material injurious to the life of the trees. Tree paint shall contain an antiseptic.

H. Pine bark mulch shall be clean, shredded, free of weeds, seeds, insects and extraneous materials.

I. Plant Materials:

1. Plant materials shall conform to American Standard for Nursery Stock (April 15, 1951), sponsored by the American Association of Nurserymen, Inc., Standard Plant Names (1942) shall be the authority for plant names. Plant materials shall be of standard quality true to name and type and first-class representatives of their species or variety.
2. All plants shall conform to the varieties specified on the Contract Drawings. No substitutions will be permitted unless approved in writing by the Engineer. Each bundle of plants and all separate plants shall be properly identified by

- name on legible, waterproof labels, securely attached thereto before delivery to the site.
3. Plant materials shall be free of damage as a result of handling and transportation.
 4. All plant material shall be certified by the supplier to be free of disease and infestation.
 5. All plants shall be subject to approval at their source prior to shipment. The Contractor shall accompany the Engineer to inspect the materials and shall request such inspection at least one week in advance.
 6. All plants shall be typical of their species or variety and shall have a normal habit of growth. They shall be first quality, sound, healthy, vigorous, well branched and densely foliated. They shall be free of disease, insect pests, eggs or larvae, and shall have healthy, well-furnished root systems. Plants lacking compactness or proper proportions, and plants injured by too close planting in nursery rows will not be accepted.
 7. All plants shall conform to the measurements specified on the Contract Drawings. Measurements specified shall be the minimum acceptable for each variety. Plants that meet these requirements specified, but do not possess a normal balance between height and spread, will not be accepted. Plants shall not be pruned prior to delivery.
 8. All plants and all tree trunks shall be measured when the branches are in their normal position. Dimensions noted for height and spread refer to the main body of the plant, and not from branch tip to branch tip. Height is defined as the approximate dimension from ground to top of last year's growth. Top spread is defined as the approximate spread to top or principal width. The height of tree trunks need not be specified if the required height can be obtained by pruning the lower branches without leaving unsightly scars or otherwise damaging the trunk. Shade trees shall be free of branches up to five feet, with a single leader, well branched and reasonably straight stems. No trees which have had their leaders cut, or are so damaged that cutting is necessary, will be accepted. Trees which had their tops cut off some years previous will only be acceptable if the scar has not decayed. No trees with cut off tops will be accepted unless corrective surgery has been performed to affect a complete healing of the stem.
 9. Caliper of trees shall be measured one foot above ground.
 10. Plants larger in size than those specified in the Contract Drawings may be provided if approved by the Owner or the Engineer, but the use of larger plants shall not increase the cost of the Contract. If the use of larger plants is approved, the ball of earth or spread of roots shall be increased in proportion to the size of the plant. If plants required to be bare rooted are furnished in sizes greater than specified, they shall be balled and burlapped.
 11. All trees shall have straight trunks with single leader intact. There shall be no abrasion of the bark and no fresh cuts of limbs over 1-1/4 inch which have not completely callused over.
 12. All plants shall be grown in nurseries and cultivated, sprayed, pruned, and fertilized annually in accordance with good horticultural practice. All plants shall have been grown under climatic conditions similar to those in the locality

of the project or shall have been acclimated to the conditions of the locality for at least two years.

13. All plants shall be freshly dug; neither heeled in plants nor plants from cold storage will be accepted. All plants shall have been transplanted or root pruned at least once in the past three years. Balled and burlapped plants shall come from soil which will hold a firm ball.
14. All plants shall be handled so that the roots are adequately protected at all times. During shipment all plants shall be properly protected by a tarpaulin or other suitable covering.
15. No plants shall be so bound with rope or wire at any time so as to damage the bark, break branches, or destroy its natural shape. All balled and burlapped plants which cannot be planted immediately on delivery shall be set on the ground and well protected with soil or other acceptable material including watering. Until planted, all material shall be properly maintained.

2.3 STORAGE OF MATERIAL

- A. Materials such as fertilizers, ground limestone, etc. shall be stored in weatherproof storage areas and in such a manner that their effectiveness will not be impaired.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Equipment:
 1. Provide all equipment necessary for the proper preparation of the ground surface and for the handling and placing of all required materials.
 2. Demonstrate to the Engineer that the equipment will apply materials at the specified rates.
- B. Subsoil Preparation:
 1. Before spreading topsoil, the subgrade shall be raked by approved means. Remove all stones greater than four inches and all debris or rubbish to a depth of six inches. Such materials shall be removed from the site.
- C. Screening:
 1. All topsoil shall be screened clear of all stones greater than one inch, sticks, plants, and all other foreign materials before being spread.
 2. During the screening of topsoil, commercial fertilizers and lime as required by the soil analysis shall be mixed with the topsoil so that they are evenly distributed throughout the screened topsoil.
 3. At the completion of this operation, topsoil is referred to as improved topsoil for the purpose of this specification and the Drawings.

3.2 SEED AND SOD BED PREPARATION

- A. Spread improved topsoil uniformly over subgrade and all areas where the existing grade has been changed and areas disturbed by construction operations except for those areas indicated on the site plans to be paved. No subsoil, topsoil, or improved topsoil shall be handled in any way when in a wet or frozen condition.
- B. Fine rake surface to receive seed or sod.
- C. After natural settlement and a light rolling, the completed work shall conform to the

lines, grades, pitches, and spot elevations shown on the plans.

- D. Seeding may be done immediately thereafter, provided the seed bed has remained in a good friable condition and has not become wet.

3.3 SEASON

- A. Do all seeding work within the dates herein specified.
- B. If special conditions exist which may warrant a variance in the above dates, submit a written request to the Engineer stating the conditions and proposed variance. Permission for the variance will be given if, in the opinion of the Engineer, the variance is warranted.
- C. If seeding is authorized between May 15 and August 15, annual rye shall be sown separately in addition to the specified seed mix. Sow at the rate of six to eight pounds per 1000 square feet.

3.4 SEEDING AND SODDING

- A. Immediately before seeding and sodding, the ground shall be restored as necessary to a loose friable condition by discing or other approved method to a depth of not less than two inches. The surface shall be cleared of all debris and of all stones one inch or more in diameter.
- B. Seed all areas to be seeded with the specified grass seed, sowing evenly with an approved mechanical seeder at the rate specified in the seed mix schedule. Sow one half the seed in one direction and the other half at right angles to the first seeding. Cultipacker or approved similar equipment may be used to cover the seed and to firm the seed bed in one operation. In areas inaccessible to Cultipacker, the seeded ground shall be lightly raked and rolled in two directions with a water ballast roller. Extreme care shall be taken during seeding and raking to insure that no change shall occur in the finished grades and that the seed is not raked from one spot to another.
- C. The hydraulic spray method of sowing seed may be used where approved by the Engineer. This work shall be done with an approved machine operated by a competent crew. Seed and fertilizing materials shall be mixed with water in the tank of the machine and kept thoroughly agitated so the materials are uniformly mixed and suspended in the water at all times during operation. The spraying equipment must be designed and operated to distribute seed and fertilizing materials evenly and uniformly on the designated areas at the required rates. If the Engineer finds the application uneven or otherwise unsatisfactory, he may require the hydraulic spray method to be abandoned and the balance of the work done as specified herein. Seed must be lightly raked into the surface of the soil unless seeding is to be followed within 24 hours by mulching.
 - 1. Applying Mulch - At the option of the Contractor, any of the following types of mulch material may be applied.
 - a. Hay or straw mulch shall be spread evenly and uniformly over the designated areas. Unless other directed, mulch shall be applied to a thickness of 1". Too heavy application of mulch shall be avoided and lumps and thick spots shall be thinned. Unless otherwise authorized, the mulch shall be anchored in place by uniformly applying an asphalt mulch binder. Application of a concentrated stream of mulch binder will not be allowed. Asphalt mulch binder may be omitted when authorized by the

Engineer and when there is a danger of the asphalt contaminating the surface of nearby structures, houses, vehicles, or other objects. Other methods of anchoring mulch may be used subject to the approval of the Engineer.

- b. Wood fiber mulch shall be applied as a water-borne slurry. The wood fiber and water shall be thoroughly mixed and sprayed on the area to be covered so as to form a uniform mat of mulch at the rate of not less than 30 pounds per 1,000 square feet unit of area. Wood fiber mulch may be mixed with the proper quantities of seed, fertilizer and lime as required in this section, or may be applied separately after seeding has been carried out. In the latter case, it must be applied within 24 hours after seeding.
2. Maintenance - The Contractor shall maintain the mulch by repairing any damaged mulch and by correcting any shifting of the mulch due to wind, water or other causes, until an acceptable growth of grass has been achieved, regardless of the acceptance status of the seeding. He shall supply additional mulch necessary as a result of damage or seed failure. Repairs to mulched areas and furnishing of additional mulch shall be incidental to this item. If wood fiber is used, any reseeded will require additional wood fiber mulch.
- D. Do not perform broadcast seeding work during windy weather.
- E. Compacting:
 1. Compact the entire area immediately after the seeding operations have been completed.
 2. Compact by means of a cultipacker, roller, or other equipment approved by the Engineer weighing 60 to 90 pounds per linear foot of roller.
 3. If the soil is of such type that a smooth or corrugated roller cannot be operated satisfactorily, use a pneumatic roller (not wobbly wheel) that has tires of sufficient size to obtain complete coverage of the soil.
 4. When using a cultipacker or similar equipment, perform the final rolling at right angles to the prevailing slopes to prevent water erosion, or at right angles to the prevailing wind to prevent dust.
- F. Thoroughly wet soil surfaces before sodding. Place sod pieces tightly together, tamping gently into position as the work progresses. After each area of sodding is completed, roll the entire surface in two directions with a water ballast roller, and soak the newly sodded areas.
- G. After the grass has started, all of the areas greater than five square feet which fail to show a uniform stand of grass for any reason whatsoever shall be reseeded repeatedly until all areas are covered with a satisfactory growth of grass.
- H. At the time of the first cutting, set mower blades two inches high. All lawns shall receive at least two mowings before acceptance. Schedule for mowing shall be coordinated with the Engineer.
- I. Maintenance shall also include all temporary protection fences, barriers and signs and all other work incidental to proper maintenance.
- J. Maintain grass areas until a full stand of grass is indicated, which will be a minimum of 45 days after all seeding or sodding work is completed, and shall not necessarily relate to Substantial Completion of the General Contract.
- K. Protection and maintenance of grass areas shall consist of watering, weeding, cutting,

repair of any erosion and reseeding as necessary to establish a uniform stand of the specified grasses, and shall continue until Acceptance by the Engineer of the work of this section. It shall also include the furnishing and applying of such pesticides as are necessary to keep grass areas free of insects and disease. All pesticides shall be approved by Engineer prior to use.

3.5 SEEDING AND SODDING INSPECTION FOR PROVISIONAL ACCEPTANCE

- A. The Engineer shall inspect all work for Provisional Acceptance upon written request of the Contractor. The request shall be received at least ten calendar days before the anticipated date of inspection.
- B. Upon completion and reinspection of all repairs or renewals necessary in the judgment of the Engineer, the Engineer shall certify in writing to the Owner as to the Provisional Acceptance of the work of this section.
- C. Upon approval of the Provisional Acceptance by the Owner, the Owner will assume maintenance of the lawn areas.

3.6 GUARANTEE

- A. The Contractor shall submit a written guarantee to the Engineer, after Provisional Acceptance of grass, covering reseeding of grass areas which do not survive through one full growing season after the date of Provisional Acceptance, at no cost to the Owner.

3.7 CLEAN-UP

- A. Any soil or similar material which has been brought on to paved areas by hauling operations or otherwise shall be removed promptly, keeping these areas clean at all time.
- B. Upon completion of work under this section all excess stones, debris, and soil resulting from work under this section, which have not previously been cleaned up, shall be removed from the project site.

3.8 PLANTING METHOD

- A. The Contractor shall excavate plant pits, furnish and place all plants, and then maintain them in a satisfactory manner until final acceptance.
- B. All pits shall be of size and shape as shown on the Drawings.
- C. For tree and shrub planting, soil used for backfilling shall be improved topsoil as recommended by soil analysis, with the following additions:
 - 1. For deciduous plants use a mixture of four parts topsoil and one part of manure.
 - 2. For evergreen plants use a mixture of four parts topsoil and one part of peat moss as specified under Soil Enrichers.
- D. Plant pits within or near paved areas shall be prepared prior to the laying of the pavement. Where tree pits in paved areas are to be covered with mulch, trees shall be placed at sufficient depth below finished grade to allow for the depth of the mulch.
- E. Plants shall be set plumb and straight, and at such a level that after settlement, a normal or natural relationship of the crown of the plant with the ground surface is established. Each plant shall be planted in the center of the pit. When balled, burlapped and platformed plants are set, the platform shall first be removed from the pit and the soil shall be carefully tamped under and around the base of each ball to

fill all voids. All burlap, ropes, and wires shall be removed from the sides and tops of balls, but no burlap shall be pulled out from under the balls, except for plastic burlap, which shall be completely removed from the pit.

- F. All seals shall remain unbroken and visible on plant material until final inspection by Engineer. The Contractor shall remove all seals immediately after final inspection.

3.9 PLANTING SEASON

- A. Do all planting work within the dates herein specified.

3.10 PRUNING, PAINTING, SPRAYING

A. Pruning:

1. Each tree and shrub planted shall be pruned to preserve the natural character of the plant and in a manner appropriate to the particular requirements of the landscape design. In general, approximately one third of the wood shall be removed by thinning or shortening branches, but no leaders shall be cut.
2. All pruning shall be done with sharp tools. All pruning cuts shall be made flush and clean, especially where lower branches have been removed from collected trees.

B. Painting:

1. Pruning cuts over one-half inch in diameter shall be painted with tree paint specified under "Materials" on all exposed cambium as well as other exposed living tissues.

3.11 STAKING

- A. All staking shall be done immediately after wrapping. Stakes shall be driven perpendicular into the ground around the periphery of the ball of the tree. Plants shall stand plumb after staking.

3.12 WATERING

- A. Plantings shall be watered in accordance with supplier recommendations during and immediately after planting, until provisional acceptance.

3.13 MAINTENANCE

- A. Maintenance shall begin immediately after each plant is planted. Plants shall be watered, mulched, weeded, fertilized, cultivated and otherwise maintained and protected until provisional acceptance.
- B. Guys shall be tightened and repaired. Defective work shall be corrected as soon as possible after defects become apparent, and weather and season permit.

3.14 INSPECTION AND PROVISIONAL ACCEPTANCE

- A. The Engineer will inspect all planting work for provisional acceptance upon request of the Contractor.
- B. The Contractor shall furnish full and complete written instructions for maintenance of the planting to the Owner at the time of provisional acceptance.
- C. After all necessary corrective work has been completed and maintenance instructions have been received by the Owner, the Engineer will certify in writing the provisional acceptance of the planting.

3.15 GUARANTEE PERIOD

- A. All plants shall be guaranteed by the Contractor for a period of not less than one full year from time of provisional acceptance.
- B. At the issuance of provisional acceptance, the Owner shall take over maintenance of the planting. Nevertheless, the guarantee of all plant material will remain with the Contractor. The Contractor shall ascertain that the Owner properly waters and maintains all planting during the one year guarantee period.
- C. At the end of the guarantee period, any plant that is missing, dead, not true to name or size as specified, or not in satisfactory growth, as determined by the Engineer, shall be replaced. In case of reasonable doubt or question regarding the condition and satisfactory establishment of a rejected plant, the Engineer may allow such a plant to remain through another complete growing season, at which time the rejected plant, if found to be dead, in an unhealthy or badly impaired condition, shall be replaced at once. The Contractor will not be required to replace an inspected and accepted plant more than once.
- D. Replacements shall be plants of the same kind and size as specified in the Contract Drawings. They shall be furnished and planted as specified herein. The cost of replacement shall be borne by the Contractor, except where it can be definitely shown that loss resulted from Owner's failure to maintain planting as instructed.

3.16 FINAL INSPECTION AND FINAL ACCEPTANCE

- A. At the end of the guarantee period, inspection will be made by the Engineer, at the request of the Contractor.
- B. After all necessary corrective work has been completed, the Engineer will certify in writing the final acceptance of the planting.

3.17 CLEAN UP

- A. Upon completion of work under this section, all excess stones, debris and soil resulting from planting work shall be removed from project site. The site shall be restored to a better condition than was present prior to construction.

END OF SECTION

SECTION 02485LOAMING & SEEDINGPART 1 - GENERAL1.1 DESCRIPTION

- A. Work Included: Furnish, place, and test topsoil, seed, lime, and fertilizer where shown on the drawings and protect and maintain seeded areas disturbed by construction work, as directed by the Engineer.
- B. Related Work Specified Elsewhere (When Applicable): Earthwork, excavation, backfill, compaction, site grading and temporary erosion control are specified in the appropriate Sections of this Division.

1.2 SUBMITTALS AND TESTING

- A. Seed:
 - 1. Furnish the Engineer with duplicate signed copies of a statement from the vendor, certifying that each container of seed delivered to the project site is fully labeled in accordance with the Federal Seed Act and is at least equal to the specification requirements.
 - 2. This certification shall appear in, or with, all copies of invoices for the seed.
 - 3. The certification shall include the guaranteed percentages of purity, weed content and germination of the seed, and also the net weight and date of shipment. No seed may be sown until the Contractor has submitted the certificates and certificates have been approved.
 - 4. Each lot of seed shall be subject to sampling and testing, at the discretion of the Engineer, in accordance with the latest rules and regulations under the Federal Seed Act.
- B. Topsoil:
 - 1. Inform the Engineer, within 30 days after the award of the Contract, of the sources from which the topsoil is to be furnished.
 - 2. Obtain representative soil samples, taken from several locations in the area under consideration for topsoil removal, to the full stripping depth.
 - 3. Have soil samples tested by an independent soils testing laboratory, approved by the Engineer, at the Contractor's expense.
 - 4. Have soil samples tested for physical properties and pH (or lime requirement), for organic matter, available phosphoric acid, and available potash, in accordance with standard practices of soil testing.
 - 5. Approval, by the Engineer, to use topsoil for the work will be dependent upon the results of the soils tests.
- C. Lime & Fertilizer:
 - 1. Furnish the Engineer with duplicate copies of invoices for all lime and fertilizer used on the project showing the total minimum carbonates and minimum percentages of the material furnished that pass the 90 and 20 mesh sieves and the grade furnished.

2. Each lot of lime and fertilizer shall be subject to sampling and testing at the discretion of the Engineer.
3. Sampling and testing shall be in accordance with the official methods of the Association of Official Agricultural Chemists.
4. Upon completion of the project, a final check may be made comparing the total quantities of fertilizer and lime used to the total area seeded. If the minimum rates of application have not been met, the Engineer may require the Contractor to distribute additional quantities of these materials to meet the minimum rates.

1.3 DELIVERY, STORAGE & HANDLING

A. Seed:

1. Furnish all seed in sealed standard containers, unless exception is granted in writing by the Engineer.
2. Containers shall be labeled in accordance with the United States Department of Agriculture's rules and regulations under the Federal Seed Act in effect at the time of purchase.

B. Fertilizer:

1. Furnish all fertilizer in unopened original containers.
2. Containers shall be labeled with the manufacturer's statement of analysis.

1.4 JOB CONDITIONS

- #### A. Topsoil:
- Do not place or spread topsoil when the subgrade is frozen, excessively wet or dry, or in any condition otherwise detrimental, in the opinion of the Engineer, to the proposed planting or to proper grading.

B. Seeding:

1. Planting Seasons: The recommended seeding time is from April 1 to September 15. The Contractor may seed at other times. Regardless of the time of seeding, the Contractor shall be responsible for each seeded area until it is accepted.
2. Weather Conditions:
 - a. Do not perform seeding work when weather conditions are such that beneficial results are not likely to be obtained, such as drought, excessive moisture, or high winds.
 - b. Stop the seeding work when, in the opinion of the Engineer, weather conditions are not favorable.
 - c. Resume the work only when, in the opinion of the Engineer, conditions become favorable, or when approved alternate or corrective measures and procedures are placed into effect.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Seed:

1. Provide the grass seed mixture approved by the Engineer, having the following composition:
 - a. Park Mixture:
50 percent Creeping Red Fesque
30 percent Kentucky Bluegrass

- 20 percent Annual Ryegrass
- b. Roadside Mixture:
 - 50 percent Creeping Red Fescue
 - 15 percent Kentucky Bluegrass
 - 5 percent White Clover
 - 2 percent Red Top
 - 3 percent Birdsfoot Trefoil
 - 25 percent Annual Ryegrass
- 2. Do not use seed which has become wet, moldy, or otherwise damaged in transit or during storage.
- B. Topsoil:
 - 1. Fertile, friable, natural topsoil typical of the locality, without admixture of subsoil, refuse or other foreign materials and obtained from a well-drained site. Mixture of sand, silt, and clay particles in equal proportions.
 - 2. Free of stumps, roots, heavy of stiff clay, stones larger than 1-inch in diameter, lumps, coarse sand, weeds, sticks, brush or other deleterious matter.
 - 3. Not less than 4 percent nor more than 20 percent organic matter.
 - 4. Topsoil depth shall be 4-inches, unless otherwise indicated.
- C. Lime:
 - 1. Provide lime which is ground limestone containing not less than 85% of total carbonate and of such fineness that 90% will pass a No. 20 sieve and 50% will pass a No. 100 sieve.
 - 2. Coarser materials will be acceptable provided the specified rates of application are increased proportionately on the basis of quantities passing a No. 100 sieve. No additional payment will be made to the Contractor for the increased quantity.
- D. Fertilizer:
 - 1. Provide a commercial fertilizer approved by the Engineer.
 - 2. Provide fertilizer containing the following minimum percentage of nutrients by weight:
 - 10% Available phosphoric acid
 - 10% Available potash
 - 10% Available nitrogen (75% of the nitrogen shall be organic)

PART 3 - EXECUTION

3.1 PREPARATION

- A. Equipment:
 - 1. Provide all equipment necessary for the proper preparation of the ground surface and for the handling and placing of all required materials.
 - 2. Demonstrate to the Engineer that the equipment will apply materials at the specified rates.
- B. Soil: Perform the following work prior to the application of lime, fertilizer or seed.
 - 1. Scarify the subgrade to a depth of 2 inches to allow the bonding of the topsoil with the subsoil.
 - 2. Apply topsoil to a depth of 4 inches or as directed on areas to be seeded.

3. Trim and rake the topsoil to true grades free from unsightly variations, humps, ridges or depressions.
4. Remove all objectionable material and form a finely pulverized seed bed.

3.2 PERFORMANCE

A. Grading:

1. Grade the areas to be seeded as shown on the Drawings or as directed by the Engineer.
2. Leave all surfaces in even and properly compacted condition.
3. Maintain grades on the areas to be seeded in true and even conditions, including any necessary repairs to previously graded areas.

B. Placing Topsoil:

1. Uniformly distribute and evenly spread topsoil on the designated areas.
2. Spread the topsoil in such a manner that planting work can be performed with little additional soil preparation or tillage.
3. Correct any irregularities in the surface resulting from topsoiling or other operations to prevent the formation of depressions where water may stand.
4. Thoroughly till the topsoil to a depth of at least 3 inches by plowing, harrowing, or other approved method until the condition of the soil is acceptable to the Engineer. The surface shall be cleared of all debris and or stones one inch or more in diameter.

C. Placing Fertilizer:

1. Distribute fertilizer uniformly at a rate determined by the soils test over the areas to be seeded.
2. Incorporate fertilizer into the soil to a depth of at least 3 inches by discing, harrowing, or other methods acceptable to the Engineer.
3. The incorporation of fertilizer may be a part of the tillage operation specified above.
4. Distribution by means of an approved seed drill equipped to sow seed and distribute fertilizer at the same time will be acceptable.

D. Placing Lime:

1. Uniformly distribute lime immediately following or simultaneously with the incorporation of fertilizer.
2. Distribute lime at a rate determined from the pH test, to a depth of at least 3 inches by discing, harrowing, or other methods acceptable to the Engineer.

E. Seeding:

1. Fine rake and level out any undulations or irregularities in the surface resulting from tillage, fertilizing, liming or other operations before starting seeding operations.
2. Hydroseeding:
 - a. Hydroseeding may be performed where approved and with equipment approved by the Engineer.
 - b. Sow the seed over designated areas at a minimum rate of 5 pounds per 1000 square feet.
 - c. Seed and fertilizing materials shall be kept thoroughly agitated in order to maintain a uniform suspension within the tank of the hydroseeder.

- d. The spraying equipment must be designed and operated to distribute seed and fertilizing materials evenly and uniformly on the designated areas at the required rates.
- 3. Drill Seeding:
 - a. Drill seeding may be performed with approved equipment having drills not more than 2 inches apart.
 - b. Sow the seed uniformly over the designated areas to a depth of 1/2 inch and at a rate of 5 pounds per 1,000 square feet.
- 4. Broadcast Seeding:
 - a. Broadcast seeding may be performed by equipment approved by the Engineer.
 - b. Sow the seed uniformly over the designated areas at a rate of 5 pounds per 1,000 square feet.
 - c. Sow half the seed with the equipment moving in one direction and the remainder of the seed with the equipment moving at right angles to the first sowing.
 - d. Cover the seed to an average depth of 1/2 inch by means of a brush harrow, spike-tooth harrow, chain harrow, cultipacker, or other approved devices.
 - e. Do not perform broadcast seeding work during windy weather.
- F. Compacting:
 - 1. Seeded areas must be raked lightly after sowing unless seeding is to be directly followed by application of an approved mulch.
 - 2. Compact the entire area immediately after the seeding operations have been completed.
 - 3. Compact by means of a cultipacker, roller, or other equipment approved by the Engineer weighing 60 to 90 pounds per linear foot of roller.
 - 4. If the soil is of such type that a smooth or corrugated roller cannot be operated satisfactorily, use a pneumatic roller (not wobbly wheel) that has tires of sufficient size to obtain complete coverage of the soil.
 - 5. When using a cultipacker or similar equipment, perform the final rolling at right angles to the prevailing slopes to prevent water erosion, or at right angles to the prevailing wind to prevent dust.

3.3 PROTECTION & MAINTENANCE

- A. Protection:
 - 1. Protect the seeded area against traffic or other use.
 - 2. Erect barricades and place warning signs as needed.
- B. Maintenance:
 - 1. At the time of the first cutting, set mower blades two inches high. All lawns shall receive at least two mowings before acceptance. Coordinate schedule for mowing with Engineer.
 - 2. Maintenance shall also include all temporary protection fences, barriers and signs and all other work incidental to proper maintenance.
 - 3. Maintain grass areas until a full stand of grass is indicated, which will be a minimum of 45 days after all seeding work is completed, and shall not necessarily related to Substantial Completion of the General Contract.

4. Protection and maintenance of grass areas shall consist of watering, weeding, cutting, repair of any erosion and reseeding as necessary to establish a uniform stand for the specified grasses, and shall continue until Acceptance by the Engineer of the work of this section. It shall also include the furnishing and applying of such pesticides as are necessary to keep grass areas free of insects and disease. All pesticides shall be approved by Engineer prior to use.

3.4 ACCEPTANCE

- A. At final acceptance of the project all areas shall have a close stand of grass with no weeds present and no bare spots greater than three inches (3") in diameter over greater than five percent (5%) of the overall seeded area.

END OF SECTION

SECTION 02513ABITUMINOUS CONCRETE PAVINGPART 1 - GENERAL1.1 DESCRIPTION

A. Work Included:

1. Furnish all plant, labor, equipment and materials required to install bituminous concrete pavement courses, including sidewalks, driveways, temporary and permanent trench paving and restoration of pavement markings as shown on the Drawings and as specified herein.
2. Remove bituminous asphaltic and/or Portland cement pavement, and replace bituminous asphaltic pavement, base, binder courses and surface courses, including temporary pavement, within the area(s) shown on the Drawings and as directed by the Engineer.
3. Keep pavement removal to a minimum width suitable for the required construction.
4. Apply pavement markings to the permanent paving as specified.

B. Work Not Included: Removal and replacement of paving for the convenience of the Contractor will not be considered for payment.

C. Related Work Specified Elsewhere (When Applicable):

1. Excavation, backfill, aggregate base and subbase.

1.2 QUALITY ASSURANCE

A. Materials: Use only materials furnished by a bulk bituminous concrete producer regularly engaged in the production of hot mixed, hot laid bituminous concrete.

B. Equipment: Provide, maintain and operate pavers, dump trucks, tandem, 3-wheel and pneumatic tired rollers well suited to the mixtures being placed. Provide, maintain and operate hand equipment as required. When applicable, provide, maintain and operate trimming equipment and materials.

C. Mix Requirements, Method of Placement and Compaction: All mixes shall conform to the State of Maine Department of Transportation's SUPERPAVE mix standards.

1.3 SUBMITTALS

A. A Job Mix Formula approved by the State of Maine Department of Transportation's Central Laboratory in Bangor shall be submitted for each mixture to be supplied at least 15 calendar days prior to production.

B. Delivery slips shall be furnished with each load of mix delivered to the project. Information shall include:

1. Vehicle identification.
2. Date.
3. Project.
4. Identification of material.
5. Gross, tare and net weights.
6. Signed by the bituminous concrete producer.

7. Stamped by a licensed public weighmaster.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Hot Bituminous Paving Mix:
1. Binder Course - Maine D.O.T. Type 19.0 mm Superpave Mix
 2. Surface Course - Maine D.O.T. Type 12.5 mm Superpave Mix
 3. Sidewalks and Drives - Maine D.O.T. Type 9.5 mm Superpave Mix
 4. Deep Lifts in Full Construction - Maine D.O.T. Type 25.0 Superpave Mix.
- B. Composition of Mixtures - Control Points

SIEVE SIZE	GRADING			
	TYPE 25 mm	TYPE 19 mm	TYPE 12.5 mm	TYPE 9.5 mm
	PERCENT BY WEIGHT PASSING - COMBINED AGGREGATE			
37.5 mm	100			
25 mm	90-100	100		
19 mm	-90	90-100	100	
12.5 mm	-	-90	90-100	100
9.5 mm	-	-	-90	90-100
4.75 mm	-	-	-	-90
2.36 mm	15-41	23-49	28-58	32-67
1.18 mm	-	-	-	-
0.60 mm	-	-	-	-
0.30 mm	-	-	-	-
0.075 mm	1-7	2-8	2-10	2-10

- C. Tack Coat:
1. Emulsified type, Grade RS-1, CRS-1, HFMS-1, CSS-1, 1h
- D. Pavement markings shall be in accordance with Section 02577.

PART 3 - EXECUTION

3.1 GENERAL

- A. Grade Control:
1. The Contractor shall establish and maintain the required lines and grades, including crown and cross-slope, for each course during construction operations.
- B. Trench areas shall receive initial paving as the work progresses where trenches are in paved streets. Not more than 300 linear feet of backfill trench shall be left unpaved.
- C. Reset all existing manholes to finished grade as required at no additional cost to the Owner.

3.2 PAVEMENT REMOVAL

A. General:

1. Exercise extreme care in the removal of pavement so that pavement will not be unnecessarily disturbed or destroyed.
2. Mechanically cut pavement to be removed to a straight line, unless otherwise directed by the Engineer.
3. All pavement removed shall become the property of the Contractor and disposed of at locations acceptable to or designated by the Owner at no additional cost to the Owner.

B. Maine DOT Areas:

1. When removing pavement under the jurisdiction of the Maine DOT, strictly adhere to all DOT regulations controlling pavement openings.

3.3 SURFACE PREPARATION

A. Tack coats shall conform to Section 410 of the Maine D.O.T. Standard Specifications.

B. Tack Coat:

1. Apply to contact surfaces of previously constructed asphalt or Portland cement concrete and surfaces abutting or projecting into asphalt concrete pavement. Distribute at rate of 0.05 to 0.15 gallons per square yard of surface.

3.4 WEATHER AND SEASONAL LIMITATIONS

A. The State is divided into 2 paving zones as follows:

1. Zone 1 - Areas north of US Route 2 from Gilead to Bangor and north of Route 9 from Bangor to Calais.
2. Zone 2 - Areas south of Zone 1 including the US Route 2 and Route 9 boundaries.

B. The Contractor may place Hot Mix Asphalt Pavement for use other than a traveled way wearing course in either Zone between the dates of April 15th and November 15th, provided that the air temperature as determined by an approved thermometer (placed in the shade at the paving location) is 2°C or higher and the area to be paved is not frozen. The Contractor may place Hot Mix Asphalt Pavement as traveled way wearing course in Zone 1 between the dates of May 1st and the Saturday following October 1st and in Zone 2 between the dates of April 15th and the Saturday following October 15th, provided the air temperature determined as above is 10°C or higher. For the purpose of this Subsection, the traveled way includes truck lanes, ramps, approach roads and auxiliary lanes.

