

Horsley Witten Group

Sustainable Environmental Solutions

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508-833-6600 • horsleywitten.com



PROJECT MANUAL

Wompatuck State Park Parking Lot & Trail Access

Norwell, Massachusetts

Dated: February, 2021

WOMPATUCK STATE PARK – PARKING LOT & TRAIL ACCESS
Norwell, MA 02703

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DIVISION 0

BIDDING REQUIREMENTS

SECTION 000200

ADVERTISEMENT

The Town of Norwell, MA is requesting bids for the following:

Wompatuck State Park Parking Lot & Trail Access, Norwell, MA

THIS PROJECT IS BEING ELECTRONICALLY BID AND HARD COPY BIDS WILL NOT BE ACCEPTED. Please review the instructions in the bid documents on how to register as an electronic bidder. The bids are to be prepared and submitted at www.biddocsonline.com. Tutorials and instructions on how to complete the electronic bid documents are available online (click on the "Tutorial" tab at the bottom footer).

The Town of Norwell, Massachusetts, **the Awarding Authority**, invites sealed bids from General Contractors for the **Wompatuck State Park Parking Lot & Trail Access, Norwell, MA project at approximate address of Grove Street (Lot 4) in the Town of Norwell, Massachusetts**, in accordance with the documents prepared by **HORSLEY WITTEN GROUP, INC.** dated February 2021. The work to be performed under this contract includes but is not limited to the construction of a parking lot, gravel path and wooden footpath, and associated site work, stormwater management, landscaping, and erosion and sediment control.

Construction shall begin after the Notice of Proceed and be completed no later than 120 days from the start of construction.

Bidding procedures and award of Contract and subcontracts are subject to the provisions of the General Laws of the Commonwealth of Massachusetts applicable sections of MGL c.30, 39M. Estimated cost of the base bid with alternate is \$297,000.

General Bids will be received until March 11, 2021 **at 10:00AM** and publicly opened, forthwith online.

All Bids should be submitted electronically online at www.biddocsonline.com and received no later than the date and time specified above.

General bids shall be accompanied by a bid deposit that is not less than five (5%) of the greatest possible bid amount (considering any and all alternates) and made payable to the **Town of Norwell**.

Bid Forms and Contract Documents will be available for pick-up at www.biddocsonline.com (may be viewed electronically and hardcopy requested) or at Nashoba Blue, Inc. at 433 Main Street, Hudson, MA 01749 (978-568-1167), beginning on February 17, 2021. There is a plan deposit of **\$50** per set (maximum of 2 sets) payable to BidDocs Online Inc.

Deposits may be electronically paid or must be a check. This deposit will be refunded for up to two sets for general bidders upon return of the sets in good condition within thirty days of receipt of general bids. Otherwise the deposit shall be the property of the Awarding Authority.

Additional sets may be purchased for **\$50**.

Bidders requesting Contract Documents to be mailed to them shall include a separate check for **\$40.00** per set for UPS Ground (or \$65.00 per set for UPS overnight), payable to BidDocs ONLINE, Inc., to cover mail handling costs.

There will be no **Pre-Bid Conference**. Bidders may visit the site at their convenience and submit any questions in writing to Eliza Hoffman at ehoffman@horsleywitten.com by 4:00 pm on March 1, 2021.

The Contract Documents may be seen at:

Nashoba Blue Inc.
433 Main Street
Hudson, MA 01749
978-568-1167

The successful bidder will be required to furnish a Labor and Materials Payment Bond and a Performance Bond each in the amount of one hundred percent (100%) of the contract amount.

Full compliance with State and Municipal Wage Laws is required of all work. Minimum Wage Rates as determined by the Commissioner of Department of Labor and Industries under the provision of the Massachusetts General Laws, Chapter 149, Section 26 to 27D, as amended, apply to this project. It is the responsibility of the contractor, before bid opening, to request if necessary, any additional information on Minimum Wage Rates for those trades people who may be employed for the proposed work under this contract.

All bidders shall be required to submit a Certification of Non-Collusion and State Tax Certification Clause as well as provide Certification of Occupational Safety and Health Administration (OSHA) Training in accordance with Massachusetts General Law 30: Section 39S, as amended by Chapter 306 of the Acts of 2004, effective 7/1/06.

Bidders are not to include in their Bid Proposal sales and compensating use taxes on materials and supplies purchased for this project. All materials used are tax exempt.

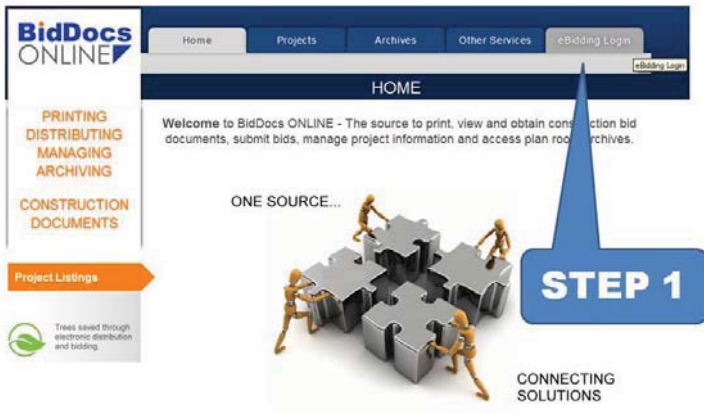
Contractors shall be required to comply with all applicable Massachusetts General Laws, Chapter 30 S.39M, and other applicable Massachusetts General Laws.

A weekly certified payroll submittal shall be required of the successful bidder in accordance with MGL C149, S27B. No payments will be made until all payroll information necessary for the Town to determine compliance with prevailing wage law requirements for the time period of the payment request have been submitted.

The Contractor shall not discriminate with regard to the personnel employed on this project on the basis of race, color, creed, national origin, gender, sexual preference, handicap or age.

A copy of this advertisement is available on the Massachusetts Newspaper Publishers Association (MNPA) website (<http://masspublicnotices.org/>).

The Town of Norwell, Massachusetts reserves the right to reject any or all proposals or waive any formalities that appear to be in the best interest of the Town of Norwell, MA. The right is also reserved to accept any proposal deemed to be best for the project. In any event, bids to be deemed acceptable shall comply in each and every way with all applicable Massachusetts General Laws.

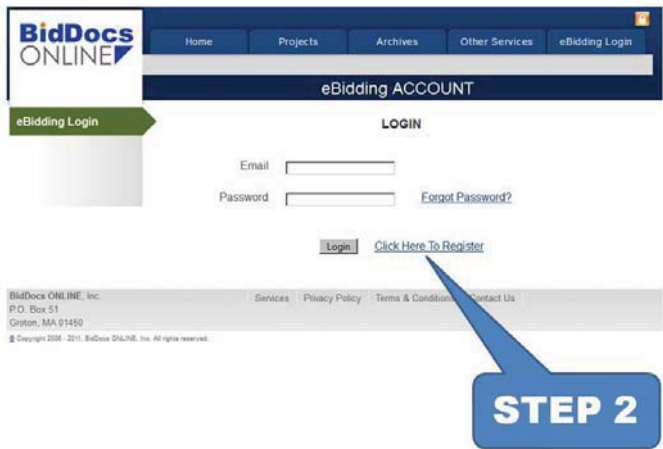


Tutorial #1 eBidding REGISTRATION INSTRUCTIONS

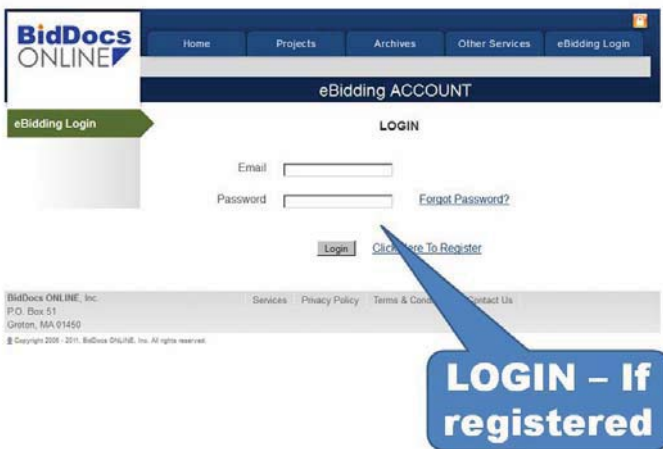
Below are the step by step instructions on how to register to use BidDocs ONLINE eBidding. There is no cost to register. Start by going to

www.biddocsonline.com

STEP 1: Click on the “eBidding Login” tab at the top of the page.



STEP 2: If your company has not previously registered, click on the text “[Click Here To Register](#)”.



STEP 3: If your company has previously registered, login by entering the registered email address and password and then click the “Login” button.

Note: Your company will have only one registration and must use the same password.

STEP 3

STEP 4

STEP 3: All fields must be completed in the registration form.

STEP 4: After completing the registration form, you must read and acknowledge the Terms and Conditions. Click the “Submit” button.

STEP 5

STEP 5: Enter the email and password previously created during the registration process and click “Login”.

STEP 6

STEP 6: After logging in, the account authorization screen will appear. You must click “Print Form” to proceed to Step 7.

STEP 7: Print and notarize the form (sign in blue ink). Return the original “Electronic Bidder Signature Authorization Form” to BidDocs ONLINE Inc.

The mailing address is:
BidDocs ONLINE Inc.
P.O. Box 51
61 Skyfields Drive (for overnight)
Groton, MA 01450

Your company is responsible for ensuring that BidDocs ONLINE receives the signed Electronic Bidder Signature Authorization Form a minimum of three (3) business days prior to the bid date. BidDocs ONLINE will notify you by email that your form has been received and processed. A unique bar code will identify your bid paperwork.

Note: The registration form will remain “active” until such time that your company requests a change in the person signing the form, the company address or other pertinent company information. Your company is responsible for printing and resubmitting an updated form as required.

STEP 8: While the Electronic Bidder Signature Authorization Form is being processed, you may commence completing the common forms (*DCAM Eligibility and Sections 1-4 of the DCAM Update Statement*) that are required for MGL c. 149 bids. (*See Tutorial #2 - eBidding Common Forms Instructions*)

Please note that you are responsible for completing the associated forms for each sub-trade and/or general bid as applicable.

Summary: THIS PROJECT IS BEING ELECTRONICALLY BID AND HARD COPY BIDS WILL NOT BE ACCEPTED BY THE AWARDING AUTHORITY. You must submit your bid electronically at www.biddocsonline.com. At any time during the bidding process, you may print the various bid documents for your company’s records. Additional instructions to complete the other bid forms are accessible on the BidDocs ONLINE website (click on the “Tutorial” tab at the bottom footer).

FORM FOR GENERAL BID

TO THE AWARDING AUTHORITY

A. The undersigned proposes to furnish all labor and materials required for _____ for the
PROJECT
in _____, Massachusetts,
in accordance with the accompanying plans and
specifications prepared by _____

Name of Engineer/Architect

For the contract price specified below, subject to additions and deductions according to the terms of the specifications.

B. This bid includes addenda numbered: _____

C. The proposed contract price is:

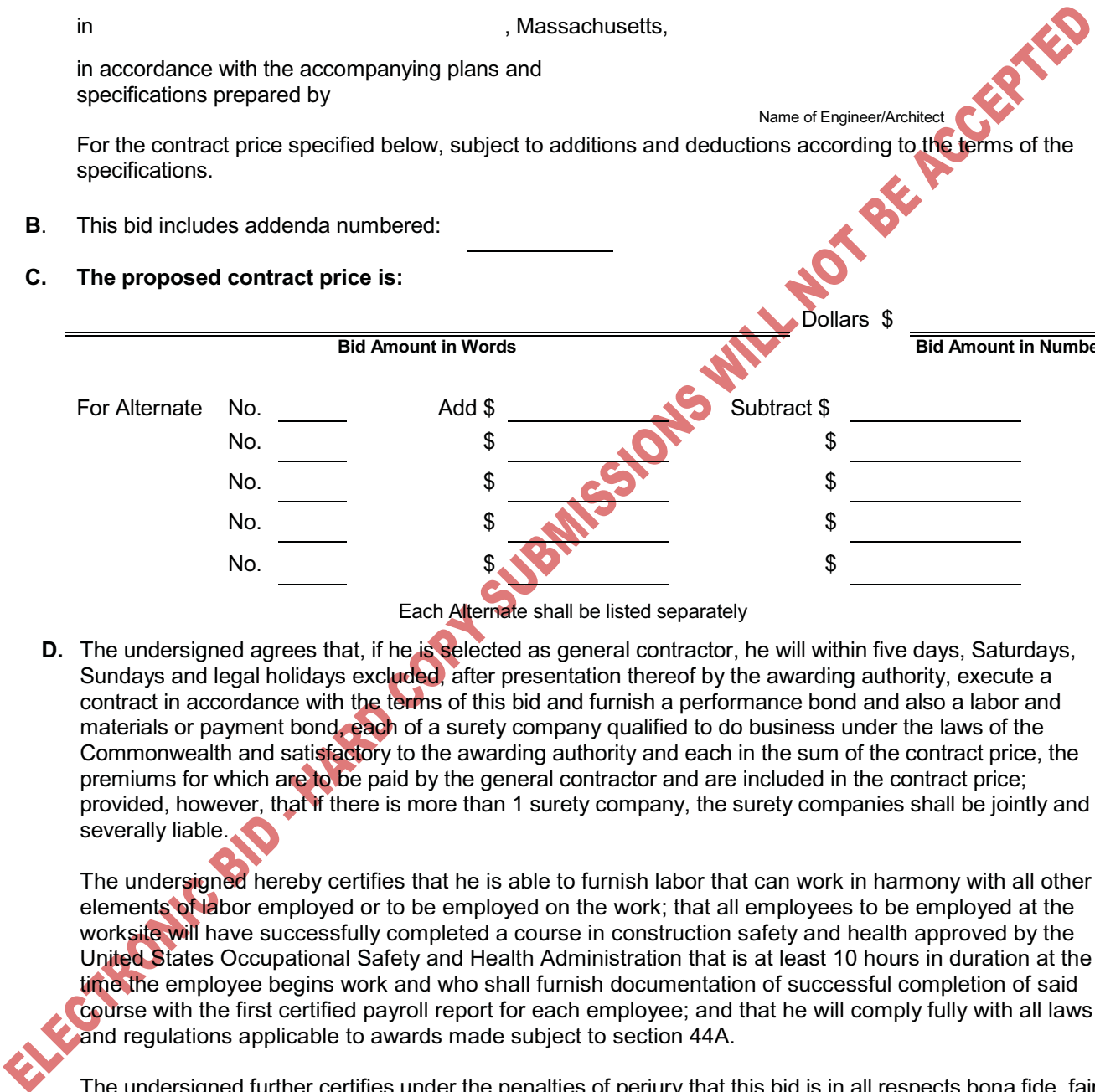
		Dollars \$	
Bid Amount in Words			Bid Amount in Numbers
For Alternate No. _____	Add \$ _____	Subtract \$ _____	_____
No. _____	\$ _____	\$ _____	_____
No. _____	\$ _____	\$ _____	_____
No. _____	\$ _____	\$ _____	_____
No. _____	\$ _____	\$ _____	_____

Each Alternate shall be listed separately

D. The undersigned agrees that, if he is selected as general contractor, he will within five days, Saturdays, Sundays and legal holidays excluded, after presentation thereof by the awarding authority, execute a contract in accordance with the terms of this bid and furnish a performance bond and also a labor and materials or payment bond, each of a surety company qualified to do business under the laws of the Commonwealth and satisfactory to the awarding authority and each in the sum of the contract price, the premiums for which are to be paid by the general contractor and are included in the contract price; provided, however, that if there is more than 1 surety company, the surety companies shall be jointly and severally liable.

The undersigned hereby certifies that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work; that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and that he will comply fully with all laws and regulations applicable to awards made subject to section 44A.

The undersigned further certifies under the penalties of perjury that this bid is in all respects bona fide, fair and made without collusion or fraud with any other person. As used in this subsection the word "person" shall mean natural person, joint venture, partnership, corporation or other business or legal entity. The undersigned further certifies under penalty of perjury that the said undersigned is not presently debarred from doing public construction work in the Commonwealth under the provisions of section twenty-nine F of chapter twenty-nine, or any other applicable debarment provisions of any other chapter of the General Laws or any rule or regulation promulgated there under.



NAME OF BIDDER

SIGNATURE AND TITLE OF PERSON SIGNING BID

Date:

BUSINESS ADDRESS

ELECTRONIC BID - HARD COPY SUBMISSIONS WILL NOT BE ACCEPTED

REQUIRED BID SUBMITTAL FORM

Wompatuck State Park Parking Lot & Trail Access, Norwell, MA

CERTIFICATE OF NON-COLLUSION

The undersigned certifies under penalties of perjury that this proposal has been made and submitted in good faith and without collusion or fraud with any other person. As used in this certification the word "person" shall mean any natural person, business, partnership, corporation, union, committee, club or other organization, entity, or group of individuals.

FIRM _____	SIGNATURE _____
ADDRESS _____	NAME (print) _____
_____	TITLE _____
TELEPHONE _____	DATE _____
FAX _____	EMAIL _____

STATE TAX CERTIFICATION CLAUSE

I certify under the penalties of perjury that I, to my best knowledge and belief, have filed all State Tax returns and paid all State Taxes under law.

_____	By: _____
* Signature of Individual or Corporate Name (Mandatory)	Corporate Officer (Mandatory, if applicable)

**Social Security No. (Voluntary)
or Federal Identification No.

* Approval of a contract or other agreement will not be granted unless this certification clause, if signed.

Your Social Security Number will be furnished to the Massachusetts Department of Revenue to determine whether you have met tax filing or tax payment obligations. Providers who fail to correct their non-filing or delinquency **will not have a contract or agreement issued, reviewed, or extended. This request is made under the authority of Mass. G.L. 62C, S.49A.

Town of Norwell

OSHA Training Certification of Contractors

The Town of Norwell will comply with the amended MGL chapter 30 section 39s “**Contracts for Construction: Requirements**” as follows.

The work will be performed on property owned by the Town of Norwell. Therefore, all bids and contracts will require bidders and/or contractors to comply with the requirements of certifying that they and their employees have complied with MGL chapter 30 section 39s. This law requires successful completion of a 10 hour OSHA safety training course prior to working on the Town’s worksite or in the work subject to the bid or contract.

The Town will reject any bids that do not include proper certification submitted with the bids at the posted time for bid opening, however, the Town may, at its sole discretion, allow up to two (2) working days for the contractor to submit the required certification. In those cases where contracts are offered without using the sealed bid process, the same certification will be due upon contract signing.

It is expected that the contractor, by signing the certification form provided with the bid is fully meeting the language of the law, as amended, and that they are accepting the responsibilities to comply with the law for the full term of the work.

The Town of Norwell will pay certified payrolls that are deemed complete. The statute indicates that with the first certified payroll submitted to the Town, documentation must be provided that each employee on the payroll documents submitted to the Town has successfully completed the OSHA training.

Any employee whose name does not appear on the first certified payroll must submit certification with the first payroll they do appear on. Failure to provide full documentation may result in a delay in payment to the vendor as the packet submitted for payment would be determined to be incomplete.

Any employee found on a worksite subject to this section without documentation of successful completion of a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration shall be subject to immediate removal.

This certification requirement will go into effect for any bids received or contracts awarded after July 1, 2006 in accordance with MGL 30 39s as amended by Chapter 306 of the Acts of 2004.

REQUIRED BID SUBMITTAL FORM

**CERTIFICATION
OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) TRAINING**

In accordance with Massachusetts General Law 30: Section 39S, as amended by Chapter 306 of the Acts of 2004, effective 7/1/06, for all contracts for the construction, reconstruction, alteration, remodeling or repair of any public work or the construction, reconstruction, installation, demolition, maintenance or repair of any public building estimated to cost more than \$10,000, the Contractor hereby certifies to the following:

(1) that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the work; (2) that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and (3) that all employees to be employed in the work subject to this bid have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration.

(b) Any employee found on a worksite subject to this section without documentation of successful completion of a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration shall be subject to immediate removal.

(c) The attorney general, or his designee, shall have the power to enforce this section including the power to institute and prosecute proceedings in the superior court to restrain the award of contracts and the performance of contracts in all cases where, after investigation of the facts, he has made a finding that the award or performance has resulted in violation, directly or indirectly, of subsection (b), and he shall not be required to pay to the clerk of the court an entry fee in connection with the institution of the proceeding.

The undersigned hereby certifies under the penalties of perjury to the above:

Company: _____

Authorized Signature: _____

Print Name: _____

Title: _____

Date: _____

Telephone: _____

Fax: _____

SECTION 002000

INSTRUCTIONS TO BIDDERS

1. SECURING DOCUMENTS

- A. The Advertisement, Instructions to Bidders, General Conditions, Supplementary Conditions, Bid Drawings and Specifications, all Addenda issued prior to the execution of the Town of Norwell-Contractor Agreement, Performance and Labor and Materials Payment Bonds, all amendments, Change Orders and written interpretations of the Contract Documents issued by the Town of Norwell, Labor Rates, completed Bid Proposal and supporting forms signed and submitted by the Contractor, Applications and Certification for Payment, Town of Norwell-Contractor Agreement and all other documents in these Project Specifications and Drawings referenced in the Agreement compose the Contract Documents.
- B. All questions regarding this invitation to bid should be addressed to Eliza Hoffman, email address is: ehoffman@horsleywitten.com. All questions must be received by **4:00PM on March 1, 2021**. All bid documents are by request through www.biddocsonline.com

2. BID FORMS

- A. All bids must be submitted electronically as described in Section 002270 - eBIDDING INSTRUCTIONS TO BIDDERS.

3. BID SECURITY

- A. Bid Security in the amount of **FIVE PERCENT (5%) of the bid dollars** (this includes all alternates, if any included in this bid) shall accompany each bid submittal. At the option of the Bidder, the security may be a bid bond issued by a surety authorized to do business in the Commonwealth, certified check, or treasurer's or cashier's check issued by a responsible bank or trust company, payable to NORWELL, MA. Personal or business checks will not be accepted.
- B. The bid security shall secure the execution of the Contract.
- C. Should any bidder to whom an award is made fail to enter into a Contract therefore within ten (10) days, Saturdays, Sundays, and legal holidays excluded, after notice of award has been mailed to him or fail within such time to furnish Performance and Payment Bonds as required, the amount so received from such bidder through their bond, certified check, treasurer's or cashier's check as bid deposit shall become the property of NORWELL, MA, as liquidated damages; provided that the amount of the bid deposit which becomes the property of NORWELL, MA shall not, in any event, exceed the difference between their bid price and the bid price of the next lowest responsible and eligible bidder; and that provided further that in the case of death, disability, bona fide clerical or mechanical error of a substantial nature, or other unforeseen circumstances affecting the bidder, their deposit shall be returned to them.
- D. Bid deposits of the three lowest responsible and eligible bidders will be held by NORWELL, MA during the time stipulated for the execution of the contracts and the submission of the performance bonds, and may be disposed of in such a manner as will accomplish the purpose for which they are submitted. After expiration of such period, bid

guarantees not disposed, or the amounts thereof, will be returned within five (5) days, Saturdays, Sundays and legal holidays excluded.

4. DEFINITIONS

- A. All definitions set forth in the General Conditions are applicable to all bidding documents, which include the Advertisement, Instructions to Bidders, Addenda issued prior to receipt of general bids.
- B. Addenda are written or graphic instruments issued prior to the execution of the contract which modify or interpret the bidding documents, including drawings and specifications, by additions, deletions, clarifications or corrections. Addenda will become part of the Contract Documents upon execution of the Agreement.

5. BIDDER'S REPRESENTATION

- A. Each bidder, in submitting their proposal, represents that they have read and understand the bidding documents, reports, amended order of conditions, drawings, or other such documents provided by NORWELL, MA pursuant to this bid.
- B. Each bidder represents that they have visited the site, familiarized themselves with the local conditions under which the work is to be performed, compared the site with the drawings and specifications, satisfied themselves of the conditions of delivery, handling and storage of materials, and all other matters that may be incidental to the work that may affect: 1) the cost, progress or performance of the work; 2) the means, methods, techniques, sequences and procedures of construction; and 3) the bidder's safety precautions and programs, before submitting their proposal.
- C. Each bidder agrees at the time of submitting its bid that 1) the bidding documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the work; and 2) 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(s) bid and within the times required, and in accordance with the other terms and conditions of the bidding documents.
- D. Each bidder is familiar with all federal, state and local laws and regulations that may affect cost, progress or performance of the work.
- E. Each bidder represents that their bid is based upon the materials and equipment described in the bidding documents, including any addenda issued thereto.
- F. The submission of a bid will constitute an incontrovertible representation by the bidder that: 1) the bidder has complied with every requirement of this Section; 2) without exception, the bid submitted is premised upon performing and furnishing the work required by the bidding documents and applying any specific means, methods, techniques, sequences and procedures of construction that may be shown or indicated or expressly required by the bidding documents; 3) the bidder has given NORWELL, MA written notice of all conflicts, errors, ambiguities and discrepancies that the bidder has discovered in the bidding documents and the written resolutions thereof by NORWELL, MA are acceptable to the bidder; and 4) the bidding documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the work. No allowance will subsequently be made to the successful bidder by reason of any error or omission on his part, due to his neglect in complying with the requirements of this article, except with respect to conflicts with the General Laws.

6. EXAMINATION OF BIDDING DOCUMENTS

Each bidder shall examine the bidding documents carefully and, not later than seven (7) days prior to the date for receipt of bids, shall make a written request to NORWELL, MA for interpretation or correction of any ambiguity, inconsistency or error therein which they may discover. Any interpretation or correction will be issued as an addendum by NORWELL, MA. Only interpretations or correction by addendum shall be binding. No bidder shall rely upon any interpretation or correction given by any other method.

7. ADDENDA

- A. Prior to the receipt of the bids, addenda will be posted on biddocsonline.com and will be available for inspection wherever the bidding documents are kept available for that purpose.
- B. Addenda issued during the time of bidding shall be listed in the space provided. Biddocsonline (BDO) will email notification of addenda posting to all planholders registered for the project on the web-site. Failure of a bidder to receive any addendum shall not release the bidder from any obligations under their bid. Bidders should always confirm final addendum(s) issued before submitting their bid.

8. REJECTION OF PROPOSALS

The bidder acknowledges the right of NORWELL, MA to reject any or all bids and to waive any informality or irregularity in any bid received. In addition, the bidder recognizes the right of NORWELL, MA to reject a bid if the bidder fails to furnish any required bid security, or fails to submit the data required by the bidding documents, or if the bid is in any way incomplete or irregular.

9. QUALIFICATIONS OF BIDDER

- A. Any bidder, if requested, shall submit a financial statement, experience records, and an equipment schedule, on forms to be provided by NORWELL, MA. Financial statements shall reflect true financial conditions of bidder within three months prior to date of bid opening and shall be validated by a Certified Public Accountant.
- B. A bidder, in order to be eligible for the contract, must be able to show their financial ability to carry on the work until the project is complete and accepted by NORWELL, MA.

10. LABOR AND MATERIALS PAYMENT & PERFORMANCE BONDS

- A. Within ten (10) days after the date of Notice of Award of Contract, Saturdays, Sundays and legal holidays excluded, the bidder to whom the award is made shall furnish a Performance bond and Labor and Materials Payment bond, each equal to the full amount of the contract price, including accepted alternates (if applicable) to guarantee the faithful performance of all terms, covenants and conditions of the same. The bonds are to be issued by an acceptable bonding company qualified to do business under the laws of the Commonwealth of Massachusetts and satisfactory to NORWELL, MA.
- B. The Performance bond shall guarantee the satisfactory completion of the project and that the Contractor will make good any faults or defects in their work which may develop

during the period of said guarantee as a result of improper or defective workmanship, material or apparatus. The full performance bond shall remain in effect until final payment is received by the Contractor.

The Labor and Materials Payment bond shall guarantee that the contractor shall pay in full all persons, firms or corporations who furnish labor or material or both labor and materials for, or on account of the work included herein. Payment bonds will be in effect until such time as the contractor furnishes proof that payment in full has been made for all materials used on the contract work. The bonds shall be paid for by the Contractor. NORWELL, MA shall have the right to demand proof that parties signing the bonds are duly authorized to do so.

- C. Every such bond shall have a power of attorney attached thereto, authorizing NORWELL, MA to enter judgment thereon in any court in the United States of America or elsewhere against the obligors therein named for the amount therein named and shall be conditioned for the honest and faithful compliance with all provisions of the bidder or bidders.
- D. Separate Performance Bond and Labor and Materials Payment Bond forms shall be provided with Acceptance of Bid.

11. **“OR EQUAL” CLAUSE:** (Statutory reference: M.G.L. Ch.30, §39M(b)) Where products, materials or equipment are prescribed by manufacturer name, trade name, or catalog reference, the word “or approved equal” shall be understood to follow. An item shall be considered equal to the item so named or described if, in the opinion of NORWELL, MA:

- a. it is at least equal in quality, durability, appearance, strength and design;
- b. it performs at least equally the function imposed for the public work being contracted for or the material being purchased; and
- c. it conforms substantially, even with deviations, to the detailed requirements for the items as indicated by the specifications.

Any structural or mechanical changes made necessary to accommodate substituted Equipment under this paragraph shall be at the expense of the Contractor or Subcontractor responsible for the work item. See other paragraphs of the General Conditions for any procedures that may be used in determining compliance with the standards of this paragraph.

12. SUBSTITUTIONS

- A. The Bid shall be based on using the materials or products as specified and provided. Where several materials are specified by name for one use, any of those so specified may be supplied.
- B. Whenever the specified products or class of materials is specified exclusively by trade name, by manufacturer’s name or by catalog reference, only such items shall be used, unless NORWELL, MA’s written approval for substitution is secured in accordance with the Conditions of the Contract.

13. WORK TIME LIMITS

- A. Contractor shall furnish a proposed construction schedule, in writing, with their bid. A final construction schedule shall be submitted at the time of delivery of the properly executed contract, bonds and certificates of insurance to the Awarding Authority, allowing for completion of the contract work prior to the date specified below and

appearing on the Contract Form. Thereupon NORWELL, MA will review the completed documents and proposed schedule, ask for revisions or corrections, or issue a "NOTICE TO PROCEED" indicating its agreement with final contract terms. Work is anticipated to begin on or before April 1, 2021. All work must be completed within 120 days from start of work.

14. TAX EXEMPTION

The project is exempt from payment of Massachusetts sales tax to the extent permitted by MGL Ch. 64H, Subsection 6F. Use Certificate of Exemption Number E 046-001-253.

15. ACCEPTANCE OF PROPOSALS

Within five (5) days after the opening of the proposals NORWELL, MA intends to act upon them. The acceptance of a proposal will be a Notice of Acceptance in writing signed by a duly authorized representative of NORWELL, MA and accompanied by Performance and Labor and Materials Payment Bond forms. No other act of NORWELL, MA shall constitute the acceptance of a proposal. The acceptance of the proposal shall bind the successful bidder to the contract. The rights and obligations provided for in the contract shall become effective and binding upon the parties only upon its formal execution.

16. TIME FOR EXECUTING CONTRACT AND PROVIDED CONTRACT BONDS

Any contractor whose proposal shall be accepted will be required to execute the contract and furnish contract bonds within ten (10) days, Saturdays, Sundays and legal holidays excluded after the notice that the contract has been awarded to them.

17. PAYMENT OF EMPLOYEES

- A. For work done in the Town of Norwell, the payment for employees of the Contractor and any or all Sub-contractors and suppliers shall comply with the wage scale current at the commencement of construction, as published by the Department of Labor and Industries, under provisions of the Massachusetts General Laws. The Contractor and each of his Sub-contractors and suppliers shall pay each of their employees engaged in work on the project under the contract in full, less deductions made mandatory by law, and not less often than once a week. All forms required by local authorities, the Commonwealth of Massachusetts, and the United States Government, shall be properly submitted. No payments will be made on any application for payment until all required payroll and Affirmative Action/Equal Opportunity information for the period covered by the application has been submitted to Norwell, MA.
- B. A copy of applicable wage rate schedules is attached and forms part of the contract documents.

18. WITHDRAWAL OF PROPOSALS

- A. At any time prior to the scheduled closing time for receipt of proposals, any bidder may withdraw his proposal, either personally or by email or written request. If withdrawal is made personally, proper receipt shall be given therefore.
- B. After the scheduled time for receipt of proposals and before award of contract, no bidder will be permitted to withdraw his proposal unless said award is delayed for a period

exceeding thirty (30) days. Negligence on the part of the bidder in preparing his bid confers no rights for the withdrawal of the proposal after it has been opened.

END OF SECTION

eBIDDING INSTRUCTIONS TO BIDDERS

THIS PROJECT IS BEING ELECTRONICALLY BID AND HARD COPY BIDS WILL NOT BE ACCEPTED. Please review the instructions in the bid documents on how to register as an electronic bidder. The bids are to be prepared and submitted at www.biddocsonline.com. Tutorials and instructions on how to complete the electronic bid documents are available online (click on the "Tutorial" tab at the bottom footer).

ARTICLE 1 - PREPARATION AND SUBMISSION OF BIDS

1.1 Forms and Bid Preparation

Bids shall be submitted electronically on the "**Form for General Bid**" at www.biddocsonline.com, as appropriate and available at no cost. The forms enclosed in the Project Manual shall not be extracted or used.

- 1.1.1 All bidders must complete and submit the electronic bidder registration form (Signature Authorization Form – hard copy) to BidDocs ONLINE Inc. The form must be received by BidDocs ONLINE Inc. at least three business days prior to the bidding opening for processing. The Awarding Authority, the designer or BidDocs ONLINE Inc. will not be held accountable if the bidder fails to submit the electronic bidder registration form in a timely manner. Instructions to submit the form are in the Contract Documents and are available at www.biddocsonline.com (click on the "Tutorial" tab at the bottom footer).
- 1.1.2 All entries on the bid form shall be made online. Any documents that are attached to the bid must be in a pdf format.
- 1.1.3 Sums shall be expressed in both words and figures in the space indicated on the bid form. Where there is a discrepancy between the bid sum expressed in words and the bid sum expressed in figures, the words shall control. Note: **The electronic bid forms automatically matches the "word" amount to the numeric "figure" amount entered.**

1.2 Bid Deposits shall be:

- 1.2.1 at least five percent (5%) of the greatest possible bid amount, considering all alternates;
- 1.2.2 made payable to the **Awarding Authority**;
- 1.2.3 conditioned upon faithful performance by the principal of the agreements contained in the bid, and
- 1.2.4 in the form of:
 - .1 cash,
 - .2 certified check, treasurer's or cashier's check issued by a responsible bank or trust company, or
 - .3 a bid bond issued by a surety company licensed to do business in the Commonwealth of Massachusetts.

Note: Both the "bid bond" or "check" bid deposits are to be scanned and uploaded to the system as a pdf file. **IMPORTANT NOTICE:** If the bidder elects to make a bid deposit in the form of "cash" or "check" the bidder must have the cash or check physically delivered to the Awarding Authority prior to the date and time of the bid opening.