C. Hot Mix Asphalt Pavement used for curb, driveways, sidewalks, islands, or other incidentals is not subject to seasonal limitations, except that conditions shall be satisfactory for proper handling and finishing of the mixture. Unless otherwise specified, the Contractor shall not place Hot Mix Asphalt Pavement on a wet or frozen surface, and the air temperature shall be 2°C or higher.

3.5 PLACING THE MIX

A. General:

1. Place asphalt concrete mixture on prepared surface. Minimum allowable temperature for placing is 250°F. Maximum shall be 325°F. Place in areas

inaccessible to paving machine and small areas by hand. Place each course to required grade, cross-slope and compacted thickness.

B. Protection:

1. After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened to the extent that the pavement will not be damaged.

3.6 PAVEMENT MARKINGS

- A. Material, approved by the Engineer, is to be furnished and applied after the installation of permanent paving.
- B. Apply pavement markings in accordance with existing markings. Match paint color, marking dimensions, layout and other details with existing markings in the vicinity of the project.

END OF SECTION

SECTION 02601MANHOLES, COVERS AND FRAMESPART 1 - GENERAL1.1 DESCRIPTION

- A. Work Included: Construct manholes, covers, frames, brick masonry, inverts and apply waterproofing in conformance with the dimensions, elevations, and locations shown on the Drawings and as specified herein.
- B. Related Work Specified Elsewhere (when applicable):
 - 1. Final sewer testing is specified in this Division.
 - 2. Pipe, excavation, backfill, paving and dewatering are specified in the appropriate Sections in this Division.
 - 3. Concrete and grout are specified in Division 3.

1.2 QUALITY ASSURANCE

- A. Precast Manhole Base, Barrel and Top Sections:
 - 1. Conform to ASTM C478-97 except as modified herein, and on the Drawings.
 - 2. Minimum strength of 4,000 psi at 28 days.
 - 3. Testing:
 - a. Determine concrete strength by tests on 6-inch by 12-inch vibrated test cylinders cured in the same manner as the bases, barrels and tops.
 - b. Have tests conducted at the manufacturer's plant or at a testing laboratory approved by the Engineer.
 - c. Have not less than 2 tests made for each 100 vertical feet of precast manhole sections.
- B. Manhole Steps
 - 1. Conform to ASTM C478-06 for load carrying capacity and pull out resistance.
 - 2. Acceptable Manufacturers:
 - a. Parson Environmental Products, Inc.
 - b. M. A. Industries, Inc.
 - c. Or equivalent.
- C. Frames and Covers:
 - 1. Acceptable Manufacturers:
 - a. EJ Castings
 - b. Neenah Foundry Company.
 - c. Or equivalent.
- D. Masonry:
 - 1. Brick: Shall comply with the ASTM Standard Specifications for Sewer Brick (made from clay or shale), Designation C32, for Grade SS, hard brick.
 - 2. Cement: ASTM C-150.
 - 3. Hydrated Lime: ASTM C-207
 - 4. Sand: ASTM C144

- E. Waterproofing:
 - 1. Acceptable Manufacturers:
 - a. Karnak #220 AF Fibered Emulsion Dampproofing, Karnak Corp., Clark, NJ.
 - b. PPS 922 Superseal, International Precast Supply.
 - c. Or approved equal.

1.3 SUBMITTALS TO THE ARCHITECT/ENGINEER

- A. Submit shop drawings and manufacturer's literature in conformance with Section 01340 and the Standard General Conditions of the Construction Contract.
- B. Precast Manhole Sections: Submit test results and receive approval from the Engineer prior to delivery to the site.

PART 2 - PRODUCTS

2.1 PRECAST MANHOLE SECTIONS

- A. Dimensions, shall be as shown on the Drawings:
 - 1. Base & Riser Sections:
 - a. Diameter: As shown on the Drawings.
 - b. Length: As required.
 - c. Wall Thickness: Not less than 5 inches.
 - d. Joints: Bell-and-spigot or tongue-and-groove formed on machine rings to insure accurate joint surfaces.
 - 2. Tops:
 - a. Diameter: Eccentric cone type, 24 inches I.D. at top, 48 inches I.D. at bottom unless otherwise shown on the Drawings.
 - b. Length: 4 feet.
 - c. Wall thickness: Not less than 5 inches at the base, tapering to not less than 8 inches at the top.
 - d. Joints: Bell-and-spigot or tongue-and-groove formed on machine rings to insure accurate joint surfaces.
 - e. Exterior face of cone sections shall not flare out beyond the vertical.
 - 3. Flat Slab Tops:
 - a. Location: Where shallow installations do not permit the use of a cone-type top and where indicated on the Drawings.
 - b. Slab thickness: Not less than 6 inches.
 - c. Constructed to support an HS-20 wheel loading.
- B. Openings:
 - 1. Provide openings in the risers to receive pipes entering the manhole.
 - 2. Make openings at the manufacturing plant.
 - 3. Size: To provide a uniform annular space between the outside wall of pipe and riser.
 - 4. Location: To permit setting of the entering pipes at the correct elevations.
 - 5. Openings shall have a flexible watertight union between pipe and the manhole base.
 - a. Cast into the manhole base and sized to the type of pipe being used.

- b. Type of flexible joint being used shall be approved by the Engineer. Install materials according to the Manufacturer's instructions.
 - i. Lock Joint Flexible Manhole Sleeve made by Interpace Corporation.
 - ii. Kor N Seal made by National Pollution Control System, Inc.
 - iii. Press Wedge II made by Press-Seal Gasket Corporation.
 - iv. A-Lok Manhole Pipe Seal made by A-Loc Corporation.
 - v. Or equivalent.
- C. Joints:
 - 1. Joint gaskets to be flexible self-seating butyl rubber joint sealant installed according to manufacturer's recommendations. Install a double row of joint sealants for every manhole joint. For cold weather applications, use adhesive with joint sealant as recommended by manufacturer.
Acceptable Materials:
 - a. Kent-Seal No. 2
 - b. Ram-Nek
 - c. Or equivalent.
 - 2. Joints between precast sections shall conform to related standards and manufacturer's instructions.
 - 3. All manholes greater than 6 ft. diameter and all manholes used as wet wells, valve pits and other dry-pit type structures shall be installed with exterior joint collars. The joint collar shall be installed according to the manufacturer's instructions. Acceptable materials:
 - a. MacWrap exterior joint sealer as manufactured by Mar-Mac Manufacturing Company.
 - b. Or equivalent.
- D. Waterproofing:
 - 1. The exterior surface of all manholes shall be given two coats of waterproofing material at a application rate as recommended by the manufacturer.
 - 2. The coating shall be applied after the manholes have cured adequately and can be applied by brush or spray in accordance with the manufacturer's written instruction.
 - 3. Sufficient time shall be allowed between coats to permit sufficient drying so that the application of the second coat has no effect on the first coat.
- E. Frost Protective Wrapping:
 - 1. The frost protective wrap shall be constructed of an ultraviolet resistant polyethylene material and shall be a minimum thickness of 6 mils.

2.2 FRAMES AND COVERS

- A. Standard Units:
 - 1. Made of cast iron conforming to ASTM A48-76, Class 30 minimum.
 - 2. Have machined bearing surfaces to prevent rocking.
 - 3. Castings shall be smooth with no sharp edges.
 - 4. Constructed to support an HS-20 wheel loading.
 - 5. Dimensions and Style shall conform to the Drawings, Standard castings differing in non-essential details are subject to approval by the Engineer:
 - a. Covers -solid with sewer in 3-inch letters diamond pattern.
 - b. Frame - 24-inch diameter clear opening, with flange bracing ribs.

6. Minimum weight of frame and cover shall be 370 lbs.
- B. Water Tight Units:
 1. Same features as above for Standard Units, with 22-inch diameter minimum clear opening.
 2. Sealing features:
 - a. Inner lid held by a bronze tightening bolt in a locking bar.
 - b. Neoprene gasket
 - c. Water tight pick hole.
 3. Minimum weight of frame and cover shall be 510 lbs.

2.3 MANHOLE STEPS

- A. Polyethylene coated steel safety type designed with a minimum concentrated live load of 300 pounds.
- B. Thoroughly clean all surfaces to be embedded with a suitable cleaning agent to ensure that the surfaces are free from all foreign matter such as dirt, oil and grease.
- C. The steps shall become thoroughly dry before being placed into the concrete.
- D. All steps shall be cast into walls of the precast section so as to form a continuous ladder with a distance of 12-inches between steps.

2.4 MASONRY

- A. Brick:
 1. Sound, hard, uniformly burned, regular and uniform in shape and size, compact texture, and satisfactory to the Engineer.
 2. Immediately remove rejected brick from the work.
- B. Mortar:
 1. Composition (by volume):
 - a. 1 part portland cement.
 - b. 1/2 part hydrated lime.
 - c. 4-1/2 parts sand.
 2. The proportion of cement to lime may vary from 1:1/4 for hard brick to 1:3/4 for softer brick, but in no case shall the volume of sand exceed 3 times the sum of the volume of cement and lime.
- C. Cement shall be Type II portland cement.
- D. Hydrated lime shall be Type S.
- E. Sand:
 1. Shall consist of inert natural sand.
 2. Grading:

<u>Sieve</u>	<u>Percent Passing</u>
No. 4	100
No. 8	95-100
No. 16	70-100
No. 30	40-75
No. 50	10-35
No. 100	2-15
No. 200	0-5

PART 3 - EXECUTION

3.1 PERFORMANCE

- A. Precast Manhole Sections:
 - 1. Perform jointing in accordance with manufacturer's recommendations and as approved by the Engineer.
 - 2. Install riser sections and tops level and plumb.
 - 3. Make all joints watertight.
 - 4. When necessary, cut openings carefully to prevent damage to barrel sections and tops. Replace damaged manhole sections and tops at no additional cost to the Owner.
 - 5. When manhole steps are included in the Work, install barrel sections and tops so that steps are in alignment.
- B. Drop Manholes:
 - 1. The difference in elevation between the invert of the inlet pipe and outlet pipe is to be either less than 6-inches (which does not require a drop manhole) or more than 24-inches (which does require a drop manhole).
 - 2. Where difference in elevation between the invert of the inlet pipe to the invert of the outlet pipe exceeds 24 inches, construct a drop manhole as shown on the Drawings or as directed by the Engineer.
- C. Adjust to Grade:
 - 1. Adjust tops of manholes to grade with brick masonry.
 - 2. Concrete rings are not acceptable for adjusting to grade.
- D. Pipe Connections to Manholes: Connect pipes to manholes with joint design and materials approved by the Engineer as shown on the drawings.
- E. Invert Channels:
 - 1. After manhole and all pipes entering or exiting the manhole have been installed, construct the invert channels and shelf.
 - 2. Channels to be smooth and semicircular in shape conforming to the inside of the adjacent sewer section.
 - 3. Make changes in direction of flow with smooth curves having a radius as large as permitted by the size of the manhole.
 - 4. Stop the pipes at the inside face of the manhole where changes of direction occur.
 - 5. Form invert channels and shelf with brick.
 - 6. The maximum change in elevation from the invert of the inlet pipe to the invert of the outlet pipe is 6-inches. Shape invert to make smooth transition in vertical grade.
 - 7. Slope the floor of the manhole (shelf) to the flow channel, as shown on the Drawings.
- F. Masonry:
 - 1. Laying Brick:
 - a. Use only clean bricks in brickwork for manholes.
 - b. Moisten the brick by suitable means until they are neither so dry as to absorb water from the mortar nor so wet as to be slippery when laid.
 - c. Lay each brick in a full bed and joint of mortar without requiring subsequent grouting, flushing, or filling, and thoroughly bond as directed.

- d. Construct all joints in a neat workmanlike manner. Construct the brick surfaces inside the manholes so they are smooth with no mortar extending beyond the bricks and no voids in the joints. Maximum mortar joints shall be 1/2 inch.
 - e. Outside faces of brick masonry shall be plastered with mortar from 1/4-inch to 3/8-inch thick.
 - f. Completed brickwork shall be watertight.
- 2. Curing:
 - a. Protect brick masonry from drying too rapidly by using burlaps which are kept moist, or by other approved means.
 - b. Protect brick masonry from the weather and frost as required.
- G. Frames and Covers:
 - 1. Set all frames in a full bed of mortar, true to grade and concentric with the manhole opening.
 - 2. Completely fill all voids beneath the bottom flange to make a watertight fit.
 - 3. Place a ring of mortar at least one inch thick around the outside of the bottom flange, extending to the outer edge of the manhole all around its circumference.
 - 4. Clean the frame seats before setting the covers in place.
- H. Plugging and Patching:
 - 1. Fill all exterior cavities with non-shrink grout and with bituminous waterproofing once the concrete and mortar has set.
 - 2. Touch up damaged water proofing.
- I. Cleaning:
 - 1. Thoroughly clean manholes, steps, frames and covers of all debris and foreign matter.
- J. Bedding and Backfilling:
 - 1. Bedding of manholes shall be 6 inches of 3/4" screened stone.
 - 2. Backfill a minimum of 18 inches all around manhole with gravel borrow.
- K. Frost Protective Wrap:
 - 1. The Contractor shall comply with the manufacturer's instructions for the particular conditions of installations in each case.
 - 2. Clean each manhole exterior of all dirt and remove any sharp protrusions.
 - 3. Apply two (2) 6-inch wide vertical strips of bituminous waterproofing material and/or duct tape from the top to bottom of the manhole per layer.
 - 4. Prior to installing pipe through each manhole or valve pit, wrap each manhole to the maximum depth of frost penetration, but not less than 5 feet below grade, with four (4) layers of the polyethylene material by beginning the wrap at the adhesive strip and proceeding around the manhole, valve pit, etc., continuously by overlapping the adhesive strip by 24 inches on the final layer. Cut the polyethylene wrap in areas where piping exits the manhole. The size of the cut is to be equivalent to the pipes outside diameter.
 - 5. Tuck and pleat the polyethylene wrap at the top of each manhole in a continuous manner, minimizing the size of each fold. Extend the polyethylene wrap past the top of the manhole frame and temporarily tuck the remainder inside the frame, until final backfill and paving.

6. In paved areas, cut the polyethylene wrap flush with the manhole rim after the pavement is in place.
7. In unpaved areas, pull the polyethylene wrap together, and tie around frame with galvanized wire.
8. Protect the installed frost barrier from harmful weather exposures and from possible physical abuses, where possible by prompt installation of concealing work or, where that is not possible, by temporary covering or enclosure.
9. Backfill around the manhole/frost barrier with material as outlined in Section 02200 - Earthwork.

3.2 MANHOLE TESTING

A. General:

1. Perform either a vacuum test or a combination of the exfiltration and infiltration tests on all manholes.
2. All testing must be performed in the presence of the Engineer.
3. Suitably plug all pipes entering each manhole and brace plugs to prevent blow out.

B. Exfiltration Tests After Backfilling:

1. Fill each manhole with water to the top of the manhole frame.
2. A period of up to 2 hours may be permitted, if the Contractor so wishes, to allow for absorption.
3. At the end of the absorption period, refill each manhole with water to the top of the manhole frame and begin the 4-hour test period.
4. At the end of the 4-hour test period, refill each manhole to the top of the manhole frame and measure the volume of water added. The leakage for each manhole shall not exceed 1/16 gallon per foot of diameter per vertical foot (above ground water) per 4-hour period.

C. Infiltration Tests:

1. When the groundwater is above the bottom of the manhole, infiltration testing may be performed on that portion of the manhole below water level.
2. After a 15-minute period, if no water is visibly moving down the interior surfaces of a manhole, the portion of the manhole below groundwater may be considered to be satisfactorily watertight.
3. The remaining portion above the groundwater level must be tested for exfiltration as specified above.

D. Vacuum Test:

1. The manhole shall be tested by a vacuum test after assembly of the manhole, connection piping and backfilling. Vacuum testing to be conducted prior to construction of invert channels.
2. Plug all lifting holes completely with non-shrink grout.
3. Properly tighten all boot clamps and brace all plugs to prevent them from being sucked into the manhole.
4. Install the testing equipment according to the manufacturer's instructions.
5. A vacuum of 10 inches of Hg shall be drawn on the manhole and the loss of 1 inch of Hg vacuum timed. The manhole shall be considered to have passed the test if the time for the loss of 1 inch of Hg vacuum is:
 - a. Greater than 2 minutes for manholes less than 10-feet deep.

- b. Greater than 2.5 minutes for manholes 10 to 15-feet deep.
 - c. Greater than 3 minutes for manholes more than 15-feet deep.
- 6. If the manhole fails the initial test, the Contractor shall locate the leak(s) and make repairs. The manhole shall be retested until a satisfactory test result is obtained.
- E. Manhole Repairs:
 - 1. Correct leakage by reconstruction, replacement of gaskets and/or other methods as approved by the Engineer.
 - 2. The use of lead-wool or expanding mortar will not be permitted.
- F. After the manholes have been backfilled and prior to final acceptance, any signs of leaks or weeping visible inside the manholes shall be repaired and the manhole made watertight.

END OF SECTION

SECTION 02903REVETMENT MATTRESSPART 1 - GENERAL1.1 DESCRIPTION

- A. This section includes polymeric marine mattress systems with structural geogrid, braid, mechanical connection elements and stone infill.
- B. Work under this section includes:
 - 1. Furnishing geogrids, braid, mechanical connection elements and stone fill materials as specified herein and as shown on the Contract Drawings. Geogrid material shall include sufficient quantities to form lifting hoops for the units.
 - 2. Fabricating, filling and placing polymeric marine mattress units in accordance with this section and in reasonably close conformity with the lines, grades and dimensions shown on the Contract Drawings or established by the Engineer. Some pre-fabrication of the units may be accomplished prior to delivery to the site.
- C. Related Work Specified Elsewhere: (When Applicable)
 - 1. Section 02200 – Earthwork
 - 2. Section 02260 – Geotextile Fabric

1.2 QUALITY ASSURANCE

- A. Requirements of Regulatory Agencies:
 - 1. All work shall be performed and completed in accordance with all local, state and federal regulations.
 - 2. The General Contractor shall secure all other necessary permits unless otherwise indicated from, and furnish proof of acceptance by, the municipal and state departments having jurisdiction and shall pay for all such permits, except as specifically stated elsewhere in the Contract Documents.
- B. Certification:
 - 1. Each shipment of revetment mattress to the job site shall be accompanied by a certificate which states that the material conforms to the requirements of this specification.
 - 2. The certificate shall be on company letterhead and signed by an officer of the company having legal authority to bind the company.
- C. Remove any damaged components from the construction site and replace at no additional cost to the Owner.

1.3 SUBMITTALS

- A. Submit shop drawings of the details and typical section and connections.
- B. Submit geogrid product data sheet and certification from the manufacturer that the geogrid product supplied meets the requirements of sub-part 2.2 of this section.
- C. Submit manufacturer's general recommendations and instructions for fabrication, filling, installation, and repair.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Storage and protection
 - 1. The Contractor shall be responsible for the coordination of delivery, handling, and proper storage of the product.
 - 2. The Contractor shall prevent excessive mud, wet concrete, epoxy, or other deleterious materials from coming in contact with and affixing to mattress materials.
 - 3. Rolled materials may be laid flat or stood on end.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Tensar Earth Technologies, Inc.
- B. Approved Equivalent.

2.2 MATERIALS

- A. Structural Geogrid
 - 1. Unless otherwise called out on the Contract Drawings or Shop Drawings, or as directed by the Engineer, the structural geogrid type shall be:
 - a. Type 1 for the internal diaphragms of the units.
 - b. Type 2 for the top, bottom, and sides of the units.
 - 2. The structural geogrid shall be produced from virgin resin and classified as high density polyethylene (HDPE) and/or polypropylene (PP) and shall possess complete continuity of all properties throughout its structure.
 - 3. The structural geogrid shall accept applied force in use by positive mechanical interlock (i.e. direct mechanical keying) with:
 - a. Compacted soil or construction fill materials.
 - b. Continuous sections of itself when overlapped and embedded in compacted soil or construction fill materials, and
 - c. Rigid mechanical connection elements such as bodkins, pins or hooks.
 - 4. The structural geogrid shall have the following characteristics:

PROPERTY	UNITS	TYPE 1	TYPE 2
True 1% Tensile Modulus in Use (MD)	kN/m (lb/ft)	750 (51,400)	1,650 (113,090)
Junction Strength (MD)	kN/m (lb/ft)	48.60 (3,330)	100.8 (6,908)
Flexural Stiffness	Mg0cm	670,000	6,600,00
Resistance to Installation Damage	%GP	85	85
Resistance to Long Term Degradation	%	100	100
Ultraviolet Stability (Retained Strength @ 500 hours)	%	100	100

B. Mechanical Connection Elements:

- 1. The mechanical connection elements shall be as shown on the Construction Drawings and Shop Drawings and shall be composed of high-density polyethylene (HDPE) and / or polypropylene (PP), unless otherwise approved by the Engineer.

2. The mechanical connection used shall be bodkin type, unless otherwise approved by the Engineer
- C. UV Stabilized Braid
1. The braid used for tying and lacing in the fabrication of the units shall be 8-strand hollow-core braid composed of high-density polyethylene (HDPE). Each strand shall consist of a bundle of monofilament HDPE.
 2. The braid shall have a nominal diameter of not less than 3/16 inch and a breaking strength of not less than 400 lbs on a test specimen 36 inches in length.
 3. The braid shall be UV stabilized with a minimum carbon black content of 2.0% by weight.
- D. Stone Fill Materials
1. See Section 02200 for stone fill requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. The Contractor shall check the geogrid, braid and mechanical connection elements upon delivery to verify that the proper material has been received. These materials shall be inspected by the Contractor to be free of flaws or damage occurring during manufacturing, shipping, or handling.

3.2 FINAL FABRICATION AND FILLING

- A. Mechanical Connections - The joints where the ends and baffles of each unit join the top or bottom of the unit shall be made with a mechanical connection between geogrid elements as shown on the Construction Drawings and Shop Drawings.
- B. Seaming - Unless otherwise shown on the Construction Drawings or Shop Drawings or approved by the Engineer:
1. All cut ends of braid material shall be knotted within 1 inch to 2 inch of the end to prevent raveling of the braid material. The braid material shall be securely knotted to the geogrid at all ends of all stitched seams, and at a spacing not to exceed 6 feet along any stitched seam. Pieces of braid material may be spliced end to end by securely knotting.
 2. The stitches along each seam shall be sufficiently tight to close the gap between the adjacent pieces of geogrid. The braid material shall be stitched through each pair of apertures along each seam at least once. The spacing of stitches shall be reasonably uniform at approximately 6 (minimum) stitches per foot along the entire length of each seam.
 3. Seaming to connect adjacent units is not required.
- C. Filling - Unless otherwise shown on the Contract Drawings or Shop Drawings and as approved by the Engineer:
1. Each unit shall be filled, and the fill shall be packed while the unit is supported in an upright position resting on its side with the open side facing upward and the long direction of the compartments running vertical. Each compartment shall be filled in lifts and each lift shall be tightly packed, except the final lift. The typical lift height shall not exceed 3 feet (loose) or 2.5 feet (packed). The

final lift height shall not exceed 9 inches in height and should overfill each compartment by approximately 2 inches.

2. Packing of the stone fill material and complete filling of each compartment shall be accomplished by rodding and / or vibration. The degree of filling and packing shall be adequate to achieve complete filling as evidenced by tightly confined stone particles, tensioned interior diaphragms, snug bodkin connections, slight bulging of each compartment, and no evidence of air space between compartments during lifting. Excessive bulging of the unit or displacement on the interior diaphragms, such as caused by overpacking or inadequate support, shall not be allowed.
3. Lifting hoops shall be formed by joining the top and bottom layers of grid from each unit by means of approved mechanical connections.
4. When filling and fabrication of a unit are complete, the unit shall be rotated to a horizontal position resting on its bottom in order to facilitate subsequent lifting.
5. Filling shall be accomplished in a manner that does not cause excessive damage to the geogrid, mechanical connection elements or the braid.

3.3 PREPARATION

- A. Subgrade - The subgrade soil shall be prepared as indicated on the Contract Drawings and as directed by the Engineer and Owner.
- B. Leveling Stone – Leveling stone shall be placed and prepared as indicated on the Contract Drawings and as directed by the Engineer and Owner.

3.4 INSTALLATION

- A. Position - The units shall be placed at the proper elevation, alignment and orientation as shown on the Contract Drawings or as directed by the Engineer.
- B. Placement Procedures:
 1. The procedure used in placement of the units shall be in accordance with the recommendations of the system supplier and as approved by the Engineer.
 2. For lifting of each unit, a spreader beam and / or spreader bars shall be used in a manner that the unit is not subjected to severe bending or distortion and that the top and bottom layers of geogrid are tensioned uniformly across their width. Units should generally be lifted from a horizontal position.
 3. Personnel shall stay clear of the area beneath units and rigging during lifting. Tag lines and / or divers may be required to facilitate proper placement of the units.
- C. Splicing and Anchoring - Where applicable, splicing and / or anchoring of the units shall be accomplished as shown on the Contract Drawings, the Shop Drawings or as directed by the Engineer.

3.5 REPAIR

- A. Any units damaged during fabrication, filling, or installation shall be repaired in a manner approved by the Engineer or shall be replaced by the Contractor. Any such measures required shall be at no additional cost to the Owner.

END OF SECTION

SECTION 03420

PRECAST CONCRETE STRUCTURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Precast concrete structures:
 - 1. All round precast concrete structures with a size greater than or equal to 6'-0" interior diameter (sections assembled vertically).
- B. Joint sealants
- C. Waterproofing

1.2 RELATED SECTIONS

- A. Section 01340 - Submittals
- B. Section 02200 - Earthwork
- C. Section 02601 - Manholes, Covers and Frames

1.3 REFERENCES

- A. This section contains references that are applicable to this Specification Section. The applicable edition of the indicated references shall be the version that was the most current at the time of the Advertisement of Bids. If referenced documents have been discontinued by the issuing organization, references to those documents shall mean the replacement documents issued or otherwise identified by that organization or, if there are no replacement documents, the last version of the document before it was discontinued. Where document dates are given in the following listing, references to those documents shall mean the specific document version associated with that date, whether or not the document has been superseded by a version with a later date, discontinued, or replaced.
- B. ACI 117 – Specifications for Tolerances for Concrete Construction and Materials
- C. ACI 301 Specifications for Structural Concrete
- D. ACI 302.1R Guide for Concrete Floor and Slab Construction
- E. ACI 304.2R Placing Concrete by Pumping Methods
- F. ACI 306.1 Specification for Cold Weather Concreting
- G. ACI 306R – Guide to Cold Weather Concreting
- H. ACI 308.1 – Standard Specification for Curing Concrete
- I. ACI 318 Building Code Requirements for Structural Concrete and Commentary
- J. ACI 347 Guide to Formwork for Concrete
- K. ACI 350 Code Requirements for Environmental Engineering Concrete Structures
- L. ACI 355.2 – Qualifications of Post-Installed Mechanical Anchors in Concrete
- M. ACI 355.4 – Qualifications of Post-Installed Adhesive Anchors in Concrete
- N. ACI ITG -7 – Specification For Tolerances for Precast Concrete
- O. ACI SP-66 – ACI Detailing Manual
- P. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
- Q. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron

- and Steel Hardware
- R. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
 - S. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
 - T. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
 - U. ASTM A675/A675M - Specification for Steel Bars, Carbon, Hot-Wrought, Special Quality, Mechanical Properties
 - V. ASTM A706/A706M – Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement
 - W. ASTM A775/A775M - Specification for Epoxy-Coated Reinforcing Steel Bars
 - X. ASTM A1064/A1064M – Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain or Deformed, for Concrete
 - Y. ASTM A1094/A1094M - Specification for Continuous Hot-Dip Galvanized Steel Bars for Concrete Reinforcement
 - Z. ASTM C33/C33M - Specification for Concrete Aggregates
 - AA. ASTM C40/C40M – Standard Test Method for Organic Impurities in Fine Aggregates for Concrete
 - BB. ASTM C88/C88M – Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
 - CC. ASTM C94/C94M - Specification for Ready Mixed Concrete
 - DD. ASTM C131/C131M – Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Abrasion Machine
 - EE. ASTM C150/C150M - Specification for Portland Cement
 - FF. ASTM C171/C171M - Standard Specification for Sheet Materials for Curing Concrete
 - GG. ASTM C260/C260M - Specification for Air Entraining Admixtures for Concrete
 - HH. ASTM C309/C309M – Standard Specification for Liquid Membrane - Forming Compounds for Curing Concrete
 - II. ASTM C443/C443M - Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets
 - JJ. ASTM C478/C478M - Standard Specification for Circular Precast Reinforced Concrete Manhole Sections
 - KK. ASTM C494/C494M - Specification for Chemical Admixtures for Concrete
 - LL. ASTM C535/C535M – Standard Test Method for Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Abrasion Machine
 - MM. ASTM C595/C595M - Specification for Blended Hydraulic Cements
 - NN. ASTM C618/C618M - Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
 - OO. ASTM C857/C857M - Standard Practice for Minimum Structural Design Loading for Underground Precast Concrete Utility Structures
 - PP. ASTM C877/C877M - Standard Specification for External Sealing Bands for Concrete Pipe, Manholes, and Precast Box Sections

- QQ. ASTM C881/C881M - Specification for Epoxy-Resin-Base Bonding Systems for Concrete
- RR. ASTM C887/C887M - Standard Specification for Packaged, Dry, Combined Materials for Surface Bonding Mortar
- SS. ASTM C890/C890M - Standard Practice for Minimum Structural Design Loading for Monolithic or Sectional Precast Concrete Water and Wastewater Structures
- TT. ASTM C913 - Specification for Precast Concrete Water and Wastewater Structures
- UU. ASTM C920/C920M - Standard Specification for Elastomeric Joint Sealants
- VV. ASTM C923/C923M - Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals
- WW. ASTM C989/C989M - Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars
- XX. ASTM C990/C990M - Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants
- YY. ASTM C1240/C1240M - Specification for Silica Fume Used in Cementitious Mixtures
- ZZ. ASTM C1260/C1260M – Standard Test Method for Potential Alkali Reactivity of Aggregates (Mortar-Bar Method)
- AAA. ASTM C1293/C1293M – Standard Test Method for Determination of Length Change of Concrete Due to Alkali-Silica Reaction
- BBB. ASTM C1433 - Specification for Precast Reinforced Concrete Monolithic Box Sections for Culverts, Storm Drains, and Sewers
- CCC. ASTM C1478/C1478M - Standard Specification for Storm Drain Resilient Connectors Between Reinforced Concrete Storm Sewer Structures, Pipes, and Laterals
- DDD. ASTM C1567/C1567M – Standard Test Method for Potential Alkali-Silica Reactivity of Combinations of Cementitious Materials and Aggregate (Accelerated Mortar Bar Method)
- EEE. ASTM C1602/C1602M – Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Production
- FFF. ASTM D1187/D1187M - Standard Specification for Asphalt-Base Emulsions for Use as Protective Coatings for Metal
- GGG. ASTM D1227/D1227M - Standard Specification for Emulsified Asphalt Used as a Protective Coating for Roofing
- HHH. ASTM D4101/D4101M - Standard Specification for Polypropylene Injection and Extrusion Materials
- III. ASTM E329/E329M – Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction
- JJJ. AWS D1.4/D1.4M – Structural Welding Code – Reinforcing Steel
- KKK. Concrete Reinforcing Steel Institute - 10MSP, Manual of Standard Practice
- LLL. Concrete Reinforcing Steel Institute - Placing Reinforcing Bars
- MMM. AASHTO Standard Specifications for Highway Bridges (17th Edition)
- NNN. Precast/Prestressed Concrete Institute (PCI) – Manual for Quality Control for Plants and Production of Structural Precast Concrete Products (MNL-116)
- OOO. Precast/Prestressed Concrete Institute (PCI), Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products (MNL-117)

PPP. Precast/Prestressed Concrete Institute (PCI), Manual for Quality Control for Plants and Production of Glass Fiber-Reinforced Concrete Products (MNL-130)
QQQ. Precast/Prestressed Concrete Institute (PCI), Tolerance Manual for Precast and Prestressed Concrete Construction (MNL-135)
RRR. CSA Group – A23.4 Precast Concrete – Materials and Construction

1.4 DESIGN REQUIREMENTS

- A. All precast units shall be constructed with interlocking ship lap joints and of shapes and sizes as shown on the Drawings.
- B. Design shall be for normal environmental exposure areas and shall be done by the ACI 350 "Strength Design Method" (Normal Environmental Exposure Condition) or the ACI 350 "Alternate Design Method" (Appendix I – Normal Exposure Condition).
- C. Structural design calculations shall include the following loading conditions:
 - 1. Empty precast structure with all external loads at maximum groundwater elevation
 - 2. Precast structure full of liquid with no backfill (leak test condition for tanks)
 - 3. Lifting of precast units. Member design shall consider forces and distortions during curing, stripping, storage, transportation, and erection so that precast members are not overstressed or otherwise damaged.
- D. All base sections shall be designed with the floor slabs cast as an integral placement with the bottom wall section.
- E. Minimum 28-day compressive strength: $f_c' = 5,000$ psi.
- F. Reinforcing Steel:
 - 1. ASTM A615/A615M grade 60 deformed bars or ASTM A1064/A1064M welded wire fabric.
 - 2. Minimum reinforcing steel in all concrete sections shall be no less than 0.003 times the gross area of the concrete section.
- G. Concrete cover on reinforcing steel: 1½ inches minimum.
- H. The interior dimensions of the precast concrete structures shall be as shown on the Drawings. Walls, top slabs and base slabs shall be a minimum of 8" thick.
- I. The precast concrete structure shall be designed to support its own weight plus the following minimum superimposed vertical and lateral loads:
 - 1. Live load on top slab – AASHTO HS25 vehicular loading. Point loads for buried slabs may be distributed in accordance with Chapter 6 from the AASHTO Standard Specifications for Highway Bridges.
 - 2. Dead load of soil on top slab – 125 pounds per cubic foot (pcf) x depth of fill.
 - 3. Lateral soil pressure - 95 pcf/vf. The top of the pressure diagram shall be assumed to originate at finish grade as shown on the drawings.
 - 4. Uniform live load lateral surcharge of 125 psf applied horizontally to the sides of the precast structure for a depth of 10 feet below finish grade.
 - 5. Interior liquid loading (tanks) – Design for the tank to be filled to the top with no backfill in place. Liquid density shall be assumed to be 63 pcf/vf.
 - 6. Seismic total lateral load = $0.1 \cdot S_s \cdot F_a \cdot \gamma \cdot H^2$ (full height inverted triangle loading diagram):
 - a. S_s = Maximum considered earthquake spectral response acceleration factor for short periods

- b. F_a = Seismic Site Coefficient for short periods
 - c. γ = Unit weight of soil (assume weights of 130 pcf shall be used)
 - d. H = Height of soil
- 7. Except where higher loads are specified herein, utility structures shall be designed for the minimum loads prescribed in ASTM C857/C857M.
- J. The precast concrete structure shall be designed to resist flotation:
 - 1. A factor of safety of 1.15 shall be used against flotation based on weights of empty structure and soil directly over footing extensions and above the top slab (if any).
 - 2. The base slab may be extended beyond the face of the wall to provide additional resistance to flotation.
 - 3. Unless otherwise indicated on the Drawings, additional cast-in-place concrete base slabs will not be permitted for flotation resistance.
 - 4. Frictional resistance shall not be permitted.
 - 5. Where the structure is composed of successive vertical segments, the weight of the segments shall be such as to provide the same factor of safety for buoyancy, or stainless-steel mechanical connections shall be used to connect the segments together. The design shall also include such anchorage to the reinforced concrete anti-buoyancy slab, if such slab is indicated on the Drawings.
 - 6. The buoyant force acting on an object is equal to the weight of the volume of water that is displaced by the object. The actual weight of the same volume determines whether or not the object is buoyant.
 - 7. If the Engineer determines that the submitted buoyancy calculations are incorrect, the Engineer shall direct the Contractor to implement specific measures to counteract buoyancy to the Engineer's satisfaction. Any and all costs associated with such measures shall be borne entirely by the Contractor and shall be at no additional cost to the Owner.
- K. Segmented structure joints:
 - 1. Joints shall be designed to transfer shear without continuous reinforcing steel.
 - 2. Provide mechanical connections between all vertical joints in box culvert tank structures.
 - 3. Provide waterstop sealants and external sealing bands in all joints to create watertight joints.

1.5 SUBMITTALS

- A. Manufacturer's Data:
 - 1. Submit manufacturer's specifications and instructions for all manufactured materials and products including hatches, sealants, sealing bands, dampproofing, pipe sleeves, flexible wall boots, anchorage hardware and other items. Include manufacturer's certifications and laboratory test reports as required.
 - 2. Submit the proposed erection procedure for precast units, sequence of erection, and required handling equipment.
- B. Shop Drawings:
 - 1. Submit shop drawings showing complete information for the fabrication and installation of precast concrete units.

2. Submit layout drawings prepared and stamped by a Professional Engineer registered in the State of [Note to Specifier: Insert State]. Drawings shall include the following information:
 - a. Overall layout drawings of the assembled precast concrete tank including overall dimensions. Provide identification of each precast unit corresponding to the sequence and procedure of installation.
 - b. Drawings of individual members indicating plan and cross section dimensions, locations, sizes, types and details of reinforcement.
 - c. Location and details of anchorage devices that are to be embedded in the precast concrete sections.
 - d. Locations and details of joints including ship laps and details of mechanical connections.
 - e. Locations of wall penetrations for pipes. All openings shall be cast-in-place at the manufacturing plant. Field coring of pipe penetrations shall not be allowed.
3. Submit structural design and buoyancy calculations demonstrating the structural integrity of all precast concrete units. Calculations and Drawings shall be prepared and stamped by a Professional Engineer registered in the State of Maine.
4. Submit Concrete Mix designs including test data that meets the criteria specified in ACI 301, Section 4. Mix design shall include:
 - a. Proportions for all ingredients, 28-day design compressive strength, water to cementitious materials ratio, admixture dosages, slump, and air content.
 - b. Cement Manufacturer's Certificates of conformance with ASTM C150/C150M taken during the last 90 days.
 - c. Supplementary Cementitious Materials: Source and test reports with certificates of conformance with ASTM C618/C618M for fly ash and ASTM C989/C989M for ground granulated blast furnace slag for actual material to be used in the Work taken during the last 90 days
 - d. Aggregate: data not older than 90 days, except test data for soundness, abrasion, alkali reactivity – not older than 12 months. Fine and coarse aggregate data shall include:
 - i. Sources
 - ii. Specific Gravity
 - iii. Sieve analyses per ASTM C33/C33M, including fineness modulus of fine aggregate
 - iv. Organic impurities for fine aggregate per ASTM C40/C40M
 - v. Potential alkali reactivity (except not required if a cement containing less than 0.60% alkalis is used, per ASTM C33/C33M), per ASTM C1260/C1260M, ASTM C1293/C1293M, or ASTM C1567/C1567M
 - vi. Soundness per ASTM C88/C88M
 - vii. Abrasion for coarse aggregate per ASTM C131/C131M and ASTM C535/C535M
 - e. Product data and material safety data sheets for concrete admixtures.
 - f. Test reports by testing agencies meeting ASTM E329/E329M:

- i. Test data used to determine the standard deviation used for establishing the required average design strength, and test data documenting that the proposed concrete proportions will produce an average compressive strength equal or greater than the required average compressive strength, shall be from within the previous 12 months.
 - ii. Laboratory trial batch data shall be from with the previous 24 months.
5. Submit past Project list with Owner contact information.
6. Submit letter from precast concrete manufacturer stating that all segmented precast concrete structures have been shop assembled prior to shipment and all fabrication and erection tolerances have been adhered to.

1.6 QUALITY ASSURANCE

- A. The manufacturer shall exhibit satisfactory performance on projects of similar magnitude under similar or equal service conditions for a period not less than five (5) years.
- B. Precast concrete manufacturing plant shall be certified by the Prestressed Concrete Institute (PCI) Plant Certification Program. Manufacturer shall be certified in Group C and CA products. The precast concrete manufacturing plant shall implement a Quality Control Plan and maintain a permanent Quality Control Manual outlining the quality control procedures used by the plant. The Quality Control Plan and Manual shall adhere to the requirements set forth in MNL-116. Engineer (or Independent Testing Laboratory) may perform a plant inspection at any time during casting of precast concrete components during the construction period. General Contractor shall notify the Engineer a minimum of 14 days prior to the availability of specific precast components for inspection. After notification, Engineer will notify the General Contractor a minimum of 72 hours prior to the inspection.

1.7 WARRANTY

- A. The Precast Concrete manufacturer shall provide a one (1) year warranty (from the Date of Substantial Completion) for the following:
 1. Cracking, spalling or other surface and structural defects.
 2. Separation of joints or misalignment of adjacent units due to faulty precast concrete sections.
 3. Leakage through all joints between concrete sections due to faulty materials.
- B. The manufacturer shall repair or replace all defective work at no additional cost to the Owner.

1.8 DELIVERY, STORAGE AND HANDLING

- A. All materials shall be inspected at the project site by the General Contractor for surface and structural defects at the time of delivery. All damaged materials shall be replaced by the Contractor at no additional cost to the Owner.
- B. Store precast concrete units at the project site to ensure against cracking, distortion, staining, or other physical damage, and so that markings are visible. Lift and support units at the designated lift points only.
- C. All precast concrete units shall be placed on supports such that they are stored off the

ground.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. American Concrete (Superior Concrete, LLC), Auburn, ME
- B. Or equivalent

2.2 MATERIALS

- A. Concrete mix design shall conform to the following:
 - 1. Minimum compressive strength of concrete at 28 days (f'_c) = 5000 psi.
 - 2. Maximum water/cement ratio = 0.45
 - 3. Cement:
 - a. Cement for all units shall be Type II Portland cement conforming to ASTM C150/C150M.
 - b. Blended cements: ASTM C595/595M. Do not use blended cements conforming to ASTM C595/595M if they contain cements conforming to ASTM C1157/C1157M.
 - c. Supplementary Cementitious Materials:
 - i. Ground Granulated Blast Furnace Slag: ASTM C989/C989M - Grade 100 or 120.
 - ii. Silica Fume: ASTM C1240/C1240M
 - iii. Fly Ash: ASTM C618/C618M - Type F
 - d. The proposed mix shall contain cementitious materials in the following proportions:
 - i. Portland Cement - No less than 75% of the total by weight.
 - ii. Ground Granulated Blast Furnace Slag - No greater than 50% of the total by weight.
 - iii. Fly Ash - No greater than 25% of the total by weight.
 - 4. Entrained air content of concrete: $6\% \pm 1.5\%$. Air entrainment admixture shall conform to ASTM C260/C260M.
 - 5. Admixtures:
 - a. Low Range Water Reducer: MasterPozzolith 210 by Master BuildersBASF; WRDA with HYCOL by W.R. Grace Construction Products Division& Company; or equivalent meeting ASTM C494/C494M Type A.
 - b. High Range Water Reducer (superplasticiser): Rheobuild 1000 or Glenium 3000 NS by Master BuildersBASF; Daracem 100 or ADVA 140M by W.R. Grace & CompanyW.R. Grace; or equivalent meeting ASTM C494/C494M Type F.
 - c. Air entraining agent: MasterAir AE 200 by Master Builders, DAREX II AEA by W.R. Grace & Company; or equivalent meeting ASTM C260/C260M.
 - 6. Coarse aggregate shall consist of a well graded crushed stone or a washed gravel conforming to the requirements of ASTM C33/C33M and the following requirements:

SIEVE	PERCENT PASSING			
	NO. 8 (3/8")	NO. 67 (3/4")	NO. 57 (1")	NO. 467 (1 1/2")
1-1/2 inch	-	-	100	95-100
1 inch	-	100	95-100	
3/4 inch	-	90-100	-	35-70
1/2 inch	100	-	25-60	
3/8 inch	85-100	20-55	-	10-30
No. 4	10-30	0-10	0-10	0-5
No. 8	0-10	0-5	0-5	
No. 16	0-5	-	-	
No. 50		-	-	

7. Fine aggregate shall consist of washed inert natural sand, free from mineral or other coatings, soft particles, clay, loam, organic or other deleterious materials conforming to the requirements of ASTM C-33/C33M and the following requirements:

SIEVE NO.	PERCENT PASSING
4	95 to 100
8	80 to 100
16	50 to 85
30	25 to 60
50	5 to 30
100	0 to 10

8. Potable water shall conform to ASTM C1602/C1602M.
- B. Reinforcing steel:
1. Bars: ASTM A615/A615M Grade 60; deformed new materials. Cold-bent in accordance with CRSI 10MSP
 2. Welded wire fabric: ASTM A185/A185M. Flat sheets are required, rolls are not permitted
 3. Tie wire: ASTM A82/A82M, annealed.
- C. Plates and inserts:
1. Plates:
 - a. Provide cast-in-place plates as shown on the Drawings. Plates shall be either:
 - i. ASTM A36/A36M. Hot dipped galvanized in accordance with ASTM A123/A123M or
 - ii. AISI Type 316 stainless steel.
 - b. Inserts:
 - i. Provide AISI Type 316 stainless steel inserts as required for lifting, connections, etc.
- D. Manhole Steps:
1. Provide manhole steps as shown on the Drawings.

2. Steps shall be constructed of steel reinforced copolymer polypropylene. Steps shall conform to ASTM C478/C478M and the polypropylene shall conform to ASTM D4101/D4101M.
 3. The top surface shall have a molded non-slip surface
 4. Step widths shall be between 13.75 inches – 14 inches. Step projects from face of concrete shall be between 5 inches – 6 inches.
 5. Steps shall be able to support the following loads in accordance with ASTM C478/C478M:
 - a. Minimum pullout load of 300 pounds
 - b. Minimum vertical load of 800 pounds with a maximum permanent deflection of ½ inch
 6. Thoroughly clean all surfaces to be embedded with a suitable cleaning agent to ensure that the surfaces are free from all foreign matter such as dirt, oil and grease.
 7. All steps shall be cast into walls of the precast section so as to form a continuous ladder with a distance of 12-inches between steps. Step inserts may be cast into the walls if reviewed with No Exceptions Taken by the Engineer.
 8. Acceptable products:
 - a. Model ML-13-NCR by American Step Company, Inc.
 - b. Model P-14938 by Parson Environmental Products, Inc.
 - c. Model PS2-PF by M. A. Industries, Inc.
 - d. Or equal
- E. Pipe Openings:
1. Provide flexible rubber watertight connectors at all pipe penetrations in the precast concrete structure. Connector shall conform to ASTM C923/C923M.
 2. Connectors shall either be cast into the concrete base or fastened to the structure with stainless steel expansive sleeves.
 3. Pipes shall be fastened to the connector with stainless steel bands.
 4. Acceptable products:
 - a. Kor-N-Seal (106-406 Series) by Trelleborg Pipe Seals
 - b. PSX: Positive Seal by Press-Seal Corporation
 - c. Z-Lok Connector made by A-Loc Products Inc.
 - d. Or equal
- F. Precast section joints:
1. Provide rubber sealant and wraps at all precast concrete section joints.
 2. Rubber sealants:
 - a. Install solid, continuous flexible butyl rubber sealants in all joints to achieve watertight joints. Install a double row of joint sealants for every manhole joint.
 - b. Sealant shall conform to ASTM C990/C990M.
 - c. Sealant shall maintain stability at all temperatures and not shrink or harden over time.
 - d. Acceptable products:
 - i. Kent Seal No. 2 by Hamilton Kent
 - ii. RN 101 Ram-Nek Joint Sealant by Henry
 - iii. EZ-STIK or PRO_STIK Butyl Sealant by Press-Seal Corporation

- iv. ConSeal CS-102 (CS-202 when the temperature during installation is less than 30°F) by Concrete Sealants, Inc.
 - v. Or equal
 - 3. Joint Wrap:
 - a. Wraps shall consist of two layers: a butyl joint wrap layer (30 mil) and an EPDM rubber backing layer (45 mil).
 - b. Wraps shall be 12" wide.
 - c. Install solid, continuous flexible butyl rubber wraps around the exterior face of all joints to achieve watertight joints.
 - d. Wraps shall conform to ASTM C877/C877M Type III.
 - e. Acceptable products:
 - i. EZ-WRAP by Press-Seal Corporation
 - ii. ConSeal CS-212
 - iii. Or equal
- G. Liquid Asphalt Dampproofing:
 - 1. Apply a two-coat waterborne emulsified-asphalt dampproofing system for all below grade exterior wall surfaces:
 - 2. First coat: Fiber free waterborne emulsified-asphalt dampproofing conforming to ASTM D 1187/D1187M (Type 1) and ASTM D 1227/D1227M (Type 3, Class I). Hydrocide 600 by Sonneborn Building Products - or equal.
 - 3. Second coat: Waterborne emulsified-asphalt dampproofing reinforced by long fibers conforming to ASTM D 1187/D1187M (Type 1) and ASTM D 1227/D1227M (Type 2, Class I). Hydrocide 700 by Sonneborn Building Products or equal.
 - 4. Hatches: Provide hatches as shown on the Drawings. Integral hatches are furnished under this Section, and specified in Specification Section 08305 "Special Doors".
- H. Manhole covers and frames: Provide manhole covers and frames as shown on the Drawings. Integral manholes covers and frames are furnished under this Section, and specified in Specification Section 02601 "Manholes, Covers and Frames".
- I. Concrete Repair Materials:
 - 1. Grout Paint: Mix 1-part Type II portland cement, 1-part fine sand, and enough water to the consistency of thick paint.
 - 2. Patching Mortar: 1-part of a mixture of white and grey Type II portland cement to 2.5 parts of damp loose sand. Cement type to match substrate.
 - 3. Epoxy Adhesive:
 - a. Two- or three-part water based epoxy bonding agent with cementitious components
 - b. Acceptable products:
 - i. Arimatec 110 Epocem by Sika Corporation
 - ii. Corr-Bond by Euclid Chemical Co.
 - iii. MasterEmaco P 124 by Master Builders
 - iv. Or equivalent
 - 4. Repair of random cracks (dry – free of liquid or moisture):
 - a. 2-component, 100% solids, moisture-tolerant, low-viscosity, high-strength, multipurpose, epoxy resin adhesive.

- b. Acceptable products:
 - i. Sikadur 35 Hi-Mod LV by Sika Corporation
 - ii. Eucopoxy Injection Resin by Euclid Chemical Co.
 - iii. MasterInject 1500 by Master Builders
 - iv. Or equivalent
- 5. Repair of random cracks (wet - presence of liquid or moisture):
 - a. Low viscosity polyurethane resin that expands and forms a closed cell foam when it comes in contact with water.
 - b. All cracks that are wet (either damp or leaking) at the time of repair shall be repaired with a material that is specifically intended for wet repair as recommended by the manufacturer.
 - c. Acceptable products:
 - i. SikaFix HH Hydrophilic by Sika Corporation
 - ii. Dural Aqua-Fil by Euclid Chemical Co.
 - iii. MasterInject 1210 IUG by Master Builders
 - iv. Or equivalent
- 6. Repair of excessive cracking:
 - a. Two component, 100% solids, moisture-tolerant, epoxy or urethane crack healer / penetrating sealer
 - b. Acceptable products:
 - i. Sikadur 55 SLV by Sika Corporation
 - ii. Euco Qwikstitch by Euclid Chemical Co.
 - iii. MasterSeal 370 by Master Builders
 - iv. Or equivalent
- 7. Repair of spalls, honeycombs areas and air voids and cementitious overlays:
 - a. Polymer modified, non-sag cementitious repair mortar with corrosion inhibitor.
 - b. Repair material shall include peastone for repairs of greater depth as required by the manufacturer. For repair areas involving depths generally in excess of three (3) inches, utilize a repair material suitable for the depth of repair.
 - c. Acceptable products:
 - i. SikaTop 122 Plus or 123 Plus by Sika Corporation
 - ii. Tamms Structural Mortar by Euclid Chemical Co.
 - iii. MasterEmaco N 400 MasterEmaco N 400
 - iv. Or equivalent

PART 3 - EXECUTION

3.1 FORMWORK

- A. Forms for manufacturing precast concrete products shall be of the type and design consistent with industry standards and practices.
- B. Forms shall be capable of consistently providing uniform products and dimensions.
- C. Forms shall be constructed so that the forces and vibrations to which the forms will be subjected can cause no product damage

3.2 FABRICATION AND PLACING REINFORCEMENT

- A. Detailing and fabrication of reinforcement shall conform to the CRSI Code of Standard Practice unless otherwise indicated on the Drawings.
- B. Reinforcing steel bars shall be clean and free from loose mill scale and rust and from coatings that reduce bond.
- C. Place reinforcement of structural members on accessory bolsters and chairs. Accessories shall be stainless steel or have plastic tips.
- D. All reinforcing shall have adequate concrete cover as specified.
- E. Do not weld reinforcement unless the Engineer takes no exceptions in writing. When permitted, welding shall be in accordance with AWS D1.4/D1.4M.

3.3 PRODUCTION, CURING, FINISHING, REPAIRS AND STORAGE

- A. Production, curing and storage of the precast units shall conform to the provisions of MNL 116. Production:
 - 1. Each precast concrete unit shall be an integral placement without any construction or cold joints. Base slabs shall be an integral placement with the bottom wall section.
 - 2. Structures shall be fabricated from the minimum number of precast sections in order to minimize the number of joints. Joints shall be located so that penetrations do not intersect joints.
 - 3. Tolerances: Fabricate precast units without exceeding the tolerances specified in MNL 116 unless otherwise indicated below: Round, square and rectangular vertical type manhole and vault structures:
 - i. Interior width:
 - (1) Less than 48": $\pm 7/16"$
 - (2) 48" – 96": $\pm 3/4"$
 - (3) Greater than 96": $\pm 1"$
 - ii. Vertical wall width: $-3/16"$, $+1"$
 - iii. Top and bottom slab depth: $-3/16"$, $+1"$
 - iv. Variation in length of opposite surfaces:
 - (1) Per foot of internal span: $\pm 1/8"$
 - (2) Span = 7' or less: $\pm 5/8"$
 - (3) Span > 7': $\pm 3/4"$
 - v. Variation From Specified Plan End Squareness or Skew: $\pm 1/2"$
 - vi. Offsets in Alignment of Adjacent Members at Any Joint: $\pm 1/4"$
- B. Curing:
 - 1. All exposed precast concrete shall be cured by either:
 - a. Moist curing (steam, ponding or application of burlap kept continuously wet)
 - b. Covering the exposed surface with polyethylene sheets
 - c. Covering the exposed concrete with membrane curing compounds
 - d. Application of steam. This method may only be used after the initial set of the concrete.
 - 2. Alternate wetting and drying shall not be permitted
- C. Finishing:
 - 1. Unless otherwise indicated all surfaces shall be cast with an "As Cast" finish.

2. All exposed surfaces shall be free of form defects, joint marks and shall be within the color variation as defined by the submitted samples and/or mock up sample.
 3. Slight color variations, small surface holes (up to ¼ inch diameter) caused by air bubbles will be accepted but no major imperfections, excessive honeycombing, sand streaks or other major defects shall be permitted.
- D. Repairs of Defects at the Plant:
1. Minor defects:
 - a. Defects not impairing the functional use or expected life of a precast concrete product as determined by the Engineer of Record shall be considered minor defects.
 - b. Minor defects shall be repaired by any method that does not impair the product.
 - c. All repairs shall be made and identified prior to shipment to the Project site.
 2. Major defects:
 - a. Defects in precast concrete products that impair the functional use or the expected life of products as determined by the Engineer of Record shall be considered major defects.
 - b. All precast units with major defects shall be rejected and not delivered to the Project site
- E. Storage:
1. Areas used for storage of products shall be firm enough and level enough to avoid causing damage to stored products.
 2. Products shall be stored on level surfaces in a manner that will minimize damage caused by uneven bearing, improperly located dunnage blocks, stacking products too high or difficulty in handling.

3.4 HANDLING, AND TRANSPORTATION

- A. All precast concrete units shall be lifted using designated pick points and lifting inserts. Extreme caution shall be exercised so as not to damage the units during handling.
- B. Prior to shipment, all precast products shall be inspected by Plant personnel to assure design conformance, all defects have been repaired and all units have proper identification. Products not conforming to requirements shall be clearly labeled and the defects noted on the inspection report. Only products conforming to the requirements shall be shipped.
- C. Transportation:
1. Precast concrete units shall be properly supported during transportation to minimize damage.
 2. Transport units in a position consistent with their shapes in order to avoid excessive stresses that may cause damage. Unique shipping instructions or special stacking may be required for irregularly shaped pieces.
 3. Do not transport units until they have been cured for a minimum of 5 days or have reached 75% of their 28-day design strength.

3.5 REPAIR OF UNITS AT PROJECT SITE

- A. Definitions:
 - 1. Honeycombed areas: Areas where voids are left in the concrete due to inadequate vibration and consolidation resulting in a failure of the mortar to effectively fill the spaces among coarse aggregate particles.
 - 2. Spalls: Concrete that has chipped, flaked, scaled or broken off from the surface of the concrete.
 - 3. Surface Defects: Those defects that affect the appearance of the finished concrete but do not affect the structural integrity. Surface defects include
 - 4. Structural Defects: Those defects that affect the appearance of the finished concrete and the structural integrity. Structural defects include:
- B. Surface Defects:
 - 1. Form tie holes
 - 2. Air voids (bugholes) larger than those specified for the required surface finish
 - 3. Honeycomb areas with a depth less than 1 inch
 - 4. Blisters
 - 5. Delaminations
 - 6. Crusting
 - 7. Visible construction joints, fins and burs
 - 8. Non-uniform concrete color and appearance
 - 9. Floors that are not level
- C. Structural Defects:
 - 1. Random cracks
 - 2. Excessive cracking (crazing)
 - 3. Spalls
 - 4. Air voids (bugholes) and honeycombed areas with a depth greater than or equal to 1 inch
- D. All repairs to precast concrete sections shall be at no additional cost to the Owner.

3.6 REPAIR OF SURFACE DEFECTS

- A. Form Tie Holes: After cleaned and thoroughly dampened, apply grout paint and fill holes solid with patching mortar.
- B. Air voids (bugholes): After cleaned and thoroughly dampened, apply grout paint and fill holes solid with patching mortar.
- C. Honeycomb areas:
 - 1. All honeycombed areas shall be removed to sound concrete by means of hand chisels or pneumatic chipping hammers or hydrodemolition.
 - 2. Saw cut a 1 inch minimum square groove around the edges of the defective area perpendicular to the surfaces to serve as the boundary for concrete removal. Saw cut the edges perpendicular to the surface. No feather-edges shall be allowed.
 - 3. Remove all loose aggregate paste and debris and scrub clean. Thoroughly wet area to be repaired. Brush and scrub grout paint into the substrate of the area to be repaired.
 - 4. Mix patching mortar using as little water as possible. Allow to stand with frequent manipulation of trowel to achieve stiffest consistency. Blend white and gray portland cement to achieve color match with surrounding concrete.

5. Prior to the set of grout paint (but after it has cast its water sheen), apply a stiff consistency of patching mortar to the area with a trowel. Leave patched surface slightly higher than surrounding surface. Do not finish for 1 hour minimum. Cure in same manner as adjacent concrete.
- D. Blisters, delaminations and crusting: Repairs shall be similar to those for honeycomb areas. Depth of saw cut shall match the depth of the defective concrete.
- E. Visible construction joints, fins and burrs: Remove by grinding until a smooth uniform surface is attained.
- F. Concrete with an overall non-uniform color or appearance as determined by the Engineer shall be repaired with a complete cementitious overlay. Application of the overlay shall be in strict accordance with the manufacturer's written instructions and recommendations.
- G. Finished Flatwork exceeding specified tolerances:
 1. High areas shall be repaired by grinding after the concrete has cured 14 days.
 2. Low areas shall be repaired by adding appropriate overlay material. Grind concrete if required to provide minimum overlay thickness as required by the manufacturer. Finish repair area to match adjacent concrete.

3.7 REPAIR OF STRUCTURAL DEFECTS

- A. Remove and replace or repair all structural defects in precast concrete sections.
- B. Unless otherwise indicated, all concrete defects shall be repaired in accordance with the specific repair material manufacturer's recommendations.
- C. Random cracks:
 1. Cleaning of cracks:
 - a. Dry cracks: Crack or void must be dry at time of application. Remove all dust, debris or disintegrated material from cracks or voids by the use of oil-free compressed air or vacuuming. Cracks saturated with oil or grease must be chipped out to unsaturated concrete. "Vee" out cracks in horizontal surfaces slightly.
 - b. Wet cracks: Clean the crack surface so that the crack can be located. If the crack is wide or high water flows are encountered, seal the surface of the crack with a surface sealing material as recommended by the manufacturer.
 2. Where cracks extend through members and are accessible, seal bottom of crack which is to receive the repair material.
 3. Patching of vertical wall or overhead cracks shall be accomplished in the same manner using a similar epoxy material of higher viscosity as recommended by the manufacturer.
 4. Apply repair material in strict accordance with manufacturer's recommendations.
- D. Excessive cracking (Crazing):
 1. Slabs containing an excessive amount of cracks as defined herein, and which will remain exposed, shall receive topping after sealing of cracks in accordance with the above paragraph.
 2. Excessive cracking shall be defined as areas containing cracks averaging 1/64th-inch wide or greater, and in excess of 15 linear feet of cracks per 100 square feet of slab. In the event that excessive cracking occurs in isolated areas

of a given floor, topping shall only be applied in the area of the cracks bounded by construction, expansion, or control joints.

3. Apply repair material in strict accordance with manufacturer's recommendations.
- E. Spalls and honeycomb areas:
 1. All weakened, damaged or disintegrated concrete shall be removed to sound concrete by means of hand chisels or pneumatic chipping hammers or hydrodemolition.
 2. Saw cut a 1-inch minimum square groove around the edges of the defective area perpendicular to the surfaces to serve as the boundary for concrete removal. Saw cut the edges perpendicular to the surface. No feather-edges shall be allowed.
 3. Remove defective concrete. If defective areas extend around reinforcing steel, chip to provide a clear space of at least 1 inch all around the bar. When pneumatic chipping hammers are used for removal of concrete around reinforcement, they shall not exceed 15 pounds.
 4. Apply repair material in strict accordance with manufacturer's recommendations.

3.8 REPAIR OF PRECAST CONCRETE SECTIONS AT PROJECT SITE

- A. Contractor shall repair all damaged, cracked, or chipped units in accordance with the requirements of this Section. All units that are damaged beyond repair as determined by the Engineer shall be removed from the project site and replaced at no additional cost to the Owner.

3.9 ERECTION OF PRECAST STRUCTURES

- A. Install all precast structures level and plumb to the elevations and in the locations shown on the Drawings. All precast concrete units shall be lifted using designated pick points and lifting inserts in accordance with the written instructions from the Precast Concrete supplier.
- B. Installation Tolerances: Install precast units without exceeding the tolerances specified in MNL 116. Attach precast concrete units to concrete foundations as indicated on the Drawings or as required by the Precast Concrete manufacturer.
- D. Connect adjacent precast concrete units as required by the manufacturer. All units shall fit tight to their adjacent units.
- E. Joints: All joints shall be watertight and shall be sealed as indicated below:
 1. Install butyl rubber sealants in all joints. A minimum of 2 rows of sealants shall be applied at each joint.
 2. Install butyl joint wraps around the exterior face of all horizontal and vertical joints to achieve watertight joints. For segmented box culvert type tank structures, install wrap on the interior face of joints in the base slab.
 3. All sealants and wraps shall be installed in accordance with the manufacturer's recommendations.
- F. After erection is complete, all surface damages to the precast concrete units shall be properly repaired in accordance with this Section. All lifting inserts and holes shall be patched after final installation.

3.10 LIQUID ASPHALT DAMPPROOFING APPLICATION

- A. Apply dampproofing to the exterior surfaces all below grade precast concrete walls and on the top surface of below grade top slabs. For installation of concrete tanks, damproofing shall be applied after tanks have been successfully tested.
- B. Apply two coats in strict accordance with manufacturer's printed instructions and as specified herein. Clean and prepare surfaces as required.
- C. Do not apply dampproofing at temperatures below 40° F or when temperature is expected to fall below 40° F within 12 hours.
- D. Do not place backfill for at least 48 hours after application.
- E. All damproofing materials spilled on adjacent structures shall be cleaned with a material recommended by the dampproofing manufacturer.

END OF SECTION

APPENDIX A
Project Permits



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
NEW ENGLAND DISTRICT, CORPS OF ENGINEERS
698 VIRGINIA ROAD
CONCORD, MASSACHUSETTS 01742-2751

MAINE GENERAL PERMIT (GP)
AUTHORIZATION LETTER AND SCREENING SUMMARY

JUSTIN EARLY, P.E.
TOWN OF FALMOUTH
FALMOUTH, MAINE 04105

CORPS PERMIT # NAE-2020-01800
CORPS GP ID# non-screen
STATE ID# PBR

DESCRIPTION OF WORK:

Place permanent fill in 460 s.f. of freshwater wetland adjacent to Casco Bay off Underwood Road at Falmouth, Maine in order to reconstruct an existing stormwater outfall. This work is shown on the attached plans entitled "TOWN OF FALMOUTH UNDERWOOD ROAD DRAINAGE IMPROVEMENTS" in ten sheets dated "2/10/2020".