1.3 Electronic Submission of General Bids

General Bids, including the bid deposit, bidder's reference form and any required miscellaneous forms noted in the bid documents shall be submitted electronically online at www.biddocsonline.com. No hard copy bids will be accepted.

- 1.3.1 Date and time for receipt of bids is set forth in the Advertisement.
- 1.3.2 Timely submission of a bid online shall be the full responsibility of the Bidder.

1.4 Addenda

- 1.4 .1 All modifications to the bid documents will be issued via an addendum. All registered plan holders will be electronically notified when addenda are issued. Hard copies of the addenda will not be forwarded to the plan holders. The bidder is solely responsible for reviewing all addenda posted on the project website. The bidder must acknowledge all addenda have been reviewed by selecting “yes” or “no” as part of the eBidding process. If the bidder selects “no”, the bidder will automatically be directed to the Addenda icon on the project page.

ARTICLE 2 - ALTERNATES

- 2.1 Each General Bidder shall acknowledge Alternates in Section C on the Form for General Bid by entering the dollar amount of addition or subtraction necessitated by each Alternate.
- 2.2 In the event an Alternate does not involve a change in the amount of the base bid, the Bidder shall so indicate by entering "**0**" (**numeric figure**) in the “Add” space provided for that Alternate.
- 2.4 General Bidders shall enter on the Form for General Bid a single amount for each Alternate.
- 2.5 The low Bidder will be determined on the basis of the sum of the base bid and the accepted alternates.

ARTICLE 3 - WITHDRAWAL OF BIDS

3.1 Before Opening of Bids

- 3.1.1 Any bid may be withdrawn (retracted) prior to the time designated for receipt of bids upon clicking the tab to “Retract Bid”. The bidder and Awarding Authority will receive an email confirming that the bidder retracted the bid.
- 3.1.2 Withdrawn bids may be modified and resubmitted up to the time designated for the receipt of bids.

END OF SECTION

BIDDER'S REFERENCE FORM

Bidders Name: _____

Project Title: _____

The bidder must provide five (5) business references for projects performed & completed within the past five (5) years.

(1) Reference Name: _____ Contact: _____

Address: _____ Phone: () _____

Description and date(s) of work: _____

(2) Reference Name: _____ Contact: _____

Address: _____ Phone: () _____

Description and date(s) of work: _____

(3) Reference Name: _____ Contact: _____

Address: _____ Phone: () _____

Description and date(s) of work: _____

(4) Reference Name: _____ Contact: _____

Address: _____ Phone: () _____

Description and date(s) of work: _____

(5) Reference Name: _____ Contact: _____

Address: _____ Phone: () _____

Description and date(s) of work: _____

References will be contacted to confirm the bidder's skills, abilities and qualifications to faithfully perform the work specified. The Authority reserves the right to contact references not listed above. The Bidder will be given the opportunity to explain any unfavorable references received from such outreach.

SECTION 005000

WOMPATUCK STATE PARK PARKING LOT & TRAIL ACCESS

AGREEMENT BETWEEN THE TOWN OF NORWELL, MA. AND CONTRACTOR

THIS AGREEMENT, made this _____ day of _____ 2021 by and between THE TOWN OF NORWELL, 345 MAIN STREET, NORWELL, MA 02061 hereinafter referred to as NORWELL, MA. and _____ with legal address and principal place of business at _____

hereinafter called Contractor:

WITNESSETH: That for and in consideration of the payments and agreements hereinafter mentioned, to be made and performed by NORWELL, MA, the CONTRACTOR hereby agrees with NORWELL, MA to commence and complete the Wompatuck State Park Parking Lot & Trail Access Project hereinafter called the Project, for the consideration set forth in its Bid and all extra work in connection therewith, under the terms as stated in the General and Supplemental General Conditions of the Contract; and at its own cost and expense to furnish all the materials, supplies, machinery, equipment, tools, superintending, labor, insurance, and other accessories and services necessary to complete said Project in accordance with the conditions and prices stated in its Bid submitted _____, the General Conditions, the Supplemental and Special Conditions of the Contract, any addenda previously issued, and all other plans, specifications and other documents included in the bound volume entitled "WAPMATUCK STATE PARK PARKING LOT & TRAIL ACCESS IN THE TOWN OF NORWELL, MASSACHUSETTS" and the bid submitted _____, all of which are made a part hereof and collectively evidence and constitute the Contract.

Force Majeure. The Agreement shall be subject to **Force Majeure** considerations. Either party hereto shall be excused from performance of any act under the contract if prevented for the performance of any act required by reasons of strikes, lockouts, labor trouble, inability to procure materials, failure of power, fire, winds, Acts of God, riots, insurrections, war or other reason of a like nature not reasonably within the control of the party. The period for the performance of such obligation shall be extended for an equivalent period for no additional cost to the owner. In the event that the extension is not possible, the Contractor may be required to rebate to NORWELL, MA a portion of the fee. Continued failure to perform for periods aggregating sixty (60) or more days, even for causes beyond the control of the Contractor, shall be deemed to render performance impossible, and NORWELL, MA shall thereafter have the right to terminate this agreement in accordance with the provisions of the section entitled "Termination of Contract".

Termination of Contract - Subject to the provisions of the section explaining Force Majeure, if the Contractor shall fail to fulfill in a timely and satisfactory manner its obligations under this agreement, or if the Contractor shall violate any of the covenants, conditions, or stipulations of this agreement, which failure or violation shall continue for seven (7) business days after written notice of such failure or violation is received by the contractor, then NORWELL, MA shall thereupon have the right to terminate

this agreement by giving written notice to the contractor of such termination and specifying the effective date thereof, at least seven (7) days before the effective date of such termination.

Insurance - The Contractor shall maintain insurance with minimum limits as defined in Article 6 of the Supplementary General Conditions for the entire duration of the project work to be performed, and provide a certificate of insurance with NORWELL, MA as certificate holder and additional insured. All insurance shall be primary and noncontributory. The Contractor's insurance certificate shall state that the Contractor waives all rights of subrogation as to NORWELL, MA, Renewal certificates of insurance must be submitted to NORWELL, MA.

Governing Law – This contract is governed by the laws of the Commonwealth of Massachusetts.

Massachusetts General Law Chapter 149 and 30 S.39M hereby apply to this contract. Prevailing wages as determined by the Department of Labor apply to this contract. The contractor shall submit weekly certified payrolls with invoices to NORWELL, MA, Attn: Kenneth Kirkland, 345 Main St. Norwell, MA 02061. OSHA 10 certification is required for all employees and subcontractors performing work on the job site. A one hundred percent (100%) payment bond and performance bond is required with this signed contract.

The Contractor shall indemnify, defend, and save harmless the town of NORWELL, MA, all of its officers, agents and employees from and against all suits and claims of liability of every name and nature, including attorney's fees and costs of defending any action or claim, for or on account of any claim, loss, liability or injuries to persons or damage to property of the TOWN any person, firm, corporation or association arising out of or resulting from any act, omission, or negligence of the Contractor, subcontractors and their agents or employees in the performance of the work covered by this Agreement and/or their failure to comply with terms and conditions of this Agreement. The foregoing provisions shall not be deemed to be released, waived or modified in any respect by reason of any surety or insurance provided by the Contractor under this contract.

NORWELL, MA agrees to pay the Contractor for the performance of the Contract, subject to additions and deductions, as provided in the General Conditions of the Contract, and to make payments on account thereof as provided in Sub-Section 9 of Section 3, General Conditions.

CONTRACT AMOUNT \$ _____

The total payment shall not exceed this contract amount, without the written authorization of NORWELL, MA.

This Agreement constitutes the entire contract and there are no agreements other than those incorporated herein. This Agreement may not be changed, altered, amended, modified, or terminated orally and any such change, alteration, amendment, or modification must be in writing and executed by the parties hereto.

IN WITNESS WHEREOF, the parties to these presents have executed this Contract in the year and day first above mentioned.

Horsley Witten Group, Inc.

AGREEMENT
005000-2

By:

Town of Norwell, MA

Print Name and Title

Contractor

Print Name and Title

At a duly constituted meeting of _____ held on _____
Name of (Corporation) (Date)

at which all Directors were present or waived notice, it was voted that:

(Name) (Officer)

of this company, be and he/she is hereby authorized to execute contracts and bonds in the name and
behalf of said company, and affix its Corporate Seal thereto, and such execution of any contract or
obligation in this company's name on its behalf of such

_____ under seal of the company, shall
(Officer)

be valid and binding upon this company.

A TRUE COPY,
ATTEST:

(Clerk)

Place of Business: _____

Date of this Contract: _____

I hereby certify that I am the clerk of the _____
_____ that _____

is duly elected _____ of said company, and the above
vote has not been amended or rescinded and remains in full force and effect as
of the date of this contract

(Clerk)

(CORPORATE SEAL)

On this _____ day of _____, 2018, before me, the undersigned notary public, personally appeared _____, proved to me through satisfactory evidence of identification, which were _____, to be the person whose name is signed on the preceding or attached document in my presence.

Notary Public

My commission expires:

IF A CORPORATION, COMPLETE ABOVE OR ATTACH TO EACH SIGNED COPY OF THE CONTRACT A NOTARIZED COPY OF VOTE OF CORPORATION AUTHORIZING THE SIGNATORY TO SIGN THIS CONTRACT. IF ATTESTING CLERK IS THE SAME PERSON AS THE INDIVIDUAL EXECUTING THIS CONTRACT, HAVE SIGNATURE NOTARIZED ABOVE.

END OF SECTION

TOWN OF NORWELL, MA.

_____, 2021

ACCEPTANCE OF BID

_____ is herewith notified that their bid for WOMPATUCK STATE PARK PARKING LOT & TRAIL ACCESS

in the Town of Norwell, Massachusetts, Contract Number _____ in the amount of _____ submitted on _____ has been accepted.

Please complete the attached "AGREEMENT BETWEEN CONTRACTOR AND TOWN OF NORWELL, MA." "PERFORMANCE BOND" and "LABOR AND MATERIALS PAYMENT BOND" forms and return to Town of Norwell, Office of the Town Administrator 345 Main St. Norwell, MA 02061, together with a Certificate of Insurance.

Town of Norwell, MA

END OF SECTION 005500

TOWN OF NORWELL, MA

NOTICE TO PROCEED

DATE: _____, 2021

SUBJECT: WOMPATUCK STATE PARK PARKING LOT & TRAIL ACCESS

TO:

1. You are hereby given formal NOTICE TO PROCEED in accordance with the provisions of the subject contract.
2. It is requested that acknowledgment of this NOTICE be indicated by endorsement hereon, and that the original be returned to this office. The duplicate should be retained in your office files.

TOWN OF NORWELL, MA

FIRST ENDORSEMENT

TO: Town of Norwell, Planning Department
Attn: Kenneth Kirkland
345 Main St.
Norwell, MA 02061

Receipt is hereby acknowledged of the above **NOTICE TO PROCEED**

By: _____

Date: _____

END OF SECTION 005510

SECTION 006150 – LABOR AND MATERIALS PAYMENT BOND

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

CONTRACTOR (*Name and Address*):

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

OWNER (*Name and Address*):

CONTRACT

Effective Date of Agreement:

Amount:

Description (*Name and Location*):

BOND

Bond Number:

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

Amount:

Modifications to this Bond Form:

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

CONTRACTOR AS PRINCIPAL

SURETY

Contractor's Name and Corporate Seal (Seal)

Surety's Name and Corporate Seal (Seal)

By: _____
Signature

By: _____
Signature (Attach Power of Attorney)

Print Name

Print Name

Title

Title

Attest: _____
Signature

Attest: _____
Signature

Title

Title

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

Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner to pay for labor, materials, and equipment furnished by Claimants for use in the performance of the Contract, which is incorporated herein by reference.

1. With respect to Owner, this obligation shall be null and void if Contractor:
 - 1.1 Promptly makes payment, directly or indirectly, for all sums due Claimants, and
 - 1.2 Defends, indemnifies, and holds harmless Horsley Witten Group, Inc., and the Town of Norwell, from all claims, demands, liens, or suits alleging non-payment by Contractor by any person or entity who furnished labor, materials, or equipment for use in the performance of the Contract, provided Owner has promptly notified Contractor and Surety (at the addresses described in Paragraph 12) of any claims, demands, liens, or suits and tendered defense of such claims, demands, liens, or suits to Contractor and Surety, and provided there is no Owner Default.
2. With respect to Claimants, this obligation shall be null and void if Contractor promptly makes payment, directly or indirectly, for all sums due.
3. Surety shall have no obligation to Claimants under this Bond until:
 - 3.1 Claimants who are employed by or have a direct contract with Contractor have given notice to Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.
 - 3.2 Claimants who do not have a direct contract with Contractor:
 1. Have furnished written notice to Contractor and sent a copy, or notice thereof, to Owner, within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials or equipment were furnished or supplied, or for whom the labor was done or performed; and
 2. Have either received a rejection in whole or in part from Contractor, or not received within 30 days of furnishing the above notice any communication from Contractor by which Contractor had indicated the claim will be paid directly or indirectly; and
 3. Not having been paid within the above 30 days, have sent a written notice to Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to Contractor.
4. If a notice by a Claimant required by Paragraph 4 is provided by Owner to Contractor or to Surety, that is sufficient compliance.
5. Reserved.
6. Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by Surety.
7. Amounts owed by Owner to Contractor under the Contract shall be used for the performance of the Contract and to satisfy claims, if any, under any performance bond. By Contractor furnishing and Owner accepting this Bond, they agree that all funds earned by Contractor in the performance of the Contract are dedicated to satisfy obligations of Contractor and Surety under this Bond, subject to Owner's priority to use the funds for the completion of the Work.
8. Surety shall not be liable to Owner, Claimants, or others for obligations of Contractor that are unrelated

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

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

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

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

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

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

14. Definitions

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

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

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

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

Surety Agency or Broker:

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

PERFORMANCE BOND

KNOW ALL MEN AND WOMEN BY THESE PRESENTS, THAT

_____ as principal,

and _____

as surety, are held and firmly bound unto the Town of Norwell,

Massachusetts, in the sum of _____

_____ lawful money of the United States of America, to be paid to the Town of Norwell, MA, for which payments, well and truly to be made, we bind ourselves, our respective heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the said principal has made a contract with the Town of Norwell, Massachusetts, bearing the date of _____, 2021, for the construction of

Wompatuck State Park Parking Lot & Trail Access

Now the condition of this obligation is such that if the principal shall well and truly keep and perform all the undertakings, covenants, agreements, terms and conditions of said contract on its part to be kept and performed during the original term of said contract any extensions thereof that may be granted by the Town of Norwell, MA, with or without notice to the surety, and during the life of any guarantee required under the contract, and shall also well and truly keep and perform all the undertakings, covenants, agreements, terms and conditions of any and all duly authorized modifications, alterations, changes or additions to said contract that may be hereafter made, notice to the surety of such modifications, alterations, changes or additions being hereby waived, then this obligation shall become null and void; otherwise it shall remain in full force and virtue.

IN WITNESS WHEREOF we hereunto set our hands and seal this _____ day of _____, 2021.

Seal

By: _____

By: _____

END OF SECTION 006200

CHANGE ORDER

CHANGE ORDER NO. _____

DATE: _____

CONTRACT TITLE: WOMPATUCK STATE PARK PARKING LOT & TRAIL
ACCESS

CONTRACTOR'S NAME: _____

CONTRACTOR'S ADDRESS: _____

CONTRACT AMOUNT AS BID	\$ _____
PREVIOUS CONTRACT AMOUNT	\$ _____
AMOUNT OF THIS ORDER (increase)	\$ _____
TOTAL REVISED CONTRACT AMOUNT	\$ _____

This change order extends the time to complete the work by _____ days.

The adjusted completion date of contract is _____.

This order covers the contract modification hereunder described:

The work covered by this order shall be performed under the same terms and conditions as included on the original construction contract.

Change Submitted:

By: _____
Contractor: Signature, Name and Title

Date: _____

Change Approved:

By: _____
Town of Norwell, MA
Horsley Witten Group, Inc.

Date: _____

Section 007200

**STANDARD GENERAL CONDITIONS
OF THE CONSTRUCTION CONTRACT**

Prepared by



Issued and Published Jointly by



These General Conditions have been prepared for use with the Agreement Between Owner and Contractor for Construction Contract (EJCDC® C-520, Stipulated Sum, or C-525, Cost-Plus, 2013 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other.

To prepare supplementary conditions that are coordinated with the General Conditions, use EJCDC's Guide to the Preparation of Supplementary Conditions (EJCDC® C-800, 2013 Edition). The full EJCDC Construction series of documents is discussed in the Commentary on the 2013 EJCDC Construction Documents (EJCDC® C-001, 2013 Edition).

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ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.1 *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.

1.2 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

2.1 *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.

2.2 *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.

2.3 *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.

2.4 *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.

2.5 *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.

2.6 *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

3.1 *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.

3.2 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.

3.3 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).

3.4 *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.

3.5 *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,

EJCDC® C-700, Standard General Conditions of the Construction Contract.

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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

4.1 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.

4.2 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.

4.3 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.

4.4 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.

4.5 *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

5.1 *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.

5.2 *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.

5.3 *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.

5.4 *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.

5.5 *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.

5.6 *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.
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ARTICLE 6 – BONDS AND INSURANCE

6.1 *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.

6.2 *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),

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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.

6.3 *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,

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and not by reference to excess or umbrella insurance provided in other policies.

6.4 *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.

6.5 *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

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- (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.

6.6 *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.

6.7 *Receipt and Application of Property Insurance Proceeds*

- A. Any insured loss under the builder's risk and other policies of insurance required by
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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

7.1 *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.

7.2 *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.

7.3 *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.

7.4 "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.

7.5 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.

7.6 *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.

7.7 *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.

7.8 *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

7.9 *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.

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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

8.1 *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.

8.2 *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.

8.3 *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

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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

9.1 *Communications to Contractor*

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

9.2 *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.

9.3 *Furnish Data*

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

9.4 *Pay When Due*

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

9.5 *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.

9.6 *Insurance*

- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

9.7 *Change Orders*

- A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.

9.8 *Inspections, Tests, and Approvals*

- A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.

9.9 *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

10.1 *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.

10.2 *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.

10.3 *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.

10.4 *Rejecting Defective Work*

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

10.5 *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.

10.6 *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.

10.7 *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.

10.8 *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.

10.9 *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

11.1 *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.

11.2 *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.

11.3 *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.

11.4 *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 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
 - 2. 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.

11.5 *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.

11.6 *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.

11.7 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.

11.8 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

12.1 *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

13.1 *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.

13.2 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.

13.3 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

14.1 *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.

14.2 *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.

14.3 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.

14.4 *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.

14.5 *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.

14.6 *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.

14.7 *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

15.1 *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.
 - a. 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: 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.
 2. 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.
 3. 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.
 4. 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.
 5. 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;

- I. 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.

15.2 *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.

15.3 *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.

15.4 *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.

15.5 *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.

15.6 *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.

15.7 *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.

15.8 *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

16.1 *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.

16.2 *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.

16.3 *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.

16.4 *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

17.1 *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

18.1 *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.

18.2 *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.

18.3 *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.

18.4 *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.

18.5 *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.

18.6 *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.

18.7 *Controlling Law*

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

18.8 *Headings*

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

SUPPLEMENTARY CONDITIONS

SECTION 008000

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SECTION 008000
SUPPLEMENTARY CONDITIONS

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

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

ARTICLE 1 DEFINITIONS AND TERMINOLOGY

SC-1.01.A.40

Insert the following at the beginning of the definition:

“40. The Work required by the Contract has been completed except for work having a Contract Price of less than one (1) percent of the then adjusted total Contract Price, or”

SC-1.02.F

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

He, Him, His, Himself:

1. Where references are made in the Contract Documents and/or Specifications to the terms “he, him, his, himself,” or variations thereof, these shall be construed as being gender inclusive, and reference the terms “she, her, hers, herself,” or variations thereof as well.”

ARTICLE 2 - PRELIMINARY MATTERS SC-2.01.C

Delete paragraph 2.01.C of the General Conditions in its entirety.

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

SC-5.04

Delete paragraph 5.04 of the General Conditions in its entirety and insert the following in its place:

“5.04 Differing Subsurface or Physical Conditions

In accordance with Massachusetts General Laws Chapter 30 Section 39N, “If, during the progress of the work, the contractor or the awarding authority discovers that the actual subsurface or latent physical conditions encountered at the site differ substantially or materially from those shown on the plans or indicated in the contract documents either the contractor or the contracting authority may request an equitable adjustment in the contract price of the contract applying to work affected by the differing site conditions. A request for such an adjustment shall be in writing and shall be delivered by the party making such claim to the other party as soon as possible after such conditions are discovered. Upon receipt of such a claim from a contractor, or upon its own initiative, the contracting authority shall make an investigation of such physical conditions, if they differ substantially or materially from those shown on the plans or indicated in the contract documents or from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the plans and contract documents and are of such a nature as to cause an increase or decrease in the cost of performance of the work or a change in the construction methods required for the performance of the work which results in an increase or decrease in the cost of the work, the contracting authority shall make an equitable adjustment in the contract price and the contract shall be modified in writing accordingly.”

SC-5.05.A.2.d

Add the following new paragraph immediately after paragraph 5.05.A.2.d of the General Conditions:

“e. Contractor’s attention is directed to the requirements of Massachusetts General Law Chapter 82 Section 40, regarding the notification of owners of underground facilities.”

ARTICLE 6 - BONDS AND INSURANCE SC-6.02.A

In the first sentence of paragraph 6.02.A delete the words “Owner and”. SC-6.02.A

Add the following sentence immediately after paragraph 6.02.A of the General Conditions:

“Refer to the table in SC-6.03 for these insurance requirements.”

SC-6.02.B

In the first sentence of paragraph 6.02.B delete the words “Owner or”. SC-6.02.D

Delete paragraph 6.02.D of the General Conditions in its entirety. SC-6.02.E

Delete paragraph 6.02.E of the General Conditions in its entirety and replace with the following:

“Failure of Owner 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 Contractor’s obligation to obtain and maintain such insurance.”

SC-6.02.I

Delete paragraph 6.02.I of the General Conditions in its entirety. SC-6.03

The limits of liability for the insurance required by paragraph 6.03 of the General Conditions shall provide the following coverage's for not less than the following amounts or greater where required by Laws or Regulations; all Contractor's insurance shall be primary and noncontributory and shall grant waivers of subrogation in favor of the Town of Norwell, MA. :

1. Indemnification

The Contractor shall indemnify, defend, and save harmless the Town of Norwell, MA, all of their officers, agents and employees, and Horsley Witten Group, Inc, and Nation Grid, from and against all suits and claims of liability of every name and nature, including attorney's fees and costs of defending any action or claim, for or on account of any claim, loss, liability or injuries to persons or damage to property of the TOWN or any person, firm, corporation or association arising out of or resulting from any act, omission, or negligence of the Contractor, subcontractors and their agents or employees in the performance of the work covered by this Agreement and/or their failure to comply with terms and conditions of this Agreement. The foregoing provisions shall not be deemed to be released, waived or modified in any respect by reason of any surety or insurance provided by the Contractor under contract with the Town of Norwell, MA.

2. General Requirements

(a) The Contractor shall, before commencing performance of the contract, be responsible for providing and maintaining insurance coverage in force for the life of the contract of the kind and in adequate amounts to secure all of the obligations under the contract and with insurance companies acceptable to Norwell, MA. All such insurance carried should not be less than the kinds and amounts designated herein, and the Contractor agrees that the stipulation herein of the kinds and limits of coverage shall in no way limit the liability of the Contractor to any such kinds and amounts of insurance coverage. Under all insurance coverage, required or not required by Norwell, MA, the Contractor shall defend, indemnify, and hold harmless the Town of Norwell, MA, Horsley Witten Group, Inc, and Massachusetts Electric Company, their elected or duly appointed offices, directors and employees against any claim based upon negligent, accidental or intentional acts or omissions of the contractor, its employees or its agents in providing its services to employees of the municipality or their dependents pursuant to the agreement.

(b) With the exception of Professional Services Liability for architects, designers and engineers, and Worker's Compensation, the Town of Norwell, MA, Horsley Witten Group, Inc, and Massachusetts Electric Company, and their employees must be named as an additional insureds and a certificate of insurance will be provided indicating such for each of the insurance policies or surety bonds obtained pursuant to the requirements established by the issuance of the contract. Upon execution of the contract the Contractor will provide copies of certificates of insurance to Norwell, MA.

(c) Failure to provide and continue in force such insurance as aforesaid shall be deemed

a material breach of this contract, and shall constitute sufficient grounds for immediate termination of the same. All insurance maintained as provided for in the above shall be taken out and maintained at the sole expense of the Contractor. Annually, at time of vendor's policy renewal, updated insurance certificates shall be sent to Norwell, MA. Certificates of such insurance, whether by the insurer or by the insured party shall be valid unless written notice thereof is given by the parties proposing cancellation to the other party and to the Town of Norwell at least thirty (30) days prior to the intended effective date thereof, which date shall be expressed in said notice, and which shall be sent out by registered mail, return receipt requested. These provisions shall apply to the legal representatives, trustees in bankruptcy, receiver, assignee, and/or the successor in interest of the Contractor.

(d) All insurance coverage shall be placed with such company as may be acceptable to Norwell, MA and shall constitute a material part of the contract documents.

3. **Comprehensive General Liability Insurance**

The Contractor shall carry Commercial General Liability Insurance with an each occurrence limit of liability no less than Two Million Dollars (\$2,000,000.00) and a general aggregate limit of liability no less than Five Million Dollars (\$5,000,000.00); and a Products/Completed Operations (*as may be required*) Aggregate limit no less than Two Million Dollars (\$2,000,000.00) for all injury and damages to or destruction of property during the policy period.

4. **Automobile Liability and Property Damage Insurance**

The Contractor shall carry business Automobile Liability Insurance covering all owned vehicles with a combined single limit no less than One Million Dollars (\$1,000,000.00) to cover all damage caused by contracted employees of the awarded Contractor. Level of insurance must adequately cover the liability exposure of project site and is subject to Norwell, MA approval.

5. **Workers' Compensation Insurance**

The Contractor shall carry Workers' Compensation Insurance as required by Massachusetts General Law, c. 152, and Section 25, with a minimum limit of Employer's Liability as per Massachusetts General Law requirements.

6. **Excess Liability Insurance**

The Contractor shall carry excess liability insurance of not less than Eight Million Dollars (\$8,000,000.00) covering over general liability, automobile, and worker's compensation insurance.

7. **Pollution Liability Insurance**

The Contractor shall carry pollution liability insurance providing for a limit of not less than One Million Dollars (\$1,000,000.00), adding the Town as an additional insured. The coverage must extend to first party liability, third party liability and include remediation expense, outside the limits of liability, of a minimum of One Million Dollars (\$1,000,000.00).

SC-6.04

Delete paragraph 6.04 of the General Conditions in its entirety.

SC-6.07.

Delete SC-6.07 of the General Conditions in its entirety.

ARTICLE 7 - CONTRACTOR'S RESPONSIBILITIES SC-7.02.B

Add the following new paragraphs immediately after paragraph 7.02.B of the General Conditions:

“C. Regular working hours are defined as eight (8) hours per day, Monday through Friday, excluding holidays, between the hours of 7:00 AM and 6:00 PM. Requests to work other than regular working hours shall be submitted to Engineer not less than 48 hours prior to any proposed weekend work or scheduled extended work weeks. Occasional unscheduled overtime on weekdays may be permitted provided two (2) hours notice is given to Engineer.”

“D. Contractor shall reimburse the Owner for additional engineering and/or inspection costs incurred as a result of overtime work in excess of the regular working hours stipulated in Article SC-7.02.C. At Owner's option, overtime costs may either be deducted from the Contractor's monthly payment request or deducted from the Contractor's retention prior to release of final payment. Overtime costs for the Owner's personnel shall be based on the individual's current overtime wage rate. Overtime costs for personnel employed by the Engineer or Owner's independent testing laboratory shall be calculated in accordance with the terms of their respective contracts with the Owner.”

“E. This agreement is subject to the applicable provisions of the Contract Work Hours and Safety Standards Act, Public Law 87-581 87th Congress. No Contractor or Subcontractor contracting for any part of the Work shall require or permit any laborer or mechanic to be employed on the Work in excess of forty hours in any work week unless such laborer or mechanic receives compensation at a rate not less than one and one-half times that persons basic rate of pay for all hours worked in excess of forty hours in such work week.”

“F. Contractor and Subcontractors shall, insofar as practicable, give preference in the hiring of workers for the Project to qualified local residents with first preference being given to citizens of the United States who have served in the armed forces of the United States and have been honorably discharged therefrom or released from active duty therein.”

SC-7.06.A

Delete paragraph 7.06.A of the General Conditions in its entirety and insert the following in its place:

“A. Contractor shall not employ any Subcontractor, Supplier or other person or organization, (including those who are to furnish the principal items of materials or equipment), whether initially or as a substitute, against whom Owner may have reasonable objection. Acceptance of any Subcontractor, other person or organization by Owner shall not constitute a waiver of any right of Owner to reject defective Work. Contractor shall not be required to employ

any Subcontractor, other person or organization against whom Contractor has reasonable objection.”

SC-7.06.B

Add the following language at the end of paragraph 7.06.L of the General Conditions:

“Except as required otherwise by Massachusetts General Law, Chapter 149, Section 44F.”

SC-7.06.C

Add the following language at the end of paragraph 7.06.N of the General Conditions:

“Owner or Engineer may furnish to any such Subcontractor, Supplier or other person or organization, to the extent practicable, information about amounts paid on their behalf to Contractor in accordance with Contractor’s Application for Payment.”

SC-7.06.D

Add the following new paragraph immediately after paragraph 7.06.O of the General Conditions

“P. Contractor shall make payments to Subcontractors in accordance with Massachusetts General Law, Chapter 30, Section 39F.”

SC-7.09.A

Add the following new paragraph immediately after paragraph 7.09.A of the General Conditions:

“B. The materials and supplies to be used in the Work under this Contract are exempt from the Commonwealth of Massachusetts Sales and Use Tax. Contractor shall obtain the proper certificates, maintain the necessary records and otherwise comply with the requirements of Chapter 14 of the Acts of 1966 and any amendments thereto.”

SC-7.10.C

Add the following new paragraph immediately after paragraph 7.10.C of the General Conditions:

“D. 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-7.11.A

Add the following new paragraph immediately after paragraph 7.11. A of the General Conditions:

“B. Contractor shall return to Engineer, one set of the Contract Drawings overmarked in colored pencil, showing all changes made during construction and including the location, by dimensions

and elevations, of installed equipment, and underground facilities that will become hidden or buried by the construction. This shall include ties to all valves, fittings, couplings, corporations, etc. measured from permanent structures.”

SC-7.18.A

Add the following language at the end of paragraph 7.18.A of the General Conditions:

“If through the acts of neglect on the part of Contractor, any other Contractor or any Subcontractor shall suffer loss or damage on the Work, Contractor shall settle with such other Contractor or Subcontractor by agreement or arbitration if such other Contractor or Subcontractor will so settle. If such other Contractor or Subcontractor shall assert any claim against Owner on account of any damage alleged to have been sustained, Owner shall notify Contractor, who shall indemnify and save harmless Owner against any such claims.”

SC-7.18.C

Delete SC-7.18.C of the General Conditions in its entirety. SC-7.19.E

Add the following new paragraph immediately after paragraph 7.19.E of the General Conditions:

“7.20 Contractor’s Records

A. Contractor shall comply with all applicable provisions of Chapter 30, Section 39R of the Massachusetts General Laws regarding Contractor’s records.”

ARTICLE 9 - OWNER’S

Delete paragraph 9.2 in its entirety.

RESPONSIBILITIES SC-9.06

Delete paragraph 9.06 of the General Conditions in its entirety.

ARTICLE 10 - ENGINEER’S STATUS DURING CONSTRUCTION SC-10.07.A

Add the following new paragraph immediately after paragraph 10.07.A of the General Conditions:

“B. In accordance with Massachusetts General Law Chapter 30, Section 39P every contract subject to Section 39M of this Chapter or Section 44A of Chapter 149 which requires the awarding authority, or any official, its architect or engineer to make a decision on interpretation of the specifications, approval of equipment, material, or any other approval, or progress of the work, shall require that the decision be made promptly and, in any event, no later than thirty- days after the written submission for decision; but if such decision requires

extended investigation and study, the awarding authority, the official, architect or engineer shall, within thirty-days after the receipt of the submission, give the party making the submission written notice of the reasons why the decision cannot be made within the thirty-day period and the date by which the decision will be made."

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

WORK SC-13.01.B.1

Delete the second sentence in paragraph 13.01.B.1 of the General Conditions and replace it with the following:

“Such employees shall include foremen at the site.” SC-13.02 Allowances

Delete Paragraph 13.02 of the General Conditions its entirety.

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

SC-14.06.A

Add the following new paragraph immediately after paragraph 14.06.A of the General Conditions:

“B. If Owner stops Work under paragraph 14.06.A, Contractor shall not be entitled to any extension of Contract Time or any increase in Contract Price.”

SC-14.07.A

In the first sentence of paragraph 14.07.A delete the word “seven” and replace with the word “ten”.

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

SC-15.01.B.3

Add the following new paragraph immediately after paragraph 15.01.B.3 of the General Conditions:

“4. Contractor shall furnish evidence that payment received on the basis of materials and equipment not incorporated and suitably stored, has in fact been paid to the respective supplier(s) within sixty days of payment by Owner. Failure to provide such evidence of payment may result in the withdrawal of previous approval(s) and

removal of the cost of related materials and equipment from the next submitted Application for Payment.”

SC-15.01.C.1

Delete paragraph 15.01.C.1 of the General Conditions and replace it with the following:

“1. Progress Payments shall be made in accordance with Massachusetts General Laws, Chapter 30, Section 39K.”

SC-15.02.A

Add the two following new paragraphs immediately after paragraph 15.02.A of the General Conditions:

“B. No materials or supplies for the Work shall be purchased by Contractor or Subcontractor subject to any chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller. Contractor warrants that Contractor has good title to all materials and supplies used by Contractor in the Work, free from all liens, claims or encumbrances.”

“C. Contractor shall indemnify and save the Town of Norwell, MA, harmless from all claims growing out of the lawful demands of Subcontractors, laborers, workmen, mechanics materialmen, and furnishers of machinery and parts thereof, equipment, power tools, and all supplies, including commissary, incurred in the furtherance of the performance of this Contract. Contractor shall at Owner’s request, furnish satisfactory evidence that all obligations of the nature hereinabove designated have been paid, discharged, or waived. If Contractor fails to do so, then Owner may, after having served written notice on the said Contractor, either pay unpaid bills, of which Owner has written notice, direct, or withhold from the Contractor’s unpaid compensation, a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged; whereupon payment to Contractor shall be resumed in accordance with the terms of this Contract, but in no event shall the provisions of this sentence be construed to impose any obligation upon Owner to either Contractor, or Contractor’s Surety. In paying any unpaid bills of the Contractor, Owner shall be deemed the agent of Contractor and any payment so made by Owner shall be considered as payment made under the Contract by Owner to Contractor and Owner shall not be liable to Contractor for any such payment made in good faith.”