See GENERAL CONDITIONS attached.

LAT/LONG COORDINATES: 43.736829° N -70.201976° W USGS QUAD: PORTLAND EAST, ME

I. CORPS DETERMINATION:

Based on our review of the information you provided, we have determined that your project will have only minimal individual and cumulative impacts on waters and wetlands of the United States. Your work is therefore authorized by the U.S. Army Corps of Engineers under the Federal Permit, the Maine General Permit which can be found at: <https://www.nae.usace.army.mil/Missions/Regulatory/State-General-Permits/> Accordingly, we do not plan to take any further action on this project.

You must perform the activity authorized herein in compliance with all the terms and conditions of the GP [including any attached Additional Conditions and any conditions placed on the State 401 Water Quality Certification including any required mitigation]. Please review the enclosed GP carefully, including the GP conditions beginning on page 5, to familiarize yourself with its contents. You are responsible for complying with all of the GP requirements; therefore you should be certain that whoever does the work fully understands all of the conditions. You may wish to discuss the conditions of this authorization with your contractor to ensure the contractor can accomplish the work in a manner that conforms to all requirements.

If you change the plans or construction methods for work within our jurisdiction, please contact us immediately to discuss modification of this authorization. This office must approve any changes before you undertake them.

Condition 37 of the GP (page 16) provides one year for completion of work that has commenced or is under contract to commence prior to the expiration of the GP on October 13, 2020. You will need to apply for reauthorization for any work within Corps jurisdiction that is not completed by October 13, 2021.

This authorization presumes the work shown on your plans noted above is in waters of the U.S. Should you desire to appeal our jurisdiction, please submit a request for an approved jurisdictional determination in writing to the undersigned.

No work may be started unless and until all other required local, State and Federal licenses and permits have been obtained. This includes but is not limited to a Flood Hazard Development Permit issued by the town if necessary.

II. STATE ACTIONS: PENDING [X], ISSUED [X], DENIED [] DATE _____

APPLICATION TYPE: PBR: X, TIER 1: _____, TIER 2: _____, TIER 3: _____, LURC: _____, DMR LEASE: _____, NA: _____

III. FEDERAL ACTIONS:

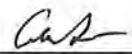
JOINT PROCESSING MEETING: non-screen LEVEL OF REVIEW: CATEGORY 1: X CATEGORY 2: _____


AUTHORITY (Based on a review of plans and/or State/Federal applications): SEC 10 _____, 404 X 10/404 _____, 103 _____

EXCLUSIONS: The exclusionary criteria identified in the general permit do not apply to this project.

FEDERAL RESOURCE AGENCY OBJECTIONS: EPA N/A, USF&WS N/A, NMFS N/A

If you have any questions on this matter, please contact my staff at 978-318-8676 at our Augusta, Maine Project Office. In order for us to better serve you, we would appreciate your completing our Customer Service Survey located at http://corpsmapu.usace.army.mil/cm_apex/f?p=136:4:0


COLIN M. GREENAN
PROJECT MANAGER
MAINE PROJECT OFFICE


FOR FRANK J. DEL GIUDICE
CHIEF, PERMITS & ENFORCEMENT BRANCH
REGULATORY DIVISION
7/13/20 DATE



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

**PLEASE NOTE THE FOLLOWING GENERAL AND SPECIAL CONDITIONS FOR
DEPARTMENT OF THE ARMY
GENERAL PERMIT
NO. NAE-2020-01800**

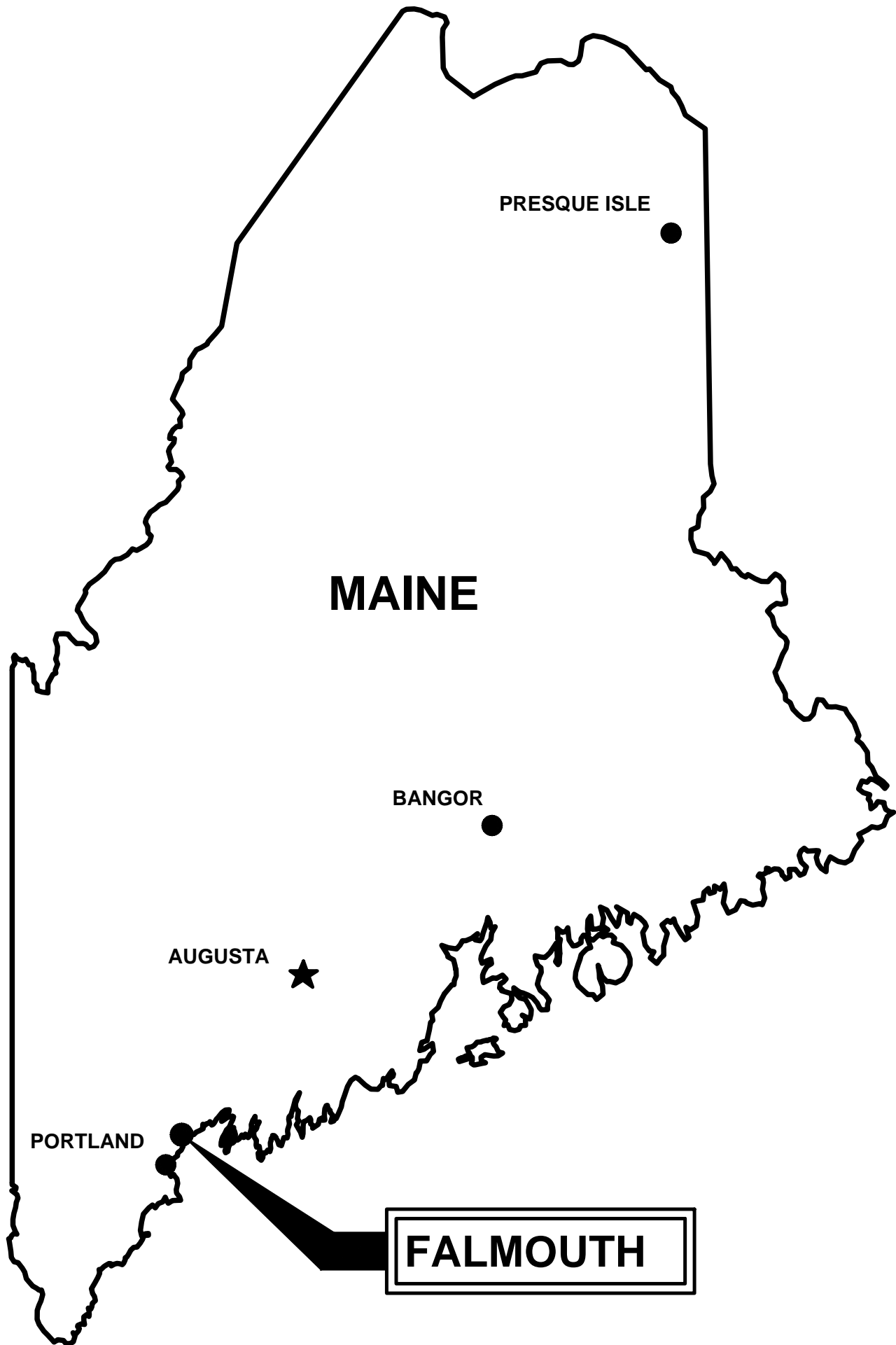
GENERAL CONDITIONS

16. Soil Erosion, Sediment and Turbidity Controls: a. Adequate sedimentation and erosion control management measures, practices and devices, such as phased construction, installation of sediment control barriers (i.e. silt fence, vegetated filter strips, geotextile silt fences, erosion control mixes, hay bales or other devices) downhill of all exposed areas, retention of existing vegetated buffers, application of temporary mulching during construction, and permanent seeding and stabilization shall be installed and properly maintained to reduce erosion and retain sediment on-site during and after construction. They shall be capable of preventing erosion; of collecting sediment, suspended and floating materials; and of filtering fine sediment. b. Temporary sediment control barriers shall be removed upon completion of work, but not until all disturbed areas are permanently stabilized. The sediment collected by these sediment barriers shall be removed and placed at an upland location and stabilized to prevent its later erosion into a waterway or wetland. c. All exposed soil and other fills shall be permanently stabilized at the earliest practicable date.

26. Permit on Site: The permittee shall ensure that a copy of this GP and any accompanying authorization letter with attached plans are at the site of the work authorized by this GP whenever work is being performed and that all construction personnel performing work which may affect waters of the U.S. are aware of its terms and conditions. The entire permit authorization shall be made a part of any and all contracts and subcontracts for work that affects areas of Corps jurisdiction at the site of the work authorized by this GP. This shall be achieved by including the entire permit authorization in the specifications for work. The term "entire permit authorization" means this entire GP and the authorization letter (including its drawings, plans, appendices and other attachments) and also includes permit modifications. If the authorization letter is issued after the construction specifications, but before receipt of bids or quotes, the entire permit authorization shall be included as an addendum to the specifications. If the authorization letter is issued after receipt of bids or quotes, the entire permit authorization shall be included in the contract or subcontract. Although the permittee may assign various aspects of the work to different contractors or subcontractors, all contractors and subcontractors shall be obligated by contract to comply with all environmental protection provisions contained within the entire GP authorization, and no contract or subcontract shall require or allow unauthorized work in areas of Corps jurisdiction.

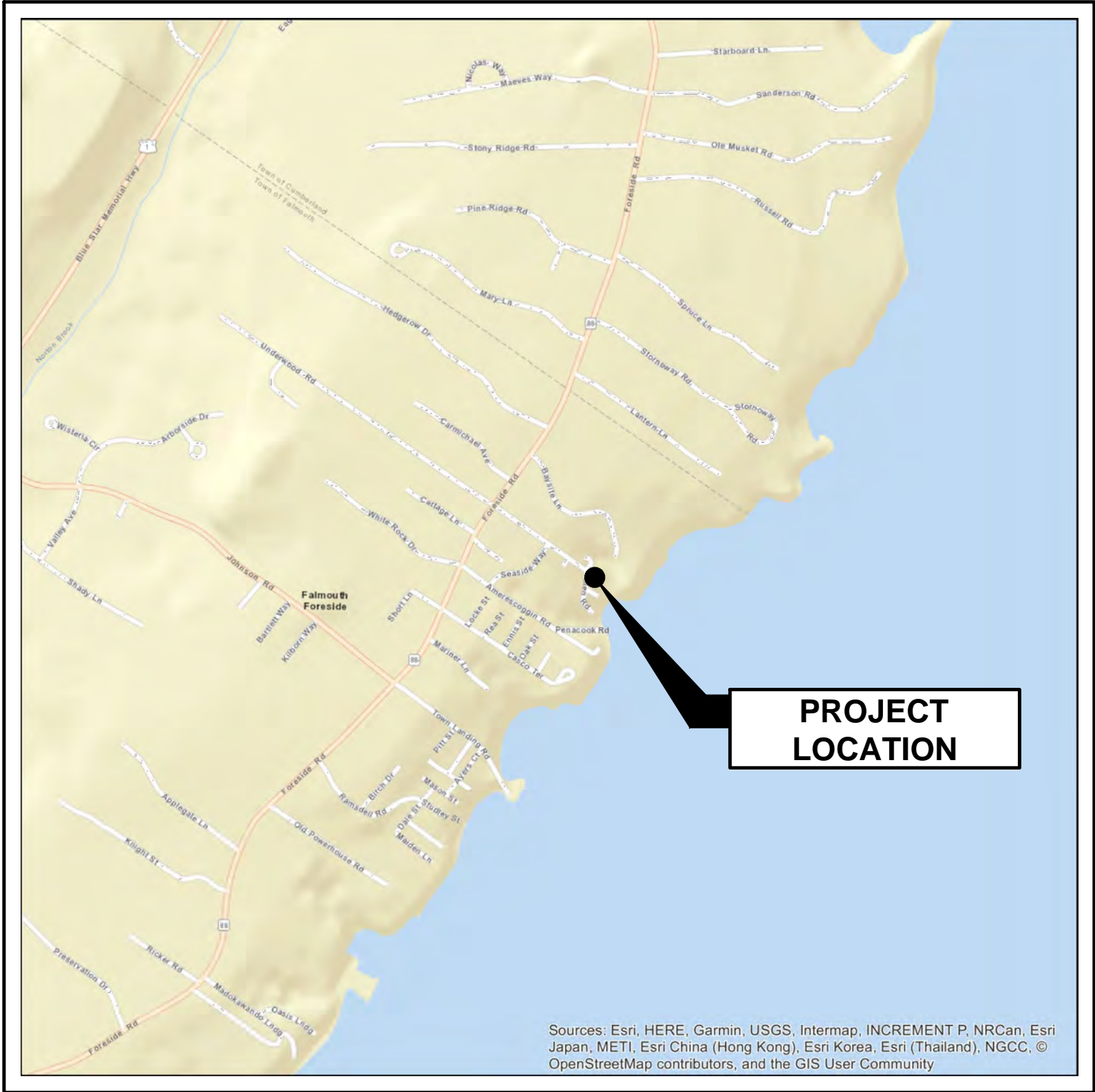
28. Inspections: The permittee shall allow the Corps to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of this GP and any written verification.

TOWN OF FALMOUTH
PERMITTING DRAWINGS FOR
UNDERWOOD ROAD
DRAINAGE IMPROVEMENTS
FALMOUTH, MAINE
MARCH 2020



**FOR PERMITTING
PURPOSES ONLY**

<u>DRAWING INDEX</u>	
<u>GENERAL</u>	
-----	COVER SHEET
<u>CIVIL</u>	
C-1	GENERAL NOTES, LEGEND AND ABBREVIATIONS
C-2	EXISTING CONDITIONS AND DEMOLITION PLAN
C-3	SITE LAYOUT PLAN
C-4	PROFILES
C-5	SECTIONS
C-6	DETAILS I
C-7	DETAILS II
C-8	DETAILS III
C-9	EROSION CONTROL NOTES AND DETAILS
C-10	CONSTRUCTION PHASING PLAN



LOCATION PLAN

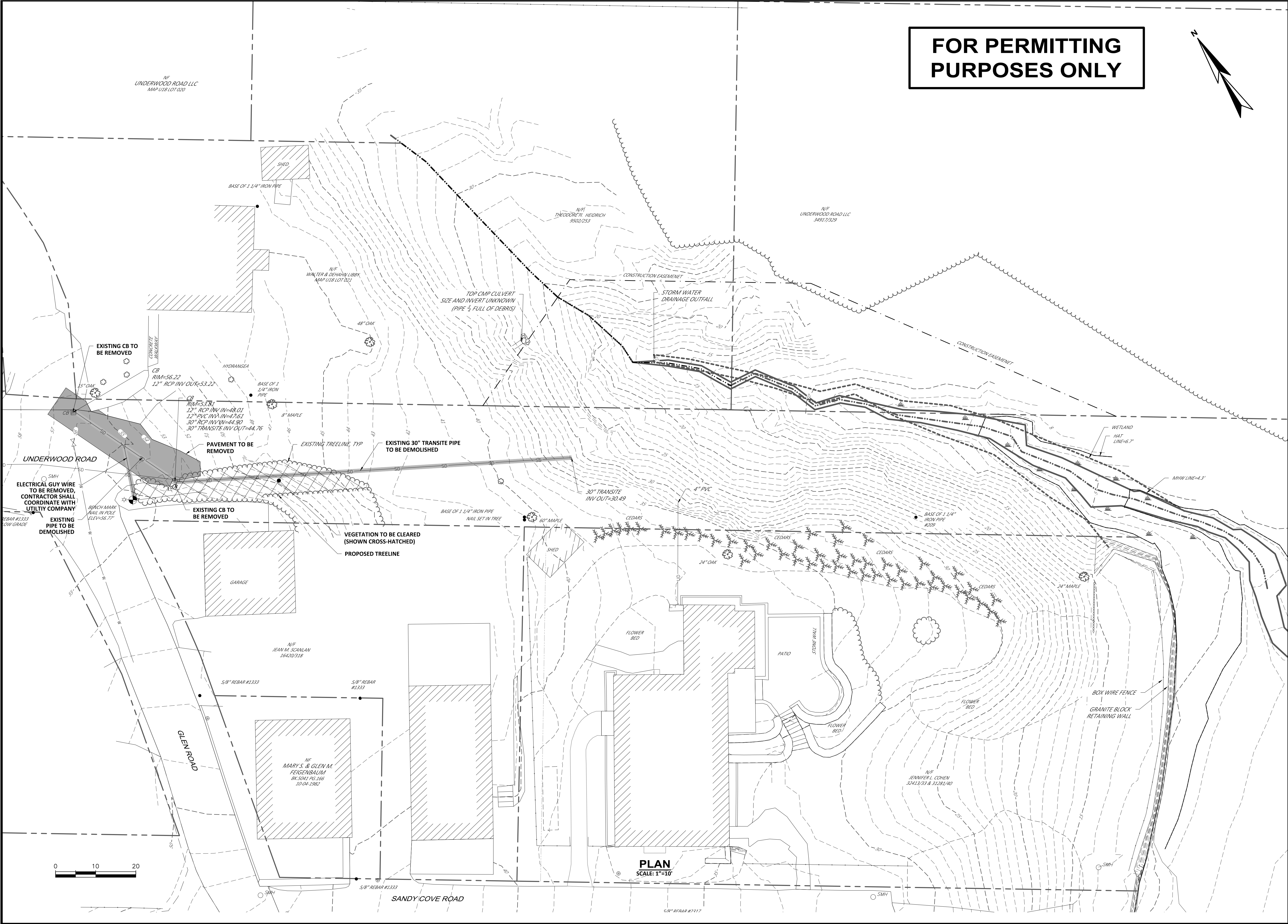
WRIGHT-PIERCE 
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888.621.8156 | www.wright-pierce.com

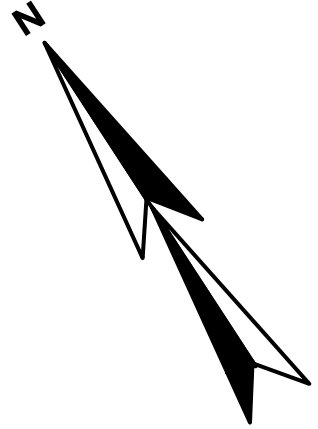
FOR REVIEW _____

FOR BIDDING _____

WP PROJECT No. 13042A



FOR PERMITTING
PURPOSES ONLY

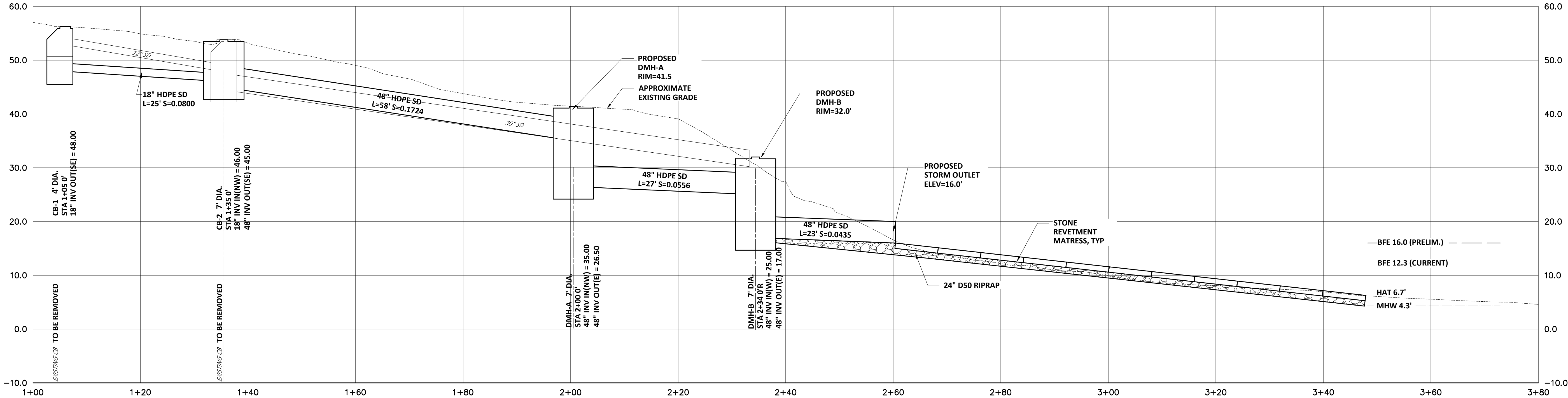


SUBMISSIONS/REVISIONS		DATE
ISSUED FOR PERMITTING		
NO		
DESIGNED BY: J.WAL		
CAD COORD: M.LAP		
CAD: J.WAL		
CHECKED BY: J.WAL		
DATE: 3-26-2020		
APPROVED BY: R.WIN		
DATE: 3-26-2020		
PROJECT NO: 13042		

TOWN OF FALMOUTH UNDERWOOD ROAD DRAINAGE IMPROVEMENTS FALMOUTH, MAINE	
EXISTING CONDITIONS AND DEMOLITION PLAN	

DRAWING	
C-2	

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OUTFALL
PROFILE

SCALE
VERT: 1"=10'
HORIZ: 1"=10'

FOR PERMITTING
PURPOSES ONLY

TOWN OF FALMOUTH
UNDERWOOD ROAD
DRAINAGE IMPROVEMENTS
FALMOUTH, MAINE

PROFILES

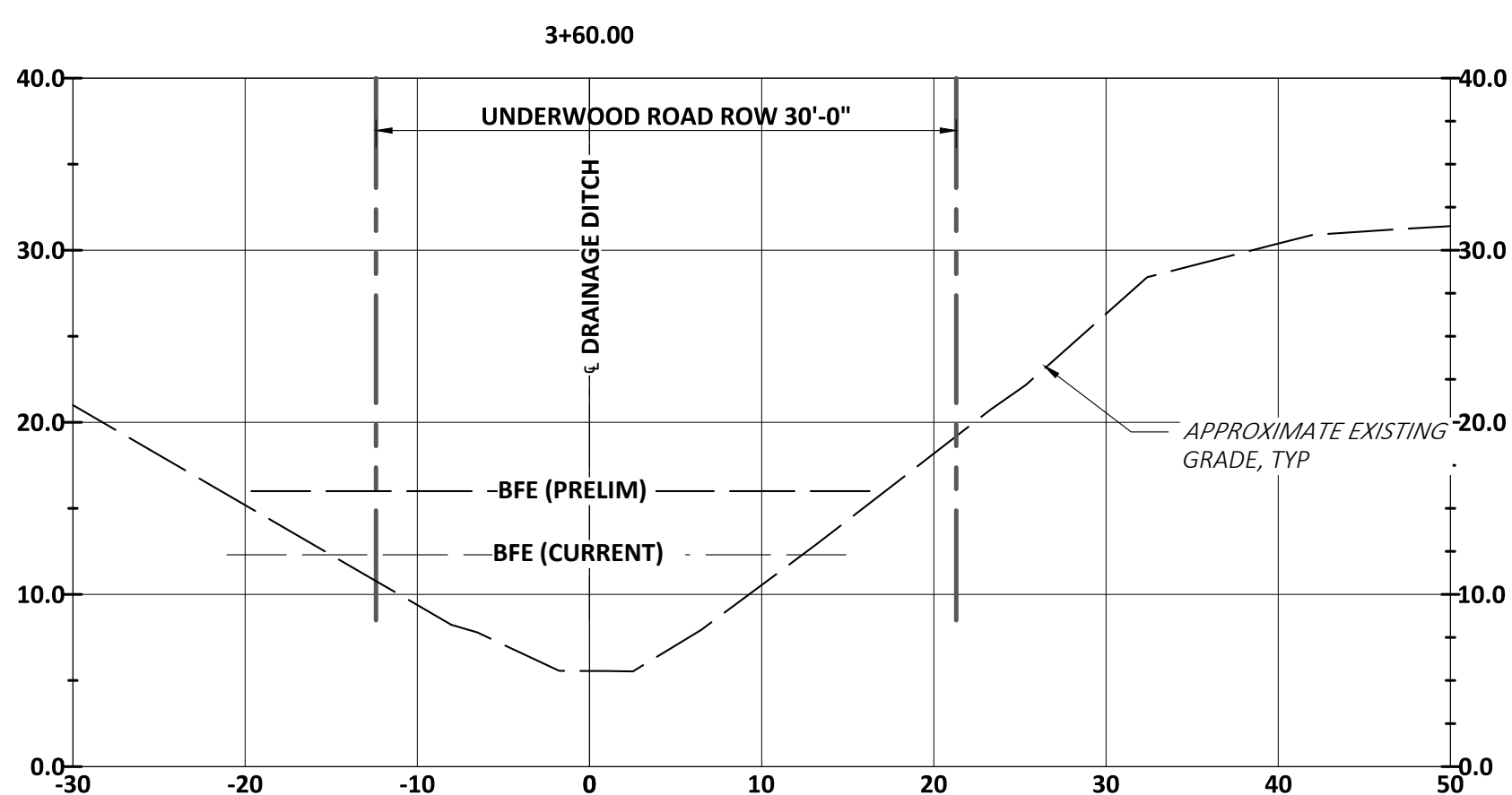
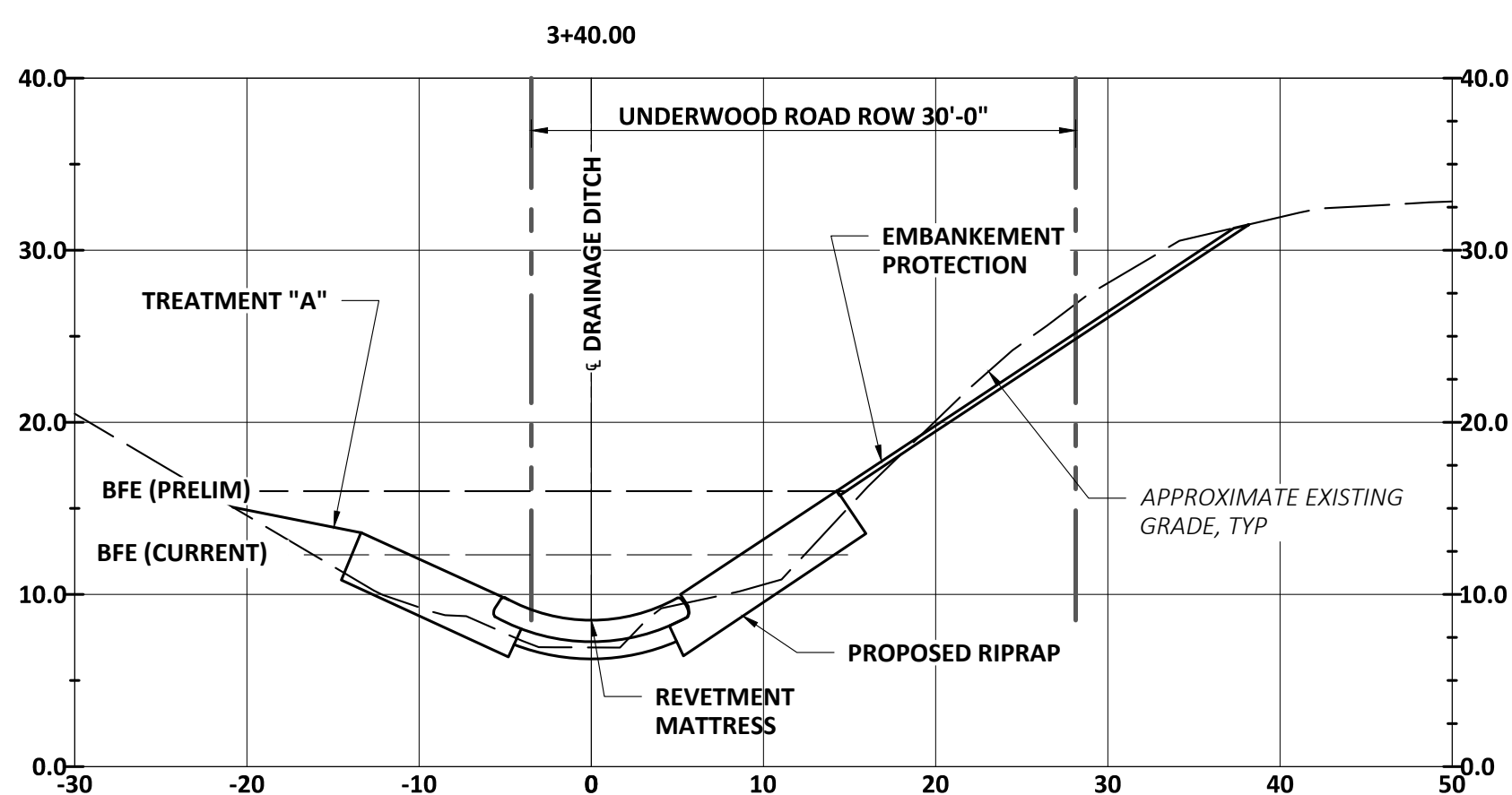
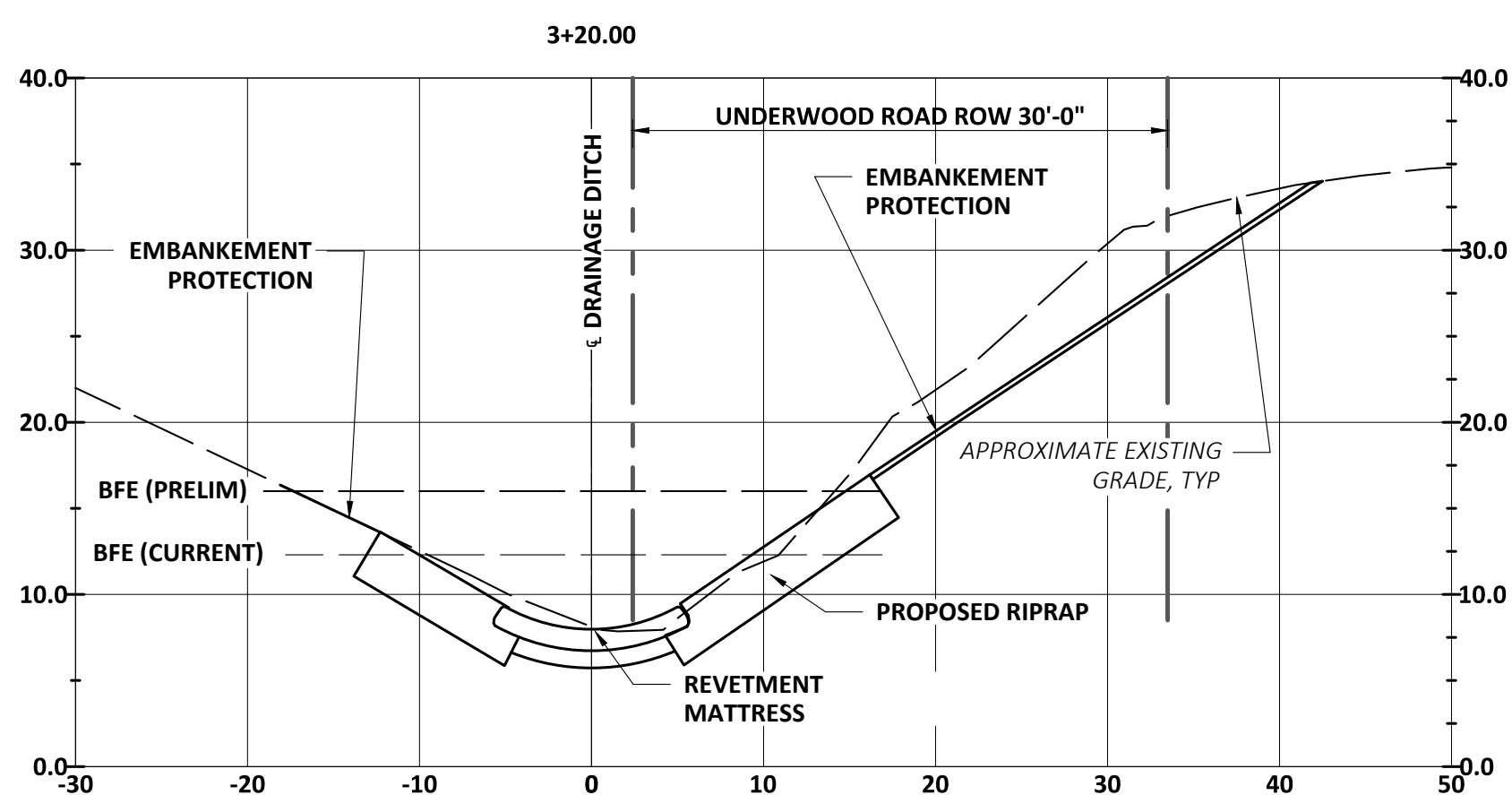
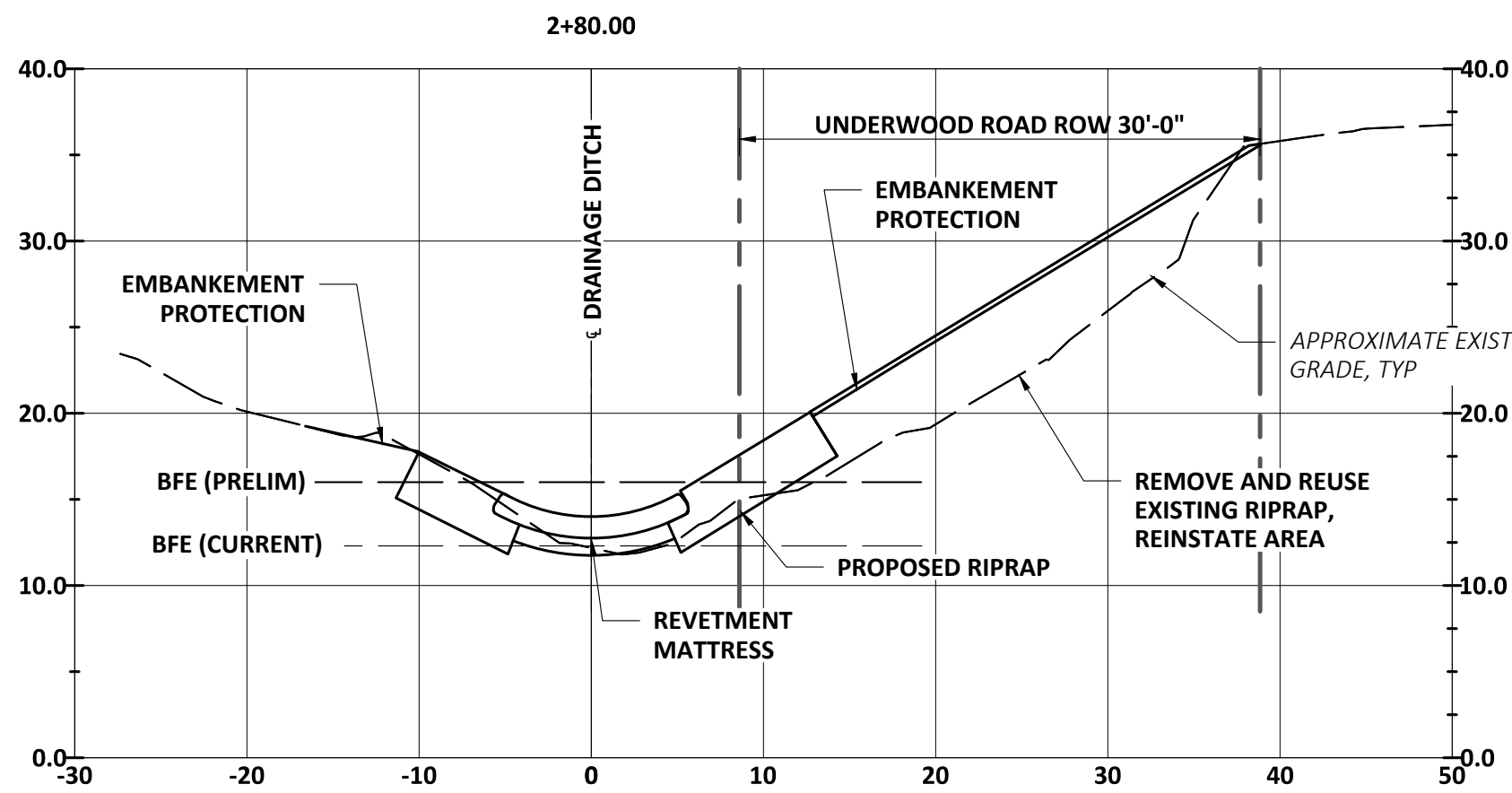
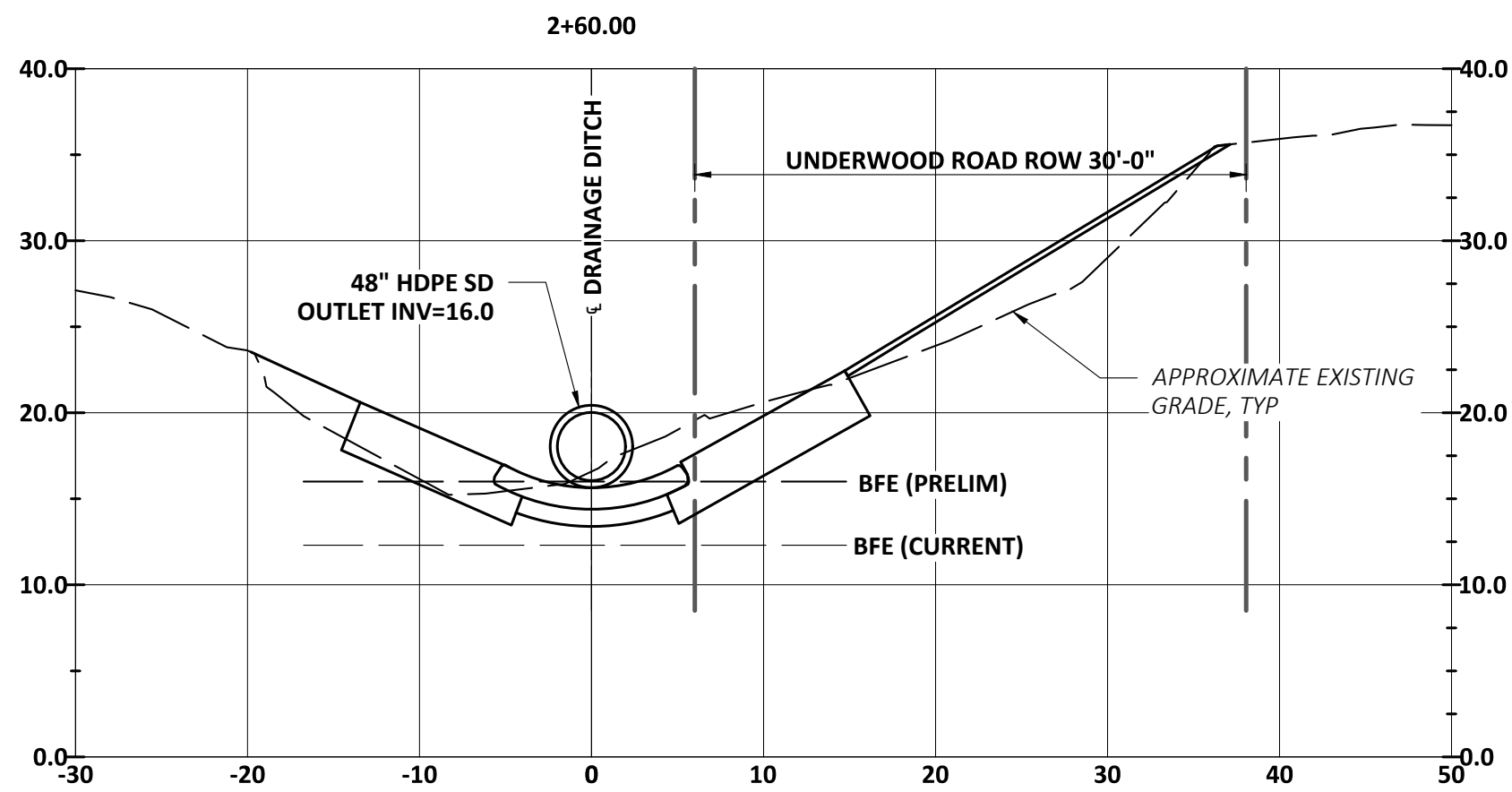
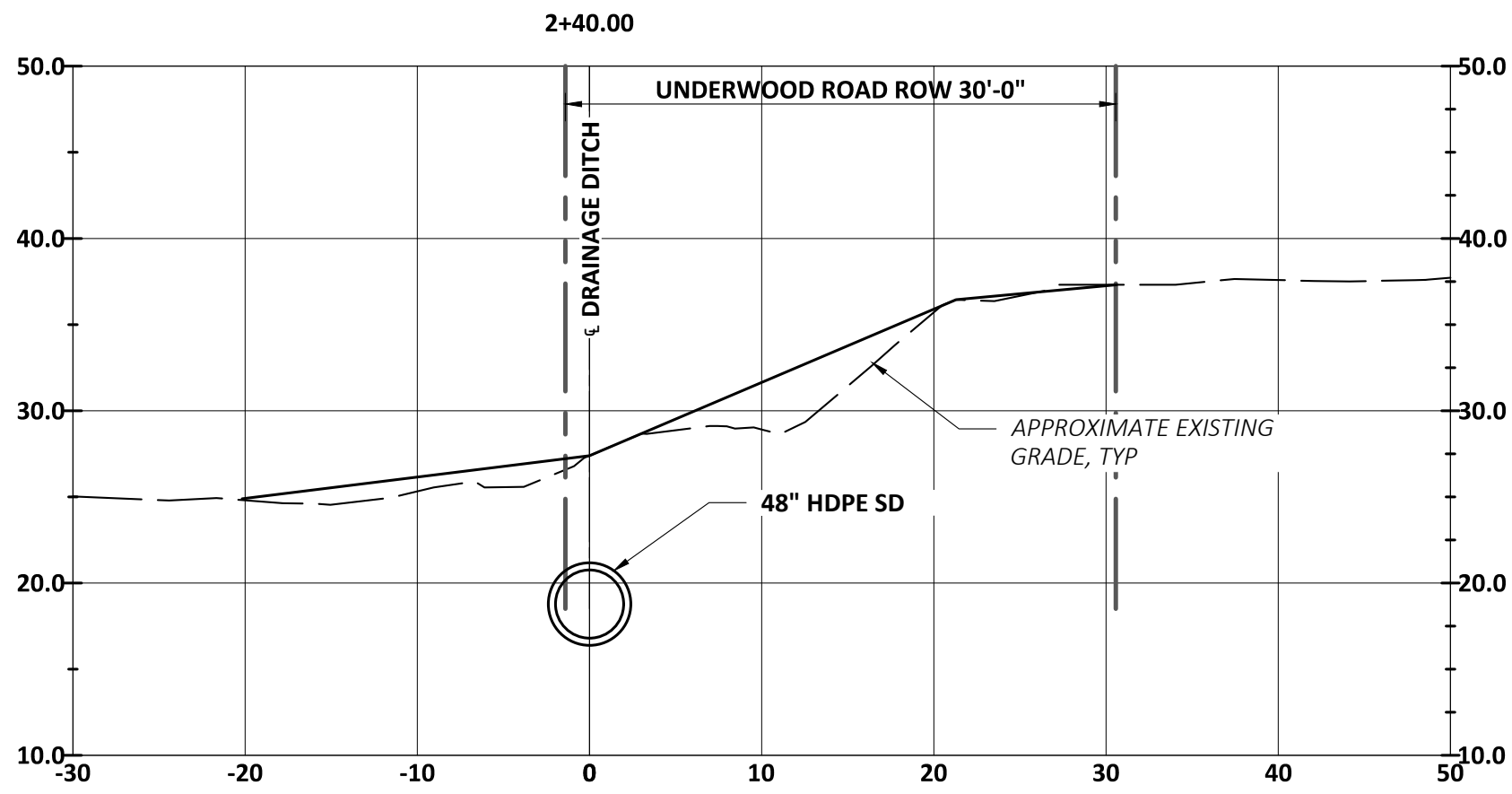
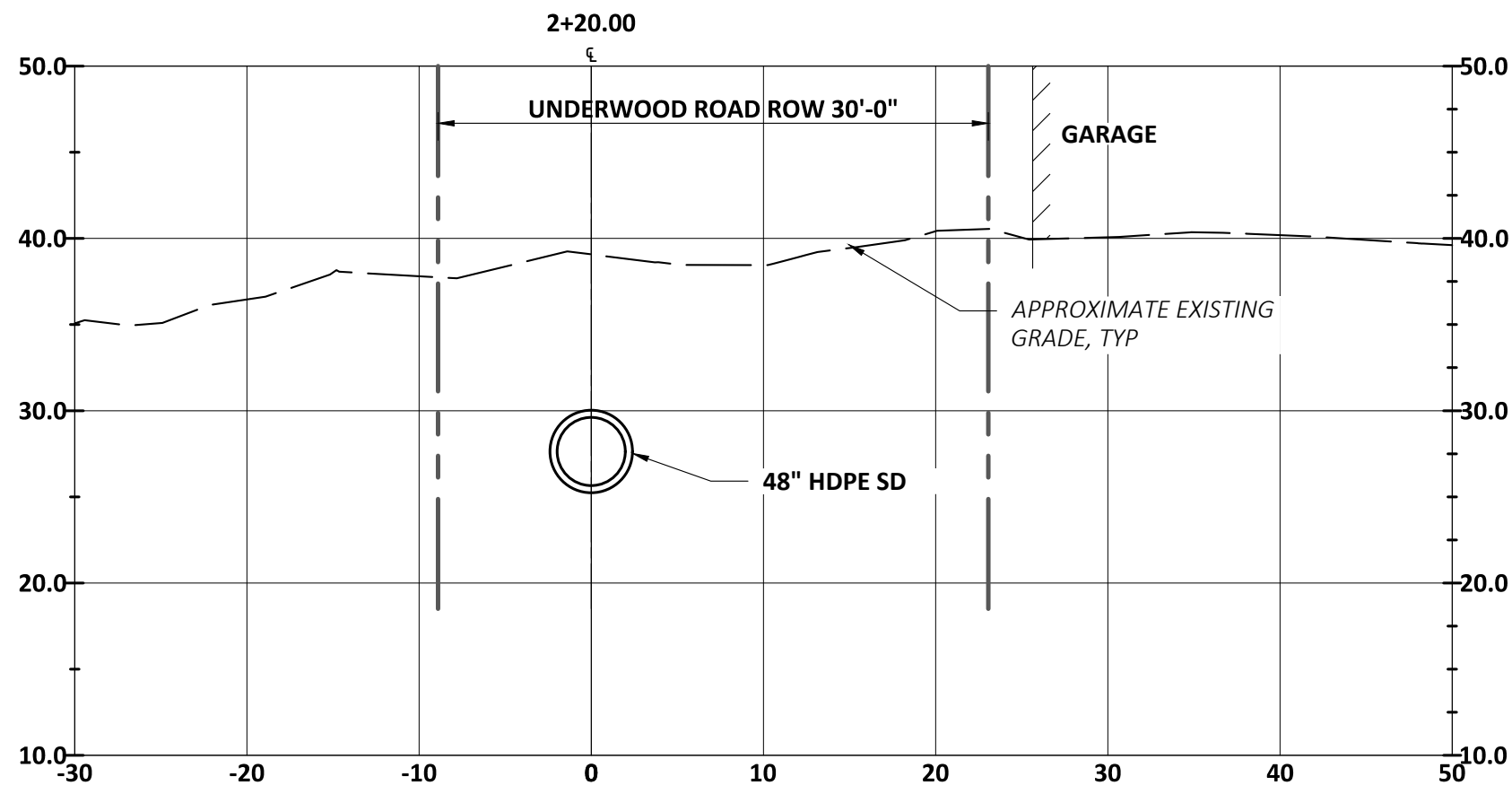
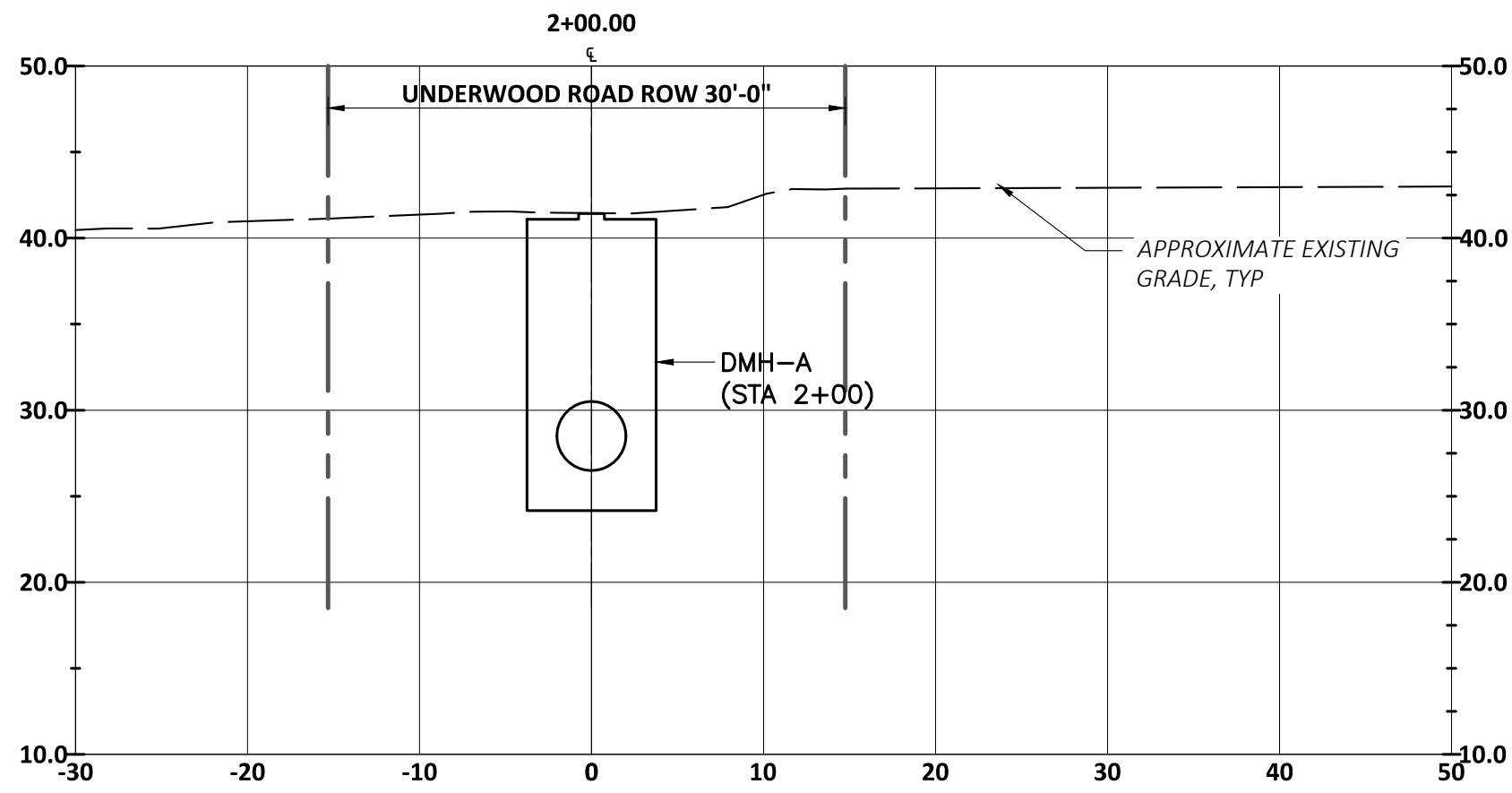
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DRAWING
C-4

SUBMISSIONS/REVISIONS		APP'D	DATE
ISSUED FOR PERMITTING		R. WIN	3-20
NO			
DESIGNED BY: J.WAL			
CAD COORD: M.LAP			
CAD: M.LAP			
CHECKED BY: J.WAL			
DATE: 3-26-2020			
APPROVED BY: R. WIN			
DATE: 3-26-2020			
PROJECT NO: 13042			

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LAST SAVED BY: MATT.LAPIERRE 3/25/2020 3:05 PM



X-SECTIONS
SCALE: 1"=10'-0"

**FOR PERMITTING
PURPOSES ONLY**

SUBMISSIONS/REVISIONS		APPD	DATE
ISSUED FOR PERMITTING		R.WIN	3-20
NO			
DESIGNED BY: J.WAL			
CAD COORD: M.LAP			
CHECKED BY: J.WAL			
DATE: 3-26-2020			
APPROVED BY: R.WIN			
DATE: 3-26-2020			
PROJECT NO: 13042			

TOWN OF FALMOUTH
UNDERWOOD ROAD
DRAINAGE IMPROVEMENTS
FALMOUTH, MAINE

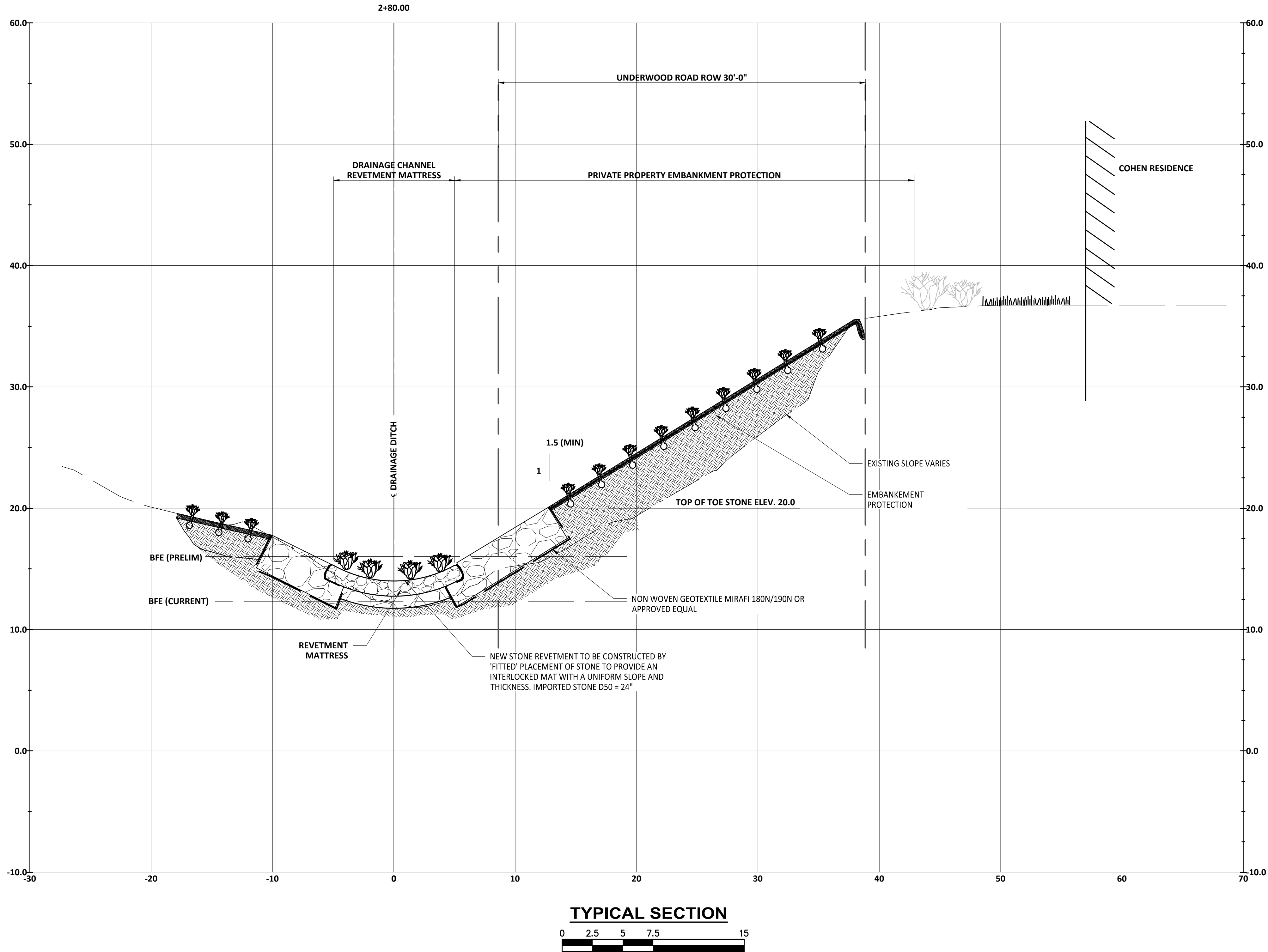
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DRAWING
C-5

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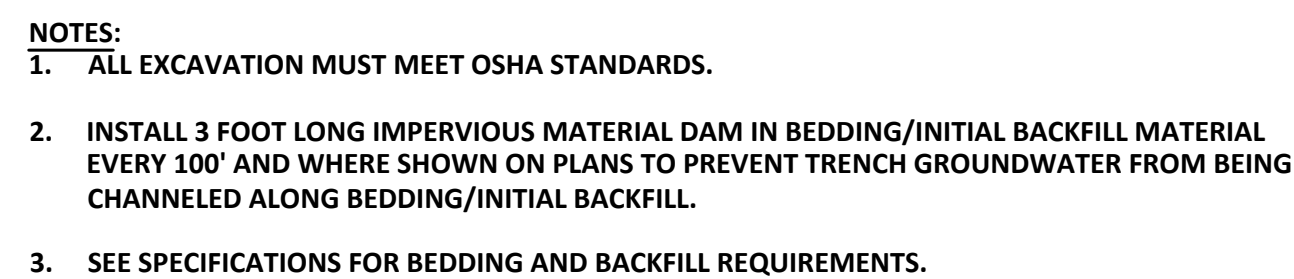
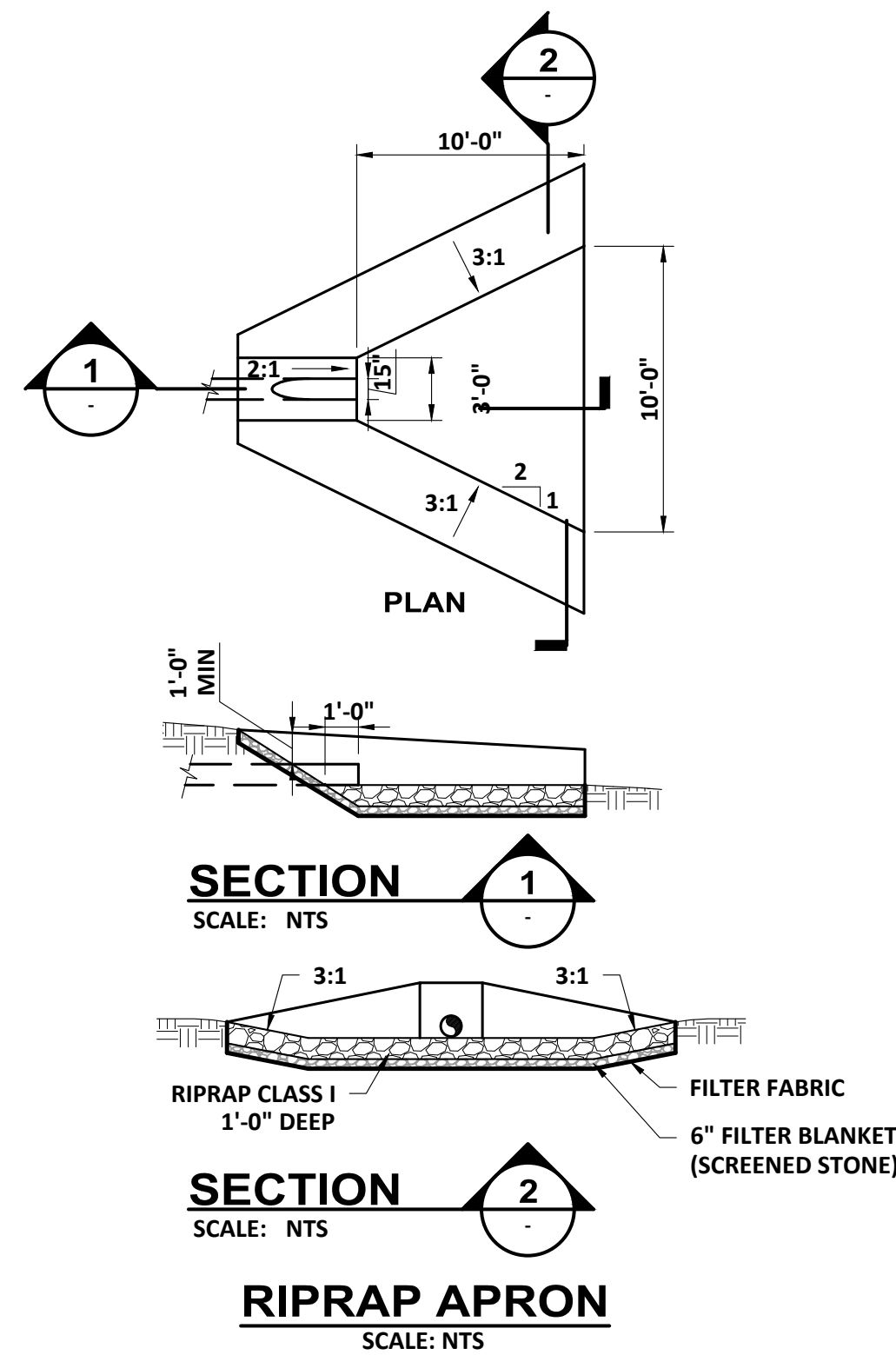
FOR PERMITTING
PURPOSES ONLY



TOWN OF FALMOUTH UNDERWOOD ROAD DRAINAGE IMPROVEMENTS FALMOUTH, MAINE		WRIGHT-PIERCE Engineering a Better Environment 888.621.8156 www.wright-pierce.com		DETAILS 1		DRAWING C-6	
DESIGNED BY: J.WAL		SUBMISSIONS/REVISIONS		APP'D		DATE	
C&D COORD: M.LAP		ISSUED FOR PERMITTING		R.WIN		3-20	
CHECKED BY: J.WAL							
DATE: 3-26-2020							
APPROVED BY: R.WIN							
DATE: 3-26-2020							
PROJECT NO: 13042							

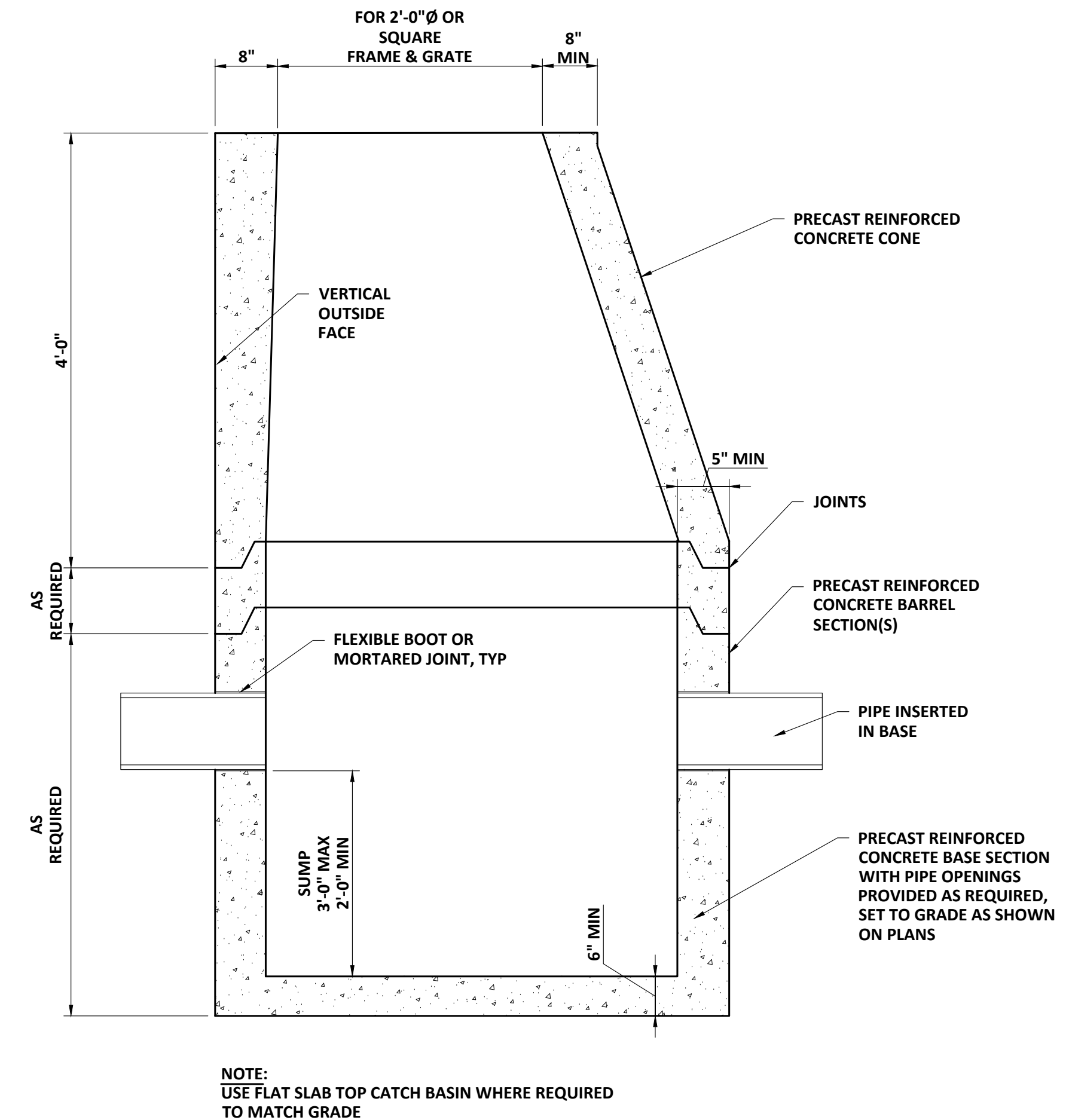


- NOTES:**
1. PLACE RIPRAP AT 1.5:1(HORIZONTAL:VERTICAL) SLOPE MAXIMUM.
 2. TOE OF SLOPE RIPRAP SHOULD BE KEYED INTO THE EXISTING GROUND SURFACE A MINIMUM OF 1'-4".
 3. A NON-WOVEN GEOTEXTILE FILTER FABRIC (MIRAFI 140N OR EQUIVALENT) SHOULD BE INSTALLED OVER SUBGRADE PRIOR TO PLACING RIPRAP. THE FILTER FABRIC SHOULD OVERLAP THE TOP OF THE RIPRAP.
 4. WHERE REQUIRED, GRANULAR BORROW SHOULD BE PLACED IN 12" THICK LIFTS AND COMPACTED TO 92% OF IT'S MAXIMUM DRY DENSITY PER ASTM D-698 (STANDARD PROCTOR)