SC-15.06.B.1

Delete paragraph 15.06.B.1 of the General Conditions and replace it with the following:

“1. If, on the basis of Engineer’s observations of the Work during construction and final inspection, and Engineer’s review of the final Application for Payment and accompanying documentation, all as required by the Contract Documents, Engineer

is satisfied that the Work has been completed and Contractor's other obligations under the Contract Documents have been fulfilled, Engineer will indicate in writing Engineer's recommendation of payment and present the Application for Payment to Owner for payment. Thereupon Engineer will give written notice to Owner and Contractor that the Work is acceptable subject to the provisions of paragraph 15.01. 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. If the Application and accompanying documentation are appropriate as to form and substance, Owner shall in accordance with the Applicable Massachusetts General Law, pay Contractor the amount recommended by the Engineer."

ARTICLE 16 – SUSPENSION OF WORK AND TERMINATION SC-16.01.A

Delete paragraph 16.01.A of the General Conditions in its entirety and insert the following in its place:

"A. Owner may order, at any time and without cause, suspension of the Work in accordance with Massachusetts General Laws, Chapter 30, Section 39O.

SC-16.02.A.4

Add a new paragraph immediately after paragraph 16.02.A.4 of the General Conditions.

"5. If Contractor abandons the Work, or sublets this Contract or any part thereof, without the previous written consent of Owner, or if the Contract or any claim thereunder shall be assigned by Contractor otherwise than as herein specified."

ARTICLE 17 – FINAL RESOLUTION OF DISPUTES SC 17.01.B

Add a new paragraph after paragraph 17.01.B of the General Conditions:

"C. Contractor shall carry on the Work and maintain the progress schedule during the dispute resolution proceedings, unless otherwise agreed by Contractor and Owner in writing."

ARTICLE 18 - MISCELLANEOUS SC-18.01.A.2

Add the following new paragraph immediately after paragraph 18.01.A.2 of the General Conditions:

"3. Both the address given in the Bid Form upon which this Agreement is founded, and Contractor 's office at or near the site of the Work are hereby designated as places to either of which notices, letters, and other communications to Contractor shall be

certified, mailed, or delivered. The delivering at the above named places, or depositing in a postpaid wrapper directed to the first-named place, in any post office box regularly maintained by the post office department, of any notice, letter or other communication to Contractor shall be deemed sufficient service thereof upon Contractor; and the date of said service shall be the date of such delivery or mailing. The first-named address may be changed at any time by an instrument in writing, executed and acknowledged by Contractor, and delivered to Owner and Engineer. Nothing herein contained shall be deemed to preclude or render inoperative the service of any notice, letter, or other communication upon Contractor personally.”

SC-18.07.A

In paragraph 18.07.A, delete the words “state in which the Project is located” and substitute “Commonwealth of Massachusetts”.

SC-18.08

Add the following new paragraph immediately after paragraph 18.08 of the General Conditions:

“SC-18.09 Wage Rates

“A. The requirements and provisions of all applicable laws and any amendments thereof or additions thereto as to employment of labor, and to the schedule of minimum wage rates established in compliance with laws shall be a part of these Contract Documents. A copy of the wage schedule is included in this Specification (Appendices A and B). If after the Notice of Award, it becomes necessary to employ any person in a trade or occupation not classified in the wage determinations, such person shall be paid at not less than such rates as shall be determined by the officials administrating the laws mentioned above.

Such approved minimum rate shall be retroactive to the time of the initial employment of such person in such trade or occupation. Contractor shall notify Owner of Contractor’s intention to employ persons in trades or occupations not classified in sufficient time for Owner to obtain approved rates for such trades or occupations.”

“B. The schedule of wages referred to above is minimum rates only, and Owner will not consider any claims for additional compensation made by Contractor because of payment by Contractor of any wage in excess of the applicable rate contained in these Contract Documents. All disputes in regard to the payment of wages in excess of these specified in the schedule shall be resolved by Contractor.”

END OF SUPPLEMENTARY CONDITIONS

DIVISION 1

GENERAL REQUIREMENTS

SECTION 01 10 00 - SUMMARY

A. GENERAL

A.1 SUMMARY

- A. Project Description.
- B. Definitions – Owner and Engineer.
- C. Work by Owner.
- D. Project Manual formats and conventions.

A.2 PROJECT DESCRIPTION

A Work covered by the Contract Documents: The Project includes, but is not limited to the construction of a parking lot, gravel and wooden foot path, and associated site work, stormwater management, landscaping, and erosion and sediment control.

- 1. Project Address: Grove Street, (Lot 4) Norwell, MA 02061
- 2. Completeness: The Work shall be as shown on the Drawings and be complete in every respect and in conformance with all applicable requirements of the governing laws and codes.

B. Contract time: The Contractor may begin on-site work on, or before April 1, 2021 with receipt of a written Notice to Proceed, or suitable Letter of Intent. After commencement of work, the Contractor shall pursue the Work continuously and with diligence and bring the Project to Substantial Completion within 120 days of the start of work.

- 1. Substantial completion is the stage in the progress of the Work when the work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so the Owner can occupy or utilize the Work for its intended use. This includes any and all permits required by governmental agencies necessary for occupancy and use.

C. Permits: Contractor is responsible to ensure all required permits are obtained, and that the work pertaining to permits is properly inspected and certified. Subcontractors are required to obtain permits relating to their work.

- 1. The Project is subject to an Order of Conditions issued by the Norwell Conservation Commission, which is attached as Appendix 3 and made part of the Contract documents. The Contractor shall comply with all conditions of the Order. The Contractor shall be responsible for compliance with all permit requirements of the National Pollutant Discharge Elimination System (NPDES) program and for the submittal of a Stormwater Pollution Prevention Plan (SWPPP).
- 2. The Project is subject to an assent agreement between the Town of Norwell and National Grid, which is attached as Appendix 2 and made part of the Contract documents.

A.3 DEFINITIONS – OWNER AND ENGINEER

A. Whenever the term “Owner” is used in the specification, it refers to:

Town of Norwell, MA.
c/o Planning Department
345 Main Street
Norwell, MA 02061

1. The terms “Owner” and “Awarding Authority” as used in the Project Manual have the same meaning and are interchangeable in Contract Documents. Both terms refer to same entity.
2. All papers required to be delivered to the Owner shall, unless otherwise specified in writing to the contrary, be delivered to the office of the Engineer
 - a. Whenever the term “Engineer” is used in the Contract Documents, it refers to:

Horsley Witten Group, Inc.
90 Route 6A, Unit 1
Sandwich, MA 02563

A.4 WORK BY OWNER

Reserved

A.5 PROJECT MANUAL FORMATS AND CONVENTIONS

A. Project Manual Format: The Project Manual is organized into Divisions and subdivided into Sections and Documents using Construction Specification Institute (CSI) publication "MasterFormat, 2014 Edition" numbering system.

1. Section Identification: Six digit Section numbers are utilized and cross- referenced throughout the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete because only those Section numbers which are applicable to this Project are used
2. Division One of the Project Manual governs procedural and administrative requirements of the Work. Division One requirements are applicable to all Sections and Documents in the Project Manual.

B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular as applicable to the context of the Contract Documents.
2. Imperative mood and streamlined language is generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the

Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.

- a. The words “shall,” “shall be,” or “shall comply with,” depending on the context, are implied when a colon (:) is used within a sentence or phrase.

B. – PRODUCTS (Not Used)

C. – EXECUTION (Not Used)

END OF SECTION

SECTION 01 14 00 – WORK RESTRICTIONS

PART 1 GENERAL

1.1 SUMMARY

- A. Use of Site.
- B. Access to Site.
- C. Hours for on-site operations and restrictions.
- D. Worker conduit, appearance and Work Rules.

1.2 USE OF SITE

- A. Use of, and access to, site will be subject to special requirements of the Owner, as directed.
 - 1. Prior to beginning the Work of this Contract, the Contractor shall meet with the Owner and the Engineer to determine procedures regarding access and use of the site, locations and access to staging and storage areas, tree protection, temporary barriers and fencing, and any special site conditions or restrictions regarding the use of the site areas surrounding the construction.
 - 2. Security: Owner access must always be permitted in all construction areas, for purposes of security.
- B. Confine operations to areas within Contract limits indicated on the Drawings. Portions of the site beyond areas in which construction operations are indicated are not to be disturbed.
 - 1. Use of on-site areas outside of the contract limits for workers parking or storage of materials must be pre-arranged with Owner. Schedule deliveries to minimize requirements for storage of materials.
- C. Keep all public roads and walks, and access drive to facility clear of debris caused by this Work during building operations.

1.3 ACCESS TO SITE

- A. Keep all public roads and walks, and access drive to facility clear of debris caused by this Work during construction operations.

1.4 HOURS FOR ON-SITE OPERATIONS AND RESTRICTIONS

- A. Hours of operation and restrictions:
 - 1. Hours of construction, 7:30 AM to 6:00 PM local time, Monday to Friday. Provisions for working hours other than those specified, must be pre-arranged with the Owner.

1.5 WORKER CRIMINAL OFFENDER AND SEX OFFENDER RECORDS

- A. Criminal Offender Record Information (CORI) Reporting. In accordance with MGL c6 §172, the Owner may require criminal offender record information ("CORI") from the criminal history systems board, relating to any worker who is scheduled to work on any portion of the Project. The General Contractor, Filed Subcontractors and Subcontractors shall make every effort to provide the Owner's Project Manager with a list of the proper paperwork at least two weeks before any workmen who they anticipate will be on site. The Owner reserves the right to stop work if there has been failure to comply with this paragraph, in which event the Contractor, Filed Subcontractors and Subcontractors shall have no claim for damages, delay or time extensions against the Owner.
- B. Sex Offender Record Information (SORI) Reporting. In accordance with MGL c6 §178, the Owner will require sex offender record information ("SORI") from the criminal history systems board, relating to any worker who is scheduled to work on any portion of the Project. The General Contractor, Filed Subcontractors and Subcontractors shall make every effort to provide the Owner's Project Manager with a list of the proper paperwork at least two weeks before any workmen who they anticipate will be on site. The Owner reserves the right to stop work if there has been a failure to comply with this paragraph, in which event the Contractor, Filed Subcontractors and Subcontractors shall have no claim for damages, delay or time extensions against the Owner.

1.6 WORK CONDUCT, APPEARANCE AND WORK RULES

- A. General Conduct and Demeanor: All construction workers shall treat all other workers, Owner staff, and the public with respect and courtesy.
 - 1. The conduct and appearance of each worker at the job site is of paramount importance. The Owner reserves the right to require any worker to be removed from the Site.
- B. Physical Appearance: Require each worker to dress appropriately in a clean, neat, and professional manner
- C. Entertainment Devices (including, but not limited to radios, CD players, MP3 players and televisions): The use of all entertainment devices, including portable listening devices (iPod™ type) with headphones or earphones, is always strictly prohibited.
 - 1. Contractor shall control the volume of all communication radios and loudspeakers to avoid creating a nuisance
- D. Medications and Drugs: Do not allow any drugs or mood-altering substances, except for qualified, legal prescriptions; when requested, allow inspection of prescription drugs
- E. Smoking: Smoking is strictly prohibited on-site.
- F. Language: Foul and rude language is strictly prohibited.
- G. Physical Actions: Running, horseplay, fighting, and other unprofessional conduct is prohibited. Fighting is a major infraction of the work rules.

- H. Stealing: Stealing of any materials, objects, furnishings, equipment, fixtures, supplies, clothing, or other items will not be tolerated and is a major infraction of the work rules.
- I. Sexual Harassment: All forms of physical and verbal sexual harassment will not be tolerated and is a major infraction of the work rules. Sexual harassment includes, without limitation: touching, whistling, sexually explicit stories, jokes, drawings, photos and similar representations, exhibitionism and all other sexually oriented offensive behavior.
- J. Warnings and Dismissal:
 - 1. For minor infractions of the rules, the Owner may issue a warning. Only one warning will be allowed per worker. A second infraction will result in immediate dismissal of the worker from the Site.
 - 2. For major infractions of the rules, the worker shall be dismissed immediately without warning and is subject to possible criminal prosecution.
- K. Notification of Workers: Clearly notify and educate each worker about these Work Rules and the requirements for worker conduct and appearance.
 - 1. Recommendation: The Owner recommends that the Contractor notify each worker of the work rules in writing and obtain a signed acknowledgment of the worker's understanding of the work rules as a condition of employment on this project.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION

SECTION 01 23 00 - ALTERNATES

PART 1 – GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for alternates.

1.2 DEFINITIONS

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if the Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
 - 2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.3 PROCEDURES

- A. Alternates are listed in a numerical sequence in order of priority. Alternates shall be considered in descending numerical sequence, such that no single alternate shall be considered unless every alternate preceding it on the list has been added or subtracted from the bid price, in accordance, with MGL c.149 Section 44G (B).
- B. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
 - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for complete installation whether or not indicated as part of alternate.
- C. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected or deferred for later consideration. Include a complete description of negotiated revisions to alternates.
- D. Execute accepted alternates under the same conditions as other work of the Contract.
- E. Schedule: A schedule of alternates is included at the end of this Section.

PART 2 – PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

- A. Alternate No. 1: Wetland Crossing and associated work northeast of parking lot
 - 1. Base Bid: Construction of all work shown on the Drawings except that shown as ADD ALTERNATE.
 - a. Alternate: Add all work associated with ADD ALTERNATE as shown on the drawings. The Work of this Alternate is indicated on the Drawings.

END OF SECTION

SECTION 01 25 13 – PRODUCT SUBSTITUTION REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

- A. Product options.
- B. Product substitution procedures.

1.2 RELATED REQUIREMENTS

- A. Section 01 60 00 – PRODCUT REQUIREMENTS: Basic product requirements.

1.3 PRODUCT OPTIONS

- A. Product selections: Comply with the following for selection of products.
 - 1. Products specified by reference standards or by description only: Provide any acceptable product meeting those standards or description.
 - 2. Products specified by performance requirements only: Provide any acceptable product which has been tested to show compliance with specified requirements, including indicated performances.
 - 3. Products specified by naming one or more manufacturers: Provide products of manufacturers named or, submit a request for substitution for any manufacturer or product not named in accordance with Massachusetts General Laws, Chapter 30, Section 39M(b).
- B. Visual matching: Where Specifications require matching a sample, the Engineer's decision on whether a proposed product matches is final. Where no product matches and complies with other requirements, comply with provisions for "substitutions" for selection of a matching product in another category.

1.4 PRODUCT SUBSTITUTION

- A. Products specified by reference standards or by description only: Any product meeting those standards or description.
- B. Pursuant to Massachusetts General Laws, Chapter 30, Section 39M(b), where products or materials are prescribed by manufacturer name, trade name or catalog reference, the word "or approved equal" shall be implied. The Engineer will evaluate the proposed "equal" item on the following criteria.
 - 1. The submitted "equal" item is at least equal in quality, durability, appearance, strength and design.
 - 2. The submitted "equal" item is at least equal in function for the purpose intended by the design of the Work.
 - 3. The submitted "equal" item conforms substantially to the detailed requirements for the items as indicated by the specifications.

- C. The Engineer's evaluation and decision on whether a proposed product is equal to that specified, based on the *above* evaluation requirements, is final. The Contractor retains the right to appeal the Engineer's determination of equality through regulated statutory provisions.
 - 1. The Engineer and Owner reserve the right to reject proposed substitutions where data for VOCs is not provided or where emissions of individual VOCs are higher than for specified materials.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION

SECTION 01 26 00 – SCHEDULE OF VALUES

PART 1 GENERAL

1.1 DESCRIPTION

- A. Work Included: 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.

1.2 RELATED WORK

- A. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

1.3 GENERAL

- A. For accounting purposes for Norwell's convenience and as an aid in determining progress payments and price additions or deductions for Contract modifications, the Contractor shall furnish to Norwell schedule of values which shall be approved.
 - 1. The schedule of values shall apportion the total amount of the Contract price(s) for each separate item among the main features or costs that form the completed Work.
 - 2. The price breakdown shall be in sufficient detail to permit an analysis of all material, labor, equipment, subcontract and overhead costs, as well as profit, and shall cover all work involved for the properly completed item and feature listed.
 - 3. Any amount claimed for subcontracts shall be supported by a similar schedule of values with the total amount shown by this price under the Contract price stated in the bid form.
 - 4. The Schedule of Values shall include a line item for maintenance of plants landscaping work throughout the maintenance and guarantee periods as further discussed in in Section 329219 SEEDING and Section 329300 PLANTS. Payment for maintenance of plants landscaping work shall not be paid until the guarantee period for landscaping is complete and the work is accepted by the Owner.

1.4 SUBMITTALS

- A. Prior to first application for payment, submit a proposed Schedule of Values to H W .
 - 1. Meet with Norwell and determine additional data, if any, required to be submitted.
 - 2. Secure Norwell's approval of the Schedule of Values prior to submitting first application for payment.

END OF SECTION

SECTION 01 29 00 – PAYMENT REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

- A. Schedule of Values.
- B. Applications for payment.
- C. Change procedures.

1.2 COORDINATION

- A. Coordinate the Schedule of Values and Applications for Payment with the Contractor's Construction Schedule, List of Subcontracts, and Submittal Schedule
 - 1. Related Sections:
 - a. Section 01 32 00 - CONSTRUCTION PROGRESS DOCUMENTATION: Contractor's Construction Schedule
 - b. Section 01 33 00 - SUBMITTAL PROCEDURES: Contractor's Construction Submittal Schedule

1.3 SCHEDULE OF VALUES

- A. Coordinate preparation of the Schedule of Values with preparation of the Contractor's Construction Schedule.
 - 1. Schedule of values shall be used only as basis for Contractor's application for payment.
- B. Correlate line items in the Schedule of Values with other required administrative schedules and forms, including.
 - 1. Contractor's construction schedule
 - 2. Application for Payment form.
 - a. List of subcontractors.
 - b. List of products.
 - c. List of principal suppliers and fabricators.
 - d. Schedule of submittals.
- C. Submit typewritten schedule of values to the Engineer at least 10 days prior to submitting first application for payment.
- D. Sub-Schedules: Where the Work is separated into phases that require separately phased payments, provide sub-schedules showing values correlated with each phase of payment.
- E. Identification: Include the following Project identification on the Schedule of Values:
 - 1. Project name and location.
 - 2. Name of the Engineer.
 - 3. Project number.
 - 4. Contractor's name and address

5. Date of submittal
 - F. Arrange the Schedule of Values in a tabular form with separate columns to indicate the following for each item listed:
 1. Generic name.
 2. Related Specification Section.
 3. Name of subcontractor.
 4. Name of manufacturer or fabricator.
 5. Name of supplier.
 6. Change Orders (numbers) that have affected value.
 7. Dollar value.
 8. Percentage of Contract Sum to the nearest one-hundredth percent, adjusted to total 100 percent.
 - G. Provide a breakdown of the Contract Sum in sufficient detail to facilitate continued evaluation of Applications for Payment and progress reports. Break principal subcontract amounts down into several line items.
 1. Upon request by Engineer, submit data that will substantiate values given.
 - H. Round amounts off to the nearest whole dollar; the total shall equal the Contract Sum.
 - I. For each part of the Work where an Application for Payment may include materials or equipment, purchased or fabricated and stored, but not yet installed, provide separate line items on the Schedule of Values for initial cost of the materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
 - J. Unit Cost Allowances: Show line item value of unit cost allowances as a product of unit cost times measured quantity as estimated from the best indication in the Contract Documents.
 - K. Margins of Cost: Show line items for indirect costs, and margins on actual costs, only to the extent that such items will be listed individually in Applications for Payment. Each item in the Schedule of Values and Applications for Payment shall be complete including its total cost and proportionate share of general overhead and profit margin.
 - L. At the Contractor's option, temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown as separate line items in the Schedule of Values or distributed as general overhead expense.
 - M. Schedule Updating: Update and resubmit the Schedule of Values when Change Orders or Construction Change Directives result in a change in the Contract Sum.
- 1.4 PROCEDURES FOR APPLICATIONS FOR PAYMENT
- A. Each Application for Payment shall be consistent with previous applications and payments as certified by the Engineer and paid for by the Owner.
 1. The initial Application for Payment, the Application for Payment at time of Substantial Completion, and the final Application for Payment involve additional requirements.

- B. Payment Application Times: Each progress payment date is as indicated in the Agreement. The period of construction Work covered by each Application or Payment is the period indicated in the Agreement.
- C. Payment Application Forms: Use AIA Document G 702 and Continuation Sheets G 703 or Engineer approved equivalent as the form for Application for Payment.
- D. Application Preparation: Complete every entry on the form, including notarization and execution by person authorized to sign legal documents on behalf of the Owner. Incomplete applications will be returned without action.
 - 1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions have been made.
 - 2. Include amounts of Change Orders and Construction Change Directives issued prior to the last day of the construction period covered by the application.
- E. Transmittal: Submit 3 executed copies of each Application for Payment to the Engineer by means ensuring receipt within 24 hours.
- F. Transmit each copy with a transmittal form listing attachments, and recording appropriate information related to the application in a manner acceptable to the Engineer.

1.5 INITIAL APPLICATION FOR PAYMENT

- A. Administrative actions and submittals that must precede or coincide with submittal of the first Application for Payment include the following:
 - 1. List of subcontractors.
 - 2. List of principal suppliers and fabricators.
 - 3. Schedule of Values.
 - 4. Contractor's Construction Schedule (preliminary if not final).
 - 5. Schedule of principal products.
 - 6. Schedule of unit prices.
 - 7. Submittal Schedule (preliminary if not final).
 - 8. List of Contractor's staff assignments.
 - 9. List of Contractor's principal consultants.
 - 10. Copies of permits.
 - 11. Copies of authorizations and licenses from governing authorities for performance of the Work.
 - 12. Initial progress report.
 - 13. Report of pre-construction meeting.
 - 14. Data needed to acquire Owner's insurance.

1.6 MONTHLY APPLICATIONS FOR PAYMENT

- A. Administrative actions and submittals that must precede or coincide with submittal of the period Application for payment, include the following:
 - 1. As-built record documents required documents and submittal records on site.
 - 2. Contractor's construction schedule, updated, with corrective action plan as applicable.
 - 3. Weekly up-to-date, accurate, certified submission of payroll records.

4. Pre-installation meeting conducted in accordance with Section 01 31 00, prior to first billing for any activity.
5. Material Status Report.
6. Stored Materials forms.
7. Submittal Schedule and submittal status reports.
8. Monthly Progress report and Notarized Progress report Statement from the Contractor's project manager stating that the work is on schedule and that the Contractor will meet the Substantial Completion date for the Work and the Substantial Completion dates for every portion thereof.
9. Construction progress photographs.
10. Quality control reports and procedures in compliance with Section 01 45 00 – QUALITY CONTROL

1.7 APPLICATION FOR PAYMENT AT SUBSTANTIAL COMPLETION:

- A. Following issuance of the Certificate of Substantial Completion, submit an Application for Payment; this application shall reflect any Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work:
- B. Administrative actions and submittals that shall proceed or coincide with this application include:
 1. Warranties (guarantees) and maintenance agreements.
 2. Maintenance instructions.
 3. Final cleaning.
 4. Application for reduction of retainage, and consent of surety.
 5. Advice on shifting insurance coverage.
 6. Final progress photographs.
 7. List of incomplete Work recognized as exceptions to Engineer's Certificate of Substantial Completion.

1.8 FINAL PAYMENT APPLICATION

- A. Administrative actions and submittals which must precede or coincide with submittal of the final payment Application for Payment include the following:
 1. Completion of Project Closeout requirements.
 2. Completion of items specified for completion after Substantial Completion.
 3. Assurance that unsettled claims will be settled.
 - a. Assurance that Work not complete and accepted will be completed without undue delay.
 4. Transmittal of required Project construction records to Owner.
 5. Proof that taxes, fees and similar obligations have been paid.
 6. Removal of temporary facilities and services.
 7. Removal of surplus materials, rubbish and similar elements.

1.9 PAYMENT FOR STORED MATERIALS

- A. Provide supporting documentation for the value of stored materials. Acceptable form of supporting documentation includes a certified and notarized invoice from the manufacturer or

supplier which indicates the actual amount due, including discounts to which the Contractor may be entitled, and the date which the invoice was paid.

- B. Provide notice to Engineer 48 hours in advance and provide transportation for Engineer and Owner's Representative to the site where materials are stored to permit inspection of the materials.
- C. With Application for Payment, submit notarized certificate of title and evidence of insurance for materials stored off-site.
- D. With each subsequent Application for Payment, indicate in the appropriate columns the value of stored material which has been taken from off-site location and brought to the project site. Provide supporting documentation.

1.10 CHANGE PROCEDURES

- A. The Engineer will advise of minor change in the Work not involving adjustment to Contract Sum/Price or Contract Time.
- B. The Engineer may issue a Proposal Request or Notice of Change which includes a detailed description of a proposed change with supplementary or revised Drawings and Specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the request price will be considered valid. The Contractor will prepare and submit an estimate within 10 days.
- C. The Contractor may propose changes by submitting a request for change to the Engineer describing the proposed change and its full effect on the Work. Include a statement describing the reason for the change, and the effect on the Contract Sum/Price and Contract Time and full documentation and a statement describing the effect on Work by separate or other contractors. Document any requested substitutions in accordance with Section 01 25 13- PRODUCT SUBSTITUTION PROCEDURES
- D. Stipulated Sum/Price Change order:
 - 1. Based on Proposal Request or Notice of Change and Contractors price quotation or Contractors request for a Change Order as approved by the Engineer.
- E. Unit Price Change Order:
 - 1. For a pre-determined unit prices and quantities, the Change Order will be executed on a fixed unit price basis. For unit costs or quantities of units of work which are not pre-determined, execute Work under a Construction Change Directive. Changes in Contract Sum/Price or Contract Time will be computed as specified for Time and Material Change Order.
- F. Construction Change Directive:
 - 1. Engineer may issue a Construction Change Directive signed by the Owner instructing the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order. Document will describe changes in the Work and designate method of determining any change in Contract Sum/Price or Contract Time.

2. Promptly execute the change.

G. Time and Material Change Order:

1. Submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract. Engineer will determine the change allowable in Contract Sum/Price and Contract Time as provided in the Contract Documents.
2. Maintain detailed records of work done on Time and Material basis. Document each quotation for a change in cost or time with sufficient data to allow evaluation of proposed changes and to substantiate changes in the Work.

H. Documentation of change in Contract Sum/Price and Contract Time:

1. Change order Forms: as appropriate to Owner-Contractor Agreement.
2. Maintain detailed records. Document each quotation for a change in cost or time with sufficient data to allow evaluation of the quotation.
3. On request, provide additional data to support computations:
 - a. Quantities of products, labor and equipment.
 - b. Taxes, insurance and bonds.
 - c. Overhead and profit.
 - d. Justification for any change in Contract Time.
 - e. Credit for deletions from Contract, similarly document.
4. Support each claim for additional costs and for work done on a time and material basis, with additional information:
 - a. Origin and date of claim.
 - b. Dates and times work was performed, and by whom.
 - c. Time records and wage rates paid.
 - d. Invoices and receipts for products, equipment, and subcontracts, similarly documented.

I. Execution of Change Orders: Engineer will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION

SECTION 01 31 00 – PROJECT MANAGEMENT AND COORDINATION

PART 1 GENERAL

1.1 SUMMARY

- A. Project coordination.
- B. Project meetings.

1.2 RELATED REQUIREMENTS

- A. Section 013300 – SUBMITTAL PROCEDURES
- B. Section 017800- CLOSEOUT SUBMITTALS

1.3 GENERAL PROJECT COORDINATION

- A. Coordination: The Contractor is fully responsible for coordinating the Work of this Contract including scheduling, submittals, Work and other activities included in various Sections to assure efficient and orderly sequence of installation of interdependent construction elements. The Contractor is responsible for coordinating actual installed location and interface of work, and to make provisions to accommodate items scheduled for later installation.
- B. Where installation of one component depends on installation of other components before or after its own installation, schedule activities in the sequence required to obtain efficient installation with the least amount of alterations, or cutting and patching, to completed Work.
 - 1. The Contractor shall be responsible to uncover work completed in order to install ill-timed work, at no additional cost to the Owner
- C. Where space is limited, coordinate installation of different components to assure maximum accessibility for maintenance, service and repair.
- D. Coordinate space requirements and installation of electrical work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- E. Coordinate completion and cleanup of Work of separate Sections in preparation for Substantial Completion and Owner's occupancy.
- F. After Owner occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

1.4 UTILITIES, AND ELECTRICAL COORDINATION

- A. Coordinate all Work of this Project. Provide full and complete coordination for utilities, and electrical work.
- B. Give all advance notice to public utility companies as required by law, and provide proper disposition, subject to Landscape Architect's approval of all existing pipe lines, conduits, sewers, drains, poles, wiring, and other utilities that in any way interfere with the Work, whether or not they are specifically shown on the Drawings
- C. Coordination regarding existing utilities:
 - 1. Notify Owner and appropriate authorities when coming across an unknown utility line(s) and await decision as to how to dispose of same.
 - 2. When an existing utility line must be cut and plugged or capped, moved, or relocated, or has become damaged, notify the Owner and Utility company involved, and assure the protection, support, or moving of utilities to adjust them to the new work.
 - 3. The Contractor shall be responsible for all damage caused to existing, active utilities located within the limits of this Contract, whether or not such utilities are shown on the Drawings, including resultant damages or injuries to persons or properties.

1.5 GENERAL PROJECT ADMINISTRATION

- A. Prepare memoranda for distribution to each party involved outlining required coordination procedures. Include required notices, reports, and attendance at meetings.
- B. Prepare similar memoranda for the Owner and separate contractors where coordination of their Work is required.
- C. Conduct conferences among subcontractors and others concerned with the Work, to establish and maintain coordination and schedules, and to resolve coordination matters in dispute.
- D. Administrative Procedures: Coordinate scheduling and timing of administrative procedures with other activities to avoid conflicts and ensure orderly progress. Such activities include:
 - 1. Preparation of schedules.
 - 2. Installation and removal of temporary facilities.
 - 3. Delivery and processing of submittals.
 - 4. Progress meetings.
 - 5. Project closeout activities.

1.6 SITE MOBILIZATION CONFERENCE

- A. In addition to any pre-bid conference, the Engineer may, prior to commencement of the Work, schedule a meeting at a meeting room provided by the Owner.
 - 1. Attendance is required by Engineer, engineering consultants, Contractors' Project Manager and Superintendent, and other major subcontractors, applicators, installers and suppliers. Other persons are required to attend as the Engineer may direct or the Contractor may wish to have present.
 - 2. Items of Agenda
 - a. Use of premises by Owner, Contractor, and subcontractor(s).

- b. Temporary utilities.
- c. Barricading and protection of the public, dust barriers.
- d. Survey and layout.
- e. Potentially difficult areas of work.
- f. Project coordination.
- g. Security and housekeeping procedures.
- h. Construction schedules.
- i. Work beyond Contract Limit.
- j. Procedures for testing and inspection.
- k. Procedures for maintaining record documents.
- l. Inspection and acceptance of equipment put into service during construction period.

1.7 COORDINATION MEETINGS

- A. In addition to other specified meetings and additional meetings as required. Contractor shall hold project coordination meetings, at least monthly at regularly scheduled times. Hold meetings more frequently when necessary to ensure full coordination of work. Request representation at each meeting by every entity involved in coordination or planning for work of the entire project. Conduct meetings in a similar manner to progress meetings, to resolve coordination problems.
- B. Keep minutes of coordination meetings and distribute copies to all attendees, related parties and to Owner, Resident Project Representative(s), Engineer and its engineering consultants within 3 business days following meeting. Coordination meetings shall continue on an appropriate schedule, even after completion of coordination drawings by Contractor, to review progress and resolve minor conflicts not identified in the coordination drawings.
- C. The following trades shall participate in coordination meetings, preparation of coordination drawings and reviews. Additional trades shall participate as the Contractor deems necessary for proper coordination of the Work.
 1. Excavation, site utilities and site improvements.
- D. All adjustments necessary to achieve full coordination shall be determined in a timely manner, so as not to delay the work. Include time necessary for consideration by the Engineer and Resident Project Representative(s) for proposed modifications. No claim for additional compensation for extension of time arising from delays due to failure of Contractor to identify potential conflicts requiring coordination in a timely manner or from additional work made necessary by such failure will be valid.

1.8 PROGRESS MEETINGS

- A. The Engineer or its representative will schedule and administer meetings throughout the progress of the Work; make arrangements for meetings, prepare agenda with copies for participants, preside at meetings, record minutes and distribute copies within one week to Contractor, Owner and participants of meeting only. Contractor is responsible for distribution to subcontractors, vendors, suppliers and others who are affected by decisions made.
 1. Scheduled Frequency of Meetings: every other week.

- B. Attendance: Required are Contractor's Project Manager and Project Superintendent, and each Filed-Subcontractor, applicator, installer, and supplier whose work is ongoing or scheduled. Owner, Engineer, engineering consultants, and other persons are required to attend as the Engineer may direct. Subcontractors, vendors, suppliers shall be present at meetings upon request of Contractor.
1. Attendee Authority: Subcontractors and supplier representatives present at meetings shall have authority to act for and make commitments for, the entity which they represent.
 2. Restricted Attendance: Owner and Engineer reserve the right to expel or exclude from any Progress Meeting any person(s) or company representative(s) without statement of reason or excuse.
 3. Attendance of Engineer's Consultants: Contractor shall make an attendance request for specific Engineer's consultants and engineers at least 72 hours in advance of the meeting. Clearly identify in the request all consultant related issues and topics to be discussed at the meeting. The Engineer will decide if its consultant or engineer will attend.
 4. Attendance of Owner's Independent Consultants: Contractor shall make an attendance request for specific Owner's consultants at least 72 hours in advance of the meeting. Clearly identify in the request all consultant related issues and topics to be discussed at the meeting. The Owner will decide if its consultant(s) will attend.
- C. Items of Agenda:
1. Review minutes of previous meetings
 2. Review of Work progress.
 3. Field observations, problems, and decisions.
 4. Identifications of problems which impede planned progress.
 5. Review of submittals schedule and status of submittals.
 6. Review of off-site fabrication and delivery schedules.
 7. Maintenance of progress schedule.
 8. Corrective measures to regain projected schedules.
 9. Coordination of projected progress.
 10. Maintenance of quality and work standards.
 11. Progress of Work to be adjusted under coordination requirements, and effect of proposed changes on progress schedule and coordination.
 12. Other business relating to Work.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION – Not used

END OF SECTION

SECTION 01 33 00 - SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

- A. Definitions.
- B. Submittal procedures and grading.
- C. Shop drawings, product data, and samples.
- D. Manufacturer's instructions.
- E. Manufacturer's certificates.
- F. Emergency addresses.
- G. Erosion and sediment control program.

1.2 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Engineer's and Owner's responsive action.
- B. Informational Submittals: Written and graphic information and physical Samples that do not require Engineer's and Owner's responsive action. Submittals may be rejected for not complying with requirements.