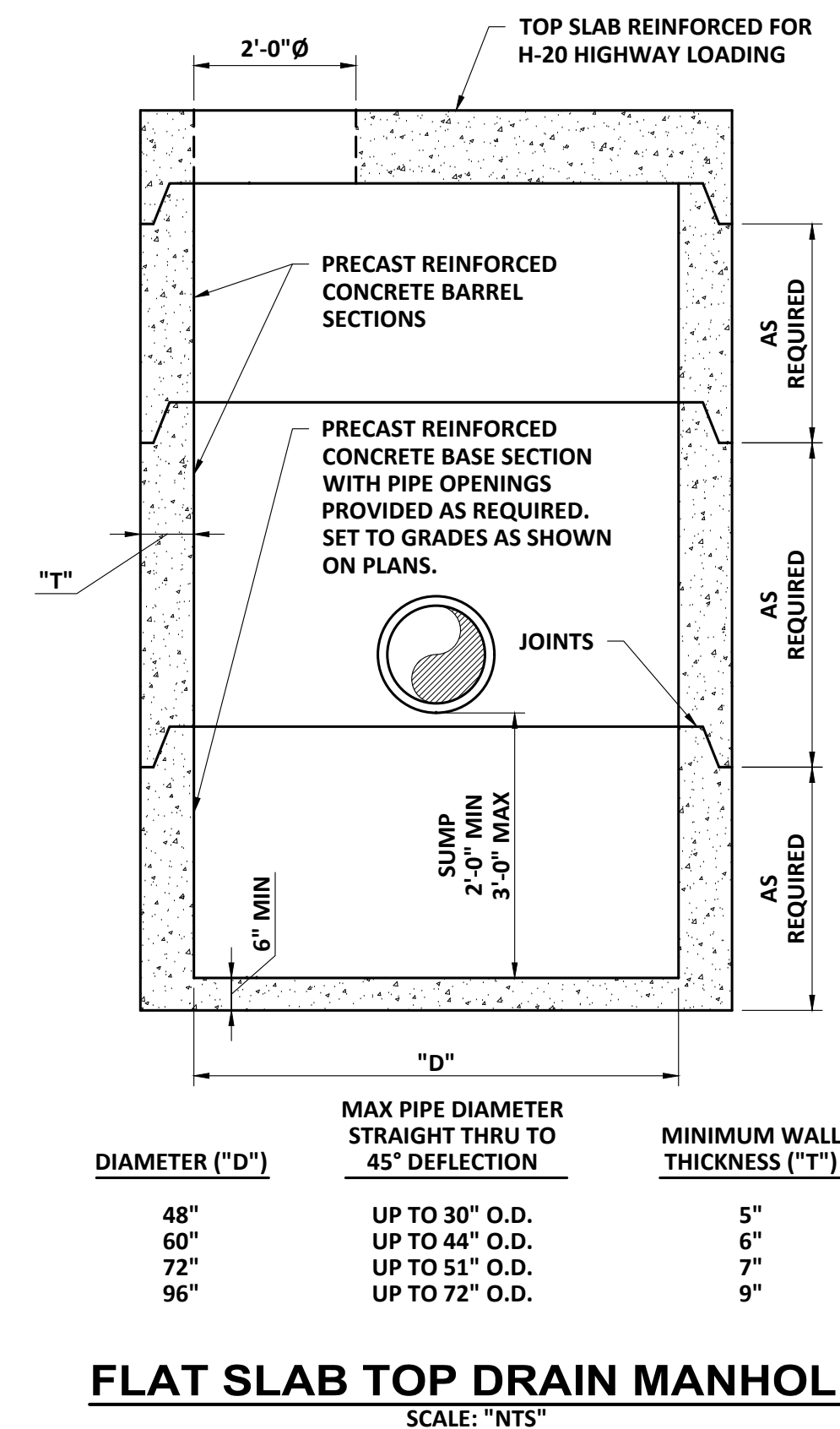
PIPE TRENCH

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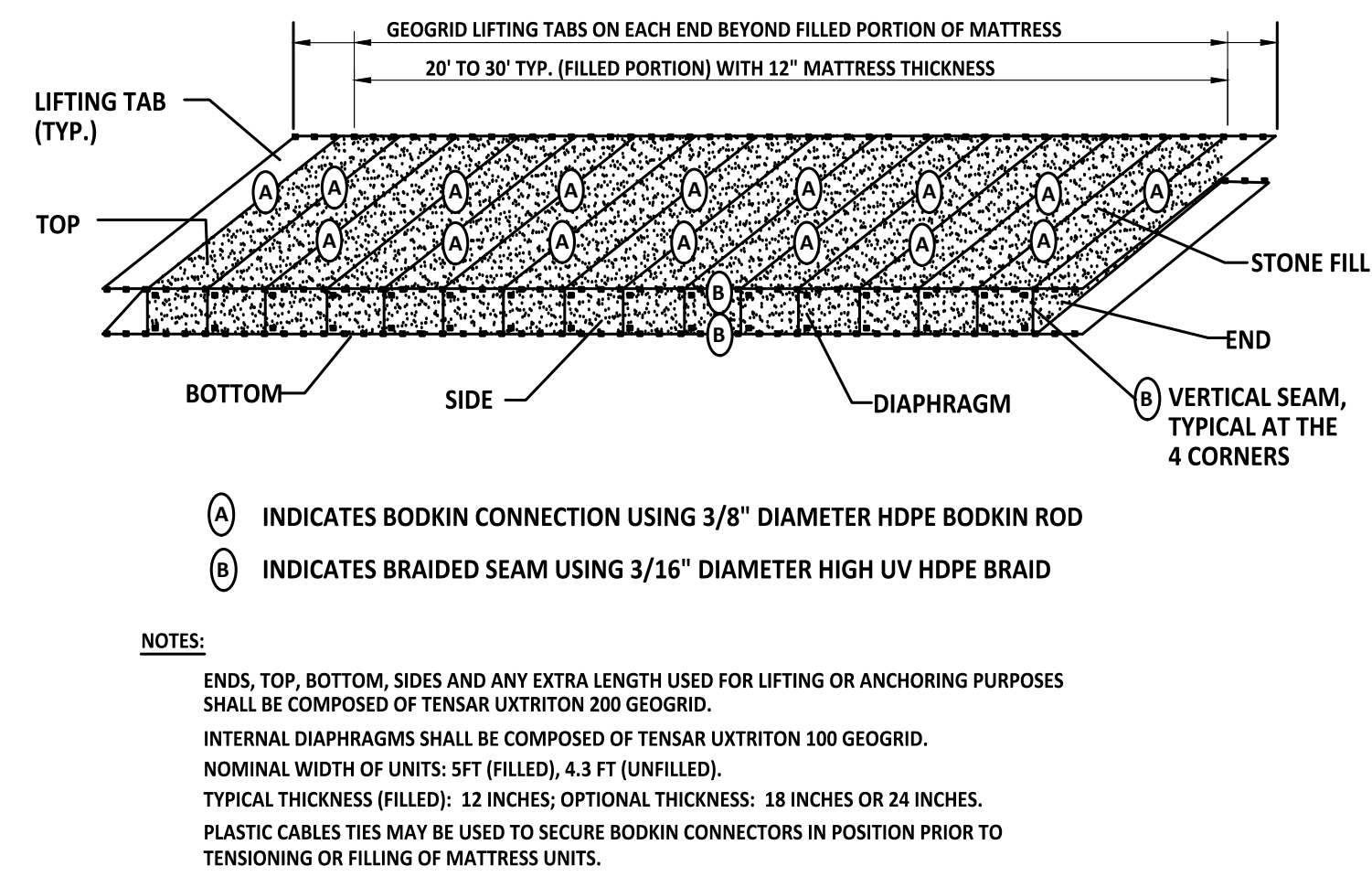
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SCALE: NTS



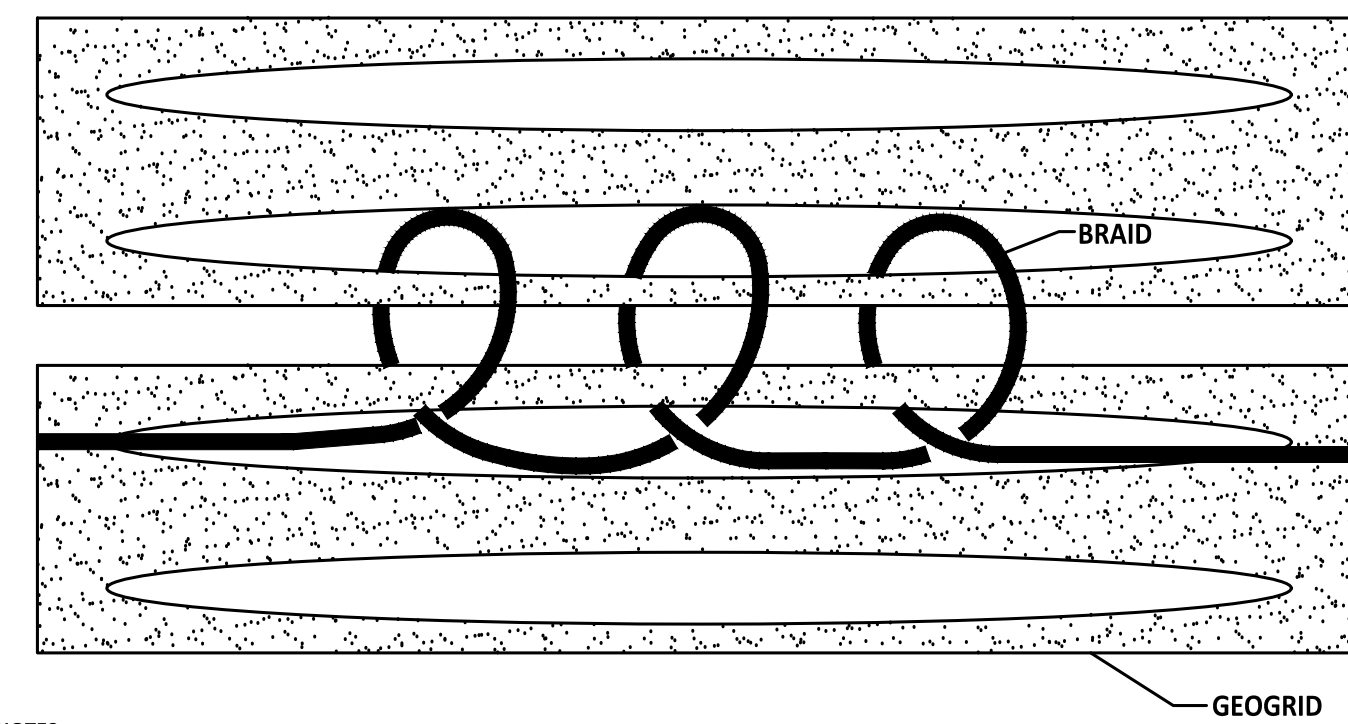
**FOR PERMITTING
PURPOSES ONLY**

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REVTMENT MATTRESS DETAIL

SCALE: NTS



NOTES:

ALL CUT ENDS OF BRAID MATERIAL SHALL BE KNOTTED WITHIN 1/2" TO 2" OF THE END TO PREVENT RAVELING OF BRAID.

AT ALL ENDS OF ALL BRAIDED SEAMS THE BRAID SHALL BE SECURELY KNOTTED TO THE GEOGRID.

AT ALL ENDS OF ALL PIECES OF BRAID MATERIAL USED, THE BRAID SHALL BE KNOTTED TO SPLICE IT TO THE NEXT PIECE OF BRAID, OR TO SECURE IT TO THE GEOGRID. EACH BRAIDED SEAM SHALL BE CONTINUOUS, WITH SECURELY KNOTTED SPLICES ALLOWED. THE BRAID SHALL BE SECURELY KNOTTED TO THE GEOGRID AT A SPACING NOT TO EXCEED 6 FT ALONG ANY SEAM.


THE BRAID SHALL BE STITCHED THROUGH EACH PAIR OF APERTURES ALONG THE SEAM AT LEAST ONCE, AND THE MINIMUM NUMBER OF STITCHES PER FOOT ALONG THE SEAM SHALL BE SIX (6). THE SPACING OF STITCHES ALONG EACH SEAM SHALL BE REASONABLY UNIFORM.

ALL KNOTS SHALL BE TIED IN A MANNER TO PREVENT SLIPPING AND CINCHING.

THE WRAPS ALONG THE SEAM SHALL BE SUFFICIENTLY TIGHT TO CLOSE THE GAP BETWEEN THE ADJACENT PIECES OF GEOGRID BUT SHALL NOT BE OVER-TIGHTENED SUCH THAT THE GEOGRID BINDS ALONG THE SEAM.

REVETMENT MATTRESS CONNECTION DETAIL
SCALE: NTS

**FOR PERMITTING
PURPOSES ONLY**

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EROSION AND SEDIMENTATION CONTROL NOTES

THIS PLAN HAS BEEN DEVELOPED AS A STRATEGY TO CONTROL SOIL EROSION AND SEDIMENTATION DURING AND AFTER CONSTRUCTION. THIS PLAN IS BASED ON THE STANDARDS AND SPECIFICATIONS FOR EROSION PREVENTION IN DEVELOPING AREAS IN ACCORDANCE WITH OCTOBER 2016 REVISION TO THE 2003 MAINE EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES (BMPs) MANUAL FOR DESIGNERS AND ENGINEERS.

THE PROPOSED LOCATIONS OF SILTATION AND EROSION CONTROL STRUCTURES ARE SHOWN ON THE SITE PLAN.

1. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE DONE IN ACCORDANCE WITH 2014 REVISION TO THE 2003 MAINE EROSION AND SEDIMENT CONTROL FIELD GUIDE FOR CONTRACTORS. ALL TEMPORARY MEASURES SHALL NOT BE REMOVED UNTIL SITE IS FULLY STABILIZED.
2. IN AREAS ADJACENT TO NATURAL RESOURCES, LOCATIONS TO BE VEGETATED IN THEIR FINISH CONDITION SHALL BE STABILIZED WITH MULCH WITHIN 7 DAYS OF DISTURBANCE.
3. AREAS THAT WILL NOT RECEIVE FINAL GRADING FOR UP TO ONE YEAR SHALL BE STABILIZED WITH MULCH WITHIN 7 DAYS OF DISTURBANCE
4. THOSE AREAS UNDERGOING ACTUAL CONSTRUCTION WILL BE MAINTAINED IN AN UNTREATED OR UNVEGETATED CONDITION FOR THE MINIMUM TIME REQUIRED. IN GENERAL AREAS TO BE VEGETATED SHALL BE PERMANENTLY STABILIZED WITHIN 15 DAYS OF FINAL GRADING AND TEMPORARILY STABILIZED WITHIN 30 DAYS OF INITIAL DISTURBANCE OF THE SOIL.
5. SEDIMENT BARRIERS (SILT FENCE, STONE CHECK DAMS, ETC.) SHOULD BE INSTALLED PRIOR TO ANY SOIL DISTURBANCE OF UPGRADIENT DRAINAGE AREAS.
6. INSTALL SILT FENCE AT TOE OF SLOPES TO FILTER SILT FROM RUNOFF. SEE SILT FENCE DETAIL FOR PROPER INSTALLATION. SILT FENCE WILL REMAIN IN PLACE PER NOTE #5.
7. ALL EROSION CONTROL STRUCTURES WILL BE INSPECTED, REPLACED AND/OR REPAIRED EVERY 7 DAYS AND IMMEDIATELY FOLLOWING ANY SIGNIFICANT RAINFALL OR SNOW MELT OR WHEN NO LONGER SERVICEABLE DUE TO SEDIMENT ACCUMULATION OR DECOMPOSITION. IF REPAIRS ARE IDENTIFIED, THEY SHALL BEGIN NO LATER THAN THE END OF THE FOLLOWING WORK DAY AND BE COMPLETE WITHIN 7 DAYS FROM INSPECTION. SEDIMENT DEPOSITS MUST BE REMOVED WHEN THEY REACH APPROXIMATELY ONE HALF THE HEIGHT OF THE BARRIER. SEDIMENT CONTROL DEVICES SHALL REMAIN IN PLACE AND BE MAINTAINED BY THE CONTRACTOR UNTIL AREAS UPSLOPE ARE PERMANENTLY STABILIZED.
8. NO SLOPES, EITHER PERMANENT OR TEMPORARY, SHALL BE STEEPER THAN TWO HORIZONTAL TO ONE VERTICAL (2 TO 1) UNLESS STABILIZED WITH RIPRAP OR OTHER STRUCTURAL MEANS. NO SLOPES IN EXCESS OF 1.5H:1V SHALL BE ALLOWED.
9. IF FINAL SEEDING AND SODDING IS NOT EXPECTED PRIOR TO THE ANTICIPATED DATE OF THE FIRST KILLING FROST, USE TEMPORARY ANNUAL RYEGRASS SEEDING AND MULCHING ON ROUGH GRADED SUBSOIL TO PROTECT THE SITE AND DELAY PERMANENT LOAMING, FINE GRADING, AND SEEDING OR SODDING UNTIL SPRING.
10. WHEN FEASIBLE, TEMPORARY SEEDING OF DISTURBED AREAS THAT HAVE NOT BEEN FINISH GRADED SHALL BE COMPLETED 30 DAYS PRIOR TO THE FIRST KILLING FROST.
11. DURING THE CONSTRUCTION PHASE, INTERCEPTED SEDIMENT WILL BE RETURNED TO THE SITE AND REGRADED UNTO OPEN AREAS. POST SEEDING SEDIMENT, IF ANY, WILL BE DISPOSED OF IN AN ACCEPTABLE MANNER.
12. REVEGETATION MEASURES WILL COMMENCE UPON COMPLETION OF CONSTRUCTION EXCEPT AS NOTED ABOVE. ALL DISTURBED AREAS NOT OTHERWISE STABILIZED WILL BE GRADED, SMOOTHED, AND REVEGETATED.
13. ALL TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED ONCE THE SITE IS STABILIZED.
14. EXCAVATION AND EARTHWORK SHALL BE DONE SUCH THAT NO MORE THAN 1 ACRE OF THE SITE IS WITHOUT STABILIZATION AT ANY ONE TIME.
15. EXPOSED AREA SHOULD BE LIMITED SUCH THAT THE AREA CAN BE MULCHED IN ONE DAY PRIOR TO ANY SNOW EVENT.
16. STABILIZATION SCHEDULE BEFORE WINTER:

<u>SEPTEMBER 15</u>	ALL DISTURBED AREAS MUST BE SEEDED AND MULCHED. ALL SLOPES MUST BE STABILIZED, SEEDED AND MULCHED. SLOPES 3:1 OR GREATER TO BE STABILIZED WITH EROSION CONTROL MATTING AND SEEDED. ALL DISTURBED AREAS TO BE PROTECTED WITH AN ANNUAL GRASS MUST BE SEEDED AT A SEEDING RATE OF 3 POUNDS PER 1,000 SQUARE FEET AND MULCHED.
<u>OCTOBER 1</u>	ALL GRASS-LINED DITCHES AND CHANNELS MUST BE STABILIZED WITH MULCH OR EROSION CONTROL BLANKET.
<u>NOVEMBER 15</u>	ALL STONE-LINED DITCHES AND CHANNELS MUST BE CONSTRUCTED AND STABILIZED. SLOPES THAT ARE COVERED WITH RIPRAP MUST BE CONSTRUCTED BY THAT DATE.
<u>DECEMBER 1</u>	ALL DISTURBED AREAS WHERE THE GROWTH OF VEGETATION FAILS TO BE AT LEAST THREE INCHES TALL OR AT LEAST 75% OF THE DISTURBED SOIL IS COVERED BY VEGETATION, MUST BE PROTECTED FOR OVER-WINTER.

17. SEDIMENT BARRIERS SHALL BE INSTALLED DOWNGRADIANT OF STOCKPILES, AND STORMWATER SHALL BE PREVENTED FROM RUNNING ONTO THE STOCKPILES.
18. CONTRACTOR SHALL MAINTAIN ALL STABILIZED CONSTRUCTION ENTRANCES UNTIL ALL DISTURBED AREAS ARE STABILIZED.
19. MULCH MAY REQUIRE ANCHORING TO ENSURE THAT MULCH REMAINS IN-PLACE. MULCH NETTING, CRIMPING, OR PUNCHING ARE ACCEPTABLE METHODS. MULCH NETTING SHALL BE TENAX RADIX EROSION CONTROL NETS OR APPROVED EQUAL, AND SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER REQUIREMENTS.
20. SPILL PREVENTION: CONTROLS MUST BE USED TO PREVENT POLLUTANTS FROM BEING DISCHARGED FROM MATERIALS AND EQUIPMENT ON-SITE, INCLUDING STORAGE PRACTICES TO MINIMIZE EXPOSURE OF THE MATERIALS TO STORMWATER, AND APPROPRIATE SPILL PREVENTION, CONTAINMENT, AND RESPONSE PLANNING AND IMPLEMENTATION.
21. GROUNDWATER PROTECTION: DURING CONSTRUCTION, LIQUID PETROLEUM PRODUCTS AND OTHER HAZARDOUS MATERIALS WITH THE POTENTIAL TO CONTAMINATE GROUNDWATER MAY NOT BE STORED OR HANDLED IN AREAS OF THE SITE DRAINING TO AN INFILTRATION AREA. AN "INFILTRATION AREA" IS ANY AREA OF THE SITE THAT BY DESIGN OR AS A RESULT OF SOILS, TOPOGRAPHY AND OTHER RELEVANT FACTORS, ACCUMULATES RUNOFF THAT INFILTRATES INTO THE SOIL. DIKES, BERMS, SUMPS, AND OTHER FORMS OF SECONDARY CONTAINMENT THAT PREVENT DISCHARGE TO GROUNDWATER MAY BE USED TO ISOLATE PORTIONS OF THE SITE FOR THE PURPOSES OF STORAGE AND HANDLING OF THESE MATERIALS.
22. MINIMIZE THE EXPOSURE OF CONSTRUCTION DEBRIS, BUILDING AND LANDSCAPING MATERIALS, TRASH, FERTILIZERS, PESTICIDES, HERBICIDES, DETERGENTS, SANITARY WASTE AND OTHER MATERIALS TO PRECIPITATION AND STORMWATER RUNOFF. THESE MATERIALS MUST BE PREVENTED FROM BECOMING A POLLUTANT SOURCE.
23. EXCAVATION DEWATERING IS THE REMOVAL OF WATER FROM TRENCHES, FOUNDATIONS, COFFER DAMS, PONDS, AND OTHER AREAS WITHIN THE CONSTRUCTION AREA THAT RETAIN WATER AFTER EXCAVATION. IN MOST CASES THE COLLECTED WATER IS HEAVILY SILTED AND ENDERS CORRECT AND SAFE CONSTRUCTION PRACTICES. THE COLLECTED WATER REMOVED FROM THE PONDED AREA, EITHER THROUGH GRAVITY OR PUMPING, MUST BE SPREAD THROUGH NATURAL WOODED BUFFERS OR RETURNED TO AREAS THAT ARE SPECIFICALLY DESIGNED TO COLLECT THE MAXIMUM AMOUNT OF SEDIMENT POSSIBLE, LIKE A COFFERDAM SEDIMENTATION BASIN. AVOID ALLOWING THE WATER TO FLOW OVER DISTURBED AREAS OF THE SITE. EQUIVALENT MEASURES MAY BE TAKEN IF APPROVED BY THE DEPARTMENT.
24. AUTHORIZED NON-STORMWATER DISCHARGES: IDENTIFY AND PREVENT CONTAMINATION BY NON-STORMWATER DISCHARGES. WHERE ALLOWED NON-STORMWATER DISCHARGES EXIST, THEY MUST BE IDENTIFIED AND STEPS SHOULD BE TAKEN TO ENSURE THE IMPLEMENTATION OF APPROPRIATE POLLUTION PREVENTION MEASURES FOR THE NON-STORMWATER COMPONENT(S) OF THE DISCHARGE. AUTHORIZED NON-STORMWATER DISCHARGES ARE:
 - A. DISCHARGES FROM FIREFIGHTING ACTIVITY;
 - B. FIRE HYDRANT FLUSHINGS;
 - C. VEHICLE WASHWATER IF DETERGENTS ARE NOT USED AND WASHING IS LIMITED TO THE EXTERIOR OF VEHICLES (ENGINE, UNDERCARRIAGE AND TRANSMISSION WASHING IS PROHIBITED);
 - D. DUST CONTROL RUNNING IN ACCORDANCE WITH PERMIT CONDITIONS;
 - E. ROUTINE EXTERNAL BUILDING WASHDOWN, NOT INCLUDING SURFACE PAINT REMOVAL, THAT DOES NOT INVOLVE DETERGENTS;
 - F. PAVEMENT WASHWATER (WHERE SPILLS/LEAKS OF TOXIC OR HAZARDOUS MATERIALS HAVE NOT OCCURRED, UNLESS ALL SPILLED MATERIAL HAD BEEN REMOVED) IF DETERGENTS ARE NOT USED USED;
 - G. UNCONTAMINATED AIR CONDITIONING OR COMPRESSOR CONDENSATE;
 - H. UNCONTAMINATED GROUNDWATER OR SPRING WATER;
 - I. FOUNDATION OR FOOTER DRAIN-WATER WHERE FLOWS ARE NOT CONTAMINATED;
 - J. UNCONTAMINATED EXCAVATION Dewatering;
 - K. POTABLE WATER SOURCES INCLUDING WATERLINE FLUSHINGS; AND
 - L. LANDSCAPE IRRIGATION.
25. UNAUTHORIZED NON-STORMWATER DISCHARGES: THE MAINDEP'S APPROVAL UNDER THIS CHAPTER DOES NOT AUTHORIZE A DISCHARGE THAT IS MIXED WITH A SOURCE OF NON-STORMWATER, OTHER THAN THOSE DISCHARGES IN COMPLIANCE WITH APPENDIX C (6). SPECIFICALLY, THE DEPARTMENT'S APPROVAL DOES NOT AUTHORIZE DISCHARGES OF THE FOLLOWING:
 - A. WASTEWATER FROM THE WASHOUT OR CLEANOUT OF CONCRETE, STUCCO, PAINT, FORM RELEASE OILS, CURING COMPOUNDS OR OTHER CONSTRUCTION MATERIALS;
 - B. FUELS, OILS OR OTHER POLLUTANTS USED IN VEHICLE AND EQUIPMENT OPERATION AND MAINTENANCE;
 - C. SOAPS, SOLVENTS, OR DETERGENTS USED IN VEHICLE AND EQUIPMENT WASHING; AND
 - D. TOXIC OR HAZARDOUS SUBSTANCES FROM A SPILL OR OTHER RELEASE.

EROSION CONTROL - WINTER CONSTRUCTION

1. WINTER CONSTRUCTION PERIOD DEFINED: NOVEMBER 1 THROUGH APRIL 15.
2. CONTINUATION OF EARTHWORK OPERATIONS ON ADDITIONAL AREAS SHALL NOT BEGIN UNTIL THE EXPOSED SOIL SURFACE ON THE AREA BEING WORKED HAS BEEN STABILIZED SUCH THAT NO LARGER AREA OF THE SITE IS WITHOUT EROSION CONTROL PROTECTION AS LISTED IN ITEM 2 ABOVE.
3. AN AREA SHALL BE CONSIDERED TO HAVE BEEN STABILIZED WHEN EXPOSED SURFACES HAVE BEEN EITHER MULCHED WITH STRAW AT A RATE OF 100 LB. PER 1,000 SQUARE FEET (WITH OR WITHOUT SEEDING) OR DORMANT SEEDED, MULCHED AND ADEQUATELY ANCHORED BY AN APPROVED ANCHORING TECHNIQUE. IN ALL CASES, MULCH SHALL BE APPLIED SUCH THAT SOIL SURFACE IS NOT VISIBLE THROUGH THE MULCH.
4. BETWEEN THE DATES OF OCTOBER 15 AND APRIL 1ST, LOAM OR SEED WILL NOT BE REQUIRED. DURING PERIODS OF ABOVE-FREEZING TEMPERATURES, THE SLOPES SHALL BE FINE GRADED AND EITHER PROTECTED WITH MULCH OR TEMPORARILY SEEDED AND MULCHED UNTIL SUCH TIME AS THE FINAL TREATMENT CAN BE APPLIED. IF THE DATE IS AFTER NOVEMBER 1ST AND IF THE EXPOSED AREA HAS BEEN LOAMED, FINE GRADED AND IS SMOOTH, THEN THE AREA MUST BE STABILIZED WITH MULCH. IF CONSTRUCTION CONTINUES DURING FREEZING WEATHER, ALL EXPOSED AREAS SHALL BE GRADED BEFORE FREEZING AND THE SURFACE TEMPORARILY PROTECTED FROM EROSION BY THE APPLICATION OF MULCH. SLOPES SHALL NOT BE LEFT EXPOSED OVER THE WINTER OR ANY OTHER EXTENDED TIME OF WORK SUSPENSION UNLESS TREATED IN THE ABOVE MANNER. UNTIL SUCH TIME AS WEATHER CONDITIONS ALLOW DITCHES TO BE FINISHED WITH THE PERMANENT SURFACE TREATMENT, EROSION SHALL BE CONTROLLED BY THE INSTALLATION OF BALES OF HAY OR STONE CHECK DAMS IN ACCORDANCE WITH THE STANDARD DETAILS.
5. THE APPLICATION OF MULCH TO FINE GRADED AREAS WILL BE STABILIZED AS FOLLOWS:
 - A. BETWEEN THE DATES OF NOVEMBER 1ST AND APRIL 15TH ALL MULCH SHALL BE ANCHORED BY EITHER PEG LINE, MULCH NETTING, ASPHALT EMULSION, CHEMICAL TACK OR WOOD CELLULOSE FIBER.
 - B. MULCH NETTING SHALL BE USED TO ANCHOR MULCH IN ALL DRAINAGEWAYS WITH A SLOPE GREATER THAN 3% FOR SLOPES EXPOSED TO DIRECT WINDS AND FOR ALL OTHER SLOPES GREATER THAN 8%. THIS SHALL BE IN ADDITION TO EROSION CONTROL MATTING-DITCHES DETAIL.
 - C. MULCH NETTING SHALL BE USED TO ANCHOR MULCH IN ALL AREAS WITH SLOPES GREATER THAN 15%. AFTER OCTOBER 1ST, THE SAME APPLIES FOR ALL SLOPES GREATER THAN 8%.
8. AFTER NOVEMBER 1ST THE CONTRACTOR SHALL APPLY MULCH AND ANCHORING ON ALL BARE EARTH AT THE END OF EACH WORKING DAY.
9. DURING WINTER CONSTRUCTION PERIODS ALL SNOW SHALL BE REMOVED FROM AREAS OF MULCHING PRIOR TO PLACEMENT.
10. THE INSPECTION FREQUENCY FOR WINTER CONSTRUCTION SHALL BE AFTER EACH RAINFALL, SNOWSTORM, OR THAWING, AND AT LEAST ONCE A WEEK.