1.3 SUBMITTAL COORDINATION

- A. Make submittals in a proper and timely fashion, allowing for administrative procedures, Engineer's review, corrections to submissions and resubmittal, if necessary, and fabrication of products without delaying the project. Minimum processing times required by the Engineer are as follows:
 - 1. Review for Engineer's Office only: Allow a minimum of 10 working days for review and processing. Some submittals may require additional time.
 - a. Simultaneous submission of a large number of shop drawings and product data may require longer than 10 working days for review.
 - b. Complex Systems may require longer than 10 working days for review each time shop drawings, layout drawings, and product data are submitted or resubmitted.
 - 2. Review by Engineer and its consultant(s): Allow 10 working days for review and processing of submittals by Engineer plus an additional 5 working days for review by each consultant as applicable.
 - 3. Reprocessing of submittals: For submittals requiring resubmittal, re- processing time required shall be the same as first submittal.
 - 4. No extension of Contract Time will be authorized due to failure to transmit submittals sufficiently in advance of scheduled performance of Work.

- B. Make submittals of similar items, systems, or those specified in a single specification section together.
- C. Make submittals for products which other products are contingent upon, first.
- D. The Contractor is fully responsible for delay in the delivery of materials or progress of work caused by late review of shop drawings due to failure of the Contractor to submit, revise, or resubmit shop drawings in adequate time to allow the Engineer checking and processing of each submission or resubmission

1.4 SUBMITTAL PROCEDURES

- A. Prepare and submit to the Engineer, all specified and requested submittals.
- B. Provide space for Contractor, Engineer and engineering consultant review stamps, on the front page of each item's submittal copy. Apply Contractor's stamp, signed or initialed certifying that review, verification of products required, field dimensions, adjacent construction Work, and coordination of information, is in accordance with the requirements of the Work and the Contract Documents. The Engineer's stamp shall contain the following data (Engineering consultant review stamps may vary in language, but intent of language is similar):
 - 1. The Engineer will insert the date of action taken and an identification of the person taking the action
 - 2. Submittal grading:
 - a. REVIEWED - No corrections, no marks
 - b. FURNISH AS CORRECTED - Minor corrections required are as noted; all items can be fabricated as noted, without further correction and resubmission of original submission; checking is complete, and all corrections are deemed obvious without ambiguity.
 - c. REVISE AND RESUBMIT - Resubmission is required; checking may be incomplete; details of items noted by checker are to be clarified further before full review can be given. Correct and resubmit, do not fabricate noted items requiring correction
 - d. REJECTED - Submittal is rejected as not in accord with the Contract Documents, too many corrections, or other justifiable reasons. When returning submission, Engineer will state reasons for rejection. Correct and resubmit, do not fabricate.
 - 3. Review/approval neither extends nor alters any contractual obligations of the Engineer or Contractor.
- C. Identify all variations from Contract Documents, and product or system limitations which may be detrimental to successful performance of the completed work.
- D. Contractor's review: Review all shop drawings, product data and samples. Include, without limitation, verification of the following:
 - 1. Proper title, original date, drawing number (which shall be changed if resubmitted), revision numbers and dates, designation of project contractor, subcontractor and/or supplier.

2. Identification of Shop Drawings, Product Data or Samples by Specification Section and subsection or paragraph where appropriate and identification of Contract Drawings by number and detail.
3. On each submittal, as a minimum, Contractor shall identify the following:
 - a. Errors, inconsistencies, and omissions discovered in the contract documents and field conditions must be reported at once to the Engineer.
 - b. Any variations from code requirements contained in the contract documents must be reported promptly in writing to both the Engineer and Owner.
 - c. Promptly report to the Engineer information that any design, process, or product infringes on a patent.
 - d. Names of subcontractor(s) and supplier(s). Include name(s) of contact person(s), address, telephone and fax number(s).
- E. Revise and resubmit submittals as required, identify all changes made since previous submittal. Distribute copies of reviewed submittals to concerned parties; instruct parties to promptly report any inability to comply with provisions.

1.5 SUBMISSION REQUIREMENTS AND QUANTITIES

- A. Furnish Engineer with electronic files through the Adobe Acrobat Portable Document Format (PDF) files for each of the following submittal types:
 1. Schedules, including, but not limited to:
 - a. Construction Schedule.
 - b. Schedule of Values.
 - c. Schedule of shop drawings, product data, and samples.
 - d. Schedule of Environmental Submissions.
 2. Shop drawings.
 3. Product data, manufacturer's instructions and certificates and similar submissions.
 4. Erosion control program.
 5. Emergency addresses: 1 file to Engineer, and 1 file direct to Owner.
- B. Furnish Engineer with the following quantities of the following physical submittals:
 1. Samples: Sets of 3 identical samples of each submission required.
- C. General submission of physical submittals.; deliver to Engineer at the following address:

Horsley Witten Group, Inc., Attn: Geoffrey Glover
90 Route 6A, Unit 1
Sandwich, MA. 02563
- D. Transmit submittals to Engineer at the above address, with individual transmittal forms, Document 00 62 12– PRODUCT SUBMITTAL FORM for each submission. Document 00 62 12 is bound into the Project Manual; unbound copies are available from the Engineer.
 1. On transmittal form, identify Project, Contractor, subcontractor, installer, or supplier, pertinent Drawing sheet and detail number(s), and specification Section number, as appropriate. Transmittals received by the Engineer from sources other than the Contractor will be returned without any action taken.

2. Contractor shall number submittals sequentially by Specifications Section prior to submittal. Resubmitted items shall retain number and be noted as resubmitted (example 260000-1 R1).

1.6 SHOP DRAWINGS

- A. General: Provide accurately prepared, large scale and detailed shop drawings prepared specifically for this Project. Shop drawings shall include fabrication and installation drawings, setting diagrams, schedules, patterns, templates and similar drawings. Standard information prepared without specific reference to Project are not considered shop drawings.
 1. Show adjacent conditions and related work. Show accurate field dimensions where appropriate.
 2. Identify materials and products shown. Note all conditions where require coordination with other trades and special installation procedures.
 3. Show gage and thickness of materials.
 4. Indicate welding details and joint types.
 5. Show every component of fabricated items, notes regarding manufacturing process coatings and finishes, identifying numbers conforming to the Contract Documents (i.e. stair numbers, door numbers and similar items }, dimensions, and appropriate trade names.
 6. Show anchorage and fastening details, including type, size and spacing.
 7. Review each submittal for conformity with the Contract requirements prior to submittal, certify such review on each shop drawing with Contractor's stamp, signature and date. Reference on shop drawings to other sections, installers, suppliers, or trade(s) shall designate the appropriate specification sections, and the term "by others" shall not be used.
- B. Size of Format: Not less than 8-1/2 by 11 inches, and no larger than 30 by 42 inches, except for templates, patterns and similar full-size drawings.
- C. The Engineer's comments and corrections will be made on the electronic submission (PDF) and returned to the Contractor. If necessary, the Contractor then shall make the necessary corrections on the original drawings and resubmit the corrected drawings in electronic format (PDF) as specified. Prints of any submittals required for the Engineer's own use, and those of engineering consultants, will be made without cost to the Contractor. The Contractor is responsible to distribute and furnish (at no additional cost to Owner) all shop documents needed for use by the Contractor, subcontractors, installers, vendors and suppliers.
- D. Drawing submittals returned "REVIEWED" or "FURNISH AS CORRECTED" Obtain and distribute adequate prints for construction, including one print of each for designated Owner's and Engineer's Project Representative(s), and then return the reproducible to the subcontractor or supplier from whom he originally received them.
- E. Drawing submittals returned "REJECTED" or "REVISE AND RESUBMIT", Obtain a record print, and then forward originals to source for correction; resubmit new reproducible and prints as specified herein above.
- F. Shop Drawings returned "NOT REVIEWED": Obtain a record print and return originals to source; do not resubmit.

G. Each drawing shall have a title block on the right-hand side containing the following data

Name of project -	Wompatuck State Park Parking Lot
Engineer –	and Trail Access
Contractor -	
Subcontractor/supplier -	
Date of submission -	

H. Each drawing shall have a clear space on the right-hand side for review stamps of both the Engineer and Contractor

1. The Contractor's Review and Action Stamp: Provide suitable space on label or title block for Contractor's review and action stamp. Stamp and sign each submittal to show Contractor's review and approval prior to transmittal
2. Engineer. Submittals not signed and stamped by Contractor will be returned without action
 - a. Only submittals received from the Contractor will be considered for review by the Engineer. Contractor shall review each submittal for accuracy and conformance with the requirements of the Contract Documents, and particularly for field measurements and proper fit with adjoining work. Modify submittals as required to show interface with adjacent work and attachment to Building.
 - b. The Contractor's Review and Action Stamp shall contain the following language or similar:

APPROVED FOR CONFORMANCE WITH THE CONTRACT DOCUMENTS.
All dimensions and quantities have been reviewed and are accepted by _____ <i>Contractor's Name</i>
All dimensions and field conditions have been or will be verified prior to fabrication of the items described herein.

- c. Submittals received from the Contractor shall be signed and comply with review requirements. Submittals not certified or improperly certified (stamped but not reviewed) will be returned to the Contractor without Engineer's review. Claims due to the return of uncertified, improperly prepared or inadequately reviewed submittals will be rejected.

1.7 PRODUCT DATA

- A. Submit Product data as specified, and as the Engineer may additionally prescribe. Product data includes, but is not limited to:
 1. Catalog cuts.
 2. Complete specifications.
 3. Standard color charts.
 4. Performance data.
 - a. Compliance with recognized trade association standards.
 - b. Compliance with recognized testing agency standards, labels and seals.
 5. Environmental data including, but not limited to:

- a. Chemical composition.
- b. VOC content.
- c. Material certifications as applicable to product.
6. Certified laboratory test report data.
7. Health and safety precautions.
8. Illustrated capacities, characteristics, wiring diagrams, controls, and other pertinent information for complete product and product use description.

B. If more than one size or type is shown on any printed sheet, indicate clearly intended item(s).

1.8 SAMPLES

- A. Submit samples clearly labeled as to its material, type or make, manufacturer, size or gauge, and other pertinent data, accompanied by an appropriate transmittal form. Samples shall show full range of color and texture variation that can be expected.
 1. When accepted or not accepted, the Engineer will retain one set of samples and return the other to the Contractor. Samples will not be permitted for use in the project.

1.9 MANUFACTURERS INSTRUCTIONS

- A. When specified in individual specification Sections, submit manufacturer's printed instructions for delivery, handling, storage, assembly, installation, start-up, adjusting, and finishing.
- B. Identify conflicts between manufacturer's instructions and Contract Documents.

1.10 MANUFACTURER'S CERTIFICATES

- A. When specified in individual specification Sections, submit manufacturer's certificates and installer certificates to Engineer for review.
- B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference date, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or product but must be acceptable to Engineer.

1.11 EMERGENCY ADDRESSES

- A. Within 15 days of Notice to Proceed, submit in writing, the name, addresses and telephone numbers of key members of their organization including Contractor's Superintendent and personnel at the site, to be contacted in the event of emergencies at the building site, which may occur during non-working hours.

1.12 EROSION AND SEDIMENT CONTROL PROGRAM

- A. Submit erosion and sediment control program within 30 days after date of Owner- Contractor Agreement for Engineer's review. Revise and resubmit as required.

- B. Erosion and sediment program shall indicate proposed methods, materials to be employed, and schedule for effecting erosion and siltation control and preventing erosion damage. Provide sufficient information to fully explain the program; the following are the minimum requirements:
1. Proposed methods for actuating erosion and siltation control including 1-inch equals 40 feet (1"=40') scale plans indicating location of erosion control devices and siltation basins.
 2. List of proposed materials including manufacturer's product data, in accordance with Division 31 - EARTHWORK and Division 33 - EXTERIOR IMPROVEMENTS.
 3. Schedule of and sediment control program indicating specific dates from implementing programs in each major area of Work.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 01 41 00 – REGULATORY REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

- A. This section consists of:
 - 1. Applicable codes and regulations.
 - 2. Trade union jurisdictions.
 - 3. Wage rate compliance

1.2 DEFINITIONS

- A. Regulations include laws, ordinances, statutes and lawful orders issued by authorities having jurisdiction, and rules, conventions and agreements within the construction industry that control performance of the Work, whether lawfully imposed by authorities having jurisdiction or not.

1.3 APPLICABLE CODES AND REGULATIONS

- A. All work shall be performed in accordance with the latest version, by DATE OF ISSUE for Contract Documents, current on date of Owner-Contractor Agreement, except as indicated otherwise, of all applicable codes including the following:
 - 1. 2009 International Building Code with Massachusetts Building Code, Ninth Edition amendments (780 CMR).
 - 2. 2008 Massachusetts Electrical Code (2008 National Electrical Code [NFPA 70], with Massachusetts modifications from 527 CMR 12.00).
 - 3. Commonwealth of Massachusetts Regulation 521 CMR: *Architectural Access Board*.
 - 4. Commonwealth of Massachusetts, Department of Public Works. "STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES CONSTRUCTION".
 - 5. Commonwealth of Massachusetts Wetlands Protection Act. Order of Conditions attached.
 - 6. Town of Norwell Wetlands Bylaw as amended.
 - 7. Town of Norwell Zoning Bylaws, as amended.
 - 8. United States Occupational Safety and Health Administration (OSHA): Standard N^o. 29-CFR-1926.59 - HAZARD COMMUNICATION STANDARD.
 - 9. United States Department of Justice, N^o 28 CFR Part 36 - AMERICANS WITH DISABILITIES ACT, (Public Law 101-336).
 - 10. Current guidance and regulations of the Commonwealth of Massachusetts relative to construction site safety and protocol during the COVID 19 pandemic.
- B. Publication Dates: Where the date of issue of a code or regulation is not specified, comply with the standard in effect as of date of Contract Documents, or as otherwise required by authorities having jurisdiction.

1.4 TRADE UNION JURISDICTIONS

- A. Maintain current information on jurisdictional matters, regulations, actions and pending actions; and administer/supervise performance of Work in a manner which will minimize possibility of disputes, conflicts, delays, claims or losses.

1.5 WAGE RATE COMPLIANCE

- A. The Contractor is responsible to ensure that the rate per hour to be paid to mechanics, apprentices, teamsters, laborers and other workers employed on the Work shall not be less than the approved wage rates applicable to this project. A legible copy of the approved rates, along with equal opportunity requirements, shall be posted on a weatherproof bulletin board outside the field office and be clearly visible for review by all workers. Prevailing wage rates are attached hereto as Appendix 1 and are made part of the Contract documents.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 01 41 17 – UTILITY NOTIFICATIONS

PART 1 GENERAL

1.1 GENERAL PROVISIONS

- A. Comply with all regulations and laws concerning excavation, demolition, or explosive work and be advised of utility notification requirements under Chapter 82, Section 40 of the Massachusetts General Laws:

1.2 ADMINISTRATIVE AUTHORITY

- A. Notification of utilities within the Commonwealth is performed through the Utilities Underground Plant Damage Prevention System, commonly referred to as "Dig Safe".

1.3 APPLICABLE CODES AND REGULATIONS

- A. Contractors must notify "Dig Safe" by telephone before performing any earth moving operations including digging, trenching, boring, site demolition, excavation, backfilling, grading, or explosive work in all public ways and private property.
- B. This notification must be made at least 72 hours (excluding weekends and holidays) prior to the Work described above, but not more than 30 calendar days before commencement of the contemplated Work. Notification shall occur between 6:00 AM to 6:00 PM local time from Monday to Friday, except in cases of emergency Publication Dates: Where the date of issue of a code or regulation is not specified, comply with the standard in effect as of date of Contract Documents, or as otherwise required by authorities having jurisdiction.
 - 1. The toll-free phone number is: **811**.
 - 2. Provide the following information:
 - a. Municipality.
 - b. Location of work.
 - c. Intersecting street.
 - d. Type of work.
 - e. Starting date and time of work.
 - f. Name and title of caller.
 - g. Phone number of caller.
 - h. Best time for "Dig Safe" to return calls.
 - i. Company name of Contractor.
 - j. Company name of subcontractor performing subgrade work
- C. Member utilities of the Utilities Underground Plant Damage Prevention System are required to respond to the notice within 72 hours from the time said notice is received by designating at the locus the location of pipes, mains, wires, or conduits.
 - 1. Locations of underground utilities will be marked by spray paint or stakes. Marks will be color coded with additional descriptions of letters and arrows as required.
- D. Do not commence work until "Dig Safe" has been properly notified and has responded as described above.

- E. Subsequently notify "Dig Safe" of unanticipated additional blasting required after the initial notification to "Dig Safe" has been made. Do not perform the additional blasting work in less than 4 hours following the subsequent notification.

1.4 PROTECTION

- A. The Contractor is fully responsible for protection of the utility location markings, wherever these occur, on or off-site.
- B. Perform Work in such a manner, and with reasonable precautions taken to avoid damage to utilities under the surface in said areas of work. Immediately notify any known or suspected damage to underground utilities to the owner of such utilities.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 01 42 00 – REFERENCES

PART 1 GENERAL

1.1 SUMMARY

- A. Abbreviations and Acronyms.
- B. Definitions
- C. Reference Standards.

1.2 ABBREVIATIONS AND ACRONYMS

- A. The following list of common abbreviations are referenced in individual specification sections. This list is provided for convenience to the Contractor and is not intended to define all abbreviations use in the Contract Documents.

1. Abbreviations for contract and specifications.

DCAM	Massachusetts Division of Capital Asset Management
EPA	United States Environmental Protection Agency
MEPA	Massachusetts Environmental Protection Agency
MGL	Massachusetts General Law
MHD	Massachusetts Highway Department (Mass Highway)
MSDS	Material Safety Data Sheet
NIC	Not in Contract
OFCI	Owner Furnished, Contractor Installed
OFI OR OFOI	Owner Furnished and Installed
VOC	Volatile Organic Compounds

2. Abbreviations for measurements and quantities.

C	Celsius
cm	Centimeter
F	Fahrenheit
Hrs	Hours
Kg	Kilogram
L	Liter
M	meter
m ²	square meter
m ³	cubic meter
mm	Millimeter
Mths	Months
psi	Pounds per square inch

1.3 DEFINITIONS

- A. Definitions of contracting parties (Owner, Owner's Project Manager, Construction Manager, and Engineer): Refer to Section 01 1000—PROJECT SUMMARY

B. Definitions for terms utilized in the Contract Documents:

1. "As necessary," "as directed," "when directed," "satisfactory," "good and sufficient," "approved," or other general qualifying terms are used on the Drawings: These terms are deemed to be followed by the words, "in the opinion of the Engineer," or "by the Engineer," as the case may be."
2. "Addenda": written or graphic instruments issued prior to the execution of the Contract which modify or interpret the Bidding Documents, including the Drawings and Specifications, by additions, deletions, clarifications or corrections.
3. "Approval," "approved," "approved equal," "or equal," or "other approved" means as approved by the Engineer."
4. The term "Day": is defined as the following:
 - a. The term "calendar day" is a full 24 hour period, starting from 12 AM (midnight), and includes all weekends and legal holidays.
 - b. The term "working day" shall mean any calendar day except Saturdays, Sundays, and legal holidays at the place of the building.
 - c. Where the term "day" is used without the adjective of "calendar" or "working", it shall mean "calendar day".
5. Furnish and Install" or "Provide": items identified shall be furnished and installed under this Contract. The term "Furnish", when used separately, shall mean that the items referred to shall be furnished, only. Similarly the term "install", when used separately, shall mean that the items referred to shall be installed, only.
6. "Knowledge," "recognize" and "discover," their respective derivatives and similar terms in the Contract Documents, as used in reference to the Contractor, shall be interpreted to mean that which the Contractor knows (or should know), recognizes (or should recognize) and discovers (or should discover) in exercising the care, skill and diligence required by the Contract Documents. Analogously, the expression "reasonably inferable" and similar terms in the Contract Documents shall be interpreted to mean reasonably inferable by a Contractor familiar with the Project and exercising the care, skill and diligence required of the contractor by the Contract Documents.
7. "Not in Contract" or "N.I.C.": equipment, furnishings; or other materials not included as a part of this Contract.
8. "Product": materials, systems and equipment

1.4 REFERENCE STANDARDS

- A. For products or workmanship specified by association, trade, or Federal Standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard by DATE OF ISSUE for Contract Documents, current on date of Owner-Contractor Agreement
- C. Should specified reference standards conflict with Contract Documents, request clarification from Engineer before proceeding.

- D. The contractual relationship to the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.
- E. Schedule of References
- F. Listed below are abbreviations for the names and titles of trade association names, federal government agencies and similar organizations which are referenced in the individual specification sections. The addresses and phone numbers provided are for the Contractor's convenience and are believed to be current and accurate, however addresses and phone numbers frequently change, and no assurance is made on their accuracy:

American Concrete Institute, International
38800 Country Club Drive, Farmington Hills, Michigan 48331
www.aci-int.org

American Concrete Pipe Association
222 West Las Colinas Boulevard, Suite 641, Irving TX
www.concrete-pipe.org

American Galvanizers Association Inc.
12200 E. Liff Ave, Suite 204, Aurora, CO 80014-1252
www.galvanizeit.org

American Institute of Architects
1735 New York Avenue, N.W., Washington, DC 20006-5292
www.aia.org

American National Standards Institute
11 W. 42nd Street, 13 Floor, New York, NY 10036 www.ansi.org

American Society for Testing and Materials
100 Barr Harbor Drive, West Conshohocken, PA 19428
www.astm.org

National Electrical Manufacturers' Association 1300 N. 171 St.,
Suite 1846, Rosslyn, VA 22209
www.nema.org

Portland Cement Association
5420 Old Orchard Road, Skokie, IL 60077-1083 www.cement.org

Product Standard
U. S. Department of Commerce www.omg.org

Underwriters' Laboratories, Inc.
333 Pfingsten Road, Northbrook, IL 60062 www.ul.com

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 01 45 00 – QUALITY CONTROL

PART 1 GENERAL

1.1 SUMMARY

- A. General quality assurance and control of installation.
- B. Site safety, worker safety and training.
- C. Contractor's quality control (QC) program.
- D. Source quality control.
- E. Field samples and mock-ups.
- F. Testing laboratory and inspection services.
- G. Manufacturer's field services and reports.
- H. Field quality control, Owner's right for confirmation

1.2 GENERAL QUALITY ASSURANCE AND CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply fully with manufacturers' instructions, including performance of each step-in sequence. Notify Engineer when manufacturers' instructions conflict with the provisions and requirements of the Contract Documents; obtain clarification before proceeding with the work affected by the conflict.
- C. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate high standards or more precise workmanship.
- D. Perform work by persons qualified to produce workmanship of specified quality.
- E. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement

1.3 REFERENCES

- A. General: The Contractor (and his subcontractors) shall, at all times, exercise reasonable precautions for the safety of all persons. All rules, regulations, and laws concerning safety that are in effect at the work site, and in particular, all applicable regulations of the Occupational Safety and Health Administration (OSHA) of the U.S. Government, in addition to specified requirements shall be complied with in all respects.

1. Contractor's responsibility for safety shall apply continuously twenty four (24) hours per Day during the term of this Contract and is not limited to normal working hours.
- B. Contractor's safety program: Prior to commencement of the Work, the Contractor shall develop and implement a Safety and Health Plan to comply with the Occupational Safety and Health Administration (OSHA) standards for the Construction Industry and all other applicable Federal, State, local laws and regulations. Contractors Safety and Health Plan, and included health and safety procedures and policies, shall be submitted to the Engineer and Owner's Representative within fifteen (15) Days after the date of Notice to Proceed and in no event later than commencement of the Work, whichever occurs first.
1. Perform pre planning to ensure access Is provided to Fire Department for all areas of the work site throughout the duration of the Contract. The Contractor shall provide the Fire Department site access maps, updated regularly, to reflect changes in the layout of the work site and shall notify the Fire Department when each update is made
 2. Post and maintain, at prominent locations throughout the Project site, emergency telephone numbers and shall insure that all personnel on site are continuously aware of this information.
 3. Ensure safe access to the Work for the Owner, Engineer, Engineer's consultants, their designated representatives, and all others charged with inspection, testing and monitoring of the Work, and visitors to the site. The Contractor shall furnish site visitors with safety test equipment, safety apparel and instructions that are required to ensure their safety on site, and In the performance of their duties related to the Work of this Contract.
- C. All employees to be employed at the worksite will have successfully completed course in construction safety and health approved by the United States Occupational Safety and Health Administration (OSHA) that is at least 10 hours in duration. The OSHA training and certification course shall occur at the time each employee begins work. Furnish documentation to Owner and Engineer, for each employee documenting successful completion of the OHSA safety training and certification course. Submit with the first certified payroll report. Comply fully with all laws and regulations applicable to awards made subject to Massachusetts General Laws (MGL).

1.4 CONTRACTOR'S QUALITY CONTROL PROGRAM

- A. Procedures: Contractor and each subcontractor shall include all labor, materials, equipment, services and incidental items necessary to implement quality control procedures to the extent necessary to demonstrate and maintain compliance with the Contract Documents
- B. Quality Control Plan: Within 20 days after Notice to Proceed, the Contractor shall submit a Quality Control (QC) Plan to the Owner's Representative and Engineer for approval. The plan shall address the following, as a minimum:
1. The Contractor's commitment to quality and implementing and managing the QC program.
 2. Identification of the Contractor's onsite QC Manager, with name, qualifications, duties and responsibilities. The QC Manager shall have the authority to direct the removal and replacement of non-conforming work. The QC Manager shall be present for all QC meetings, inspections and tests during the project.

3. Procedures for addressing and commenting QC with Contractor's staff, all subcontractors and suppliers, and Owner, Engineer and Owner's representative
4. Procedures for review of submittals and submittal status, and documentation of same.
5. Procedures for pre-installation meetings and documentation of same.
6. Procedures for inspections of deliveries and documentation of same.
7. Procedures for benchmark inspections, defined as initial installations, and documentation of same.
8. Procedures for mockup inspections and documentation of same.
9. Procedures for equipment in place, inspections and documentation of same.
10. Procedures for inspections prior to closures of concealment and documentation of same.
11. Procedures for start-up and commissioning and documentation of same.
12. Procedures for turnover and documentation of same.
13. Procedures for identifying, recording, tracking correcting and reporting items requiring rework, using a Rolling Completion list chronological item number, phase area, date listed, description, party responsible for correction, date notified, and date corrected.
14. Procedures for testing and documentation of same.
15. Procedures for corrective action on Engineer's Field Reports and Testing Agency reports and documentation of same.

- C. Procedures for reporting on all of the above on a monthly basis as a condition precedent to review of the Contractor's application for payment.

1.5 SOURCE QUALITY CONTROL

- A. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- B. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- C. Product Labeling: Attach label from agency approved by authority having jurisdiction for products, assemblies, and systems required to be labeled by applicable code(s).
 1. Label Information: Include manufacturer's or fabricator's identification, approved agency identification, and the following information, as applicable, on each label.
 - a. Model number.
 - b. Serial number.
 - c. Performance characteristics.

1.6 FIELD SAMPLES

- A. Install field samples demonstrating quality level for the Work, at the site as required by individual specifications Sections for review and acceptance by Engineer. Remove field samples prior to date of Final Inspection, or as directed.

1.7 MOCK-UPS

- A. Where requested by Engineer, or as specified in individual specification sections, assemble and erect specified items, with specified attachment and anchorage devices, flashings, seals, and finishes. Remove mock-up assemblies prior to date of Final Inspection, or as directed.
- B. Mock-ups, when approved by the Engineer, will be used as datum for comparison with the remainder of the Work for the purposes of acceptance or rejection.
- C. Demolish and remove from site prior to requesting inspection for certification of Substantial Completion, all Mock-ups which are not permitted to remain as part of the finished work.

1.8 TESTING LABORATORY AND INSPECTION SERVICES

- A. Owner will appoint, employ, and pay services of an independent firm to perform inspection and testing and other services specified in individual specification Sections and as required by the Engineer.
- B. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage and assistance as requested.
 - 1. Notify Engineer and independent firm 48 hours prior to expected time for operations requiring services.
 - 2. Make arrangements with independent firm and pay for additional samples and tests required for Contractor's use
- C. Retesting required because of non-conformance to specified requirements shall be performed by the same independent firm on instructions by the Engineer. Payment for retesting will be charged to the Contractor by deducting inspection or testing charges from the Contract Sum.

1.9 MANUFACTURER'S FIELD SERVICES AND REPORTS

- A. When called for by individual Specification Sections, provide at no additional cost to the Owner, manufacturers' or product suppliers' qualified staff personnel, to observe site conditions, start-up of equipment, adjusting and balancing of equipment, conditions of surfaces and installation, quality of workmanship, and as specified under the various Sections.
 - 1. Individuals shall report all observations, site decisions, and instructions given to applicators or installers. Immediately notify Engineer of any circumstances which are supplemental, or contrary to, manufacturer's written instructions
 - 2. Submit full report within 30 calendar days from observed site conditions to Engineer for review

1.10 FIELD QUALITY CONTROL

- A. The Owner reserves the right to take samples and perform, at random, tests of approved materials delivered to the job site to verify compliance of actual materials with specifications.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Requirements for temporary facilities and controls.

1.2 RELATED DESCRIPTIONS

- A. Division 31 - EARTHWORK: Erosion and sedimentation control.

1.3 GENERAL REQUIREMENTS

- A. The Contractor shall provide and maintain all temporary facilities, controls, and construction aids as specified herein, until they are replaced by permanent work, or until Project Substantial Completion, as appropriate.
 - 1. Temporary facilities removed from the Project shall remain the property of the Contractor, except as otherwise specified.
- B. Except where specifically noted otherwise, cost or use charges for temporary facilities, utility services, controls, and construction aids and similar items specified in this Section or as required to perform the Work, are not chargeable to the Awarding Authority or Engineer, and will not be accepted as a basis of claims for a Change Order.
- C. Establish and initiate use of each temporary facility at time first reasonably required for proper performance of the Work. Terminate use and remove facilities at earliest reasonable time when they are no longer needed, or when permanent facilities have, with authorized use, replaced the temporary facilities.
 - 1. Locate temporary facilities where they will serve Project adequately and result in minimum interference with performance of the Work.

1.4 SUBMITTALS

- A. Submit the following under provisions of Section 01 33 00 - SUBMITTAL PROCEDURES:
 - 1. Reports of tests, inspections, meter readings and similar procedures performed on temporary utilities.
 - 2. Schedule showing implementation and termination of each temporary utility within 15 days of commencement of the Work.
 - 3. Shop drawings:
 - a. Temporary signage.
 - b. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

1.5 REFERENCES

- A. Comply with applicable requirements of the following standards and those others referenced in this Section, under the provisions of Section 01 42 00 - REFERENCES. Where these standards conflict with other specified requirements, the most restrictive requirements shall govern.
 - 1. ANSI A 10 - Safety Requirements for Construction and Demolition.
 - 2. NFPA 70 - National Electrical Code.
 - 3. NFPA 241 - Building Construction and Demolition Operations.

1.6 TEMPORARY UTILITIES, GENERAL REQUIREMENTS

- A. General Installation: Install temporary utility service(s) or connect to existing service(s) as indicated, and as specified. Comply with all applicable laws, regulations, and requirements of authorities having jurisdiction.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.7 TEMPORARY UTILITIES, ELECTRICITY

- A. Temporary electricity: The Contractor is required to provide any electrical energy required for temporary light and power.

1.8 TEMPORARY UTILITIES, LIGHTING

- A. Temporary lighting: Contractor shall provide lighting to fulfill security requirements and provide illumination for construction operations and traffic conditions. Maintain lighting, replace broken lamps and provide routine repairs.
 - 1. Lamps: The Contractor shall furnish and install all lamps, both initial and all required replacements until the date of Substantial Completion.
- B. Protective night lighting is required at all times (24 hours a day, seven days a week). Contractor is required to arrange for adequate outdoor lighting to illuminate staging, stockpiles, trenches, dangerous projections, excavations and similar conditions and as additionally required to protect the safety of workmen, other personnel, and the public and as an aid in the protection against theft and vandalism.
 - 1. Shield lighting to protect overflow beyond Contract limits, protect neighbors from night light overflow

1.9 TEMPORARY UTILITIES, WATER

- A. Temporary water: Contractor is responsible for providing all water necessary for the Work; exercise measures to conserve water.

1.10 TEMPORARY HEATING AND COOLING

- A. Temporary heat: Provide heat for curing or drying of completed installations or protection of installed construction from adverse effects of low temperatures or high humidity. Provide vented self-contained liquid propane gas or fuel oil heaters with individual space thermostatic

control, UL approved and acceptable to local fire department. Use of gasoline-burning space heaters, open flame, or salamander type units is prohibited.

1. Vent heaters directly to outside air, in areas where concrete is less than 15 days old.
2. In enclosed areas, maintain a minimum temperature of 50 degrees Fahrenheit; provide higher temperatures where required by individual specification sections. Contractor is required to provide enclosures necessary to maintain specified temporary heat

1.11 FIELD OFFICES AND SHEDS

A. General:

1. Field offices: Provide furnished, insulated, weathertight, office(s) which shall be portable or mobile building(s), or buildings constructed with floors raised above ground, securely fixed to foundations, with steps and landings at entrance doors.
2. Location: The location of the field office(s) and storage areas for equipment and materials shall be upon cleared portions of the job site or areas to be cleared, and shall require review and written acceptance of the Engineer. Submit plans showing field office and storage facilities for equipment and materials for acceptance by the Engineer.
 - a. Offices and sheds located within the construction area, or within 30 feet of building lines shall be of noncombustible construction. Comply with requirements of NFPA 241.
3. Furnishings:
 - a. Conference table and chairs to seat at least 6 persons;
 - b. Racks and files for Contract Documents, submittals and Project Record Documents.
4. Outdoor weather thermometer.
5. Hard-hats for site visitors.
6. Duplex convenience outlets, at least one per wall.
7. Telephone service as specified herein above.
8. Other equipment and furniture as the Contractor deems necessary.

1.12 SANITARY FACILITIES

- A. Sanitary facilities: Provide self-contained single-occupant chemical toilet units, wash facilities and drinking water fixtures.
 1. Locate sanitary facilities within the fenced construction zone.
 2. Permanent facilities located in completed work may not be used by the Contractor's personnel
- B. Provide toilet tissue, paper towels, paper cups, cleaning compounds and similar materials
- C. Maintain facilities, through-out term of construction, and keep clean, provide covered waste containers for used material.
- D. Comply with all current guidance and regulations of the Commonwealth of Massachusetts relative to construction site safety and protocol during the COVID 19 pandemic.

1.13 FIRST AID AND FIRE EXTINGUISHERS

- A. First aid supplies: Comply with governing regulations.

- B. Fire extinguishers: Provide and maintain on site, adequate fire extinguishers UL rated for A-B-C type fires. Provide red-painted plywood standards for each extinguisher. Additionally, provide a dry chemical fire extinguisher at each location where welding, torch cutting, and other similar hazardous work is in progress.
 - 1. At welding and heat cutting work: Provide not less than a Multi-purpose dry chemical type (mono ammonium phosphate) fire extinguisher, 20-pound capacity, multi-purpose rated "2A, 1220B:C".

1.14 CONSTRUCTION AIDS - TEMPORARY HOISTS AND CRANES

- A. Hoisting equipment and machinery: Furnish all hoisting equipment, crane services and lift machinery required to perform the Work of this Contract. Install, operate and maintain in safe condition.
 - 1. Do not charge applicators and installers for these services during normal working hours.

1.15 CONSTRUCTION AIDS - SCAFFOLDING, PLATFORMS, STAGING, CHUTES

- A. Provide all ladders, ramps, runways, platforms, railings, chutes, and other mounted or installed construction aids as specified herein and as required to facilitate the Work. Furnish and erect construction aids and maintain in safe condition for the use of all subcontractors, installers and applicators.
- B. Furnish and erect scaffolds, staging, and maintain in safe condition, dismantle when no longer required. The Contractor shall provide scaffolds, staging, and other similar raised platforms, required to access the Work.
- C. Ladders, temporary stairs, platforms and railings, shall comply with OSHA guidelines
 - 1. Provide and maintain temporary stairs until permanent stairs are in place and functional. When permanent stairs are erected, provide temporary railings and guards. Protect permanent stairs with temporary covers and protective treads.
 - 2. Portable ladders and mobile platforms of all required heights, shall be provided by individual users.

1.16 DUST CONTROL

- A. Provide positive means to prevent air-borne dust from dispersing into atmosphere.
 - 1. Take all necessary measures and provide equipment and materials to minimize dust from rising and blowing across the site and also to control surface water throughout the operation so that it does not run onto paved ways without being filtered. Control all dust created by construction operations and movement of construction vehicles, both on site and on paved ways.
 - 2. During the progress of the work, maintain the areas of construction activities including sweeping and sprinkling of streets as necessary. Provide and use calcium chloride for more effective dust control, when deemed necessary by regulatory agencies, without additional cost to the Owner.
- B. Construction Entrances: Stabilized construction entrances shall be installed at all points of access to reduce or eliminate tracking or flowing of sediment onto the town roads in accordance with the following criteria:

1. Provide nominal 1 to 2-1/2 inch washed crushed stone, minimum 8 inches thick.
2. Construction entrance shall be as wide or wider than all points of ingress and egress.
3. Washing vehicle wheels before traveling on paved ways.
4. Provide temporary swales and interceptor ditches to control runoff water where necessary

1.17 NOISE CONTROL

- A. Develop and maintain a noise-abatement program and enforce strict discipline over all personnel to keep noise to a minimum.
- B. Execute construction work by methods and by use of equipment which will reduce excess noise.
 1. Equip air compressors with silencers, and power equipment with mufflers.
 2. Manage vehicular traffic and scheduling to reduce noise
- C. Interior work involving cutting, drilling, hammering or noise generating procedures shall be completed during times schedule with the Owner in advance.

1.18 TEMPORARY BARRICADES

- A. Provide barriers and barricades to prevent unauthorized entry to construction areas.
 1. Comply with standards and code requirements for erection of barricades, where required provide lighting, including flashing lights.
 2. Paint with appropriate colors, graphics and warning signs to inform personnel and the public of the hazard being protected against.
- B. Provide temporary enclosures, as required, for protection of existing facilities and new construction from exposure to weather, other construction operations and similar activities. Where heat is needed and the building envelope is incomplete, provide enclosures where there is no other provision for containment of heat.
 1. Provide doors with self-closing hardware and locks.

1.19 TEMPORARY FENCES

- A. Construction fence: Provide a 6 foot high commercial grade chain link fence around construction site; equip with vehicular and pedestrian gates and locks.
 1. Vehicular and Pedestrian Gates: Build into fence at approved locations. Provide gates with cross-bracing and hung on heavy strap hinges with post and hook for double gates. Provide heavy hasps and padlocks.
 - a. Provide a set of keys to Awarding Authority to facilitate emergency access.

1.20 POLLUTION CONTROL

- A. Provide methods, means, and facilities required to prevent contamination of soil, water, or atmosphere by, the discharge of noxious substances from construction operations.
 1. Comply with all applicable Federal, State, County, and municipal laws regarding pollution.

2. Prevent pollution of streams, lakes, or reservoirs with fuels, oils, bitumens, calcium chloride, acids, waste products, effluents, chemicals or other harmful substances. Prevent from such substances from entering storm drains and sanitary sewers.
- B. Provide equipment and personnel, perform emergency measures required to contain any spillage and to remove contaminated soils or liquids.
1. Excavate and legally dispose of any contaminated earth off-site, and replace with suitable compacted fill and topsoil.

1.21 EROSION AND SEDIMENT CONTROL

- A. General: Comply with requirements with Division 2 – Site Construction and as specified herein. The more stringent requirements shall apply.
1. Obtain all required permits from authorities having jurisdiction regarding erosion control and silt fence.
- B. Water control:
1. Grade site to drain, where exterior work has disturbed existing grades, protect site from puddling or running water.
 2. Do not allow water to accumulate in excavations, maintain free from water until all backfilling operations have been completed.
 - a. Remove water from excavations to prevent undercutting of in place structures, and soil changes detrimental to the stability of subgrades and footings.
 - b. Keep the utility system trenches free of water until pipe joint material has hardened.
 3. Provide and maintain pumps, sumps, suction and discharge lines, and other dewatering system components necessary to convey the water away from excavations.
 4. Dispose of water from excavations conforming to applicable orders, regulations, ordinances and as directed by Owner. Dispose of water in such a manner that will not damage existing property or structures, construction work completed or in progress. Dewatering operations shall not impede foot or vehicular traffic surfaces; nor cause endangerment to the public health.
 - a. Filter all water pumped or discharged from the trench or excavation prior to discharge into a receiving water or drainage system.
 - b. Filter water through baled hay, a vegetative filter strip or a vegetated channel to trap sediment occurring as a result of the construction operations. The vegetated channel shall be constructed such that the discharge flow rate shall not exceed a velocity of more than 1 foot per second. The sediment shall be cleared from the channel periodically.
- C. Erosion and sediment control: Provide an erosion and sediment control program for minimizing erosion and siltation during the term of construction

1.22 SECURITY MEASURES

- A. Protect Work, existing premises and Owner's operations from theft, vandalism, and unauthorized entry. Maintain security program throughout construction period until Owner occupancy precludes the need for Contractor security.

1. Contractor is responsible for security of site during construction, including, prevention of illegal trespassing, unauthorized entry, theft and vandalism. All losses and damages which occur are the full responsibility of the Contractor, who shall bear all costs incurred.

1.23 PROJECT IDENTIFICATION AND TEMPORARY SIGNAGE

- A. General: Signs other than those specified herein are not permitted, except those required by law or expressly authorized by the Awarding Authority.
 1. At all times during the project, signage must clearly direct occupants and the general public in the safe use of the building. Signs must clearly indicate areas of no admittance, and further must clearly define and direct users to building entries, exits, and other important destinations.
 - a. All such interim signage must be painted by a professional sign painter on 3/4-inch medium density overlay plywood with letters no less than 3 inches in height.
 - b. Coordinate required signage with Engineer.
- B. Project sign
 1. Provide 4 foot wide by 4 foot high foot project sign of exterior grade MDO plywood and wood frame construction, painted, with self-adhesive color printed text and graphics. Engineer will provide signage design.
 - a. Color prints for rendering shall be 3M Scotchprint marking film series 8640 or equal, 4 mil thickness, "ControlTac" vinyl film as manufactured by 3M company having a positionable pressure activated pigmented adhesive.
 - b. Overlay protecting film, Scotchprint Film, clear overlaminating film, as manufactured by 3M company.
 2. Erect on site at location established by Engineer.
- C. Signage at perimeter of construction site: Provide clear and visible warning signage with appropriate language such as: "Prohibited Access – Hard Hat Only – No Admittance - Authorized personnel Only”.

1.24 REMOVAL OF TEMPORARY UTILITIES CONTROLS, AND FACILITIES

- A. Remove temporary materials and construction prior to Substantial Completion.
 1. Do not remove erosion control devices until after all disturbed earth has been paved or vegetated.
- B. Restore permanent facilities used during construction to specified condition.
- C. Clean and repair damage caused by installation or use of temporary work

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 01 60 00 – PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

- A. Definition of Terms.
- B. Basic product requirements.
- C. Owner furnished products.
- D. Product delivery and handling requirements.
- E. Product storage and protection requirements

1.2 RELATED DESCRIPTIONS

- A. Section 01 25 13 – PRODUCT SUBSTITUTION PROCEDURE:
 - 1. Product options.
 - 2. Product substitution procedures.

1.3 DEFINITION OF TERMS

- A. "Products" is defined as new material, machinery, components, equipment, fixtures, and systems used in the Work. Products do not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work. Products may also include existing materials or components required for re-use.
- B. "Materials" are products that are shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.
- C. "Equipment" is a product with operational parts, whether motorized or manually operated, that requires service connections such as wiring or piping.
- D. "Fasteners" include all products required for mechanical connections and include, but are not limited to nails, screws, bolts, expansion bolts, chemical bolts, epoxy anchors, pins, powder-actuated devices, and similar fasteners, anchors, and connections.
- E. Definitions in this article are not intended to negate the meaning of other terms used in Contract Documents, including "specialties", "systems", "structure", "finishes", "accessories", "furnishings", "special construction", and similar terms, which are self-explanatory and have recognized meanings in the construction industry

1.4 BASIC PRODUCT REQUIREMENTS

- A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, that are new at time of installation.

- B. To the fullest extent possible, provide products of the same kind, from a single source.
- C. Provide interchangeable components of the same manufacturer, for similar components.
- D. When the Contractor has the option of selecting two or more products, ensure that products selected shall be compatible with products previously installed or approved.
- E. Provide all products complete with all accessories, trim, finish, safety guards and other devices and details needed for a complete installation and for the intended use and effect.
- F. Galvanic Corrosion: Install materials in manner which will effectively isolate dissimilar metals which may potential for galvanic corrosion. Use non-absorptive dielectric material, isolation coatings, or other protective isolator approved by Engineer.
- G. Fasteners, Anchors, and Connections: Provide all fasteners, anchors, and connections needed to safely, securely, and appropriately secure all Work permanently in place
 - 1. General: The Contractor is solely responsible for the capacity, suitability, adequacy, and safety of all welded, fastened and anchored connections.
 - a. Comply with applicable code requirements regarding fastener selection and installation.
 - b. Provide at least two fasteners for each individual item being fastened.
 - c. Utilize fastener manufacturer's published load tables for working loads to assist in determining fastener size and space. Do not use ultimate load capacity in determining fastener selections.
 - d. Provide a minimum safety factor of 4.
 - e. Select and utilize fasteners having minimum galvanic corrosion factor.
 - f. Hydrogen embrittlement prevention:
 - 1) Do not use high-strength and low-alloy fasteners which have been subjected to an acid pre-treatment (because they can become brittle and fail), utilize instead equivalent capacity and size bi-metal, stainless steel or high strength aluminum fasteners, as appropriate to the conditions and materials where being used.
 - 2) Utilize low-hydrogen electrodes for welding high-strength steels to prevent hydrogen embrittlement.
 - 2. To permit the Contractor control over means and methods, some fastener conditions may not be fully defined in the Contract Documents. In particular, individual specification sections that require delegated independent engineering. In such instances the Contractor is fully responsible to determine method of fastening appropriate for each condition. The Contractor shall take into consideration substrate material(s) and product(s) being fastened, live and dead loading, and both atmospheric and visual exposure considerations. Contractor is responsible to determine fastener type, material, finish, size, diameter, length and spacing.
 - 3. Torque structural fasteners as recommended by fastener manufacturer, or as otherwise specified in the Contract Documents.
- H. Permanent Labels and Nameplates:
 - 1. Restrictions:
 - a. Do not provide exposed-to-view labels, nameplates, or trademarks which are not required by code, or regulations.

- b. Do not expose manufacturers, suppliers, or installer's name, logo, or trade names on normally visible surfaces.
 - c. Do not provide labels, nameplates or trademarks when individual specification sections specifically exclude them.
 - d. All exposed-to-view advertising and name-brand labels shall be fully removed without damage to substrate finish.
2. Location for required labels: Required labels, approval plates and stamps shall be located on a concealed surface, or where required for observation after installation on accessible non-conspicuous surface.
 3. Data Plates: Provide permanent data plate on each item of service-connected or power-operated equipment.
 - a. Data Plate Information: Include manufacturer, model, serial number, date of manufacture, capacity, ratings, power requirements, and all other similar essential data.
 - b. Locate data plates on easily accessible surface that is inconspicuous in occupied spaces.

1.5 OWNER FURNISHED PRODUCTS

- A. Owner Furnished Products: As provided in the General Conditions, the Owner will provide products by others under a separate agreement.
 1. Owner's responsibilities regarding Owner furnished products:
 - a. Arrange for and deliver Owner reviewed shop drawings, product data, and samples to Contractor.
 - b. Arrange and pay for product delivery to site.
 - c. On delivery, inspect products jointly with Contractor.
 - d. Submit claims for transportation damage, and replace damaged, defective, or deficient items.
 - e. Arrange for manufacturers' warranties, inspections, and service
 2. Contractor's responsibilities regarding Owner furnished products:
 - a. Review Owner reviewed shop drawings, product data, and samples to Contractor.
 - b. For Owner-Furnished, Contractor Installed (OFICI) Products: Receive and unload products at site, inspect for completeness or damage, jointly with Owner.
 - c. Handle, store, and provide temporary protection.
 - d. Repair or replace items damaged after receipt.
 - e. As required by this Contract, finish, install, and clean products.
 - f. Provide protection of installed work.
 - g. When not installed under this Contract, the Contractor shall coordinate Owner installed work with interfacing work of this Contract. The Contractor shall provide temporary protection and final cleaning of Owner installed products, except as directed otherwise.
 3. Items noted in Drawings as "Not in Contract" or "N.I.C.", identify work or products which either exist, or are furnished by Owner; such work requires coordination with the Work of this Contract and may even require installation by this Contractor.
- B. The Contractor has coordinating responsibility for Testing laboratory services as identified under Section 01 45 00 – QUALITY CONTROL and as specified under individual specification sections.

1.6 PRODUCT DELIVERY AND HANDLING REQUIREMENTS

- A. Transport and handle products in accordance with manufacturer's instructions and as specified in individual specification sections.
- B. Schedule deliveries to avoid delays in installation of products, to minimize long-term storage, to prevent overcrowding of construction. Coordinate with installation to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other losses.
- C. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.
- D. Provide equipment and personnel to handle and store products by methods to prevent soiling, disfigurement, or damage.

1.7 PRODUCT STORAGE AND PROTECTION REQUIREMENTS

- A. Store and protect products in accordance with manufacturer's instructions and as specified in individual specification sections.
 - 1. Provide all necessary equipment and personnel to store products by methods to prevent soiling, disfigurement and damage.
 - 2. Store and protect products with seals and labels intact and legible.
- B. For exterior storage of fabricated products, place on sloped supports, above ground.
- C. Provide off-site storage and protection when site does not permit on-site storage or protection.
 - 1. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation.
 - 2. Store sensitive products in weather-tight, climate-controlled enclosures.
- D. Store loose granular materials on solid flat surfaces in a well-drained area; prevent mixing with foreign matter.
- E. Arrange storage of products to permit access for inspection. Periodically inspect to assure products are undamaged and are maintained under specified conditions.
- F. Store heavy materials in locations and in a manner that will not damage or disfigure existing, or new construction.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 01 70 00 - EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Examination of existing conditions and acceptance of conditions.
- B. Surveying and Field Engineering.
- C. Project Preparation.
- D. Execution of the Work
- E. Cutting and Patching of in-place work.
- F. Cleaning
- G. Protecting installed work.
- H. Closeout of incomplete work (punch list) requirements
- I. Closeout procedures.
- J. Conferences occurring after Substantial Completion.
- K. Project record documents.
- L. Record Project Manual.
- M. Project Record Drawings (As built drawings).
- N. Operation and maintenance data, preventive maintenance instructions.
- O. Maintenance contracts.
- P. Spare parts and maintenance materials

1.2 RELATED REQUIREMENTS

- A. Section 01 31 00 – PROJECT MANAGEMENT AND COORDINATION.
 - 1. CAD file Requirements for base sheets to prepare Project Record Drawings (As-builts).
- B. Section 01 78 00 – CLOSEOUT SUBMITTAL: Requirements for project record documents.
- C. Section 01 78 36 – WARRENTIES: Administrative and procedural requirements for warranties, guarantees and bonds.

1.3 EXAMINATION OF AND ACCEPTANCE OF EXISTING CONDITIONS

- A. The Contractor, its subcontractors shall inform themselves of existing conditions before submitting his bid and shall be fully responsible for carrying out all work required to completely and properly execute the work of the Contract, regardless of the conditions encountered in the actual work. No claim for extra compensation or extension of time will be allowed on account of actual conditions inconsistent with those assumed, except those conditions described in the General Conditions.

1.4 SURVEYING AND FIELD ENGINEERING

- A. Employ a Land Surveyor or Professional Engineer registered in the Commonwealth of Massachusetts and acceptable to the Engineer.
 - 1. Submit evidence of Surveyor's Errors and Omissions (E&O) Insurance coverage in the form of an Insurance Certificate.
- B. Submittals
 - 1. Submit name, address, and telephone number of at least three proposed Land Surveyors and obtain Engineer's acceptance before starting survey work
 - 2. On request, submit documentation verifying accuracy of survey work
 - 3. Submit a copy of registered site drawing and certificate signed by the Land Surveyor, that the elevations and locations of the Work are in conformance with the Contract Documents.
- C. Examination.
 - 1. Verify locations of survey control points prior to starting work.
 - 2. Promptly notify Engineer of any discrepancies discovered.
- D. Survey Reference Points
 - 1. Contractor shall locate and protect survey control and reference points.
 - 2. Control datum for survey is that indicated on Drawings.
 - 3. Protect survey control points prior to starting site work; preserve permanent reference points during construction.
 - 4. Promptly report to Engineer the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
 - 5. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to the Engineer.
- E. Survey Requirements.
 - 1. Provide field engineering services. Utilize recognized engineering survey practices.
 - 2. Prior to construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer and water service piping.
 - a. The existence and location of underground utilities and construction indicated on Drawings as existing are not guaranteed. Before beginning sitework, verify the existence and location of underground utilities and other construction.
 - 3. Establish a minimum of 2 permanent benchmarks on site, referenced to established control points. Record locations, with horizontal and vertical data, on Project Record Documents.

4. Establish elevations, lines and level. Located and lay out by instrumentation and similar appropriate means:
 - a. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
 - b. Grid or axis for structures.
5. Periodically verify layouts by same means.

1.5 PROTECTION OF ADJACENT ELEMENTS

- A. Protect installed Work and provide special protection where called for in individual specification Sections
- B. Protect adjacent properties from damage from construction operations. Provide temporary and removable protection for installed products and occupied areas.
- C. Protect all existing landscape areas not indicated to be cleared. Do not deface, injure, or destroy trees or other plant life. Do not remove or cut trees or other plant life, without authorization from the Owner. Do not attach any anchorages, ropes, cables or guys to any trees scheduled to remain.
 1. Prohibit traffic from landscaped areas.
 2. Protect non-owned vehicles, stored materials, site and structures from damage.
 3. Refer to respective Sections for other particular protection requirements.

1.6 EXECUTION REQUIREMENTS FOR INSTALLATION, APPLICATION AND ERECTION

- A. Inspection of conditions: The Installer of each component shall inspect the substrate and conditions under which Work is performed. Do not proceed until unsatisfactory conditions have been corrected.
- B. Resource Efficiency of Materials:
 1. Use construction practices such as material reduction and dimensional planning that maximize efficient use of resources and materials.
 - a. Recheck measurements and dimensions, before starting installation
 2. Provide materials that utilize recycled content to maximum degree possible without being detrimental to product performance or indoor air quality
 3. Where possible and feasible, provide for non-destructive removal and re-use of materials after their service life in this building.
- C. Manufacturer's instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that they are more stringent than requirements in Contract Documents.
- D. Inspect material immediately upon delivery and again prior to installation Reject damaged and defective items.
- E. Install each component during weather conditions and project status that will ensure the best results. Isolate each part from incompatible material as necessary to prevent deterioration.

- F. Coordinate temporary enclosures with inspections and tests, to minimize uncovering completed construction for that purpose
- G. Limiting exposures: Supervise operations to ensure that no part of construction, completed or in progress, is subject to harmful or deleterious exposure.
 - 1. Such exposures include, but are not limited to the following
 - a. Excessive static or dynamic loading.
 - b. Excessive internal or external pressures.
 - c. Excessive weathering.
 - d. Excessively high or low temperatures or humidity.
 - e. Air contamination or pollution.
 - f. Water or ice.
 - g. Chemicals or solvents.
 - h. Heavy traffic, soiling, staining and corrosion.
 - i. Rodent and insect infestation.
 - j. Unusual wear or other misuse.
 - k. Contact between incompatible materials.
 - l. Theft or vandalism
- H. Provide attachment and connection devices and methods necessary for securing each construction element. Secure each construction element true to line and level. Allow for expansion.
- I. Visual effects: Provide uniform joint widths in exposed Work. Arrange joints to obtain the best effect. Refer questionable choices to the Engineer for decision.
- J. Mounting heights: Where mounting heights are not indicated, review heights with Engineer, prior to commencement of Work.
- K. Cleaning and protection: During handling and installation, clean and protect construction in progress and adjoining materials in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- L. Clean and maintain completed construction as often as necessary through the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

1.7 CUTTING AND PATCHING OF IN-PLACE WORK

- A. Scope: Contractor is responsible for coordination and quality of all cutting and patching work. Cutting and patching of the Work includes, but is not limited to:
 - 1. All cutting, altering, patching, and fitting as necessary for the Work to comply with the Contract Documents.
 - a. Make all products and their components of the Work fit together properly.
 - b. Fully integrate all cutting and patching, to present the visual appearance of an entire, completed, and unified project in compliance with the Contract Documents.
 - 2. Provide openings in elements of the Work, and the patching of same, for penetrations required by all trades, including but not limited to mechanical, plumbing, fire protection and electrical work.

3. Uncover work to provide for installing, inspecting, or both, of ill-timed work;
 4. Remove and replace work not conforming to requirements of the Contract Documents or as otherwise determined to be defective.
 5. Patch and match all surfaces and products disturbed or damaged.
 6. Remove samples of in-place construction as specified for testing.
- B. Penetrating elements: Fit work tight to pipes, sleeves, conduit, and other penetrations through surfaces.
- C. General requirements of cutting and patching:
1. Submit written proposals to perform cutting and patching when cutting work affects the following:
 - a. Structural integrity of any element in the project.
 - b. Aesthetic and visual qualities of exposed-to-view elements.
 2. Cutting: Cut in-place construction using methods least likely to damage elements of as-built construction
 3. Coring and Drilling of holes incidental to work of individual sections shall be performed by the trade requiring the penetration.

1.8 PROGRESS CLEANING AND DISPOSAL OF WASTE MATERIALS

- A. General: Maintain site in a clean and orderly condition. Maintain work and surrounding areas free of waste materials, debris, and rubbish; remove from site on an ongoing basis throughout the term of construction.
1. Adjacent Areas: Keep adjacent areas, neighboring properties, public ways, and all nearby areas clean and free of construction debris and dirt including wind blown debris.
 2. Contractor shall furnish dumpsters and provide general site cleaning services, except as explicitly specified otherwise under individual Sections of the Specifications.
- B. Control accumulation of waste materials and rubbish; periodically dispose of off- site. The Contractor shall bear all costs, including fees resulting from such disposal.
- C. Conduct cleaning and disposal operations to comply with local ordinances and anti- pollution laws.
1. Do not burn or bury rubbish and waste materials on site.
 2. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
 3. Do not dispose of wastes into streams or waterways.
 4. Comply with requirements of authorities having jurisdiction including, without limitation, requirements related to fire prevention, rodents, pests, vermin, waste storage, waste trucking, waste removal, waste disposal, street cleaning, truck tire cleaning, and other requirements.
- D. Maintain project in accordance with all local, Commonwealth of Massachusetts, and Federal Regulatory Requirements.
- E. Store volatile wastes in covered metal containers, and remove from premises daily.

- F. Prevent accumulation of wastes which create hazardous conditions.
- G. Provide adequate ventilation during use of volatile or noxious substances.
 - 1. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
 - 2. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
- H. Use only those materials which will not create hazards to health or property and which will not damage surfaces.
- I. Use only those cleaning materials and methods recommended by manufacturer of surface material to be cleaned.
- J. Execute cleaning to ensure that the buildings, the sites, and adjacent properties are maintained free from accumulations of waste materials and rubbish and windblown debris, resulting from construction operations.
- K. Contractor shall provide on-site containers (dumpsters) for collection and containment of, waste materials, debris and rubbish.
 - 1. Trash Barrels and Containers: Use containers with tightly fitting lids. Use only steel containers and lids when there is any evidence of rodent or pest activity.
- L. Remove waste materials, debris, and rubbish from site at least once weekly, and dispose off-site. Comply with NFPA 241 for removal of combustible waste.
- M. Handle material in a controlled manner with as few handlings as possible. Do not drop or throw materials from heights.
- N. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not damage surrounding surfaces.

1.9 SITEMAINTENANCE AND CLEANING

- A. Maintain traffic and parking areas in a sound condition, free of excavated material, construction equipment, products, mud; snow, and ice.
 - 1. Provide means of removing mud from vehicle wheels before entering public streets and Owner's parking areas and access.
- B. Maintain existing and permanent paved areas used for construction.
 - 1. If any street or private way shall be rendered unsafe by the Contractors operations, the Contractor shall make such repairs or provide such temporary ways or guards as shall be acceptable to the governing authority.
 - 2. Promptly repair breaks, potholes, low areas, standing water, and other deficiencies, to maintain paving and drainage in original, or specified, condition.

1.10 FINAL CLEANING

- A. Scheduling: Perform final cleaning immediately prior to the Engineer's review of the project for issue of the Certificate of Substantial Completion.
 - 1. Re-clean all surfaces, materials and products of the Work immediately prior to Owner's occupancy of the Project
 - a. Should the Owner occupy any portion of the Work prior to completion of the Contract, the responsibilities for interim and final cleaning shall be in accordance with the General Conditions.
- B. Qualifications: Commercial cleaning firm, with a minimum of 3 years' experience specializing in the post-construction cleaning of facilities.
- C. Protection: During the operation of final cleaning, protect surrounding materials and finishes against undue damage by the exercise of reasonable care and precautions. Clean, or repair all products and surfaces which are soiled or otherwise damaged by Work of this Section, to match original profiles and finishes. Materials and finishes which cannot be cleaned or repaired shall be removed and replaced with new work in conformation with the Contract Documents
- D. General cleaning requirements:
 - 1. Remove from the job site all tools, surplus materials, equipment, scrap, debris, and waste.
 - 2. Remove all advertising matter and temporary instructional material from exposed surfaces throughout.
 - 3. Use only methods and cleaning materials which are compatible with and as recommended by the manufacturer of the material being cleaned.
 - 4. Finished surfaces: Remove paint smears, spots, marks, dirt, mud and dust and similar disfigurement created by the Work, from all exposed to view existing or new interior and exterior finished surfaces.
 - 5. Polished surfaces: Apply the polish recommended by the manufacturer of the material being polished.
 - 6. Cleaning Materials: Only non-hazardous cleaning materials shall be used in the final cleanup.
- E. Site: Sweep exterior paved surfaces broom clean; rake clean unpaved surfaces.
- F. Equipment: Thoroughly clean all items of electrical equipment; remove excess oils and grease from exposed surfaces.

1.11 PROTECTING INSTALLED WORK

- A. Protect all built, and in-place Work. In addition to requirements specified elsewhere, the Contractor shall protect all installed work from subsequent damage or deterioration from construction activities, and atmospheric damage until Owner's Substantial Completion and occupancy precludes the need for protection activities. No attempt is made in this Section to list all elements requiring protection or to describe how each element will be protected. It is the responsibility of the Contractor to determine for itself the scope and nature of protection required.

1. Protection of some products may be required to remain in place for a large portion duration of the project. As such, materials should be installed to provide adequate protection throughout the full extent of construction activities. Repair or reinstall protection throughout the duration of construction as required.
- B. Finish Products: Some finishes may need to be physically isolated from construction operations by means of protective barriers and coverings.
1. General: After installation, provide coverings to protect products from damage due to traffic and construction operations. Replace protective coverings which may become wet, torn, or ineffective. Remove coverings when no longer needed.
 2. Protect products from biological growth, molds and mildew.
 3. Protect products from rodents and other animals, birds and insect damage.
- C. General Protection from chemicals:
1. Cover adjacent surfaces with materials that are proven to resist chemical cleaners selected for Project unless chemicals being used will not damage adjacent surfaces. Use covering materials that contain only waterproof, UV- resistant adhesives. Apply masking agents to comply with manufacturer's written instructions. Do not apply liquid masking agent to painted or porous surfaces. When no longer needed, promptly remove masking to prevent adhesive staining.
 2. Do not clean surfaces during winds of sufficient force to spread cleaning solutions to unprotected surfaces.
 3. Neutralize and collect alkaline and acid wastes and dispose of off-site.
 4. Dispose of runoff from chemical operations by legal means and in a manner that prevents soil erosion, undermining of paving and foundations, damage to landscaping

1.12 PUNCHLIST REQUIREMENTS AND PROCEDURES

- A. Definitions:
1. Contractor's Punch List: Complete list of incomplete and incorrect Work prepared by the Contractor prior to request of Engineer's inspection for Certification of Substantial Completion. As a minimum the List shall include the following information for each work item:
 - a. Clear identification of each incomplete work item, including all subcontractor's work.
 - b. Estimated value of each incomplete work item.
 - c. A short statement of why work is not complete.
 - d. Identify subcontract responsibility, as appropriate to each item.
 2. Engineers Punch List: A list of incomplete and incorrect Work prepared by the Engineer, which modifies the Contractor's Punch List, following review and acceptance of the Contractor's Punch List.
- B. Pre-Closeout requirements: Prior to requesting initial Engineer's inspection for Certification of Substantial Completion, submit to the Engineer a full and complete list of all incomplete work items (Contractor's Punch List).
- C. Punch list procedures at Substantial Completion:
1. Engineer will review submitted Contractor's Punch List and determine whether it is suitable to proceed with the Substantial Completion Process.

- a. If the Engineer determines that the amount of completed work is insufficient to be considered for Substantial Completion, the Engineer will not proceed with the Punch List process until sufficient completion of the Project is achieved.
 - b. The Engineer will review the Contractor's Punch List and if the Engineer determines that it does not reflect proper identification of the incomplete and incorrect work, he/she will request a revision and resubmission of the Contractor's Punch List.
 - c. If the Engineer determines that the amount of work indicated on the Contractor's Punch List is excessive, the Engineer will suspend its review until the scope of work identified in the Contractor's Punch List is reduced to a level satisfactory to the Engineer.
 - d. When the Engineer reviews and accepts the Contractor's Punch List as being an accurate reflection of incomplete and incorrect work; the Engineer will prepare and issue to the Contractor the "Engineer's Punch List".
 - 1) The "Engineer's Punch List" will be based on the Contractor's Punch List with modifications and additions as may be required.
 - 2) The "Engineer's Punch List" includes work which must be completed and corrected prior to final completion.
 2. Upon receipt of the "Engineer's Punch List", the Contractor shall immediately distribute the list to all subcontractors.
- D. Completion of Punch List Work: Make reasonable efforts to ensure that all "Engineer's Punch List" items are completed or corrected within 14 calendar days from the date of the Engineer's Punch List" or within the Contract Time, whichever comes first.
- E. Engineer's Final Inspection and review of Punch List Work:
1. After Contractor certification that all Punch List Work has been properly completed the Engineer will then perform the Final Inspection.
 - a. Incomplete Items: If the Engineer discovers any incomplete or incorrect "Engineer's Punch List" items or any other deficiency in the work, the Engineer will prepare a "Revised Punch List" which may also include other incomplete Contract requirements such as record documents, owner's operation and maintenance manuals, warranties, and other Contract requirements. Engineer's site reviews of the Work for this "Revised Punch List" and any subsequent revised Punch Lists shall be performed as additional service to Owner, back-charged to the Contractor.
 - b. The Engineer may assign a dollar value for each item of incomplete or incorrect work remaining.
- F. Additional Inspections and related additional services fee: The Engineer and the Engineer's consultants will provide two site inspections, one at Substantial Completion, and one to confirm that the "Engineer's Punch List" has been completed.
1. Revised Punch List: If the Engineer prepares and issues a "Revised Punch List" because of the Contractor's failure to complete the Work, then the Owner shall compensate the Engineer and the Engineer's consultants for their additional services and additional inspections. The payment for additional services and inspections will be back- charged to Contractor. The Owner will deduct the amount of the Engineer's additional services fee from final payment to the Contractor by Change Order.

1.13 CLOSEOUT PROCEDURES - SUBSTANTIAL COMPLETION

- A. Prior to requesting inspection for certification of Substantial Completion, complete the following.
1. On Application for Payment, show 100 percent completion for portions of work claimed as substantially complete.
 - a. Submit list of incomplete items (Punch List), value of incomplete work, and reasons work is not complete.
 2. Obtain evidence of compliance with requirements of governmental agencies having jurisdiction including, but not necessarily limited to:
 - a. Certificate of Final Inspections, "signed off" by authorities having jurisdiction.
 3. Submission of product and installation warranties, workmanship bonds, maintenance agreements, installer certifications and similar documents specified in individual sections.
 4. Remove temporary facilities and services that are no longer required.
 5. Remove mock-ups, field samples and similar items.
 6. Complete Final Cleaning, including repair and restoration, or replacement of damaged Work.
 7. Remove surplus materials, rubbish and similar elements.
 8. Application for reduction of retainage.
 9. Consent of Surety.
 10. Advise the Owner of the change-over in security provisions.
 11. Notification of shifting insurance coverage.
- B. Within 2 weeks after receipt of the notice of Substantial Completion from the Contractor, the Engineer will inspect to determine status of completion.
1. Should the Engineer determine that the Work is not substantially complete:
 - a. The Engineer will notify the Contractor in writing, stating the reasons therefore.
 - b. The Contractor shall remedy the deficiencies and send a second written notice of Substantial Completion to the Engineer, requesting re-inspection.
- C. When the Engineer concurs that the Work is substantially complete.
1. The Engineer will prepare the document CERTIFICATE OF SUBSTANTIAL COMPLETION, in accordance with the requirements of the GENERAL CONDITIONS and SUPPLEMENTARY CONDITIONS, accompanied by the Contractor's list of items to be completed or corrected, as verified by the Engineer.
 2. The Engineer will submit the Certificate to the Owner, and to the Contractor, for their written acceptance of the responsibilities assigned to them in the Certificate.