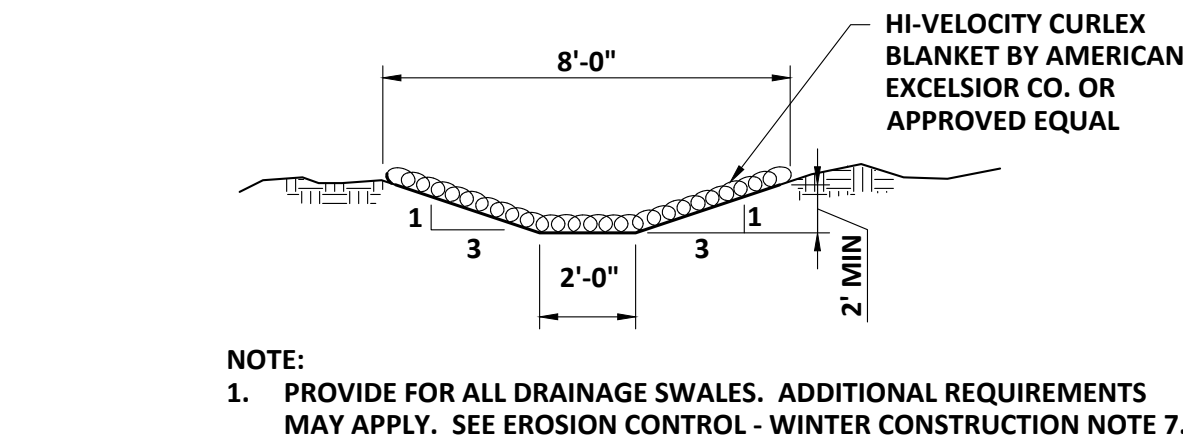
EROSION CONTROL - WETLAND NOTES

1. WETLANDS AND SURFACE WATERS (EXCEPTING THOSE WHICH ARE TO BE FILLED IN ACCORDANCE WITH STATE AND FEDERAL REGULATIONS) WILL BE PROTECTED WITH SILT FENCE INSTALLED AT THE EDGE OF THE WETLAND OR THE BOUNDARY OF WETLAND DISTURBANCE.
2. IF THE WORK INCLUDES CROSSING OF WETLANDS AND/OR STREAMS, THE CONTRACTOR SHALL TAKE SPECIAL PRECAUTIONS WORKING IN THESE AREAS.
3. ANY WETLAND CROSSING WORK SHALL BE COMPLETED BETWEEN THE PERIOD OF MAY 1 AND SEPTEMBER 30.
4. ALL EROSION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO COMMENCING CONSTRUCTION WITHIN OR ADJACENT TO WETLAND AREAS. ALL TEMPORARY MEASURES SHALL NOT BE REMOVED UNTIL SITE IS FULLY STABILIZED.
5. WETLAND VEGETATIVE LAYERS SHALL BE REMOVED AND SALVAGED FOR RESTORATION OF THE DISTURBED AREAS.
6. STORAGE AREAS FOR WETLAND MATERIALS SHALL BE PROPERLY PROTECTED AGAINST EROSION.
7. SEEDING OF THE DISTURBED AREAS WITHIN WETLAND AREAS SHALL UTILIZE MIXTURES APPROPRIATE FOR WETLAND AREAS AS OUTLINED IN THE SPECIFICATIONS.

INSPECTIONS

REGULAR INSPECTIONS OF ALL EROSION AND SEDIMENTATION CONTROLS SHALL BE MADE AT LEAST WEEKLY AND PRIOR TO AND FOLLOWING STORM EVENTS. MINIMUM INSPECTIONS SHALL BE MADE AS LISTED IN THE TABLE BELOW. SEE INSPECTIONS, MAINTENANCE AND HOUSEKEEPING PLAN FOR ADDITIONAL INFORMATION.

INSPECTED ITEM	EXAMPLE REPAIR INDICATORS
MULCHED SURFACES	THIN MULCH OR INADEQUATE APPLICATION. WIND MOVEMENT
SEEDED SURFACES	POOR SEED GERMINATION. LOSS OF MULCH. DEVELOPMENT OF RIVULETS.
SEDIMENT BARRIER	SEDIMENT BUILD-UP TO ONE HALF THE HEIGHT OF THE BARRIER. UNDERMINING OF THE BARRIER. SUPPORTING STAKES LOOSE, TOPPLED OR UNMARKED. BREAKS IN BARRIER.
PERIMETER DIVERSION	DISCHARGE IS TO STABILIZED AREA. EROSION OR BREAKS IN BARRIER. SUPPORTING STAKES LOOSE, TOPPLED OR UNMARKED.
CATCH BASIN PROTECTION	SEDIMENT BUILD-UP AND STRUCTURE BLOCKAGES. SLOW FLOW/PONDING WATER. BREAKS IN FABRIC OR VOIDS IN BARRIER.
DEWATERING FILTER	BREAKS IN FABRIC OR SUPPORTING STRUCTURE. SLOW FLOW, INDICATING HIGH SEDIMENT BUILD-UP.
CONSTRUCTION ENTRANCE	SEDIMENTATION OF ROADWAYS. OFF-SITE DUST COMPLAINTS.



EROSION CONTROL MATTING - DITCHES

SCALE: "NTS"

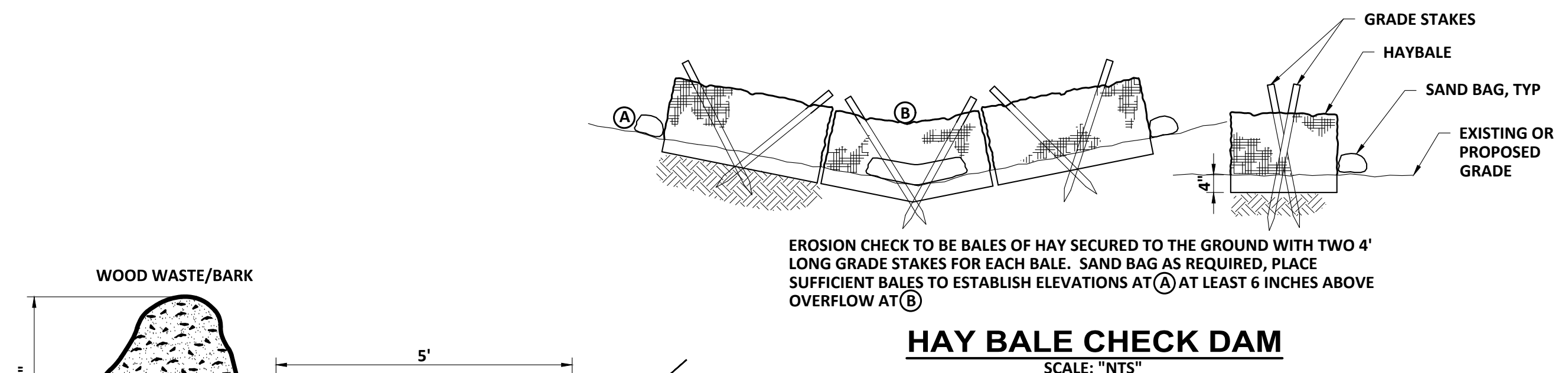
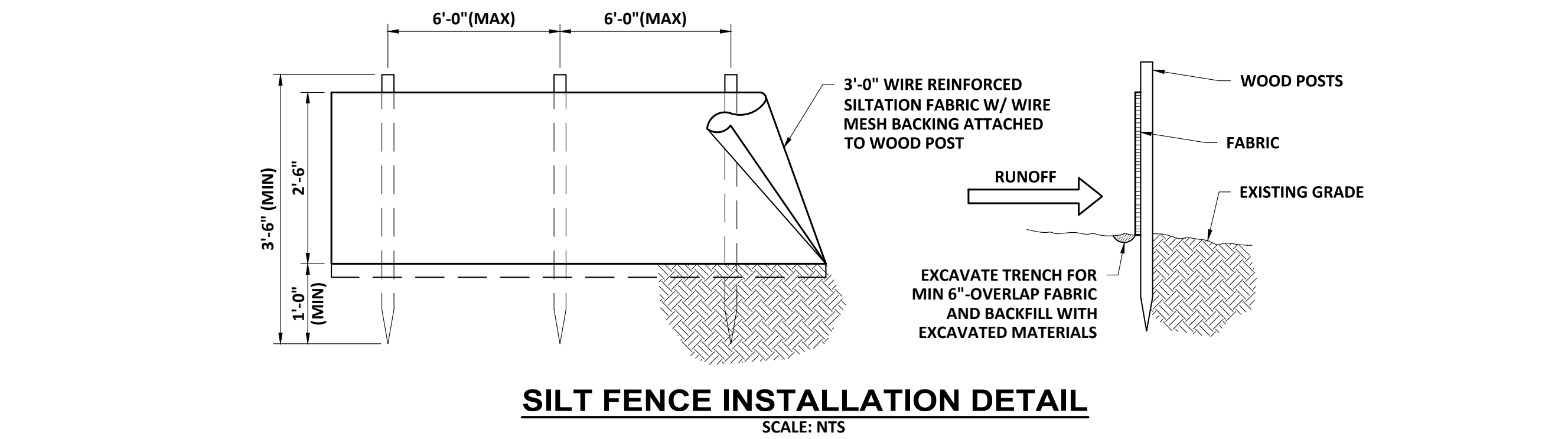
The figure consists of two main parts: a cross-section and a profile view, along with a table of ditch slope ratios.

CROSS SECTION: This diagram shows a top-down view of the stone check dam. It features a central rectangular opening (ditch) with a width of 6 inches. The ditch is flanked by stone walls. The overall width of the dam structure is 24 inches. The stone walls are labeled "2" TO 3" STONE".

PROFILE: This diagram shows a side view of the stone check dam. It illustrates the stone walls and the ditch. The top of the ditch is indicated by a dashed line. The bottom of the ditch is indicated by a solid line. The length of the dam structure is labeled "L".

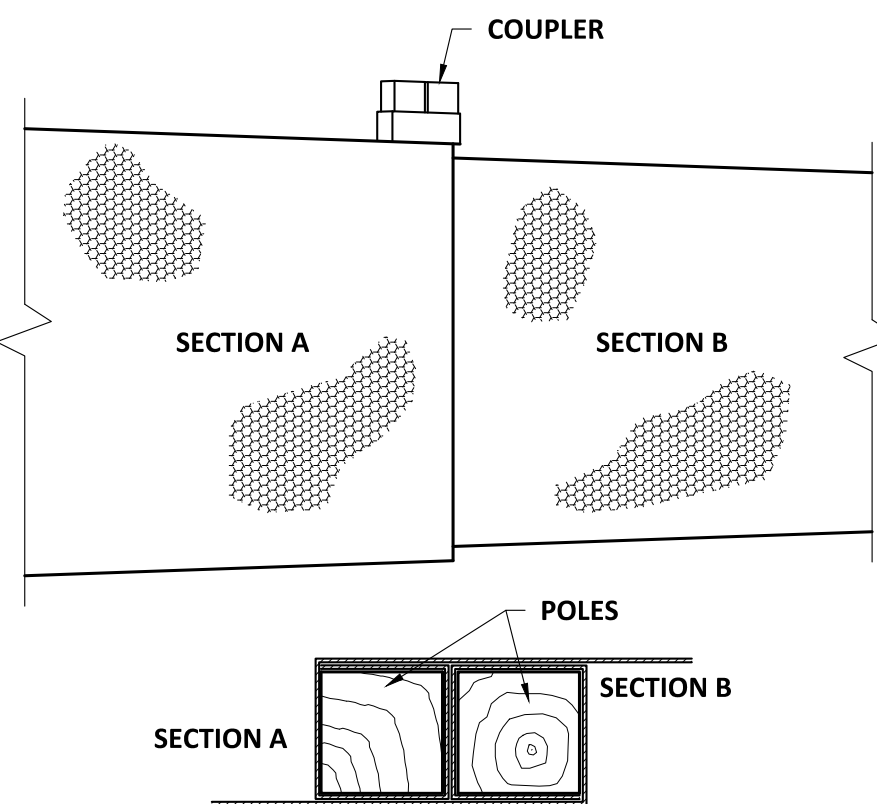
DITCH SLOPE RATIO TABLE:

DITCH SLOPE (FT/FT)	L (FT)
0.020	100
0.030	66
0.040	50
0.050	40
0.080	25
0.100	20
0.120	17
0.150	13



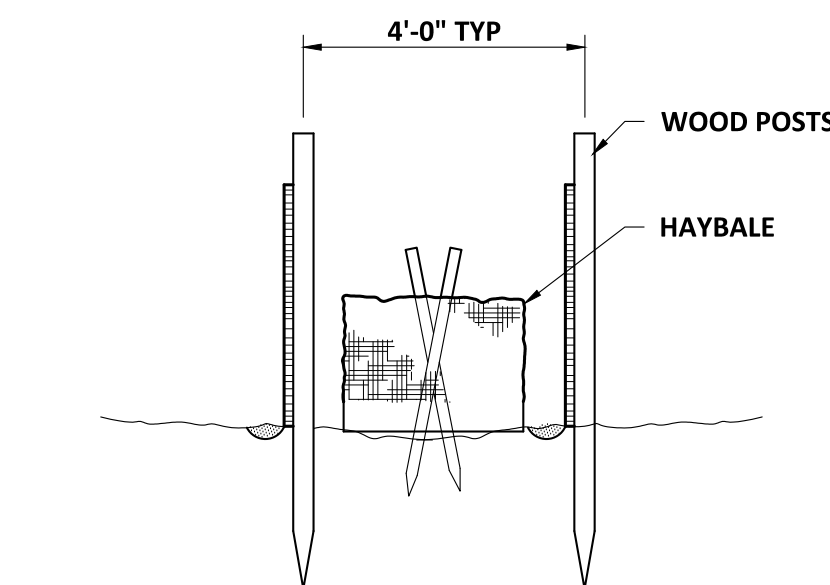
HAY BALE CHECK DAM

SCALE: "NTS"



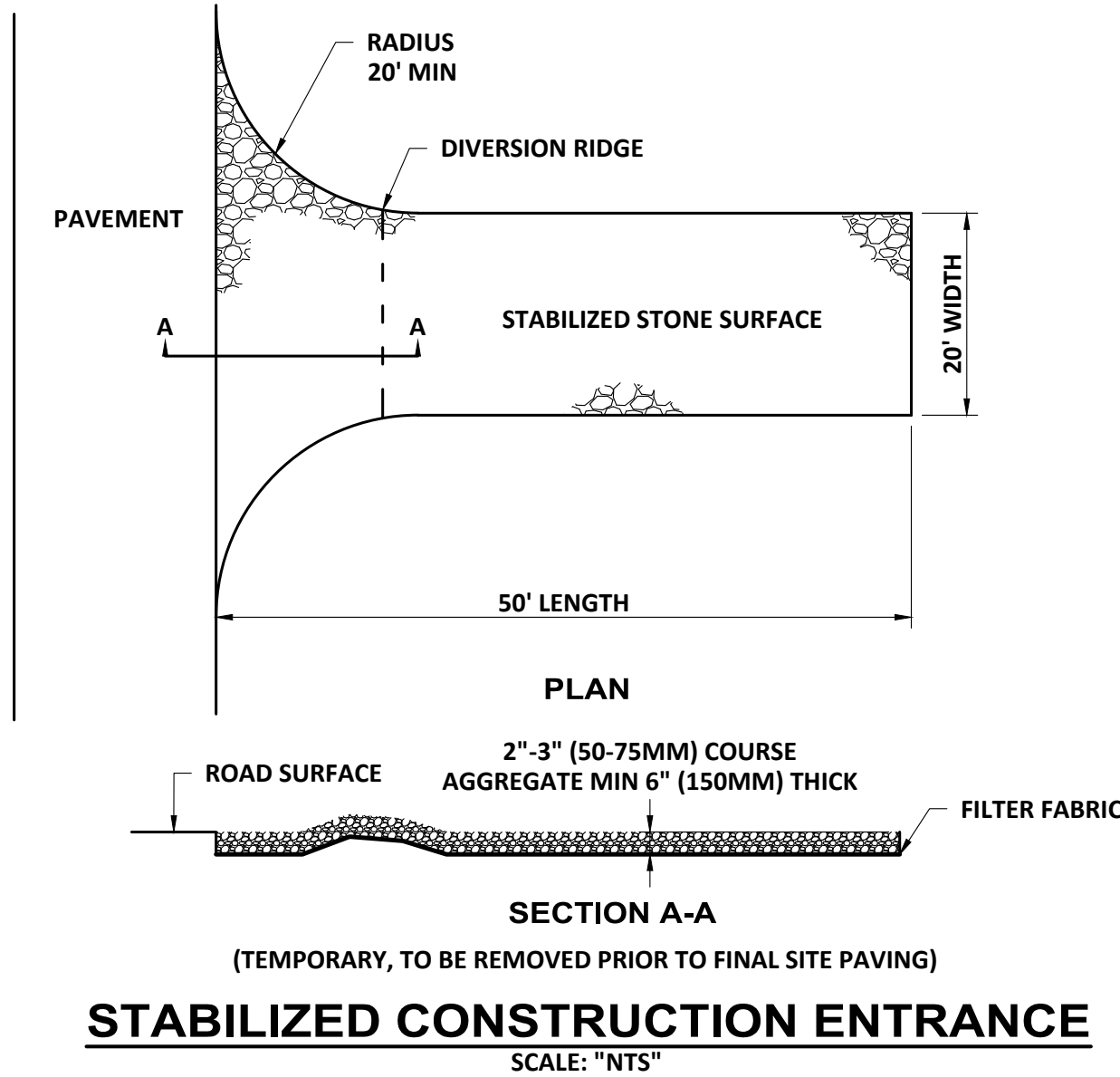
JOINING SILT FENCE SECTIONS

SCALE: "NTS"



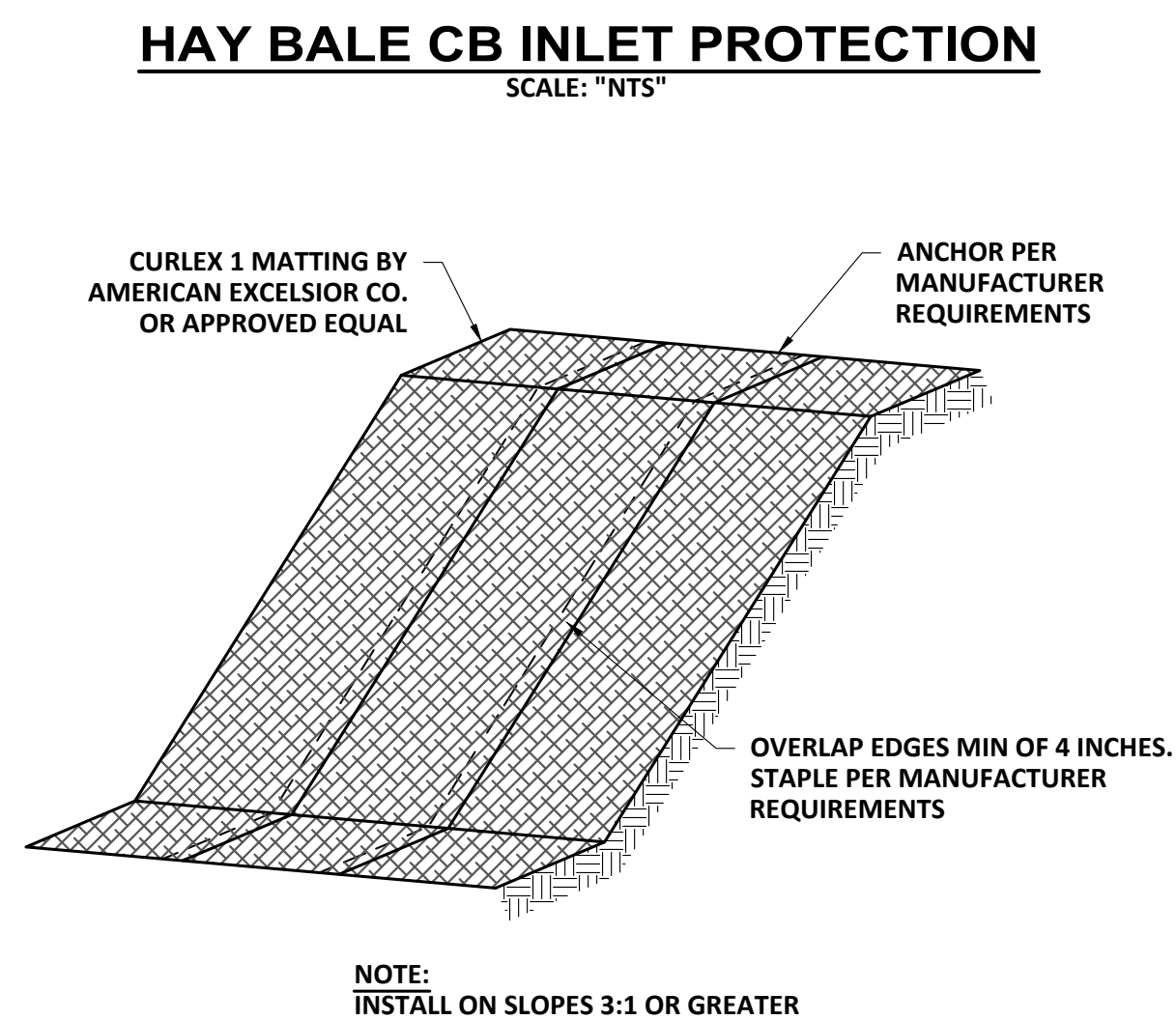
COMBINATION SILT FENCE AND HAY BALE BARRIER

SCALE: NTS



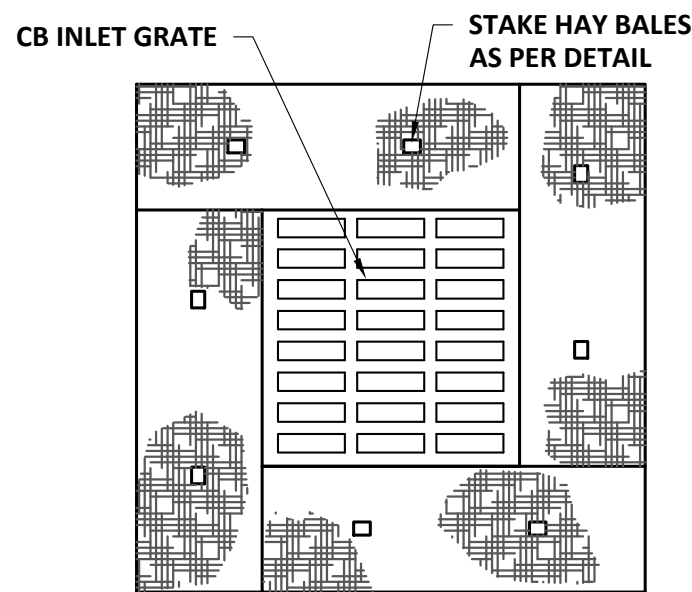
EROSION CONTROL MATTING - SLOPES

SCALE: "NTS"



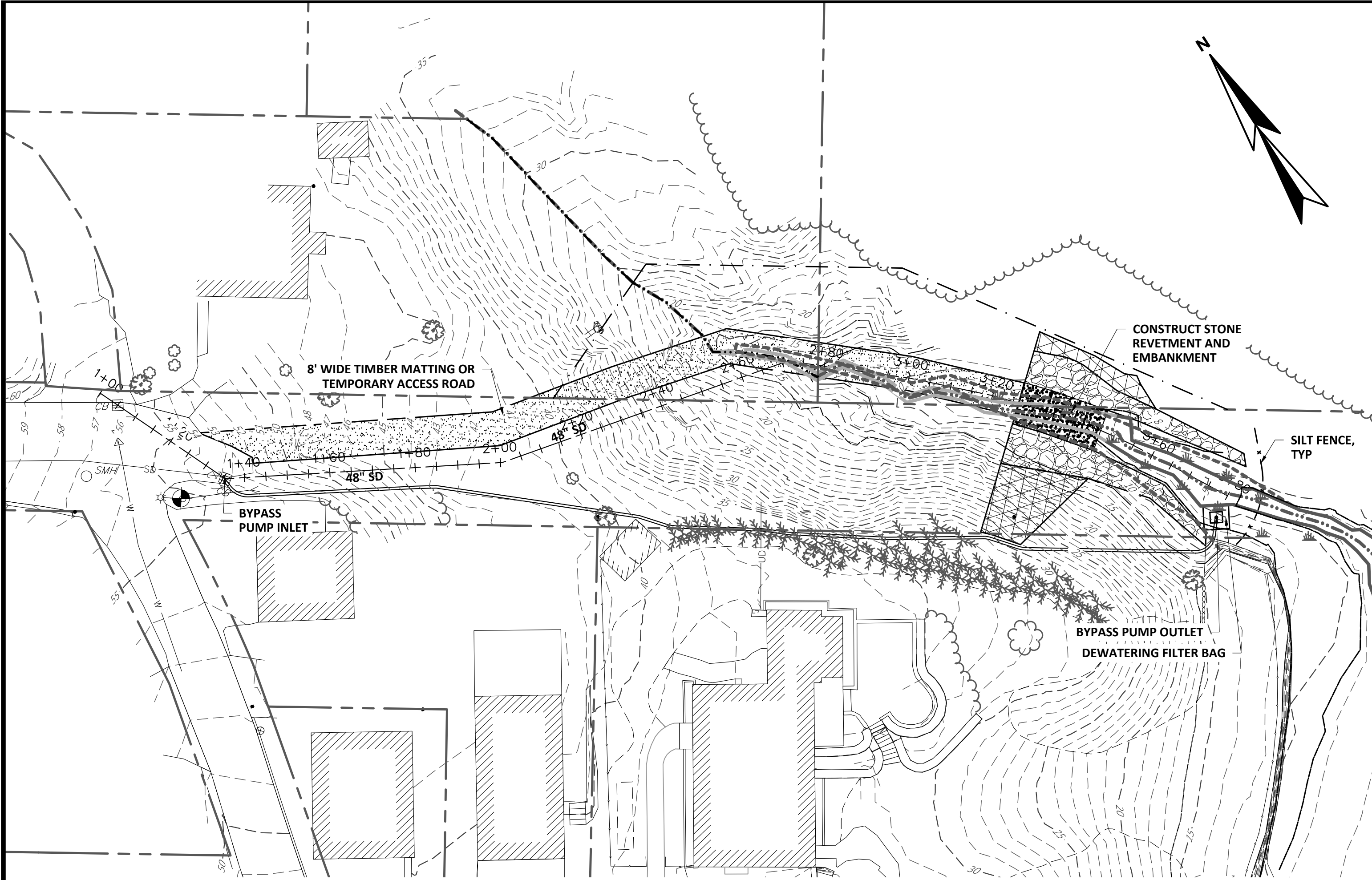
HAY BALE CB INLET PROTECTION

SCALE: "NTS"

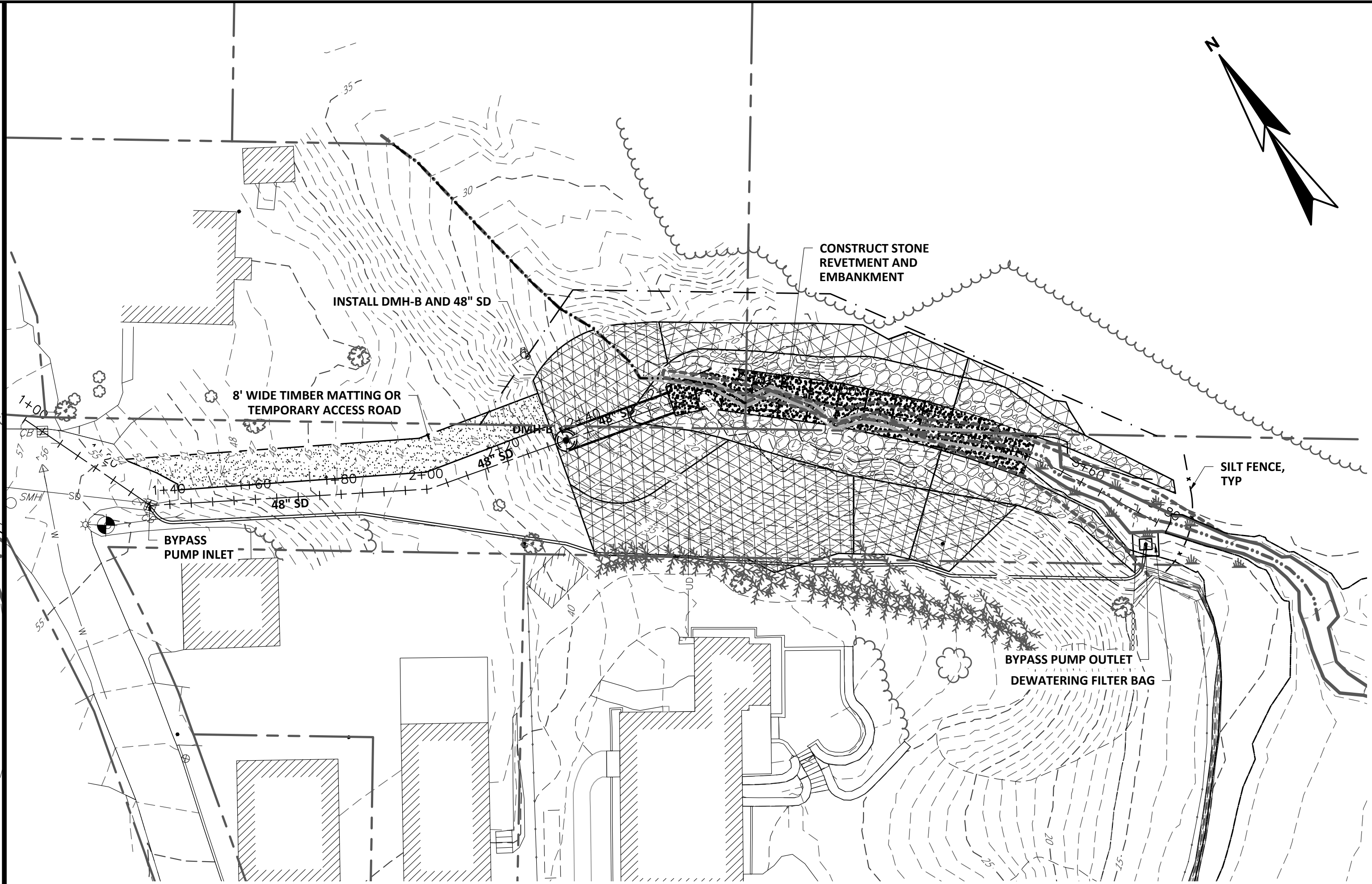


NOTE:
EMBED HAYBALES MINIMUM OF 4".