1.14 CLOSEOUT PROCEDURES - FINAL ACCEPTANCE

- A. Prior to requesting inspection for certification of Final Acceptance and final payment, perform the following:
1. Completion of incomplete Work. Submit a copy of the final inspection list stating that each item has been completed or otherwise resolved for acceptance.
 2. Prove that all taxes, fees and similar legal obligations have been paid.
 3. Submit final payment requests with release of all liens and supporting documentation.

4. Provide written assurances that all unsettled claims are in the process of and will be resolved.
 5. Submit updated final statement, including accounting for final additional changes to the Contract Sum. Show additional Contract Sum, additions and deductions, previous Change Orders, total adjusted Contract Sum, previous payments and Contract Sum due.
 6. Submit consent of surety to Final Payment.
 7. Submit evidence of continuing insurance coverage complying with insurance requirements.
 8. Remove remaining temporary facilities and services.
 9. Deliver to Owner and obtain receipts for:
 - a. Operation and Maintenance Manuals for items so listed in individual Sections of the Specifications, and for other items when so directed by the Engineer.
 - b. Project Record Documents (as-builts), including CAD format drawings.
 - c. Warranties and bonds specified in individual Sections of the Specifications.
 - d. Spare parts and materials extra stock.
 - e. List of subcontractors, service organizations, and principal vendors, including names, addresses, and telephone numbers where they can always be reached for emergency service including nights weekends, and holidays.
 10. Submit Certification stating Work has been inspected for compliance with the Contract Documents.
 11. Submit Certification stating equipment and systems have been tested in presence of Owner's representative and are fully operational.
 12. Submit Certification stating that Work is 100 percent complete and ready for final inspection.
- B. Within 2 weeks after receipt of the request for Final Acceptance from the Contractor, the Engineer will inspect to determine status of completion.
1. Should the Engineer determine that the Work is incomplete or defective:
 - a. The Engineer will notify the Contractor in writing, stating the reasons listing the incomplete or defective work.
 - b. The Contractor shall take immediate steps to remedy the deficiencies and send a second written notice of request for Final Acceptance to the Engineer.
 - c. Costs relative to the Engineers re-inspection due to failure of Work to comply with claims made by the Contractor, will be compensated by the Owner, who will deduct the amount of such compensation from the Final Payment due to the Contractor.
- C. After the Engineer finds the Work acceptable, the Engineer will review the Final Close-out submittals.
- D. Application for Final Payment: Submit Application for Final Payment in accordance with procedures and requirements of the General Conditions and Supplementary Conditions.
1. The Engineer will prepare a Final Change Order, reflecting approved adjustments to the Contract Sum not previously made by other Change Orders.

1.15 CONFERENCES AFTER SUBSTANTIAL COMPLETION

- A. The Owner reserves the right to call for conferences commencing with the date of Substantial Completion and continuing for one year thereafter, for purposes of inspecting the Work and to plan correction of any deficiencies or failures discovered during this period.
 - 1. Attendance is required by Contractor's Project Manager, Engineer, and each applicator, installer, and supplier as the Owner may direct or the Contractor may wish to have present. All representatives attending such meetings shall be the same persons, or shall have the same powers and authority, as those attending progress meetings occurring prior to the Date of Substantial Completion.

1.16 PRODUCT WARRANTIES AND PRODUCT BONDS

- A. Obtain warranties and bonds executed in duplicate by responsible Subcontractors, suppliers, and manufacturers within ten days after completion of applicable item of Work.
- B. Execute and assemble transferable warranty documents and bonds from Subcontractors, suppliers, and manufacturers.
- C. Verify documents are in proper form, contain full information, and are notarized.
- D. Co-execute submittals when required.
- E. Include table of contents and assemble in three D side ring binder.
- F. Submit prior to final Application for Payment.

1.17 PROJECT RECORD DOCUMENTS

- A. General: Record documents shall reflect actual "as-built" condition and the products installed. Include all changes and deviations from original Contract Documents, and incorporate information from
 - 1. Original Contract Documents.
 - 2. Addenda.
 - 3. Change orders.
 - 4. Construction change directives.
 - 5. Field directives, and instructions from the Owner, Engineer or regulatory authorities having jurisdiction.
- B. Project Record Documents include, but are not limited to:
 - 1. Record Project Manual.
 - 2. Project record drawings (as built drawings).
 - 3. Operation and maintenance data, preventive maintenance instructions.
 - 4. Product warranties and bonds.
 - 5. Record of all test reports and inspections.
- C. Labeling and identification of Record Documents
 - 1. Clearly label all record documents with name of Project and the words "Record Document".

2. Date progressive entries of information as appropriate.
3. Date Record Documents with the final submission date.

1.18 SUBMITTAL QUANTITY REQUIREMENTS

- A. Furnish Engineer with the following quantities of each submittal:
 1. Record Project Manual: 4 bound copies.
 2. Project record drawings (as-builts) within 30 days of substantial completion:
 - a. 2 sets of Drawings in Autocad™ format. Verify release version and disc type with Owner prior to submittal.
 - b. 2 "blackline print" sets of Drawings.
 3. Operation and maintenance data, preventive maintenance instructions: 4 bound copies.
 4. Product warranties and bonds: 2 copies
 5. Record of all test reports and inspections: 4 copies

1.19 RECORD PROJECT MANUAL

- A. The Contractor is responsible to maintain a Project Manual reflecting revisions and changes to the Original Issue Project Manual.
 1. Clearly label the Record Project Manual as "Record Document Specifications, in a three-ring binder.
 2. Do not use Record Project Manual for construction purposes; protect from loss in a secure location.
 3. Record all variations and deviations to the Contract Documents, including changes made by Addenda, Bulletin, Change Order, Change Directive and other modifications to the Contract.
 - a. Cut and paste revisions into their applicable specification section.
 - b. Identify all changes with cross-reference to appropriate Addendum Number, Modification Number, Change Order Number
 4. In each individual Specification Section, under "*Part 2 – Products*", identify all manufacturers and products which are actually used as part of the Work.
 5. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
- B. Record Project Manual: Provide prior to request for Final Acceptance.
 1. Manuals shall be in 8-1/2 by 11-inch pages and bound in 3-ring (D-shape) binders with durable plastic covers. Internally subdivide the binder contents by Division with permanent page dividers.
 2. Label front cover and spine of each binder with laser printed titles, dates, and project information.
 3. All information from "in-progress" manual shall be clearly and completely transferred.
 4. Pages shall be undamaged.

1.20 PROJECT RECORD DRAWINGS

- A. The Contractor is responsible to maintain a clean, undamaged set of prints of Contract Drawings and shop drawings for preparing the record drawings.

1. Where shop drawings are used, record a cross-reference at the corresponding location on the Contract Documents.
- B. Do not use Record Documents for construction purposes; protect from loss in a secure location. Mark-up these drawings to show clearly and completely the actual installation reflecting all changes made in the Work during construction.
 1. Mark whichever drawing is most capable of showing conditions accurately.
 2. Record all variations and deviations to the Contract Documents.
 3. Record new information that is important to the Owner but was not shown on the Contract Drawings or shop drawings.
 4. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
- C. The electrical trades shall be responsible to the Contractor to keep the record documents for their portions of the work marked currently to record all changes in the electrical work made during construction
- D. The Engineer may periodically inspect these record drawings, and their proper maintenance may be a condition precedent to approval of applications for periodic payments.
- E. Deliver all Project Record Documents, shop drawings, product data, and samples to the Engineer for the Owner's use, upon completion of the Work and prior to request for Final Acceptance of the Work.
- F. In addition, at the completion of the work, the Contractor is responsible for the preparation and submittal of neat, clean well drafted, and complete record drawings, within 30 days of substantial completion at no additional costs to the Owner. These reproducible Project Record Documents shall be transmitted to the Engineer as a condition precedent to final payment, and include documents prepared by the site utilities and electrical trades.

1.21 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Provide products, spare parts, maintenance and extra materials in quantities specified in individual specification Sections.
- B. Deliver materials to on-site location designated by the Owner; obtain receipt.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that existing Site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.
- B. Examine and verify specific conditions described in individual Specification Sections.

- C. Verify that utility services are available with correct characteristics and in correct locations.

3.2 PREPARATION

- A. Contact Dig-Safe prior to the start of construction.
- B. Review Contract Documents prior to the start of Construction.

3.3 EXECUTION

- A. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.
- B. When manufacturer's installation instructions conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- C. Verify that field measurements are as indicated on approved Shop Drawings or as instructed by manufacturer.
- D. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.
 - 1. Secure Work true to line and level and within specified tolerances, or if not specified, industry-recognized tolerances.
 - 2. Physically separate products in place, provide electrical insulation, or provide protective coatings to prevent galvanic action or corrosion between dissimilar metals.
 - 3. Exposed Joints: Provide uniform joint width and arrange to obtain best visual effect. Refer questionable visual-effect choices to Architect/Engineer for final decision.
- E. Climatic Conditions and Project Status: Install each unit of Work under conditions to ensure best possible results in coordination with entire Project.
 - 1. Isolate each unit of Work from incompatible Work as necessary to prevent deterioration.
 - 2. Coordinate enclosure of Work with required inspections and tests to minimize necessity of uncovering Work for those purposes.
- F. Mounting Heights: Where not indicated, mount individual units of Work at industry recognized standard mounting heights for application indicated.
 - 1. Refer questionable mounting heights choices to Architect/Engineer for final decision.
 - 2. Elements Identified as Accessible to Handicapped: Comply with applicable codes and regulations.
- G. Adjust operating products and equipment to ensure smooth and unhindered operation.
- H. Clean and perform maintenance on installed Work as frequently as necessary through remainder of construction period. Lubricate operable components as recommended by manufacturer.

3.4 PROTECTING INSTALLED CONSTRUCTION

- A. Protect installed Work and provide special protection where specified in individual Specification Sections.
- B. Provide temporary and removable protection for installed products. Control activity in immediate Work area to prevent damage.
- C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- D. Use durable sheet materials to protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects.
- E. Prohibit traffic or storage upon waterproofed or roofed surfaces. When traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- F. Prohibit traffic from landscaped areas.

3.5 FINAL CLEANING

- A. Execute final cleaning prior to final Project assessment.
- B. Clean equipment and fixtures to sanitary condition with appropriate cleaning materials.
- C. Remove temporary barriers and erosion control systems.
- D. Clean debris from drainage systems.
- E. Clean Site; sweep paved areas, rake clean landscaped surfaces.
- F. Remove waste and surplus materials, rubbish, and construction facilities from Site.

END OF SECTION

DIVISION 3

SUPPLEMENTAL TECHNICAL SPECIFICATIONS

SECTION 03 20 00 - CONCRETE REINFORCING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Reinforcing bars.
2. Welded wire fabric.
3. Reinforcement accessories.

B. Related Sections:

1. Section 03 30 00 - Cast-In-Place Concrete.
2. Section 32 13 13 – Concrete Paving.

1.2 REFERENCES

A. American Concrete Institute:

1. ACI 301 - Specifications for Structural Concrete.
2. ACI 318 - Building Code Requirements for Structural Concrete.
3. ACI 530.1 - Specifications for Masonry Structures.
4. ACI SP-66 - ACI Detailing Manual.

B. ASTM International:

1. ASTM A82/A82M - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
2. ASTM A184/A184M - Standard Specification for Fabricated Deformed Steel Bar Mats for Concrete Reinforcement.
3. A185/A185M-07 Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
4. ASTM A496/A496M - Standard Specification for Steel Wire, Deformed, for Concrete Reinforcement.
5. ASTM A497/A497M - Standard Specification for Steel Welded Wire Fabric, Deformed, for Concrete Reinforcement.
6. ASTM A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
7. ASTM A704/A704M - Standard Specification for Welded Steel Plain Bar or Rod Mats for Concrete Reinforcement.
8. ASTM A706/A706M - Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement.
9. ASTM A767/A767M - Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement.

10. ASTM A775/A775M - Standard Specification for Epoxy-Coated Steel Reinforcing Bars.
11. ASTM A884/A884M - Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement.
12. ASTM A934/A934M - Standard Specification for Epoxy-Coated Prefabricated Steel Reinforcing Bars.
13. ASTM A996/A996M - Standard Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement.

C. American Welding Society:

1. AWS D1.4 - Structural Welding Code - Reinforcing Steel.

D. Concrete Reinforcing Steel Institute:

1. CRSI - Manual of Standard Practice.
2. CRSI - Placing Reinforcing Bars.

1.3 SUBMITTALS

- A. Shop Drawings: Indicate bar sizes, spacings, locations, and quantities of reinforcing steel and welded wire fabric, bending and cutting schedules, and supporting and spacing devices.
- B. Certificates: Submit AWS qualification certificate for welders employed on the Work.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with the Drawings and applicable sections of CRSI - Manual of Standard Practice, ACI 301 and ACI 318.

1.5 QUALIFICATIONS

- A. Welders: AWS qualified within previous 12 months.

1.6 COORDINATION

- A. Coordinate with placement of formwork, formed openings and other Work.

PART 2 PRODUCTS

2.1 REINFORCING BARS

- A. Deformed Bars, Grade 60, meeting ASTM A 615. No re-rolled or high carbon steel bars will be permitted in the work.

2.2 STEEL WIRE

- A. ASTM A82, plain, cold drawn steel.

2.3 WELDED WIRE FABRIC

- A. All welded wire fabric (WWF) to be mesh fabrication, which meets the requirements of ASTM A 185; and to be supplied in flat sheets.

2.4 REINFORCEMENT SUPPORTS

- A. Provide supports for reinforcements including bolsters, chairs and spacers. Bar supports for surfaces exposed to view after form stripping to be small concrete blocks made of the same color and strength concrete being placed around them. Use concrete supports for reinforcing in concrete placed on grade.

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

- A. Conform to ACI 318 02, (use most recent revision) “Building Code for Reinforced Concrete” in placing reinforcing bars. All bars to be bent cold.

3.2 PLACEMENT OF STEEL

- A. Clean reinforcement of any loose mill scale, rust, oil, earth and other contaminants.
- B. Positioning, spacing, splicing: conform to ACI 318.
- C. Set wire ties so that ends are directed into concrete, not toward exposed concrete surface.

3.3 INSPECTION

- A. Contractor to notify the Engineer when reinforcing is in place and ready for inspection. Twenty-four hours advance notice to be provided to be allowed for inspection prior to placement of concrete.

END OF SECTION

SECTION 03 30 00 - CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes cast-in-place concrete including formwork, reinforcement, and finishes for the following:
1. Slabs on grade.
 2. Control, expansion and contraction joint devices.
 3. Equipment pads.
 4. Ramps and steps.
 5. Light pole base.
 6. Bollards and Posts.
- B. Related Sections:
1. Section 03 20 00 - Concrete Reinforcing.
 2. Section 32 13 13 - Concrete Paving.

1.2 REFERENCES

- A. American Concrete Institute:
1. ACI 301 - Specifications for Structural Concrete.
 2. ACI 305 - Hot Weather Concreting.
 3. ACI 306.1 - Standard Specification for Cold Weather Concreting.
 4. ACI 308.1 - Standard Specification for Curing Concrete.
 5. ACI 318 - Building Code Requirements for Structural Concrete.
- B. ASTM International:
1. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
 2. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field.
 3. ASTM C33 - Standard Specification for Concrete Aggregates.
 4. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
 5. ASTM C42/C42M - Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
 6. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete.
 7. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic Cement Concrete.
 8. ASTM C150 - Standard Specification for Portland Cement.

9. ASTM C172 - Standard Practice for Sampling Freshly Mixed Concrete.
10. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
11. ASTM C231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
12. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.
13. ASTM C330 - Standard Specification for Lightweight Aggregates for Structural Concrete.
14. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete.
15. ASTM C595 - Standard Specification for Blended Hydraulic Cements.
16. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.
17. ASTM C685/C685M - Standard Specification for Concrete Made By Volumetric Batching and Continuous Mixing.
18. ASTM C845 - Standard Specification for Expansive Hydraulic Cement.
19. ASTM C989 - Standard Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars.
20. ASTM C1017/C1017M - Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
21. ASTM C1064/C1064M - Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete.
22. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
23. ASTM C1116 - Standard Specification for Fiber-Reinforced Concrete and Shotcrete.
24. ASTM C1157 - Standard Performance Specification for Hydraulic Cement.
25. ASTM C1218/C1218M - Standard Test Method for Water-Soluble Chloride in Mortar and Concrete.
26. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures.
27. ASTM D994 - Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type).
28. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
29. ASTM D1752 - Standard Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.
30. ASTM D6690 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.
31. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials.
32. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
33. ASTM E1643 - Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill under Concrete Slabs.
34. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.

1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

1.4 SUBMITTALS

A. Design Data:

1. Submit concrete mix design for each concrete strength. Submit separate mix designs when admixtures are required for the following:
 - a. Hot and cold weather concrete work.
 - b. Air entrained concrete work.
2. Identify mix ingredients and proportions, including admixtures.
3. Identify chloride content of admixtures and whether or not chloride was added during manufacture.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with the following ACI Publications unless modified by requirements in the Contract Documents:

1. ACI 301, "Specification for Structural Concrete."
2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

B. Concrete Testing Service: Contractor to engage a qualified independent testing agency to perform material evaluation tests to ensure work is being completed in accordance with the Contract Documents as necessary.

C. Conform to ACI 305 when concreting during hot weather.

D. Conform to ACI 306.1 when concreting during cold weather.

E. Acquire cement and aggregate from one source for Work and order and secure in advance a sufficient quantity of cement(s) to complete concrete as indicated on Drawings.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Maintain concrete temperature after installation at minimum 50 degrees F for minimum 7 days. Supply cold weather curing blankets and heaters when temperatures require.

1.7 COORDINATION

A. Coordinate placement of joint devices with erection of concrete formwork and placement of form accessories.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle material to prevent damage.

- B. Handle and store materials separately in such manner as to prevent intrusion of foreign matter, segregation, or deterioration.
- C. Do not use foreign materials or those containing ice.
- D. Remove improper and rejected materials immediately from point of use.
- E. Cover materials, including steel reinforcement and accessories, during construction period. Stockpile concrete constituents properly to assure uniformity throughout project.

PART 2 PRODUCTS

2.1 CONCRETE MATERIALS

- A. Cement: American-made Portland Cement, free from water soluble salts or alkalis which cause efflorescence on exposed surfaces.
 - 1. Portland Cement: Type II, ASTM C150. Use only one brand of cement for each type of cement throughout project.
 - 2. No visual variations in color will result in exposed concrete.

- B. Normal Weight Fine Aggregate: Washed, inert, natural sand conforming to ASTM C33 and following additional requirements:

Sieve	Retained Percent
#4	0 - 5
#16	25 - 40
#50	70 - 87
#100	93 - 97
Fineness Modulus:	2.80 (Plus/Minus 0.20)
Organic:	Plate 2 maximum
Silt:	2.0 percent maximum
Mortar Strength:	100 percent minimum compression ratio
Soundness:	5 percent maximum loss, magnesium sulfate, five cycles

- C. Normal Weight Coarse Aggregate: Well graded crushed stone or washed gravel conforming to ASTM C33 and the following additional requirements:

Designated Size (inches)	3	2	1-1/2	1	3/4	1/2	3/8
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F.M. (+/-0.20)	7.95	7.45	7.20	6.95	6.70	6.10	4.50
Organic:	Plate 1 maximum						
Silt:	1.0 percent maximum						
Soundness:	5 percent maximum loss, magnesium sulfate, five cycles						

- D. Maximum designated sizes for normal weight coarse aggregate to be used in concrete sections as noted below, except that sizes be chosen in conjunction with required clearances.
1. One and one-half inches for sections over ten inches in thickness.
 2. One inch for sections more than eight and up to ten inches in thickness.
 3. Three-quarter inch for sections more than three and up to eight inches in thickness.
- E. Water-Cement Ratio: Have a maximum water cement ratio of 0.45 conforming to ACI 316R.
- F. Minimum 25% of cementitious material to be fly ash to meet LEED requirement.
- G. Air content by volume: 6 percent +/- 1 percent.
- H. Slump: Not less than 3 inches or greater than 4 inches in accordance with ASTM C143 or other method as approved by the Engineer.
- I. Water: ACI 318; potable, clean and free from oils, acids, alkali, organic matter and other deleterious material, without deleterious amounts of chloride ions.

2.2 ADMIXTURES

A. Manufacturers

1. Water-reducing agent: same manufacturer as air-entraining agent.
 - a. "WRDA" - W.R. Grace & Co.
 - b. "PDA25" - Protex Industries, Inc.
 - c. "Pozzolith 344H" - Master Builder's Co.
2. Air-entraining agent:
 - a. "DAREX AEA" - W.R. Grace & Co.
 - b. "PROTEX AEA" - Protex Industries
 - c. "MB-VR" or "MB-AE" - Master Builder's Co.

B. Air Entrainment: ASTM C260.

C. Chemical: ASTM C494/C494M.

D. Fly Ash: ASTM C618 Class to suit application.

- E. Silica Fume: ASTM C1240.
- F. Slag: ASTM C989; Grade 100 or greater; ground granulated blast furnace slag.
- G. Superplasticizer: High-range water-reducer conforming to ASTM C494, Type F or Type G.

2.3 ACCESSORIES

- A. Bonding Agent: To suit application.
- B. Non shrinkage grout: ASTM C1107/C1107M; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of not be less than 5000 psi at 7 days and 7500 psi at 28 days.
 - 1. Manufacturers:
 - a. "Embeco Pre-mixed Grout" by Master Builder's.
 - b. "Vibro-Foil Ready-Mixed" by W.R. Grace & Co.
 - c. "Ferrolith G" by Sonneborn Building Products, Inc.
- C. Concrete Reinforcing Fibers: ASTM C1116, high strength industrial-grade fibers specifically engineered for secondary reinforcement of concrete. Tensile strength -130 ksi; toughness 15 ksi; 3/4 inch long fibers, 34 million/lb fiber count.

2.4 JOINT DEVICES AND FILLER MATERIALS

- A. Joint Filler Type A: ASTM D1751 and/or ASTM D994; Asphalt impregnated fiberboard or felt, 1/4 inch thick; tongue and groove profile.
- B. Construction Joint Devices: Integral galvanized steel or extruded plastic; formed to tongue and groove profile, knockout holes spaced at 6 inches, ribbed steel spikes with tongue to fit top screed edge.
- C. Expansion Joint Devices: ASTM B221 alloy, extruded aluminum; resilient elastomeric filler strip with Shore A hardness of 35 to permit plus or minus 25 percent joint movement with full recovery.

2.5 CONCRETE MIX

- A. In accordance with "Method 1" of ACI 301, and the requirements of this Section. All concrete is normal weight unless specifically designated otherwise; air-dry weight not to exceed 150 lbs. per cubic foot.
- B. Limiting values shown below apply for specific strengths of concrete with coarse aggregates less than one and one-half inches unless noted otherwise in TABLE A below.

TABLE A

Minimum Allowable Compressive Strength at 28 day (psi)	Max. Allowable Net Water Content Gallons/Sack*	Minimum Permissible Cement Factor Sacks/Cubic Yard**
4,000	5.75	6.00
3,000	6.50	5.00

* Maximum; decrease if possible. This represents total water in mix at time of mixing, including free water on aggregate.

** Minimum; increase as necessary to meet other requirements.

- C. Admixtures: Include admixture types and quantities indicated in concrete mix designs only when approved by Architect/Engineer.
1. Water-Reducing Admixture – Use the approved water-reducing admixture in all concrete, in accordance with manufacturer's written instructions.
 2. Do not use admixtures retarding setting of cement in concrete without written approval of Engineer.
 3. Do not use admixtures causing accelerated setting of cement in concrete without written approval of Engineer.
 4. Use accelerating admixtures in cold weather. Use of admixtures will not relax cold weather placement requirements.
 5. Use calcium chloride only when necessary.
 6. Use set retarding admixtures during hot weather.
 7. Add air entrainment admixture to concrete mix for work exposed to freezing and thawing or deicing chemicals.
 8. For concrete exposed to deicing chemicals, limit fly ash, pozzolans, silica fume, and slag content as required by applicable code.
- D. Average Compressive Strength Reduction: Permitted in accordance with ACI 318.
- E. Ready Mixed Concrete: Mix and deliver concrete in accordance with ASTM C94/C94M.
- F. Site Mixed Concrete: Mix concrete in accordance with ACI 318.

2.6 FORMS

- A. Cylindrical Forms: Sonotube Fibre Forms, wax-impregnated strippable. ABS or PVC plastic reusable forms, or approved equivalent.
1. Manufacturer:

- a. Sonoco Products Company, General Products Division.
- B. Forms for Exposed Finish: Plywood, metal, metal-framed plywood faced, or other acceptable panel materials.
 - 1. Plywood: APA Ref. 1 B-B (Concrete Form), Class I Exterior Grade plywood or B-B or A-C Class I high density overlay concrete form plywood. Form work to provide a smooth, continuous, straight and level surface.
- C. Forms for Unexposed Finish: Plywood, lumber or metal, with lumber dressed on at least two edges and one side.
- D. Form Ties: Prefabricated, adjustable length galvanized steel snap-off ties, with brackets, cones, cornerlocks and other accessories as necessary.
- E. Form Release Agent: Commercial formulation compounds that do not bond with, stain or adversely affect concrete.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify all work prepared by others to receive work of this Section and report any defects affecting to the Engineer prior to installation. Commencement of concrete work indicates acceptance of all preparatory work by the others.
- B. Verify requirements for concrete cover over reinforcement.
- C. Verify anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with placing concrete.

3.2 PREPARATION

- A. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent. Remove laitance, coatings, and unsound materials.
- B. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.
- C. Remove debris and ice from formwork, reinforcement, and concrete substrates.
- D. Remove water from areas receiving concrete before concrete is placed.

3.3 FORMING

- A. Install forms to the dimensions shown in the Drawings. Forms to be free from surface debris.

3.4 MIXING AND DELIVERY

- A. Ready mix and provide concrete from the plant approved by the Engineer.
- B. Do not use hand or site mixing unless approved by the Engineer.
- C. Batch mix at the central plant constituents, including admixtures except certain corrosion inhibitors and superplasticizers. Premix admixtures solution form and dispensed as recommended by manufacturer.
- D. Central plant and rolling stock equipment and methods to conform with Truck Mixer and Agitator Standard of Truck Mixer Manufacturer's Bureau of National Ready-Mixed Concrete Association, and Contract Documents.
- E. Transport ready mixed concrete to the site in watertight agitator or mixer trucks loaded not in excess of rated capacities.
- F. Discharge concrete at site within one and one-half hours after cement was first introduced into mix. Legally dispose of site concrete not discharged within one and one-half hours.
- G. Central mixed concrete to be mixed at the plant for a minimum of five minutes. Begin agitation immediately after premixed concrete is placed in truck and continue without interruption until discharged.
- H. Mix transit mixed concrete at mixing speed for at least ten minutes immediately after charging truck followed by agitation without interruption until discharged. Provide concrete from a single plant unless approved by the Engineer in writing.
- I. Retempering of concrete which has partially hardened, that is, mixing with or without additional cement, aggregates, or water, is not be permitted.

3.5 PLACING CONCRETE

- A. Concrete not to be pumped without the approval of the Engineer.
- B. Do not place concrete with a temperature greater than 85 degrees F.
- C. Place concrete in accordance with ACI 301.
- D. Notify testing laboratory and Engineer minimum 24 hours prior to commencement of operations.
- E. Ensure reinforcement, inserts, embedded parts, formed expansion and contraction joints, and others as required are not disturbed during concrete placement.
- F. Remove water and foreign matter from forms and excavations and, except in freezing weather or as otherwise directed, thoroughly wet wood forms just prior to placing concrete.

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- G. Do not place concrete on frozen soil and provide adequate protection against frost action during freezing weather.
- H. Transport concrete from mixer to place of final deposit as rapidly as practical by methods which prevent separation of ingredients and displacement of reinforcement, and which avoid re-handling. Do not deposit partially hardened concrete.
- I. When concrete is conveyed by chutes, use equipment of such size and U-shaped design as to insure continuous flow in chute.
 - 1. Do not use flat (coal) chutes. Use metal or metal lined chutes and with a continuous slope. Slope not to be less than 25 degrees nor more than 45 degrees from horizontal and to prevent segregation of ingredients.
 - 2. Provide at the discharge end of the chute with a baffle plate or spout to prevent segregation. If the discharge end of the chute is more than five feet above surface of concrete in forms, use a spout to lower and maintain as near surface of deposit as practicable.
 - 3. When operation is intermittent, discharge chute into hopper.
 - 4. Thoroughly clean the chute before and after each run and discharge any debris and water used outside the forms.
 - 5. Do not allow concrete to flow horizontally over distances exceeding five feet.
- J. Place concrete to prevent segregation, and accumulations of hardened concrete on forms or reinforcement above mass of concrete being placed. Use suitable hoppers, spouts with restricted outlets and tremies as required.
- K. During and immediately after depositing, compact concrete by means of internal type mechanical vibrators or other tools, or by spading to produce required quality of finish. Vibration to be performed by experienced operators under close supervision and be carried on only enough to produce homogeneity and optimum consolidation without permitting segregation of constituents or "pumping" of air. Operate vibrators at speeds at not less than 7,000 vpm. Do not use vibrators to move concrete. Supplement vibration by proper wooden spade puddling to remove bubbles and honeycomb adjacent to visible surfaces. Provide at least one vibrator for every 10 cubic yards of concrete placed per hour, plus one spare. All vibrators to be operable and on site prior to starting placement.
- L. Deposit concrete continuously, and in layers of such thickness that no concrete will be deposited on concrete which has hardened sufficiently to cause formation of seams and planes of weakness within section.
- M. If section cannot be placed continuously between planned construction joints, as specified, use field joint and additional reinforcement to preserve structural continuity. Immediately notify the Engineer in any such case.
- N. When concrete is placed at or below ambient air temperatures of 40 degrees F or whenever in opinion of Engineer, lower temperatures are likely to occur within 48 hours after placement of concrete, follow cold weather concreting procedures in accordance with ACI 306 and as specified herein. Protect the entire area affected by adequate housing or covering, and heating. Do not use salt, chemicals or other foreign materials in the mix to lower freezing point of concrete.

- O. Clean chutes, hoppers, spouts, adjacent work, etc. before and after each run and discharge water and debris outside form

3.6 CURING AND PROTECTION

- A. Protect concrete work against injury from heat, cold, and defacement of any nature during construction operations. Install curing blankets over all concrete structures during curing period.
- B. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
 - 1. Protect concrete footings from freezing for minimum 7 days.
- C. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
- D. Cure concrete in accordance with ACI 308.1.
- E. Spraying: Spray water over slab areas and maintain wet for 7 days.

3.7 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed by the Contractor's third party independent testing laboratory in accordance with ACI 318.
- B. Provide free access to Work and cooperate with appointed firm for proper testing.
- C. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of Work.
- D. Concrete Inspections:
 - 1. Continuous Placement Inspection: Inspect for proper installation procedures.
 - 2. Periodic Curing Inspection: Inspect for specified curing temperature and procedures.
- E. Strength Test Samples:
 - 1. Sampling Procedures: ASTM C172.

3.8 PATCHING

- A. Allow Engineer to inspect concrete surfaces immediately upon removal of forms.
- B. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Engineer upon discovery.
- C. Patch imperfections as directed by Engineer in accordance with ACI 301.

3.9 DEFECTIVE CONCRETE

- A. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.
- B. Repair or replacement of defective concrete will be determined by Engineer.
- C. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Engineer for each individual area.

3.10 SCHEDULE - CONCRETE TYPES AND FINISHES

- A. Concrete paving (walkways, aprons): 4,000 psi 28 day concrete, air entrained, broom finish with surface sealant.
- B. Exposed exterior equipment pads, steps, ramps, other: 4,000 psi 28 day concrete, air entrained, broom finish with surface sealant.
- C. Exposed concrete retaining walls: 4,000 psi 28 day concrete, air entrained, broom finish with surface sealant.
- D. General foundations for site furnishings and appurtenances: 3,500 psi 28 day concrete, air entrained.

END OF SECTION

SECTION 03 40 00 - PRECAST CONCRETE CURB STOPS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Precast Concrete Curb Stops (Bumpers)

B. Related Sections:

1. Section 32 12 16 - Asphalt Paving

1.2 REFERENCES

A. American Concrete Institute:

1. ACI 301 - Specifications for Structural Concrete.
2. ACI 318 - Building Code Requirements for Structural Concrete.
3. ACI 530.1 - Specifications for Masonry Structures.
4. ACI SP-66 - ACI Detailing Manual.

1.3 SUBMITTALS

- A. Shop Drawings: Catalog cuts, specifications, and installation instructions for precast bumpers and setting pins.

1.4 QUALITY ASSURANCE

- A. Test Reports: Random freeze thaw tests shall be conducted by the manufacturer. Test specimens shall retain 60 percent of its initial modulus of elasticity after 300 cycles. Furnish test results to the Engineer upon request.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Precast Concrete: Normal weight, 4,000 psi, air entrained concrete. Air content shall be 6 percent by volume within an allowable tolerance of plus or minus 1.5 percent.
- B. Bar Reinforcement: ASTM A 615, Grade 40, deformed.

- C. Setting Pins: #6 bar x 30 inches long or 3/4 x 18 inches galvanized steel or as shown in the Drawings.

2.2 FABRICATION

- A. Parking bumpers shall be cast at the manufacturer's plant, not at the job site. Castings shall have plane smooth surfaces, true to line and face, free from defects and sharp arises. Overall dimensions for castings shall not vary more than 1/16 inch from those indicated.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Parking bumpers shall be installed in the locations shown in the Drawings.
- B. Center each unit between parking bay lines.
- C. Anchor each parking bumper with two setting pins driven through precast or drilled holes into the subgrade or pavement below.
- D. Reset existing parking bumpers approved for reuse by the Engineer when applicable.

3.2 FIELD QUALITY CONTROL

- A. The Engineer may conduct additional tests. Replace units taken for testing, not to exceed 10 linear feet for each 1000 feet or fraction thereof delivered to the project.

END OF SECTION

SECTION 06 13 00 - TIMBER CONSTRUCTION

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes structural lumber and timber:
 - 1. Footbridge framing including joists/stringers, and other wood framing as required.
 - 2. Miscellaneous Framing and woodwork with dimension lumber as required.
- B. Related Sections:
 - 1. Section 06 15 00 – Wood Decking.
 - 2. Section 31 20 00 – Earth Moving.

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM F593 - Standard Specification for Stainless Steel Bolts, Hex Cap, Screws, and Studs.
 - 2. ASTM D 5456-19 – Standard Specification for Evaluation of Structural Composite Lumber Products.
 - 3. ASTM D-7032-04: Standard Specification for Establishing Performance Ratings for Wood-Plastic Composite Deck Boards and Guardrail Systems (Guards or Handrails), ASTM International.
- B. American Wood-Preservers' Association:
 - 1. AWWPA M4 - Standard for the Care of Preservative-Treated Wood Products.
 - 2. AWWPA U1 - Use Category System: User Specification for Treated Wood.
- C. U.S. Department of Commerce National Institute of Standards and Technology:
 - 1. DOC PS 2 - Performance Standard for Wood-Based Structural-Use Panels.
 - 2. DOC PS 20 - American Softwood Lumber Standard.
- D. U.S. Department of Agriculture: Wetland Trail Design 2007 Edition:
 - 1. Type 3 Puncheon Design.

1.3 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit manufacturer's product data and installation instructions for each material and product used with product information including type, location produced, additives, performance criteria, and others as required. Submit data on proprietary connection devices. Submit technical data on wood preservative materials, if applicable.
- C. Shop Drawings: Submit shop drawings indicating dimension, wood species, lumber sizes, grade, component profiles, drilled holes, fasteners, connectors, erection details, and relationship with adjacent construction. Where applicable, provide shop drawings prepared and stamped by a

qualified professional engineer. Timber framing or composite framing design to be approved and stamped by a Massachusetts registered professional engineer before installation.

- D. Timber framing loading requirements: 85 psf
- E. Environmental Preferable Product Certified SCS-EPP-01699. Alternative materials, including composite/synthetic materials are possible with engineer approval.
- F. Certificates: Certification from treating plant certifying wood treatment applied complies with the criteria and physical requirements for micronized copper quaternary preservative-treated wood products as specified herein.
- G. Warranty: Provide warranty certification document.
- H. Care and maintenance material.

1.4 DEFINITIONS

- A. Dimension Lumber: Lumber of 2 inches nominal or greater.
- B. Timber Construction: structural framing.
- C. Composite: mixture of several components that may include wood, plastic and straw.
- D. Decking: Finish surface of the structure.
- E. Lumber grading agencies, and the abbreviations used to reference them, include the following:
 - 1. ALSC: American Lumber Standard Committee
 - 2. NLGA: National Lumber Grades Authority
 - 3. AWWPA: American Wood Protection Association Standards
 - 4. AF&PA: American Forest and Paper Association

1.5 QUALITY ASSURANCE

- A. Lumber Grading Agency: Certified by DOC PS 20.
- B. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years.

1.6 QUALIFICATIONS

- A. Supplier: Company specializing in manufacture of heavy timber framing certified by AITC with five years minimum experience.
- B. Installer: Company specializing in construction of heavy timber framing with five years minimum experience.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store/stockpile in a dry location in an area free of drainage channels or standing water. Stack lumber flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.
- B. Manufactured materials to be handled and stored in accordance with manufacturers requirements.

1.8 WARRANTY

- A. Manufacturer to provide lifetime warranty against structural failure due to rot, fungal decay or termite damage.

PART 2 PRODUCTS

2.1 GENERAL WOOD PRODUCTS

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
 - 1. Factory mark each piece of lumber with grade stamp of grading agency.
 - 2. Treatment plant location.
 - 3. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified.
 - 4. Preservative retention level.
 - 5. Provide dressed lumber, S4S, unless otherwise indicated.

2.2 WOOD REQUIREMENTS

- A. Wood to be southern yellow pine pressure treated structural lumber with dimensions as shown in the Drawings meeting the following:
 - 1. LifewoodMicroPro/LifeWood Preservative - MicroPro 200C or MP 200-A Micronized Copper Azole (MCA) Preservative.
 - 2. Manufacturer: Osmose, Inc. Contact: PO Drawer O, 1016 Everee Inn Road, Griffin, GA 30224-0249; Telephone: (800) 241-0240, (770) 233-4200; Fax: (770) 229-5225; E-mail: treatedwood@osmose.com; Web site: www.osmosewood.com.
 - 3. Meeting American Wood Protection Association (AWPA) Standards
 - 4. No. 1 grade lumber.
 - 5. All lumber to be **Ground Contact** pressure treated lumber treated to minimum 0.34 pound per cubic foot (pcf) retention.
 - 6. Select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.
 - 7. Provided by sole manufacturer.

2.3 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified and as shown in the Drawings.
 - 1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with stainless steel complying with ASTM F593.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Power-Driven Fasteners: NES NER-272.
- D. Connectors: All fittings, bolts, washers and other accessories to be stainless steel in accordance with the requirements of ASTM F593 – 17.
- E. Bolts, Nuts, Washers, Lags, and Screws: Medium carbon steel; stainless steel; size and type to suit application.

2.4 FABRICATION

- A. Fabricate components in accordance with AITC 108, with joints neatly fitted, welded and ground smooth. Account for shrinkage of timber in design and arrangement of fasteners for connections.

2.5 FINISHES

- A. Timber Surfaces Exposed to View: Rough sawn.
- B. Stainless steel Nuts, Bolts and Washers: ASTM F593 - 17

2.6 WOOD TREATMENT

- A. End cut treatment: Micronized Copper Azole Preservative.

2.7 WOOD/PLASTIC COMPOSITE LUMBER

- A. Material Description: Composite Decking consisting of recycled Linear Low Density Polyethylene (LLDPE) and recycled wood. The product is extruded into shapes and sizes as follows:
 - 1. Dimensions: In accordance with dimensions shows on the Drawings.
 - 2. Structural Performance: Uniform Load – 85lbf/sq.ft.

PART 3 EXECUTION

3.1 PREPARATION

- A. Operate equipment within the Limits of Disturbance in a manner to minimize impacts to the site and site improvements.

- B. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

3.2 GENERAL INSTALLATION

- A. All wood carpentry and framing to be installed in accordance with the Drawings.
- B. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry to other construction; scribe and cope as needed for accurate fit.
- C. Treating of cut or exposed surfaces to be completed where required by the wood manufacturer to satisfy the warranty requirements. Brush-on end coat wood preservative per manufacturer's requirements.
- D. Framing Standard: Where not detailed in the Drawings comply with AF&PA's "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- E. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- F. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following (as applicable):
 - 1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
 - 2. Table 2305.2, "Fastening Schedule," in BOCA National Building Code.
 - 3. Table 2306.1, "Fastening Schedule," in SBCCI's Standard Building Code.
- G. Make provisions for erection loads, and for sufficient temporary bracing to maintain structure safe, plumb, and in indicated alignment until completion of erection and installation of permanent bracing.
- H. Fit timbers to foundation and other construction as indicated on Drawings. Scribe and cope as needed for accurate fit.
- I. Properly install timber structures to adjacent construction and with uniform appearance.
- J. Fit timber frame together so that the bolts at expansion joints will be located at the centers of the slotted holes. Treat field-drilled holes in accordance with AWPA C2.
- K. Restore any damaged components. Clean and protect work from damage.

3.3 FIELD QUALITY CONTROL

- A. Framing: Engineer to perform a field visit to observe framing prior to the installation of decking to confirm location and quality of workmanship.

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END OF SECTION

SECTION 06 15 00 - WOOD DECKING

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes wood decking or composite decking as selected at Contractor's option.
- B. Related Sections:
 - 1. Section 06 13 00 – Timber Construction.

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM F593 - Standard Specification for Stainless Steel Bolts, Hex Cap, Screws, and Studs
 - 2. ASTM F1667 - Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.
 - 3. ASTM D 5456-19 – Standard Specification for Evaluation of Structural Composite Lumber Products.
 - 4. ASTM D-7032-04: Standard Specification for Establishing Performance Ratings for Wood-Plastic Composite Deck Boards and Guardrail Systems (Guards or Handrails), ASTM International.
- B. American Wood-Preservers' Association:
 - 1. AWWPA M4 - Standard for the Care of Preservative-Treated Wood Products.
 - 2. AWWPA U1 - Use Category System: User Specification for Treated Wood.
- C. U.S. Department of Commerce National Institute of Standards and Technology:
 - 1. DOC PS 2 - Performance Standard for Wood-Based Structural-Use Panels.
 - 2. DOC PS 20 - American Softwood Lumber Standard.
- D. Forest Stewardship Council:
 - 1. FSC Guidelines - Forest Stewardship Council Guidelines.
- E. National Forest Products Association:
 - 1. NFPA - Lumber Grading Rules.

1.3 SUBMITTALS

- A. Shop Drawings: Indicate compatibility and connection to framing system, loads, bearing details, and dimensions, stamped by professional as required by the drawings.
- B. Product Data: Submit manufacturer's product data and installation instructions for each material and product used with product information including type, location produced, additives, performance criteria, and others as required.
- C. Installer Data: Name, address and phone number of installer.

- D. Samples of Exposed Wood Deck: Submit two samples, 12 inch in length to illustrate wood grain, sand finish, or approved composite option.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with the following:
 - 1. Lumber Grading Agency: Certified by DOC PS 20.
 - 2. Lumber: DOC PS 20.
 - 3. Wood Panels: DOC PS 1 or DOC PS 2.
 - 4. As indicated on Drawings.
- B. Submit manufacturer's certificate certifying lumber grade.
- C. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

1.5 QUALIFICATIONS

- A. Supplier: Company specializing in manufacturing products specified in this section with minimum five years documented experience.
- B. Installer: Company specializing in performing Work of this section with minimum five years documented experience.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Stack lumber flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.
- B. Lumber delivered with grade stamping.

PART 2 PRODUCTS

2.1 SUPPLIERS

- A. Yankee Pine Corp
288 Newburyport Turnpike
Rowley, MA 01969
Phone: 978 948 7356
Website: <http://www.yankeepine.com/>
- B. Forest Products Associates
Greenfield, MA 01301
Phone: 413 772 6833
Website: www.forestproductsassociates.com
- C. Hingham Lumber Company

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Cohasset, MA 02025
Phone: 781 749 4200
Website: www.hinghamlumber.com

- D. BB&S Treated Lumber
North Kingstown, RI 02852
Phone: 401 295 3200
Website: www.bbslumber.com

2.2 SUSTAINABILITY CHARACTERISTICS

- A. Materials and Resources Characteristics:
1. Certified Wood Materials: Furnish wood materials certified in accordance with FSC Guidelines.

2.3 MATERIALS

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
1. Factory mark each piece of lumber with grade stamp of grading agency.
 2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified.
 3. Provide dressed lumber, S4S, unless otherwise indicated.
 4. All cut or exposed pressure treated lumber surfaces shall be treated with Solvent Based Heavy Duty Treatment solution. Treatment shall be Copper-Green 1- Wood Preservative or ENGINEER approved equal.
 5. All lumber should be select material dressed cut S4S (surfaced four sides).
 6. Select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.
- B. Wood Decking: Decking shall be Arsenic Free Western Wood pressure treated structural lumber with dimensions as shown in the Drawings.

2.4 WOOD/PLASTIC COMPOSITE LUMBER

- A. Material Description: Composite Decking consisting of recycled Linear Low Density Polyethylene (LLDPE) and recycled wood. The product is extruded into shapes and sizes as follows:
1. Dimensions: In accordance with dimensions shows on the Drawings.
 2. Structural Performance: Uniform Load – 85lb/sq.ft.

2.5 ACCESSORIES

- A. Fasteners and Anchors:
1. Fasteners: ASTM F593, stainless steel.
 2. Nails and Staples: ASTM F1667.

3. Deck Fasteners (Wood Screws): Deck surface boards are fastened to the decking joists with #9 x 3-inch Senco DuraSpin stainless steel exterior wood screws or meeting the following:
 - a. Stainless steel.
 - b. #2 Square drive
 - c. Flat-style head ensuring a cleaner-looking installation.
 - d. Cutting wings on the shaft counter-bore the deck board, helping to prevent fastener spin out.
 - e. Type 17 Cut point.
 - f. Driver bit included in each package.

- B. Adhesive: APA/EWA AFG-01, waterproof, air cure type, cartridge dispensed.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify support framing is ready to receive decking and has been approved by the Engineer.

3.2 PREPARATION

- A. Coordinate placement of support items.

3.3 SITE APPLIED WOOD TREATMENT

- A. Wood preservative treatment is not permitted.

3.4 INSTALLATION - DECKING

- A. All decking to be pre-drilled unless otherwise approved in writing by the Engineer with an alternative method presented by the Contractor.
- B. Install decking perpendicular to framing members, with ends staggered over firm bearing. On sloped surfaces, lay decking with tongue upward.
- C. Fit butt end deck joints occurring between support members with metal splines to maintain tight, aligned joints.
- D. Secure with fasteners. Side spike planks together, through pre-drilled holes.
- E. Maintain decking joint space of 3/8 inch (9.5 mm) or 1/2 inch maximum. Alter spacing where significant board shrinkage is anticipated with consultation with the Engineer.
- F. Boards to have straight saw cut where changes in direction are necessary.

3.5 TOLERANCES

- A. Surface Flatness of Decking Without Load: 1/4 inch in 10 feet (2 mm/m) maximum, and 1/2 inch in 30 feet (12 mm / 9 m) maximum.

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END OF SECTION

SECTION 065000 – WOODEN PARKING BARRIER

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wooden rail.
2. Wooden posts.
3. Excavating for post bases.

B. Related Sections:

1. Section 033000 – Cast-In-Place Concrete.
2. Section 312000 – Earth Moving

1.2 REFERENCES

A. ASTM International:

1. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete.

B. American Wood-Preservers' Association:

1. AWPA C14 - Wood for Highway Construction - Preservative Treatment by Pressure Processes.

C. Forest Stewardship Council:

1. FSC Guidelines - Forest Stewardship Council Guidelines.

1.3 SUBMITTALS

- A. Shop Drawings: Indicate plan layout, spacing of components, post foundation dimensions, anchorage, and schedule of components.

- B. Product Data: Submit data on rail, posts, accessories, hardware and structural capabilities of rail section.

1.4 FIELD MEASUREMENTS

- A. Verify field measurements are as indicated on the Drawings

PART 2 - PRODUCTS

2.1 MATERIALS

A. Posts and Rails:

1. Rails shall be of the same species as the post, and shall be stress grade 1,500 psi or more, extreme fiber in bending. Posts and rails shall be predrilled and cut to the required dimensions prior to treatment.
2. Bolt holes shall be shop drilled or drilled in the field to a width 1/8" smaller than the bolt width.
3. Post to be ground contact pressure treated wood timber only. Rails to be above ground pressure treated wood timbers.
4. Dressing: Provide timber which has been dressed on 4 sides (S4S) at the mill, prior to grading. Comply with grade sizes.
5. Timber Species: Southern Yellow Pine, or ENGINEER approved equal.
6. Timber Grade: SPIB Grade: Rails - No. 1 SR, Posts – No. 2 SR.

B. Hardware: Steel, bolts, nuts and washers to suit rail profile.

1. Bolts shall be galvanized carriage bolts with a smooth exterior face.
2. All bolts shall be equipped with washers and nuts to suit.

2.2 ACCESSORIES

- #### A. Concrete: Type specified in Section 033000 – Cast in Place Concrete.

2.3 FINISHES

- #### A. Galvanizing for Nuts, Bolts and Washers: ASTM A153/A153M hot dipped steel.

PART 3 - EXECUTION

3.1 EXAMINATION

- #### A. Verify location of underground utilities and adjust location of posts to avoid damaging utilities.

3.2 INSTALLATION

- #### A. General Sealing: Where treated members are cut or damaged during erection, apply a heavy brush coat of the same treatment solution to the cut surfaces in accordance with AWWA Standard M4.
- #### B. Wood Posts: Install as indicated in the Drawings and in accordance with one of the following methods:
1. Hydraulic drive post plumb with adequate installation machinery. Replace damaged post and excavate rock or refusal where necessary.

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2. Excavate by auger and set wood posts in ground. The bottom of post holes shall be tamped to grade. Post shall be set plumb at the required location. Machine tamp backfill in 4 inches layers around posts and structural base. Backfill material shall be as shown in the Drawings. Posts shall be installed level and rails shall be installed parallel to finish grade.
- C. Rails: Attach to offset blocks or to posts as indicated with the alignment resulting in a smooth continuous rail conforming to the required line and grade. Butt adjoining rail sections with a maximum separation between adjoining rail sections of 1/16 inch. Rails shall be butt jointed at alternate posts or as directed, and shall be securely attached with galvanized carriage bolts, as specified in the Drawings, of sufficient length to secure with washer and nut. Hammering or other forceful method of inserting bolt shall not be used. Rails shall be spliced accordingly.

END OF SECTION

SECTION 12 93 00 - SITE FURNISHINGS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Site Signage
2. Kiosk
3. Bench

B. Related Sections:

1. Section 03 33 00 – Cast in Place Concrete.
2. Section 32 91 19 – Landscape Grading.
3. Section 32 93 00 – Plants.

1.2 REFERENCE STANDARDS

A. ASTM International for PVC Fencing:

1. ASTM D 790 Standard Test Methods for Flexural Properties of
2. Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
3. ASTM D 1784 Standard Specification for Rigid Poly(Vinyl Chloride) (PVC)
4. Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds
5. ASTM D 2565 Standard Practice for Operating Xenon-Arc-Type Light-
6. Exposure Apparatus With and Without Water for Exposure of Plastics
7. ASTM D 6109 Standard Test Methods for Flexural Properties of
8. Unreinforced and Reinforced Plastic Lumber
9. ASTM D 7032 Standard Specification for Establishing Performance
10. Ratings for Wood-Plastic Composite Deckboards and Guardrail Systems
11. (Guardrails and Handrails)
12. ASTM E 84 Standard Test Method for Surface Burning Characteristics of
13. Building Materials.
14. Manual on Uniform Traffic Control Devices (MUTCD), latest edition
15. Massachusetts Department of Transportation (MASSDOT) Highway Division specifications.

1.3 COORDINATION

- A. Coordinate Work of this Section with other Project site work.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's product data, including installation instructions.

- B. Shop Drawings: Submit manufacturer's shop drawings, indicating materials, dimensions, sections, tolerances, fasteners, hardware, mounting, finish and accessories.
 - 1. Signage: Individual layouts with dimensions of each sign to be provided.
- C. Samples: Submit manufacturer's standard color samples.
- D. Warranty: Submit manufacturer's standard warranty.
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
 - 1. Submit manufacturer's qualifications.

1.5 QUALITY ASSURANCE

- A. Perform Work according to Manufacturer's requirements.
- B. Source Limitation: Provide each furnishing with accessories produced by or as otherwise approved by the specified manufacturer.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' documented experience.
- B. The manufacturer implements an environmental responsibility policy to reduce industrial waste and conserve energy consumption in its plant operations.
- C. The manufacturer has trained field representatives available to monitor work in progress.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Furnishings are shipped from manufacturer completely assembled where applicable. Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name, manufacturer, and location of installation.
- B. Storage: Store according to manufacturer's instructions in a clean, dry area that is secure from theft or damage. Keep temporary protective coverings in place and materials out of direct sunlight.
- C. Handling: Protect materials and finish from damage during handling and installation.

PART 2 PRODUCTS

2.1 SIGNAGE

- A. Construction Materials: Comply with the Drawings and applicable requirements of MUTCD for Streets and Highways and MassDOT specifications and details. All signs shall be high resolution, high intensity grade.
- B. Anchor Posts:
 - 1. Telespar Quick Punch Post or approved equal. Post shall be rolled carbon sheet steel, ASTM A570 Grade 50 and be hot dipped galvanized per AASHTO M-120 with yield strength of 60,000 psi minimum. Post shall have 7/16-inch die-punched knockouts on 1-inch centers for full length and all sides.
 - 2. Anchors shall have four 7/16-inch (one each side) two-inches from the end.
 - 3. Drive rivets to be TLCB516M or approved equal.
 - 4. Corner bolts to be TLCB516M or approved equal.
 - 5. Black painted exterior finish.

2.2 KIOSK

- A. Posts
 - 1. Dimensions: 5 ½” x 5 ½”
 - 2. Material: White Oak
 - 3. Foundation: 4’ below grade, backfilled with ¾” washed crushed stone.
- B. Joints
 - 1. Timber joints to be secured with white oak pegs.
- C. Other Timbers
 - 1. All other timbers to be white pine with ¼” chamfer.
 - a. Girt dimensions: 4” x 5”
 - b. Tie dimensions: 5 ½” x 5”
 - c. Plate dimensions: beveled 3” x 4”
 - d. Ridge dimensions: 3” x 3”
- D. Roof: Rough sawn pine boards with channel drain roofing
- E. Signboard: 42” x 32” of ¾” tongue-in-groove eastern white cedar.

2.3 BENCH

- A. Manufacturers:
 - 1. Victor Stanley
P.O. Drawer 330
Dunkirk, Maryland 20754 USA
1.800.368.2573 (USA & Canada)
Tel: 301.855.8300
Fax: 410.257.7579

www.victorstanley.com

2. Forms and Surfaces
30 Pine Street
Pittsburgh, PA 15223
1.800.451.0410
Tel: 412.781.9003
Fax: 412.781.7840
www.forms-surfaces.com
3. SITESCAPES
4910 Country Hill Rd.
Lincoln, NE 68516
1.888.331.9464
Tel: 402.421.9464
Fax: 402.421.9479
www.sitescapesonline.com

B. Description and Materials:

1. Victor Stanley Framers Modern Series
 - a. FM-314 Backless Bench and FM 324 Bench with Back (See Drawings)
 - b. 6' and 8' long (See Drawings)
 - c. FSC Certified Ipe Wood
 - d. Black powder coat color
 - e. Surface Mounted
2. Forms and Surfaces Trio Bench
 - a. Trio Backless Bench and Trio Bench with Back (See Drawings)
 - b. 75" and 98.7" long (See Drawings)
 - c. FSC Certified Ipe Wood
 - d. Black texture powder coat color
 - e. Surface Mounted
3. SITESCAPES Avondale Benches
 - a. Avondale Bench and Backless Bench
 - b. 6' (AV1-1110) and 8'(AV1-2110) long (See Drawings)
 - c. FSC Certified Ipe Wood
 - d. Onyx powder coat color
 - e. Surface Mounted

2.4 ACCESSORIES

- A. Accessory: Additional accessories required in the Drawings and Manufacturer's details to provide a finished fence product.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine surfaces to receive site furnishings. Notify Engineer and/or Landscape Architect of conditions that would adversely affect installation or subsequent utilization of site furnishings. Do not proceed with installation until unsatisfactory conditions are corrected.

3.2 PREPARATION

- A. Ensure surfaces to receive site furnishings are clean, flat, and level.

3.3 GENERAL INSTALLATION

- A. Installation: According to reference standard and manufacturer's instructions at locations indicated on the drawings.
- B. Install site furnishings level, plumb, square, accurately aligned, correctly located, and without warp.
- C. Embedded Mount: Embed site furnishings by direct burying in accordance with manufacturer's instructions.
- D. Bolt to Concrete: Anchor site furnishings securely in place to supports with concrete anchor bolts in accordance with manufacturer's instructions. Two-inch minimum embedment for anchors.
- E. Use hardware and fasteners in accordance with manufacturer's instructions.
- F. Repair minor damages to finish in accordance with manufacturer's instructions and as approved by Engineer and/or Landscape Architect.
- G. Remove and replace damaged components that cannot be successfully repaired as determined by Engineer and/or Landscape Architect.

3.4 FENCE INSTALLATION

- A. Excavate for post footings using accurate measurements to assure proper post spacing. Do not exceed post spacing recommended by the manufacturer for fence types specified.
- B. Establish finished grade elevations to assure top line of fence is uniform throughout runs without abrupt changes.
- C. Set posts in concrete footings or stone according to the depths and dimensions shown in the Drawings where required. Allow concrete to cure sufficiently before installing pre-fabricated fence sections.

- D. Install fence sections according to the manufacturer's instructions.
- E. Hang and adjust gates to assure proper movement.

3.5 SIGNAGE

- A. Erect signs in their designated locations, as indicated and in accordance with the Drawings and the applicable requirements of MassDOT. Install vertically level.
- B. In-Sidewalk installation: Core 4-inch diameter hole in pavement to a depth of 12-inches. Backfill with concrete and patch pavement surface per applicable details.
- C. Protect surfaces and finishes from abrasion and other damage during handling and installation.
- D. Replace damaged, unlevel or faulty signs.

3.6 CLEANING

- A. Remove excavated soil from the project site.
- B. Restore landscaping and lawns. Clean pavement and sidewalks as required.
- C. Wipe down surfaces of fencing and gates that have been soiled by excavation and concrete operations.
- D. Remove and replace damaged components that cannot be successfully repaired as determined by Engineer and/or Landscape Architect.
- E. Remove temporary protective coverings.
- F. Do not use harsh cleaning materials or methods that would damage finish.

3.7 PROTECTION

- A. Protect site furnishings from damaged during the remainder of construction. Repair damage as necessary.

END OF SECTION

SECTION 31 10 00 - SITE CLEARING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. All work to be in accordance with the **Conservation Commission Order of Conditions**.
 - 2. Removing surface debris.
 - 3. Removing designated paving, curbs, and other site features.
 - 4. Removing designated trees, shrubs, and other plant life within the Limit of Work area, as indicated on Drawings.
 - 5. Tree protection.
 - 6. Pedestrian protection.
 - 7. Removing abandoned above and below grade utilities.
 - 8. Excavating and stockpiling topsoil.

- B. Related Sections:
 - 1. Section 31 20 00 – Earth Moving.
 - 2. Section 31 25 00 – Erosion and Sediment Controls.

1.2 QUALITY ASSURANCE

- A. Conform to applicable code for environmental requirements and disposal of debris.
- B. Perform Work in accordance with State, Local and Federal requirements.
- C. Prior to the commencement of work, obtain approval of staked and/or flagged site clearing.

PART 2 PRODUCTS

2.1 WORK ZONE AND TREE PROTECTION CONSTRUCTION FENCE

- A. Temporary construction fence and tree protection:
 - 1. Stakes to be rolled “T” rail steel, 6-ft long and painted green or wooden, pointed 6-ft long 2x4’s.
 - 2. Construction Fencing: Snow fence to be orange Resinet SM60 Barrier Fence, Cortina Barrier Fence, Tenax Guardian Safety Fence, approved equal.
 - 3. Tree trunk protection to be 2 x 4 lumber, 6-ft in length secured with 9 gauge galvanized steel wire banding staples to the wood lumber.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing plant life designated to remain is tagged or identified.
- B. Identify stockpile, waste or salvage areas for placing removed or temporarily stored materials.
- C. Review temporary access and submit a plan of action to the Owner and Engineer to allow coordination with adjacent property owners.

3.2 PREPARATION

- A. Call Dig Safe at 1-888-DIG-SAFE (1-888-344-7233) not less than three working days before performing Work.
 - 1. Request underground utilities to be located and marked within and surrounding construction areas.
- B. Prior to altering any utilities, obtain consent of utility service provider.
 - 1. Arrange with the utility service providers to shut off utilities to be disturbed as indicated on the Drawings and inform Owner and Engineer of anticipated interruption.

3.3 PROTECTION

- A. Locate, identify, and protect utilities indicated to remain, from damage.
- B. Protect trees, plant growth, and features designated to remain, as final landscaping. Tree protection to be in accordance with Massachusetts Department of Transportation's Project Development and Design Guide latest edition, Chapter 13 Landscape and Aesthetics.
- C. Protect bench marks, survey control points, and existing structures from damage or displacement.
- D. During demolition and earthwork the work zone will be surrounded with temporary chainlink fencing. Tree protection and open excavation to be surrounded by construction fence (snow fence).

3.4 REMOVAL

- A. Remove and properly dispose of cleared material including roots, tree trunks, branches, leaf litter, vines, and other plant life to facility the work.
- B. Do not shred material and spray/leave it in the wooded areas/resource buffers. All chipping or material to be completed offsite.

- C. Grind stumps and remove roots, obstructions, and debris extending to a depth of 18 inches below exposed subgrade where tree will interfere with new construction. Fill depressions with granular common gravel after grinding.
- D. Remove all surplus soil and unsuitable soil.
- E. Remove debris, rock, and extracted plant life from site.
- F. Remove paving, curbs, and other site features.
- G. Remove abandoned utilities. Indicated removal termination point for underground utilities on Record Documents.
- H. Continuously clean-up and remove trash, construction debris and waste materials from site. Do not allow materials to accumulate on site.
- I. Remove all temporary facilities at the end of the project.
- J. Separate recyclable materials removed during site clearing and store/stockpile without intermixing with other materials and reuse as indicated or transport them to a recycling facility.
- K. Do not burn or bury materials on site. Leave site in clean condition.

3.5 TOPSOIL EXCAVATION

- A. Remove sod/grass before excavation of topsoil.
- B. Excavate topsoil from areas to be further excavated, re-landscaped, or re-graded, to the depths encountered without mixing with underlying soils and foreign materials for use in finish grading.
 - 1. Remove trash, debris, weeds, roots and other waste materials from stockpiled topsoil.
- C. Do not excavate wet topsoil.
- D. Transport topsoil and place in small stockpiles in locations requiring placement of topsoil.
- E. Stockpile in area designated on site to a height not exceeding 8 feet and protect from erosion.
 - 1. Stockpile material on a level area until disposal.
 - 2. Do not stockpile within the tree protection zones indicated on Drawings.
 - 3. Do not stockpile materials where they could adversely impact resource areas during a rain event or earth moving operation.
 - 4. Stockpile topsoil away from the edge of excavations, do not intermix with subsoil.
 - 5. Grade and shape stockpiles to drain surface water.
 - 6. Cover to prevent windblown dust contamination by air borne weed seed.
 - 7. Install temporary erosion control devices for all stockpiled soil, as indicated on Drawings and/or as directed by the Engineer to protect adjacent properties and/or resource areas.

F. Remove excess topsoil not intended for reuse on the Project site.

3.6 DISPOSAL

- A. Disposal: Remove surplus soil material, unsuitable topsoil, obstructions, tree, limbs, vegetation, and/or waste materials from the clearing operation including trash and debris, and legally dispose of them off the property.
1. Burning on site is prohibited.
 2. Separate recyclable materials produced during site clearing and store or stockpile without intermixing with other materials and transport them to recycling facilities.

END OF SECTION

SECTION 31 20 00 - EARTH MOVING

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes: Provide labor, materials and equipment necessary to complete the work of this Section, including:
1. Contractor to conduct work in accordance with the Site Deed Restriction and Activity and Use Limitation requirements.
 2. Removal of subsoil, excavating and trenching
 3. Backfilling
 4. Cutting, grading, filling, rough contouring, compacting, and finish grading site for site structures, building pads, utility, road, parking, sidewalks, walkways and landscape installation and other site features.
- B. Related Sections:
1. Section 03 30 00 - Cast-In-Place Concrete.
 2. Section 31 25 00 – Erosion and Sedimentation Controls.
 3. Section 32 11 23 – Aggregate Base Course.
 4. Section 32 12 16 – Asphalt Paving.
 5. Section 32 91 19 – Landscape Grading.
 6. Section 32 92 19 - Seeding and Soil Supplements.
 7. Section 32 93 00 - Plants.

1.2 REFERENCES

- A. Local utility standards when working within 24 inches of utility lines.
- B. American Association of State Highway and Transportation Officials:
1. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.
- C. ASTM International:
1. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 2. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort.
 3. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
 4. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort.
 5. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.

6. ASTM D2419 - Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate.
7. ASTM D2434 - Standard Test Method for Permeability of Granular Soils (Constant Head).
8. ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).
9. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
10. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

1.3 DEFINITIONS

- A. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions on Drawings or without approval by Engineer.
- B. Landscaped Areas: Areas not covered by structures, walks, roads, paving, or parking.
- C. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- D. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.
- E. Utility: Any buried pipe, duct, conduit, or cable.

1.4 SUBMITTALS

- A. Excavation Protection Plan: Describe sheeting, shoring, and bracing materials and installation required to protect excavations and adjacent structures and property; include structural calculations to support plan.
- B. Shop Drawings: Indicate soil densification grid for each size and configuration footing requiring soils densification.
- C. Product Data: For the following:
 1. Each type of plastic warning tape
 2. Geotextile
- D. Material Test Reports for Each Type of Offsite Earth Material: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:
 1. Classification according to ASTM D 2487 of each on-site and borrow soil material proposed for fill and backfill. On-site material not designated for re-use will not be allowed to be used as backfill unless tested.

2. Laboratory compaction curve according to ASTM D 1557 for each onsite and borrow soil material proposed for fill and backfill.

E. Materials Source: Submit name of imported materials source.

F. Manufacturer's Certificate: Certify materials meet or exceed specified requirements.

1.5 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Accurately record actual locations of utilities remaining by horizontal dimensions, elevations or inverts, and slope gradients.

1.6 QUALITY ASSURANCE

- A. Furnish subsoil and topsoil material from single source throughout the Work unless written approval is provided by the Owner.
- B. Perform Work in accordance with ASTM C136, ASTM D2419, and ASTM D2434.
- C. Testing and Analysis of Subsoil Material: Perform in accordance with ASTM D698, ASTM D1557 or AASHTO T180 where applicable.
- D. When tests indicate materials do not meet specified requirements, change material and retest.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Cold Weather Requirements:

1. Excavation: When temperatures below 32 degrees F are anticipated, do not excavate to final required elevations for concrete work unless concrete can be placed immediately.
2. Backfilling: When backfilling below 32 degrees F, the following procedures must be followed:
 - a. Remove frozen ground in its entirety from beneath and five feet beyond the area of fill placement.
 - b. Fill material to consist of selected fill free of all frozen chunks that exceed four inches in size. Material transported to the project site must only consist of material excavated from below the frost depth.
 - c. End of the work day: Cover the area of fill placement with insulated blankets. Other means of protection (straw, wood chips, etc.) may also be used for protection provided it is approved by the Engineer.
 - d. Following work day: Remove the insulated blankets and/or strip the area of all frozen material as specified previously.
 - e. Upon establishing the subgrade elevations, protect the grades with insulated blankets or place additional material that will adequately insulate the ex-posed earth surface from frost. Strip additional or protective material just prior to pouring concrete.

PART 2 PRODUCTS

2.1 SOIL MATERIALS

- A. Satisfactory Soils for General Backfill (imported or excavated):
 - 1. ASTM D2487 Unified Soil Classification Groups GW, GP, GM, SW, SP, and SM or a combination of these groups.
 - 2. Free of rock or gravel larger than 3 inches in any dimension, debris, oil and or/ hazardous waste, frozen materials, vegetation, invasive species and other deleterious matter.
 - 3. Immediately notify the Engineer if satisfactory soils are not maintained within 2 percent of optimum moisture content at the time of compaction.
- B. Unsatisfactory Soils for General Backfill (imported or excavated):
 - 1. Includes unsatisfactory imported borrow or excavated and re-used material.
 - 2. ASTM D2487 Unified Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487, or a combination of these groups.
 - 3. Contains rock or gravel larger than 3 inches in any dimension, debris, oil and or/ hazardous waste, frozen materials, vegetation, invasive species and other deleterious matter.
- C. Subsoil: Imported or excavated material, graded free of lumps larger than 6 inches, rocks larger than 3 inches, organic material, and debris.
- D. Type A - Select Granular Material: Coarse stone (gravel): washed natural stone; free of shale, clay, friable material, sand, and debris.
 - 1. Grading: AASHTO M147; Grade 57.
- E. Type B - Pea Gravel (stone): Natural stone; washed, free of clay, shale and organic matter.
 - 1. Minimum Size: 1/4 inch.
 - 2. Average Size: 3/8 inch.
 - 3. Maximum Size: 1/2 inch.
- F. Type C - Sand: ASTM C 33; washed; fine aggregate material free of silt, clay, loam, friable or soluble materials, and organic matter.
- G. Type D - Subsoil: Reused or Imported, free of rock larger than 3 inch size, and debris.
- H. Type E - Blended Material: Per Drawings.
- I. Type F - Soil Cement.
- J. Type G - Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.
- K. Type H - Berm/Embankment fill:

1. Free of roots, stumps, wood, rubbish, stones greater than 6 inches, frozen or other objectionable materials.
2. Conforming to ASTM D2487 Unified Soil Classification GC, SC, CH, or CL with at least 30 percent passing the No.200 sieve.