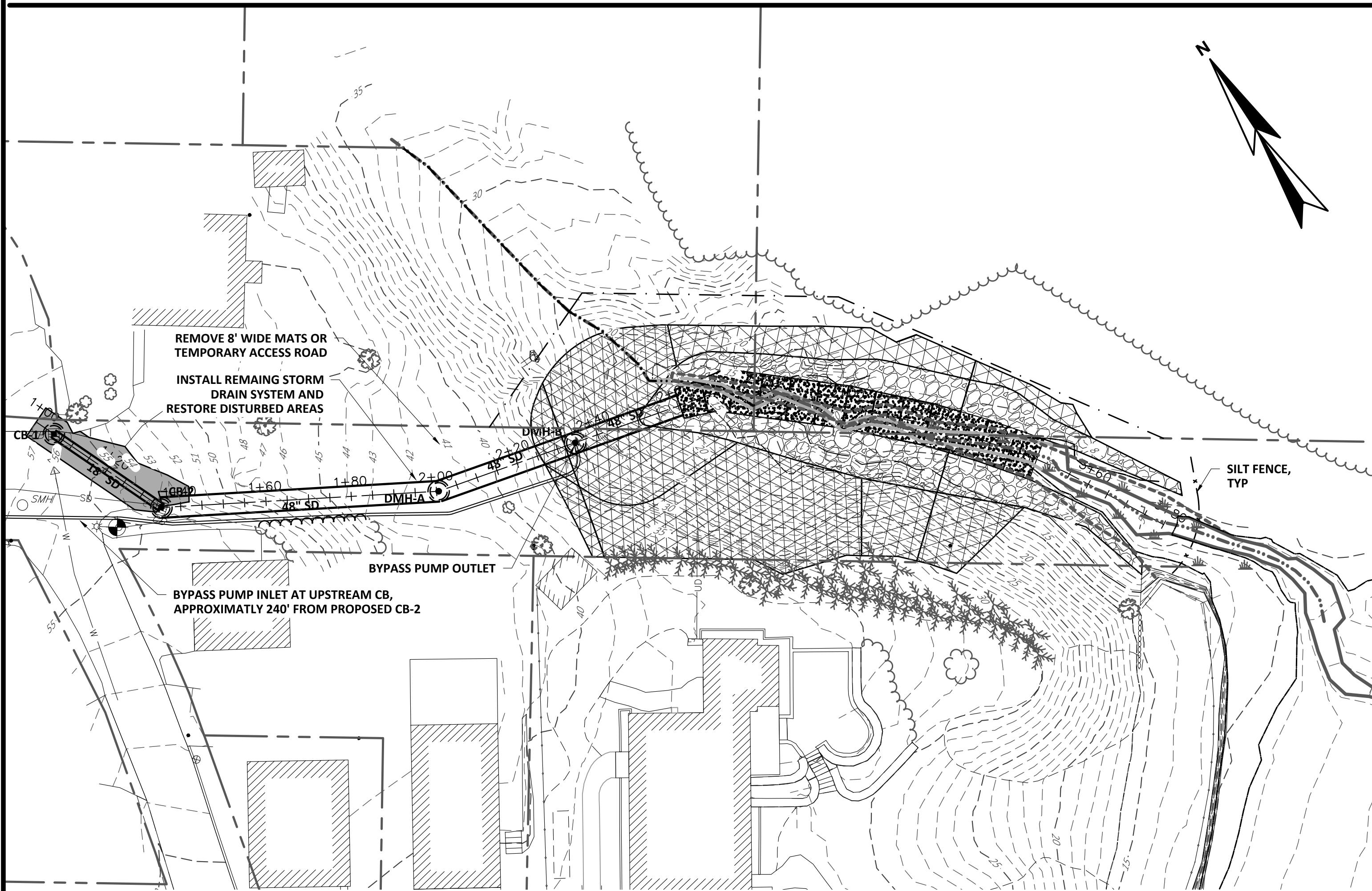
[illegible]



PHASE 1



PHASE 2



PHASE 3

CONSTRUCTION PHASING:

PHASE 1

- INSTALL ALL EROSION AND SEDIMENTATION CONTROLS AS SHOWN ON THE PLANS AND ANY ADDITIONAL AREAS THE OWNER AND/OR OWNER'S REPRESENTATIVE DEEMS NECESSARY.
- MOBILIZE EQUIPMENT AND RECEIVE MATERIALS.
- INSTALL BYPASS PUMP IN CB-2 AND ROUTE TO HAY BALE SEDIMENT BASIN ON DOWNSTREAM END OF PROPOSED REVETMENT MATTRESS.
- INSTALL TEMPORARY ROADWAY USING 8' TIMBER MATS.
- REMOVE AND PROPERLY DISPOSE OF INVASIVE SPECIES PLANTINGS PER THE PROJECT PLANS AND SPECIFICATIONS.
- EXCAVATE FOR REVETMENT MATTRESS AND 24" RIPRAP.
- INSTALL TREATMENT A & TREATMENT B OPTIONS ON EMBANKMENT AS SHOWN ON THE PLANS.
- INSTALL REVETMENT MATTRESS AND 24" RIPRAP AS SHOWN ON THE PLANS.
- CONTINUE INSTALLATION OF REVETMENT MATTRESS, 24" RIPRAP, AND TREATMENT A/B OPTIONS TO OUTLET OF PROPOSED 48" CULVERT.
- REMOVE TEMPORARY ROADWAY AS WORK PROGRESSES UP THE DRAINAGE DITCH.

PHASE 2

- INSTALL PROPOSED 48" STORM DRAIN ALONG WITH CONCRETE HEADWALL FROM THE OUTLET OF THE PROPOSED STORM DRAIN TO DMH-B.
- INSTALL RIP RAP APRON AT THE OUTLET OF THE EXISTING CULVERTS AS SHOWN ON THE PLANS.
- INSTALL REMAINING TREATMENT A/B ALONG EMBANKMENT AS SHOWN ON THE PLANS.

PHASE 3


- MOVE BYPASS PUMP FROM CB-2 TO CB UPSTREAM FROM PROJECT AREA. ROUTE BYPASS PUMP OUTLET INTO DMH-B.
- INSTALL STORM DRAIN AND STRUCTURES FROM DMH-B TO DMH-A.
- REMOVE AND DISPOSE OF EXISTING 30" TRANSITE PIPE.
- INSTALL STORM DRAIN AND STRUCTURES FROM DMH-A TO CB-1. REMOVE TRANSITE PIPE DURING INSTALLATION OF THE STORM DRAIN AND STRUCTURES.
- RESTORE AREA WITH LOAM AND SEED.

PHASE 4

- PAVE THE END OF UNDERWOOD ROAD AS SHOWN ON THE PROJECT PLAN SET.
- REMOVE ALL UN-USED MATERIALS AND CONSTRUCTION EQUIPMENT.
- LOAM AND RESEED ALL REMAINING AREAS.
- ONCE SITE HAS BECOME PERMANENTLY STABILIZED, AS DETERMINED BY THE OWNER AND/OR OWNER'S REPRESENTATIVE, REMOVE ALL REMAINING TEMPORARY EROSION CONTROL MEASURES.
- DEMOBILIZE ALL EQUIPMENT.

FOR PERMITTING
PURPOSES ONLY

SUBMISSIONS/REVISIONS		APP'D	DATE
ISSUED FOR PERMITTING		R. WIN	3-20
NO			
DESIGNED BY: J. WAL			
CAD COORD: M. LAP			
CAD: M. LAP			
CHECKED BY: J. WAL			
DATE: 3-26-2020			
APPROVED BY: R. WIN			
DATE: 3-26-2020			
PROJECT NO: 13042			

**WRIGHT-PIERCE**
Engineering a Better Environment

888.621.8156 | www.wright-pierce.com

TOWN OF FALMOUTH
UNDERWOOD ROAD
DRAINAGE IMPROVEMENTS
FALMOUTH, MAINE

CONSTRUCTION PHASING PLAN

DRAWING
C-10

APPENDIX B
Project Easements

TOWN OF FALMOUTH

ORDER NO 94-2019

ACCEPTANCE OF EASEMENT IN PAPER STREET

BE IT HEREBY ORDERED THIS 8th DAY OF APRIL 2019, BY THE FALMOUTH TOWN COUNCIL, FALMOUTH MAINE, IN TOWN COUNCIL ASSEMBLED:

WHEREAS, by virtue of a Notice dated August 14, 2017 and recorded in the Cumberland County Registry of Deeds in Book 34303, Page 131 (the "Notice") the Town Council previously extended its right, for a period of 20 years, to accept rights and interests in certain proposed, unaccepted ways, or portions thereof, also known as paper streets, as described in the Notice; and

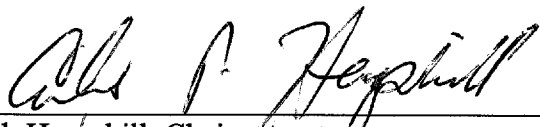
WHEREAS, the Town Council has determined that it is necessary to accept a utility easement in the Underwood Road extension, being one of the paper streets listed in the Notice, in order to perform certain necessary stormwater drainage improvements and surface stabilization work in and around such area.

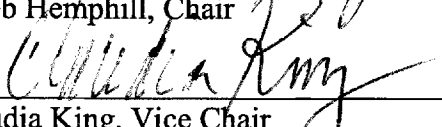
NOW, THEREFORE, the Town Council, pursuant to 23 M.R.S. § 3031(1), hereby accepts a utility easement over, under and across the entire portion of Underwood Road not previously accepted as a public street, lying easterly of Glen Road and westerly of the high water mark and being shown on plans recorded in the Cumberland County Registry of Deeds in Plan Book 16, Page 25, Plan Book 14, Page 82 and Plan Book 17, Page 1, which rights include, without limitation, the right to install, use, maintain, inspect, repair and replace storm drainage piping, structures, and appurtenances, including measures for channel and slope stabilization, and the right to access such area with persons, equipment and vehicles for the foregoing purposes.

The Town Clerk is hereby authorized and directed to record an attested copy of this Order in the Cumberland County Registry of Deeds.

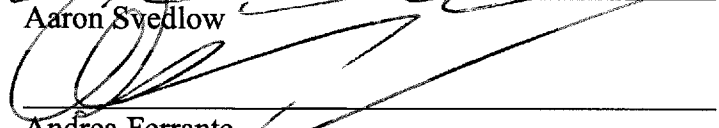
Date: April 8th, 2019


Town Council of the Town of Falmouth

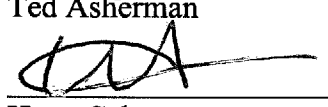

Caleb Hemphill, Chair

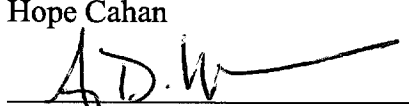

Claudia King, Vice Chair


Aaron Svedlow


Andrea Ferrante


Ted Asherman


Hope Cahan


Amy Kuhn

NOTICE

I, Ellen Planer, Town Clerk of the Town of Falmouth, Maine, do hereby certify and attest that attached hereto is a true copy of an Order duly adopted by the Falmouth Town Council on April 8, 2019, the original of which is maintained in the Town's permanent records.

Dated: April 9, 2019


Ellen Planer, Town Clerk

STATE OF MAINE
COUNTY OF CUMBERLAND, SS.

April 9, 2019

Personally appeared the above-named Ellen Planer, in her capacity as Town Clerk for the Town of Falmouth, Maine, and having been duly sworn upon oath, did state that the statements in the above Notice were true based upon her personal knowledge and that the above Notice is her free act and deed in her said capacity.

Linda M. Case
Notary Public Maine
My Commission Expires June 29, 2019


Notary Public

REPLACEMENT EASEMENT DEED

THEODORE H. HEIDRICH, of Saco, York County, Maine (“Grantor”) grants to the **TOWN OF FALMOUTH**, a Maine municipal corporation having a place of business in Falmouth, Cumberland County, Maine (the “Grantee”), the rights and easements described herein over certain property of the Grantor in Falmouth, Cumberland County, Maine being more particularly described in **Exhibit A** attached hereto and made a part hereof (hereinafter referred to as the “Easement Area”) also being depicted as “Easement Area 623+/- SF” on **Exhibit B**, which is a reduced copy of a plan prepared by Wright-Pierce dated May 2018 entitled “Town of Falmouth Underwood Road Right of Way Improvements” (Project No. 13042A). For Grantor’s source of title to the property burdened by the rights and easements granted herein, reference is made to a deed to the Grantor from the Grantee dated June 1, 2018 and recorded in the Cumberland County Registry of Deeds in Book 34917, Page 326, and a deed to the Grantor from Deborah E. Zimmermann (also referred to in instruments of record as Deborah E. Zimmerman) dated May 18, 2018 and recorded in said Registry in Book 34917, Page 327.

The Grantee, its successors and assigns, shall have a perpetual, non-exclusive right and easement to enter upon the Easement Area with persons, vehicles and equipment for the purposes of constructing, repairing, maintaining, inspecting, replacing and removing earth fill, stone rip rap, drainage piping and ancillary elements relating the Grantee’s storm drain system, and for performing slope repair and erosion prevention in connection therewith (collectively, the “Drainage Facilities”). Following any exercise of its rights hereunder, the Grantee shall restore the surface of the Easement Area as nearly as practical to its condition prior to the undertaking of such work.

Reserving to the Grantor, his heirs and assigns, the use and enjoyment of the Easement Area for all purposes as are not inconsistent with and shall not interfere with the use thereof by Grantee, its successors and assigns, for the purposes herein described, provided that no materials, fill, paving, walls, fences, building or any other improvements shall be placed on or removed from the Easement Area without the prior written consent of the Grantee.

The parties acknowledge that the Easement Area and immediately surrounding areas are highly sensitive to erosion, and neither the Grantor nor the Grantee shall do or permit anything to be done within the Easement Area or the immediately surrounding areas that destabilizes the slope, including, without limitation, dumping materials, disposing of waste or debris, or removal of trees or other vegetation within the Easement Area (except as necessary to install and maintain the Grantee’s Drainage Facilities).

By its acceptance of this Replacement Easement Deed, the Grantee accepts the terms and conditions hereof.

The rights and obligations set forth herein shall be binding upon and shall inure to the benefit of the Grantor and the Grantee and their respective heirs, successors and assigns, and shall run with the land.

This Replacement Easement Deed shall replace, in its entirety, the Easement Deed from Grantor to Grantee dated June 1, 2018 and recorded in the Cumberland County Registry of Deeds in Book 34917, Page 333 (the "Prior Easement"). The Grantee, by acceptance hereof, agrees that the Prior Easement is hereby terminated and shall be of no further force and effect.

[Signature Page Follows]

IN WITNESS WHEREOF, the Grantor has executed this instrument as of the
4 day of February, ~~2018~~ 2019

WITNESS:

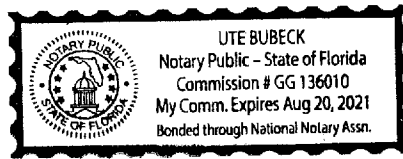
[Signature]

[Signature]
 Theodore H. Heidrich

Florida
 STATE OF ~~MAINE~~ Lee
 COUNTY OF ~~CUMBERLAND~~, ss.

4 of February ~~2018~~ 2019

Personally appeared the above-named Theodore H. Heidrich and acknowledged the foregoing instrument to be his free act and deed.



Before me,

[Signature]
 Notary Public/Attorney at Law

Printed name: Ute Bubeck

My commission expires:

EXHIBIT A**EASEMENT OVER TAX MAP U18, LOT 23 (623+/- SF):**

An easement over certain land located in the Town of Falmouth, County of Cumberland, State of Maine being described as follows:

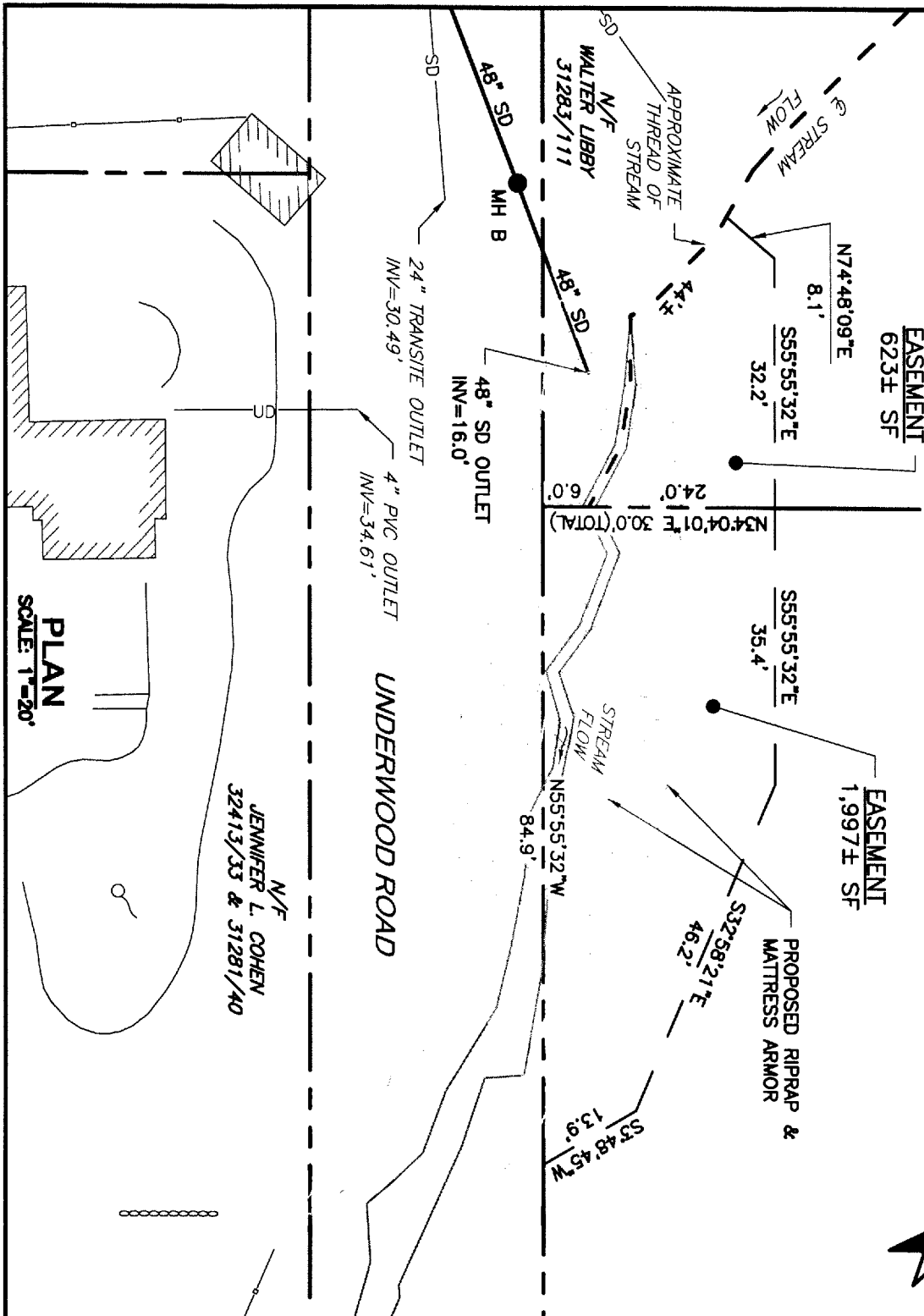
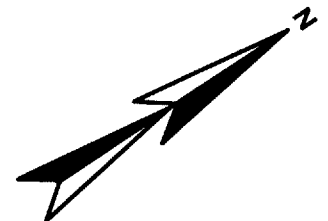
Starting at a point located at the intersection of the flow line of a stream crossing the parcel labeled "N/F Deborah E. Zimmerman 9502/252" ("Lot 23") on the plan prepared by Wright-Pierce entitled "Town of Falmouth Underwood Road Right of Way Improvements" (Project No. 13042A)" attached as **Exhibit B** and the easterly property boundary of Lot 23 and extending upstream along the thread of the stream a distance of 44 feet, more or less, and then extending 8.1 feet at a bearing of N 74°48' 09" E, then 32.2 feet at a bearing of S 55° 55' 32" E to said easterly property boundary of Lot 23, and then 24 feet, more or less, along said easterly property boundary of Lot 23 at a bearing of S 34° 04' 01" W to the point of beginning.

PLAN REFERENCE:
A SET OF PLANS ENTITLED "UNDERWOOD ROW
IMPROVEMENTS, FALMOUTH, MAINE, PROJECT
NO. 14-56" DATED APRIL 9, 2018, PREPARED BY BAKER
DESIGN CONSULTANTS.

Exhibit B

N/F
CASCO BAY LIMITED
PARTNERSHIP
10621/45

N/F
DEBORAH E. ZIMMERMAN
9502/252



TOWN OF FALMOUTH
UNDERWOOD ROAD
RIGHT OF WAY IMPROVEMENTS
UNDERWOOD ROAD, FALMOUTH, MAINE

PROJ NO: 13042A DATE: MAY 2018

WRIGHT-PIERCE

NO.	REVISIONS	DRAWN BY	APP'D
1			
2			
3			

EASEMENT EXHIBIT
TOWN OF FALMOUTH &
CASCO BAY LIMITED PARTNERSHIP

FIGURE:
E5

REPLACEMENT EASEMENT DEED

UNDERWOOD ROAD LLC, a Maine limited liability company having a mailing address of 52 King Street, Saco, ME 04072 ("Grantor") grants to the **TOWN OF FALMOUTH**, a Maine municipal corporation having a mailing address of 271 Falmouth Rd., Falmouth, ME 04105 (the "Grantee"), the rights and easements described herein over certain property of the Grantor in Falmouth, Cumberland County, Maine being more particularly described in **Exhibit A** attached hereto and made a part hereof (hereinafter referred to as the "Easement Area") also being depicted as "Easement Area 1,997+/- SF" on **Exhibit B**, which is a reduced copy of a plan prepared by Wright-Pierce dated May 2018 entitled "Town of Falmouth Underwood Road Right of Way Improvements" (Project No. 13042A). For Grantor's source of title to the property burdened by the rights and easements granted herein, reference is made to a deed to the Grantor from Casco Bay Limited Partnership dated June 1, 2018 and recorded in the Cumberland County Registry of Deeds in Book 34917, Page 329.

The Grantee, its successors and assigns, shall have a perpetual, non-exclusive right and easement to enter upon the Easement Area from the extension of Underwood Road with persons, vehicles and equipment for the purposes of constructing, repairing, maintaining, inspecting, replacing and removing earth fill, stone rip rap, drainage piping and ancillary elements relating the Grantee's storm drain system, and for performing slope repair and erosion prevention in connection therewith (collectively, the "Drainage Facilities"). Following any exercise of its rights hereunder, the Grantee shall restore the surface of the Easement Area as nearly as practical to its condition prior to the undertaking of such work.

Reserving to the Grantor, his heirs and assigns, the use and enjoyment of the Easement Area for all purposes as are not inconsistent with and shall not interfere with the use thereof by Grantee, its successors and assigns, for the purposes herein described, provided that no materials, fill, paving, walls, fences, building or any other improvements shall be placed on or removed from the Easement Area without the prior written consent of the Grantee.

The parties acknowledge that the Easement Area and immediately surrounding areas are highly sensitive to erosion, and neither the Grantor nor the Grantee shall do or permit anything to be done within the Easement Area or the immediately surrounding areas that destabilizes the slope, including, without limitation, dumping materials, disposing of waste or debris, or removal of trees or other vegetation within the Easement Area (except as necessary to install and maintain the Grantee's Drainage Facilities).

By its acceptance of this Replacement Easement Deed, the Grantee accepts the terms and conditions hereof.

The rights and obligations set forth herein shall be binding upon and shall inure to the benefit of the Grantor and the Grantee and their respective heirs, successors and assigns, and shall run with the land.

This Replacement Easement Deed shall replace, in its entirety, the Easement Deed from Grantor to Grantee dated June 1, 2018 and recorded in the Cumberland County Registry of Deeds in Book 34917, Page 338 (the "Prior Easement"). The Grantee, by acceptance hereof, agrees that the Prior Easement is hereby terminated and shall be of no further force and effect.

[Signature Page Follows]

IN WITNESS WHEREOF, the Grantor has executed this instrument as of the
4 day of February, ~~2018~~ 2019

WITNESS:

[Signature]

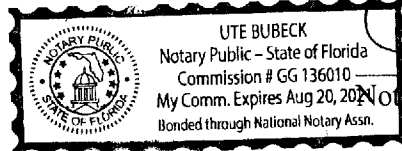
UNDERWOOD ROAD LLC

By: [Signature]
 Theodore H. Heidrich
 Member

~~STATE OF MAINE~~
~~COUNTY OF CUMBERLAND, ss~~
FLORIDA
County of Lee

4 of February, ~~2018~~ 2019

Personally appeared the above-named Theodore H. Heidrich, the Member of Underwood Road LLC, and acknowledged the foregoing instrument to be his free act and deed in his said capacity and the free act and deed of said Underwood Road LLC.



[Signature]
 Notary Public/Attorney at Law
 Printed name: _____
 My commission expires: _____

EXHIBIT A**EASEMENT OVER TAX MAP U18, LOT 25 (1,997+/- SF):**

An easement over certain land located in the Town of Falmouth, County of Cumberland, State of Maine being described as follows:

Starting at a point located at the intersection of the extension of the Underwood Road right-of-way and the westerly property boundary of the parcel labeled "N/F Casco Bay Limited Partnership 10621/45" as shown on the plan prepared by Wright-Pierce entitled "Town of Falmouth Underwood Road Right of Way Improvements" (Project No. 13042A)" attached as **Exhibit B** and extending along said property boundary a distance of 30.0 feet at a bearing of N 34° 04' 01" E, more or less, and then extending 35.4 feet at a bearing of S 55° 55' 32" E, and then 46.2 feet at a bearing of S 32° 58' 21" E, and then extending 13.9 feet at a bearing of S 03° 48' 45" W, to the said extension of the Underwood Road right-of-way, and then 84.9 feet along the said extension of the Underwood Road right of way at a bearing of N 55° 55' 32" W to the point of beginning.

PLAN REFERENCE:
A SET OF PLANS ENTITLED "UNDERWOOD ROW
IMPROVEMENTS, FALMOUTH, MAINE, PROJECT
NO. 14-56" DATED APRIL 9, 2018, PREPARED BY BAKER
DESIGN CONSULTANTS.

Exhibit B

N/F
CASCO BAY LIMITED
PARTNERSHIP
10621/45

N/F
DEBORAH E. ZIMMERMAN
9502/252

EASEMENT
623± SF

EASEMENT
1,997± SF

PROPOSED RIPRAP &
MATTRESS ARMOR

APPROXIMATE
THREAD OF
STREAM

N/F
WALTER LIBBY
31283/111

48" SD

MH B

48" SD

48" SD OUTLET
INV=16.0'

24" TRANSITE OUTLET
INV=30.49'

4" PVC OUTLET
INV=34.61'

UNDERWOOD ROAD

JENNIFER L. COHEN
32413/33 & 31281/40

48" SD

48" SD

48" SD

48" SD

48" SD

48" SD

48" SD

48" SD

48" SD

48" SD

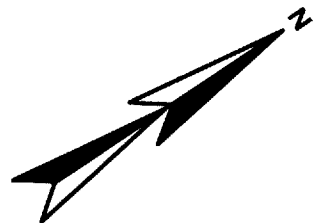
48" SD

48" SD

48" SD

48" SD

PLAN
SCALE: 1"=20'



TOWN OF FALMOUTH
UNDERWOOD ROAD
RIGHT OF WAY IMPROVEMENTS
UNDERWOOD ROAD, FALMOUTH, MAINE

PROJ NO: 13042A DATE: MAY 2018

WRIGHT-PIERCE

NO.	REVISIONS	DRAWN BY	APP'D
1			
2			
3			

EASEMENT EXHIBIT
TOWN OF FALMOUTH &
CASCO BAY LIMITED PARTNERSHIP

FIGURE:
E5

TOWN OF FALMOUTH**ORDER NO 110-2019****ORDER OF CONDEMNATION**

BE IT HEREBY ORDERED THIS 22ND DAY OF APRIL 2019, BY THE FALMOUTH TOWN COUNCIL, FALMOUTH MAINE, IN TOWN COUNCIL ASSEMBLED:

Pursuant to 23 M.R.S. § 3023 and 23 M.R.S. § 3251, the Town Council of the Town of Falmouth, Maine, having given notice of its intention to take the below-described property interests by posting the notice for at least 7 days in 2 public places in the Town of Falmouth, being the Town Hall and the Community Programs Facility, and by posting the notice in the vicinity of the taking, located near Glen Road and the Underwood Road extension in Falmouth, Maine, and having held a meeting for this purpose on April 22, 2019 in accordance with the notice and determining that public exigency requires this taking for the public health and welfare of the residents of the Town of Falmouth to provide for the safe and ecologically appropriate discharge of stormwater drainage from public roads through drains located in and near the extension of Underwood Road, and to mitigate and prevent further shoreland instability, erosion, and discharge of sediment into Casco Bay, hereby ORDER that the following described interests in real property be and hereby are taken and condemned by the Town of Falmouth for this purpose, as follows:

LOCATION:

An easement over certain property located in the Town of Falmouth, County of Cumberland, State of Maine being described as follows (hereinafter, the "Easement Area"):

Starting at a point located at the intersection of the northeasterly sideline of the extension of the Underwood Road right-of-way, as it extends southeasterly from Glen Road, and the southwesterly corner of land now or formerly of Casco Bay Limited Partnership being described in a deed recorded in the Cumberland County Registry of Deeds in Book 10621, Page 45;

Thence N 34° 04' 02" E a distance of six and one tenth feet (6.1') to the center of the Underwood Spring stream;

Thence continuing along the center of the stream and by and along land now or formerly of Deborah E. Zimmermann (also referred to in instruments of record as Deborah E. Zimmerman) being described in a deed recorded in said Registry of Deeds in Book 9502, Page 252 by the following courses:

N 27° 33' 14" W a distance of eight and six tenths feet (8.6');

N 46° 58' 13" W a distance of eight and one-tenths feet (8.1');

N 55° 34' 39" W a distance of eight and nine-tenths feet (8.9');

N 0° 05' 01" E a distance of four and eight-tenths feet (4.8')

N 14° 35' 45" W a distance of eleven and three-tenths feet (11.3'); and

N 26° 10' 47" W a distance of eight and nine-tenths feet (8.9');

Thence turning and running S 67° 42' 53" W through land of Walter Libby to the northeasterly sideline of said extension of Underwood Road; and

Thence turning and running S 55° 55' 32" E along the northeasterly sideline of said extension of Underwood Road a distance of sixty one and eight-tenths feet (61.8') to the point of beginning.

The Easement Area is shown as "Proposed Drainage Easement 893+/- SF" on the plan dated November, 2018 entitled "Taking Exhibit Town of Falmouth & Walter & DeHahn Libby" prepared by Wright-Pierce, Project number 13042A, a copy of which is attached hereto as **Exhibit A**.

Being an easement over a portion of the premises awarded to Walter Libby by virtue of an Amended Decision and Judgment issued by the Cumberland County

Superior Court in a Civil Action Docket No. RE-02-64 dated May 2, 2007 and recorded on January 13, 2014 in said Registry of Deeds in Book 31283, Page 111.

REAL PROPERTY INTERESTS TAKEN:

An easement, and not fee ownership, over the Easement Area to discharge water in and near Underwood Stream and to install, use, maintain, inspect, repair and replace storm drainage piping, structures and appurtenances, including measures for channel and slope stabilization, including access to the Easement Area with persons, equipment and vehicles for such purposes.

PROPERTY OWNER:

A copy of this Order and a check in the amount of the damages will be duly served upon the owner of the above-described property, being:

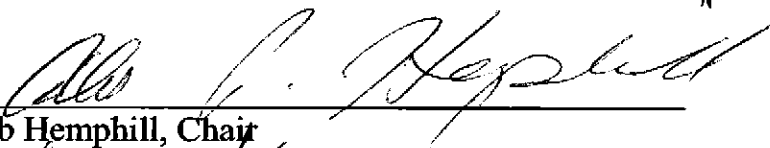
Walter Libby
8 Glen Road
Falmouth, ME 04105

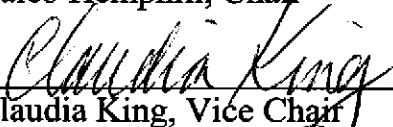
AMOUNT OF DAMAGES:

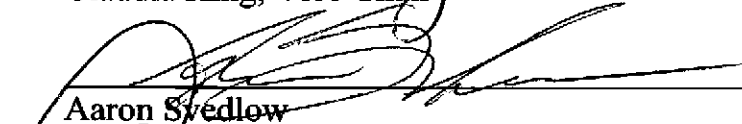
The damages determined by the Town Council to be just compensation for the property interests to be taken and condemned under this Order are as follows:


Five Thousand Dollars (\$5,000.00)


Signed by the Town Council of the Town of Falmouth, Maine this 22nd day of April, 2019.

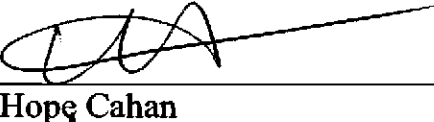

Caleb Hemphill, Chair

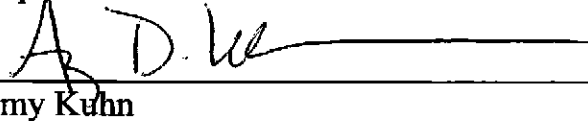

Claudia King, Vice Chair


Aaron Svedlow


Andrea Ferrante


Ted Asherman


Hope Cahan


Amy Kuhn

NOTICE

I, Ellen Planer, Town Clerk of the Town of Falmouth, Maine, do hereby certify and attest that attached hereto is a true copy of an Order duly adopted by the Falmouth Town Council on April 22, 2019, the original of which is maintained in the Town's permanent records.

Dated: April 22, 2019


Ellen Planer, Town Clerk

STATE OF MAINE
COUNTY OF CUMBERLAND, SS.

April 22, 2019

Personally appeared the above-named Ellen Planer, in her capacity as Town Clerk for the Town of Falmouth, Maine, and having been duly sworn upon oath, did state that the statements in the above Notice were true based upon her personal knowledge and that the above Notice is her free act and deed in her said capacity.


Notary Public

Linda M. Case
Notary Public Maine
My Commission Expires June 29, 2019