2.2 ACCESSORIES

- A. Geotextile Fabric: Non woven drainage geotextile made from polyolefins, polyesters, or polyamides with the following minimum properties according to ASTM D 4659 and referenced standard test methods:
 1. Grab Tensile Strength: 120 lbf (533 N); ASTM D 4632.
 2. Tear Strength: 50 lbf (222 N); ASTM D 4533.
 3. Puncture Resistance: 70 lbf (311 N); ASTM D 4833.
 4. Water Flow Rate: 120 gpm per sq. ft. (4885 L/min per sq. m); ASTM D 4491.
 5. Apparent Opening Size: No. 70 (0.212 mm); ASTM D 4751.
- B. Detectable Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities
 1. A minimum of 6 inches wide and 4 mils thick
 2. Continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection
 3. Detectable by metal detector when tape is buried up to 30 inches deep; colored as follows:
 - a. Red: Electric.
 - b. Yellow: Gas, oil, steam, and dangerous materials.
 - c. Orange: Telephone and other communications.
 - d. Blue: Water systems.

PART 3 EXECUTION

3.1 EXCAVATION EXAMINATION

- A. Verify site conditions prior to starting work.
- B. Verify survey bench mark and intended elevations for the Work as indicated on Drawings
- C. Notify Engineer of unexpected subsurface conditions and discontinue affected work in area until notified to resume work.

3.2 EXCAVATION PREPARATION

- A. Call Digsafe not less than three working days before performing Work.

1. Request underground utilities to be located and marked within and surrounding construction areas.
- B. Identify required lines, levels, contours, and datum.
- C. Notify utility company as necessary.
- D. Establish temporary traffic control and detours when trenching is performed in public right-of-way. Relocate controls and reroute traffic as required during progress of Work.

3.3 PROTECTION

- A. Maintain and protect above and below grade utilities indicated to remain.
- B. Protect plant life, lawns, rock outcroppings and other features remaining as portion of final landscaping.
- C. Protect bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.
- D. Underpin adjacent structures which may be damaged by excavation work, including service utilities and pipe chases.
- E. Grade excavation top perimeter to prevent surface water run-off into excavation or to adjacent properties.
- F. Prevent displacement or loose soil from falling into excavation; maintain soil stability.
- G. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.
- H. Protect structures, utilities and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth operations.
- I. Protect newly graded areas from traffic, freezing, erosion and over compaction.

3.4 UNDERGROUND UTILITIES

- A. Do not interrupt existing utilities that are in service until temporary or new utilities are installed and operational.
- B. Abandoned utilities:
 1. Remove abandoned utilities beneath, and five feet laterally beyond, the structure's proposed footprint. Backfill and compact excavations required for their removal.
 2. Utilities extending outside the five feet limit specified above may be abandoned in place provided their ends are adequately plugged as described below.

3. Permanently close open ends of abandoned underground utilities, exposed by excavations, which extend outside the limits of the area to be excavated.
4. Close open ends of metallic conduit and pipe with threaded galvanized metal caps or plastic plugs or other approved method for the type of material and size of pipe. Do not use wood plugs.
5. Close open ends of concrete and masonry utilities with concrete or flowable fill.

3.5 GENERAL EXCAVATION

- A. Excavate subsoil to accommodate utilities, roads, parking, sidewalks, walkways, landscape installation, building foundations, slabs-on-grade paving and site structures, construction operations, and other features as necessary.
- B. Excavate to working elevation for piling work.
- C. Compact disturbed load bearing soil in direct contact with foundations to original bearing capacity; perform compaction in accordance with this Section.
- D. Slope banks with machine to angle of repose or less until shored.
- E. Grade top perimeter of excavation to prevent surface water from draining into excavation.
- F. Trim excavation. Remove loose matter.
- G. Remove lumped subsoil, boulders, and rock up to 1 cu yd measured by volume.
 1. Remove rock to lines and grades required to permit installation of permanent construction as indicated on Drawings without exceeding the following dimensions:
 - a. 24 inches outside of concrete forms other than at footings;
 - b. 12 inches outside of concrete forms at footings;
 - c. 6 inches outside of minimum required dimensions of concrete cast against grade;
 - d. Outside dimensions of concrete walls indicated to be cast against rock with-out forms or exterior waterproofing treatments;
 - e. 6 inches beneath bottom of concrete slabs on grade;
 - f. 6 inches beneath pipe in trenches, and the greater of 24 inches wider than pipe or 42 inches wide;
 - g. As indicated on the Drawings.
- H. Notify Engineer of unexpected subsurface conditions.
- I. Correct areas over excavated with approved fill material.
- J. Remove excess and unsuitable material from site.
- K. Repair or replace items indicated to remain damaged by excavation.

3.6 SUBSOIL EXCAVATING

- A. Excavate subsoil and topsoil from areas designated.
- B. Stockpile excavated material meeting requirements for subsoil materials and topsoil materials.
- C. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
- D. Remove groundwater by pumping to keep excavations dry.
- E. Excavate subsoil from marked areas required for building foundations, piling, construction operations, and other Work.
- F. Proof roll bearing surfaces. Fill soft spots with fill and compact uniformly to 95 percent of maximum density.
- G. Correct unauthorized excavation at no cost to Owner.
- H. Backfill over-excavated areas under in accordance with specifications and as directed by the Engineer.
- I. Remove excess subsoil not being reused from site.
- J. Excavate subsoil from areas to be further excavated, relandscaped, or regraded.
- K. Do not excavate wet subsoil or excavate and process wet material to obtain optimum moisture content.
- L. When excavating through roots, perform Work by hand and cut roots with sharp axe.
- M. Remove excess excavated materials subsoil and topsoil not intended for reuse, from site.
- N. Stockpile subsoil in area designated on site to depth not exceeding 8 feet and protect from erosion.
- O. Benching Slopes: Horizontally bench existing slopes greater than 1: 4 to key placed fill material to slope to provide firm bearing.
- P. Stability: Replace damaged or displaced subsoil as specified for fill.

3.7 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within accepted tolerance.
- B. Extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
 - 1. Excavations for Footings and Foundations:

- a. Do not disturb bottom of excavation.
 - b. Excavate by hand to final grade just before placing concrete reinforcement.
 - c. Trim bottoms to required lines and grades.
2. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures:
- a. Do not disturb bottom of excavations intended as bearing surfaces.
3. Slabs and Floors: Excavate to the following depths below bottom of concrete for addition of select granular material:
- a. Interior Floors: 6 inches unless otherwise indicated on Drawings.
 - b. Exterior Slabs and Steps: 12 inches unless otherwise indicated on Drawings.

3.8 TRENCHING

- A. Excavate for storm drains, sanitary sewer, ducts, water, gas, other utilities and piping per Drawings.
- B. Excavate trenches to indicated gradients, lines, depths, and elevations. Cut trenches sufficiently wide to enable installation of utilities and allow inspection.
- C. Hand trim excavation and leave free of loose matter. Hand trim for bell and spigot pipe joints.
- D. Support pipe bells, joints, and conduit, during placement and compaction of bedding fill.
- E. Remove projecting stones and sharp objects along trench subgrade.
- F. Coordinate backfilling with utilities testing and testing agency.
- G. Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.
- H. Backfill trenches to required contours and elevations.
- I. Place and compact fill materials as for backfilling.

3.9 SHEETING AND SHORING

- A. Sheet, shore, and brace excavations to prevent danger to persons, structures and adjacent properties and to prevent caving, erosion, and loss of surrounding subsoil.
- B. Support trenches more than 5 feet deep excavated through unstable, loose, or soft material. Provide sheeting, shoring, bracing, or other protection to maintain stability of excavation.
- C. Design sheeting and shoring to be left in place as part of the completed Work, cut off minimum 18 inches below finished grade.

- D. Repair damage caused by failure of the sheeting, shoring, or bracing and for settlement of filled excavations or adjacent soil.
- E. Repair damage to new and existing Work from settlement, water or earth pressure or other causes resulting from inadequate sheeting, shoring, or bracing.

3.10 LINES AND GRADES

- A. Lay pipes to lines and grades indicated on Drawings.
 - 1. Engineer and Owner reserves right to make changes in lines, grades, and depths of utilities when changes are required for Project conditions.
- B. Use laser-beam instrument with qualified operator to establish lines and grades.

3.11 UNAUTHORIZED EXCAVATION

- A. Immediately notify the Engineer prior to the commencement of any unauthorized excavation or backfilling work.
- B. Backfill unauthorized excavation under footings, foundation bases, or retaining walls with compacted select granular material without altering the required footing elevation. Elsewhere, backfill and compact unauthorized excavation as specified for authorized excavation of the same classification.

3.12 BACKFILL EXAMINATION

- A. Verify underground tanks are anchored to their own foundations to avoid flotation after backfilling.
- B. Verify foundation or basement walls are braced to support surcharge forces imposed by backfilling operations.

3.13 BACKFILL PREPARATION

- A. Compact subgrade to density requirements for subsequent backfill materials.
- B. Cut out soft areas of subgrade not capable of compaction in place. Backfill with granular fill and compact to density equal to or greater than requirements for subsequent fill material.
- C. Scarify subgrade surface to depth of 3 inches.
- D. Proof roll to identify soft spots; fill and compact to density equal to or greater than requirements for subsequent fill material.
- E. Replace unsatisfactory soil with compacted backfill or fill material.

- F. Survey locations of underground utilities for As-built Drawings and Record Documents.
- G. Test and inspect underground utilities as specified.
- H. Remove concrete formwork.
- I. Remove trash and debris.
- J. Install permanent or temporary horizontal bracing on horizontally supported walls
- K. Reconstruct subgrade damaged by freezing temperatures, frost, rain, accumulated water, or construction activities without additional compensation.
- L. If unsatisfactory soil is encountered immediately notify Engineer before any work commences.

3.14 BACKFILLING

- A. Backfill systematically, as early as possible, to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces.
- B. Place and compact backfill in excavations promptly.
- C. Place backfill and fill soil materials in layers to specified depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
- D. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.
- E. Fill voids with approved backfill materials while shoring and bracing, and as sheeting is removed.
- F. Backfill areas to contours and elevations indicated on Drawings.
- G. Use unfrozen and unsaturated materials.
- H. Place geotextile fabric over unstable subsoil.
- I. Place material in continuous layers as follows:
 - 1. Soil Materials: Maximum 8 inches compacted depth.
 - 2. Structural Fill Materials: Maximum 8 inches compacted depth.
 - 3. Granular Fill: Maximum 8 inches compacted depth.
 - 4. Trench Fill: Maximum 6 inches compacted depth when in paved area, 8 inches compacted depth when outside paved area.
- J. Employ placement method that does not disturb or damage other work.

- K. Employ placement method so not to disturb or damage foundations, foundation perimeter drainage, foundation damp-proofing, foundation waterproofing and protective cover, or utilities in trenches.
- L. Maintain optimum moisture content of backfill materials to attain required compaction density.
- M. Backfill against supported foundation walls. Backfill simultaneously on each side of unsupported foundation walls until supports are in place.
- N. Slope grade away from building minimum 1 percent slope for minimum distance of 10 ft, unless noted otherwise.
- O. Do not leave more than 50 feet of trench open at end of working day.
- P. Protect open trench to prevent danger to Owner and/or the public.
- Q. Make gradual grade changes. Blend slope into level areas.
- R. Remove surplus backfill materials from site.
- S. Leave fill material stockpile areas free of excess fill materials.

3.15 FILLING (GRADING)

- A. Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations as indicated on Drawings.
 - 1. Provide a smooth transition between adjacent existing grades and new grades.
 - 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
- B. Fill areas to contours and elevations with unfrozen materials.
- C. Place material in continuous layers as follows:
 - 1. Subsoil Fill: Maximum 8 inches compacted depth.
 - 2. Structural Fill: Maximum 6 inches compacted depth.
 - 3. Granular Fill: Maximum 8 inches compacted depth.
- D. Maintain optimum moisture content of fill materials to attain required compaction density.
- E. Slope grade away from building minimum 1 percent slope for minimum distance of 10 ft, unless noted otherwise.
- F. Make grade changes gradual. Blend slope into level areas.

- G. Trim and rough grade area within the grading limits to a depth sufficient below the finish grades to accommodate topsoil, pavement, concrete and other finished surfaces.
- H. Repair or replace items indicated to remain damaged by excavation or filling.
- I. Install Work in accordance with State, Local or Federal standards.

3.16 EMBANKMENT/BERM FILL

- A. Fill materials for berms and key trenches:
 - 1. Furnish from approved designated borrow areas.
 - 2. Free from roots, stumps, wood, stones greater than 6 inches, and frozen or other objectionable material.
- B. Remove all unsuitable soil and scarify subgrade prior to placement of fill.
- C. Provide a key trench beneath all the berm as indicated on Drawings. Extend the trench a minimum of 2 feet below existing grade.
 - 1. Key Trench Bottom Width: minimum of 3 feet
 - 2. Key trench side slopes: minimum of 1:1 (h:v)
- D. Place the most permeable borrow material along the downstream portions of the embankment.
- E. Install principal spillway concurrently with fill placement. Do not excavate into the embankment.
- F. Place fill in 8 inch maximum layers continuous for the entire length of embankment.
- G. Compaction: As indicated on Drawings.
- H. Compact fill using a sheepsfoot type compactor. To prevent damage to the drainage pipe(s), do not cross any pipe with compaction equipment until minimum cover is established along the pipe(s).
- I. Use topsoil on the outer shell of the berm. The topsoil must meet specification requirements and have the capability to support vegetation of the quality required to prevent erosion of the berm.

3.17 STOCKPILING

- A. Stockpile materials on site at locations approved by the Owner and Engineer.
- B. Stockpile in sufficient quantities to meet Project schedule and requirements.
- C. Separate differing materials with dividers or stockpile apart to prevent mixing.
- D. Stockpile topsoil 8 feet high maximum.

- E. Prevent intermixing of soil types or contamination.
- F. Direct surface water away from stockpile site to prevent erosion or deterioration of materials.
- G. Cover to prevent windblown dust.
- H. Stockpile soil materials away from edge of excavations.
- I. Do not store within drip line of remaining trees.
- J. For soil stockpiles left overnight, provide silt sock, strawbales, silt fence, or a combination of silt fence with strawbales around the stockpile perimeter.
- K. Stockpile unsuitable or hazardous materials on impervious material and cover to prevent erosion and leaching, until disposed of.

3.18 STOCKPILE CLEANUP

- A. Remove stockpile, leave area in clean and neat condition. Grade site surface to prevent free standing surface water.
- B. When borrow area is indicated, leave area in clean and neat condition. Grade site surface to prevent free standing surface water.

3.19 TOLERANCES

- A. Top Surface of Backfilling within Building Areas and Underground Tanks: Plus or minus 1/2 inch from required elevations.
- B. Top Surface of Backfilling under paved Areas or surface stormwater features: Plus or minus 1/2 inch required elevations.
- C. Top Surface of Backfilling under lawn, or landscape: Plus or minus from required elevations.

3.20 FIELD QUALITY CONTROL

- A. Repair and reestablish grades to specified tolerances where graded surfaces have been disturbed or altered due to construction activities, weather conditions or other means.
- B. Perform inspection of excavation and controlled fill operations in accordance with applicable code.
- C. Request visual inspection of bearing surfaces by before installing subsequent work.
- D. Perform inspection of foundations in accordance with applicable code.
- E. Perform laboratory material tests

- F. Perform in place compaction tests in accordance with the following:
 - 1. Density Tests: ASTM D1556, ASTM D2167, or ASTM D2922.
 - 2. Moisture Tests: ASTM D3017.
- G. When tests indicate Work does not meet specified requirements, remove Work, replace, compact, and retest.
- H. Frequency of Tests: Initial Testing by Owner. Contractor to accommodate testing agency. Additional testing due to inadequate work by Contractor.
- I. Proof roll compacted fill surfaces under slabs-on-grade, pavers, paving, and other site features as required.

3.21 SOIL MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
 - 1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
 - 2. Remove and replace, or scarify and air dry otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.22 PROTECTION OF FINISHED WORK

- A. Reshape and re-compact fills subjected to vehicular traffic during construction.

END OF SECTION

SECTION 31 25 00 - EROSION AND SEDIMENTATION CONTROLS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Labor, materials and equipment necessary to install proper control measures to prevent erosion, siltation and sedimentation of the Project site and adjacent and off-site areas.
- B. Related Sections:
 - 1. Section 31 10 00 - Site Clearing.
 - 2. Section 31 20 00 - Earthmoving.
 - 3. Section 32 91 19 - Landscape Grading.
 - 4. Section 32 92 19 - Seeding.
 - 5. Section 33 47 30 – Stormwater Treatment Bioretention

1.2 SUBMITTALS

- A. Product Data: Product Data: Submit data on each type of proprietary erosion control devices, and geotextile.

1.3 QUALITY ASSURANCE

- A. Material and installation must be in accordance with the Order of Conditions issued by the Conservation Commission.

PART 2 PRODUCTS

2.1 MATERIAL

- A. Straw Bales: bales of straw, bound with wire or nylon twine oriented around sides, rather than over and under the bales.
- B. Stakes: Stakes for bales as indicated on Drawings.
- C. Tubular Sediment Barrier: Tubular netting filled with water permeable compost material meeting the following requirements:
 - 1. Compost:
 - a. Derived from a well-decomposed source of organic matter.
 - b. Free of weeds, refuse, contaminants or other materials toxic to plant growth. Non-composted products will not be accepted.

2. Tubular Netting:
 - a. One continuous barrier.
 - b. Diameter per Drawings.
 - c. Equal to the following:
 - 1) Silt Soxx by Filtrexx
 - 2) Silt Sock
 - 3) FilterMitt by Phase II Stormwater Products, Inc.
- D. Erosion Control Netting: woven, 100% biodegradable jute fiber 95lbs/1,000 sq. ft.
 1. Or approved equal.
- E. Erosion Control Blanket: Short term (one year) 100% natural and biodegradable blanket and weave material. Manufacturers:
 1. North American Green Bionet 150BN.
 2. American Excelsior Company Curlex NetFree
 3. East Coast Erosion Control ECS-2B (Double net).
 4. Approved equal.
- F. Temporary Stabilization Practices:
 1. Straw temporary mulch, 100 pounds per 1,000 square feet.
 2. Wood fiber cellulose temporary mulch, 35 pounds per 1,000 square feet.
 3. Tackafier for anchoring mulch or straw: a non-petroleum based liquid bonding agent specifically made for anchoring straw.
 4. Provide natural (jute, wood excelsior) or man-made (glass fiber) covering with suitable staples or anchors to secure to ground surface. Do not use wire staples and non-biodegradable coverings for any area that will be mown turf.
 5. Temporary vegetative cover for graded areas must be undamaged, air dry threshed straw free of undesirable weed seed.
 6. Spray-applied bonded fiber matrix.
- G. Construction Entrance Materials
 1. Stone size: ASTM designation C-33, size No. 2 (1-1/2 inches to 2-1/2 inches)
 2. Base Course: Crushed stone
- H. Seeding Materials
 1. Seeding and Soil Supplements as specified in Section 32 92 19.
- I. Mulch: Where specified in Drawings.
- J. Bonded Fiber Matrix: A hydraulically applied slurry consisting of long strand wood fibers, organic tackifiers and bonding agents, when dry forms a continuous erosion control blanket bonded to the soil surface. Equal to:
 1. Geoperm Bonded Fiber Matrix
 2. Mat, Inc. Soil Guard
 3. Profile Products Flexterra

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify compacted subgrade, granular base, and/or stabilized soil is acceptable and ready to support devices and imposed loads.
- B. Verify gradients and elevations of base or foundation for other work are correct.

3.2 PREPARATION

- A. Install control measures prior to construction to prevent erosion, siltation and sedimentation of construction areas, adjacent areas and off-site areas in the following work areas:
 - 1. Soil stockpiles, storage and staging areas;
 - 2. Cut and fill slopes and other stripped and graded areas;
 - 3. Constructed and existing swales and ditches;
 - 4. Bioretention areas, detention ponds, infiltration basins and other stormwater controls.
 - 5. As indicated on Drawings
- B. Provide additional means of erosion and sediment control as required for continued or unforeseen erosion problems.

3.3 GENERAL

- A. Install and maintain site erosion and sediment controls as indicated on Drawings.
- B. Remove all temporary erosion controls at the end of construction.

3.4 STABILIZED CONSTRUCTION ENTRANCE AND STONE BERMS

- A. Place stone entrances in locations indicated on Drawings.
- B. Length: As indicated on Drawings.
- C. Thickness: As indicated on Drawings.
- D. Width: Not less than full width of all points on ingress or egress, as indicated on Drawings.
- E. Washing: Spray wash truck wheels leaving the Project site, when necessary, to remove sediment prior to entrance onto public right-of-way. Perform wheel washing in an area stabilized with crushed stone which drains into an approved sediment trap or sediment basin. Prevent all sediment from entering any storm drain, ditch, or watercourse through the use of straw bales, catchbasin inserts, silt fence or other approved methods.

- F. Maintenance: Maintain the entrance to prevent tracking or flowing of sediment onto public rights-of-way. Provide periodic top dressing with additional stone as conditions demand. Repair and/or clean devices used to trap sediment. Sediment spoiled, dropped, washed or tracked onto public rights-of-way must be removed immediately.
- G. Remove construction entrances at the end of construction and re-establish conditions to pre-construction conditions or better.

3.5 TUBULAR SEDIMENT BARRIER

- A. See Drawings and manufacturer's recommendations for installation.
- B. Installed on the perimeter of the site and/or along resource areas as shown in the Drawings.

3.6 STRAW WADDLE

- A. Installed on slopes for erosion control protection. Not a substitute or equal to Tubular Sediment Barrier.

3.7 SITE STABILIZATION

- A. Incorporate erosion control devices indicated on Drawings into the Project at the earliest practicable time.
- B. Construct, stabilize and activate erosion controls before site disturbance within tributary areas of those controls.
- C. Do not exceed 35 feet height for stockpile(s) and waste pile(s). Slope stockpile(s) sides at 2:1 or flatter.
- D. Provide appropriate temporary stabilization of any disturbed area on which activity has ceased and which will remain exposed for more than 14 days.
 - 1. Provide temporary seed mix with application rates according to the State of Massachusetts DOT Standard Specifications.
 - a. Water the seeded areas as required until satisfactory establishment.
 - 2. During non-germinating periods, apply mulch at recommended rates.
- E. Provide permanent stabilization of disturbed areas which are either at finished grade or will not be disturbed within one year in accordance with permanent seeding specifications or as indicated on Drawings with one of the following:
 - 1. Application of Bonded Fiber Matrix hydroseed seed mix as specified.
 - 2. Placement of erosion control blanket as indicated on Drawings.
- F. Stabilize diversion channels, sediment traps, and stockpiles immediately.

3.8 SLOPE STABILIZATION (SLOPES OF 3:1 OR GREATER)

- A. Do not leave disturbed areas and slopes unattended or exposed for excessive periods of time such as the inactive winter season. Provide appropriate stabilization practices as indicated on Drawings on disturbed area as soon as possible, but not more than 14 days after the construction activity in that area has temporarily or permanently ceased.
- B. Reinforce temporary areas having a slope greater than 3:1 with erosion control blankets, straw waddle or approved equivalent until the site can be properly stabilized.
- C. Provide permanent slope stabilization immediately after the placement of topsoil. Provide permanent stabilization as indicated on Drawings with one of the following:
 - 1. Apply of hydroseed seed mix as specified.
 - 2. Application of Bonded Fiber Matrix hydroseed seed mix as specified.
 - 3. Placement of erosion control blanket as indicated on Drawings.
- D. Apply of hydroseed seed mix as specified.

3.9 EROSION CONTROL NETTING

- A. As indicated on Drawings and/or manufacturer's recommendations for installation.

3.10 EROSION CONTROL BLANKET

- A. As indicated on Drawings and or manufacturer's recommendations for installation.

3.11 BONDED FIBER MATRIX

- A. As indicated on Drawings and/or manufacturer's recommendations for installation.

3.12 FIELD QUALITY CONTROL AND CLEANING

- A. Inspect erosion and sediment control devices and stabilized slopes on a weekly basis and after each rainfall event of .25 inch or greater. Make necessary repairs of identified problems within 24 hours to ensure erosion and sediment controls are in good working order. Reset or replace materials as required.
- B. When field visits indicate Work does not meet specified requirements, repair and/or replace Work.
- C. Any deviation from the requirements must be approved by the Engineer.
- D. When sediment accumulation in sedimentation structures has reached a point one-third depth of sediment barrier or device, remove and dispose of sediment.

- E. Do not damage structure or device during cleaning operations.
- F. Do not permit sediment to erode into construction or site areas or natural waterways.
- G. Clean channels when depth of sediment reaches approximately one half channel depth.

3.13 PROTECTION

- A. Do not permit construction traffic over stabilized areas.
- B. Protect Project site stabilization from elements, flowing water, or other disturbance until vegetation established.

END OF SECTION

SECTION 31 37 00 – RIPRAP AND ROCK LINING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Rock or Riprap placed loose.
 - 2. Gravel and Subbase.
- B. Related Sections:
 - 1. Section 31 12 00 – Earth Moving.
 - 2. Section 32 91 19 – Landscape Grading.

1.2 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit data for riprap and geotextile fabric.
- C. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.3 QUALITY ASSURANCE

- A. Furnish each aggregate material from single source throughout the Work.
- B. Perform Work in accordance with State of Massachusetts Department of Transportation.
- C. Maintain one copy of each document on site.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Rock Lining
 - 1. Rock Lining stone for boardwalk: Granite type; irregular shaped rock; solid and nonfriable; Minimum d50 = 6", meeting MassDOT standard specification section 258.
 - 2. 3/4" Washed Stone sub base, meeting MassDOT specification section 400 where required in Drawings.
 - 3. Rip Rap for flared ends Granite type; irregular shaped rock; solid and nonfriable; Minimum d50 = 6", meeting MassDOT standard specification section 258.
 - 4. 3/4" Washed Stone sub base, meeting MassDOT specification section 400 where required in Drawings.
- B. Geotextile Fabric: Non-biodegradable, non-woven 140N, manufactured by Mirafi, or approved equal.

EXECUTION

2.2 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.
- B. Do not place rock or riprap over frozen or spongy subgrade surfaces.

2.3 PLACEMENT

- A. Place geotextile fabric over substrate, lap edges and ends.
- B. Place rock as indicated on Drawings.
- C. Installed Thickness: As indicated on Drawings.

END OF SECTION

SECTION 32 11 23 - AGGREGATE BASE COURSES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Aggregate subbase.
2. Aggregate base course.

B. Related Sections:

1. Section 31 20 00 - Earthmoving.
2. Section 32 12 16 - Asphalt Paving.
3. Section 32 13 13 - Concrete Paving.
4. Section 32 91 19 - Landscape Grading.

1.2 REFERENCES

A. American Association of State Highway and Transportation Officials:

1. AASHTO M147 - Standard Specification for Materials for Aggregate and Soil-Aggregate Subbase, Base and Surface Courses.
2. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.
3. AASHTO M288 - Standard Specification for Geotextile Specification for Highway Applications.

B. ASTM International:

1. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
2. ASTM D448 - Standard Classification for Sizes of Aggregate for Road and Bridge Construction
3. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
4. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
5. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)).
6. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
7. ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).
8. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

9. ASTM D2940 - Standard Specification for Graded Aggregate Material for Bases or Subbases for Highways or Airports.
10. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).
11. ASTM D4318 - Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

1.3 SUBMITTALS

- A. Product Data:
 1. Submit data for geotextile fabric where required.
- B. Materials Source: Submit name of aggregate materials suppliers with sieve analysis.
- C. Manufacturer's Certificate: Certify Products meet or exceed specified requirements with a sieve of each material.

1.4 QUALITY ASSURANCE

- A. Furnish each aggregate material from single source throughout the Work.

PART 2 PRODUCTS

2.1 AGGREGATE MATERIALS

- A. Subbase Aggregate: ASTM D2940; graded type.

Sieve Size	Percent Passing
2 inches	100
No. 4	30 to 60
No. 200	0 to 12

- B. Base Aggregate: ASTM D2940; graded type.

Sieve Size	Percent Passing
2 inches	100
1-1/2 inches	95 to 100
3/4 inches	70 to 92
3/8 inches	50 to 70
No. 4	35 to 55

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No. 30	12 to 25
No. 200	0 to 8

C. Crushed Stone: durable crushed rock consisting of angular fragments, free from a detrimental quantity of thin, flat, elongated pieces or durable crushed gravel stone obtained by artificial crushing of boulders or fieldstone. The crushed stone must be free from clay, loam, or deleterious material.

D. Crushed Stone to conform to the following gradations:

E.

Percent Passing By Weight		
Sieve Size	1/2-Inch Stone	3/4-Inch Stone
1 inch	---	100
3/4 inch	---	90-100
5/8 inch	100	---
1/2 inch	85-100	10-50
3/8 inch	15-45	0-20
No. 4	---	0-5
No. 8	0-5	---
Percent Passing By Weight		
Sieve Size	1-1/2-Inch Stone	2-Inch Stone
2 inch	100	90-100
1-1/2 inch	95-100	---
1-1/4 inch	---	25-50
1 inch	35-70	---
3/4 inch	0-25	0-15
1/2 inch	---	---

2.2 FINE AGGREGATE MATERIALS

- A. Fine Aggregate Type: Conforming to State of Local Public Work's standard.
- B. Fine Aggregate Type (Sand): Natural river or bank sand; free of silt, clay, loam, friable or soluble materials, and organic matter; graded in accordance with ASTM C136, ASTM D2487 Group Symbol SW SP SM SC.

2.3 SOURCE QUALITY CONTROL

- A. Coarse Aggregate Material - Testing and Analysis: Perform in accordance with ASTM D698, ASTM D1557, AASHTO T180, ASTM D4318, or ASTM C136.

- B. When tests indicate materials do not meet specified requirements, change material and retest.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify compacted substrate is dry and ready to support paving and imposed loads.
 - 1. Proof roll substrate with vibratory roller in minimum two perpendicular passes to identify soft spots.
 - 2. Remove soft substrate and replace with compacted fill.
- B. Verify substrate has been inspected, gradients and elevations are correct.

3.2 PREPARATION

- A. Correct irregularities in substrate gradient and elevation by scarifying, reshaping, and re-compacting.
- B. If fill is required, compact subgrade soil in accordance with 31 20 00.
- C. Excavate sandy loam and loamy sand topsoil from areas to be paved prior to subbase installation.
- D. Do not place fill on soft, muddy, or frozen surfaces.

3.3 AGGREGATE PLACEMENT

- A. Spread aggregate over prepared substrate to total compacted thickness indicated on Drawings.
- B. Roller compact aggregate to 95 percent maximum density unless otherwise indicated on Drawings.
- C. Level and contour surfaces to elevations, profiles, and gradients indicated on Drawings.
- D. Add small quantities of fine aggregate to coarse aggregate when required to assist compaction.
- E. Maintain optimum moisture content of fill materials to attain specified compaction density.
- F. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

3.4 TOLERANCES

- A. Tolerances as follows:
 - 1. Maximum Variation From Flat Surface: 1/2 inch measured with 10 foot straight edge.
 - 2. Maximum Variation From Thickness: 1/4 inch.

3. Maximum Variation From Elevation: 1/4 inch.

3.5 FIELD QUALITY CONTROL

- A. Contractor to accommodate the Owner's third party testing agency to perform compaction testing during the work.
- B. When tests indicate Work does not meet specified requirements, remove Work, replace and retest.

3.6 COMPACTION

- A. Compact materials to 98 percent of maximum density as determined from test strip, in accordance with ASTM D2940.

END OF SECTION

SECTION 32 12 16 - ASPHALT PAVING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Asphalt materials.
 - 2. Aggregate materials.
 - 3. Asphalt paving base course, binder course, and wearing course.
 - 4. Asphalt paving overlay for existing paving.
 - 5. Surface slurry.
 - 6. Asphalt berm (Cape Cod berm).
 - 7. Pavement patching.

- B. Related Requirement:
 - 1. Section 31 20 00 – Earth Moving
 - 2. Section 32 11 23 – Aggregate Base Courses.
 - 3. Section 32 17 23 – Pavement Markings.

1.2 REFERENCE STANDARDS

- A. American Association of State Highway and Transportation Officials:
 - 1. AASHTO M17 - Standard Specification for Mineral Filler for Bituminous Paving Mixtures.
 - 2. AASHTO M29 - Standard Specification for Fine Aggregate for Bituminous Paving Mixtures.
 - 3. AASHTO M140 - Standard Specification for Emulsified Asphalt.
 - 4. AASHTO M208 - Standard Specification for Cationic Emulsified Asphalt.
 - 5. AASHTO M288 - Standard Specification for Geotextile Specification for Highway Applications.
 - 6. AASHTO M320 - Standard Specification for Performance-Graded Asphalt Binder.
 - 7. AASHTO M324 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.
 - 8. AASHTO MP1a - Standard Specification for Performance-Graded Asphalt Binder.

- B. Asphalt Institute:
 - 1. AI MS-2 - Mix Design Methods for Asphalt Concrete and Other Hot- Mix Types.
 - 2. AI MS-2 – Asphalt Plant Manual
 - 3. AI MS-19 - Basic Asphalt Emulsion Manual.

- C. U.S. Army Corp OF Engineers
 - 1. UN-13 (CE MP-ET) – Hot Mix Asphalt Handbook

- D. ASTM International:
 - 1. ASTM C1371-2004a - Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers.
 - 2. ASTM C1549-2004 - Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer.

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3. ASTM D242 - Standard Specification for Mineral Filler for Bituminous Paving Mixtures.
4. ASTM D692 - Standard Specification for Coarse Aggregate for Bituminous Paving Mixtures.
5. ASTM D946 - Standard Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction.
6. ASTM D977 - Standard Specification for Emulsified Asphalt.
7. ASTM D1073 - Standard Specification for Fine Aggregate for Bituminous Paving Mixtures.
8. ASTM D1188 - Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Coated Samples
9. ASTM D2027 - Standard Specification for Cutback Asphalt (Medium-Curing Type).
10. ASTM D2397 - Standard Specification for Cationic Emulsified Asphalt.
11. ASTM D2726 - Standard Test Method for Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixtures.
12. ASTM D2950 - Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods.
13. ASTM D3381 - Standard Specification for Viscosity-Graded Asphalt Cement for Use in Pavement Construction.
14. ASTM D3515 - Standard Specification for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures.
15. ASTM D3549 - Standard Test Method for Thickness or Height of Compacted Bituminous Paving Mixture Specimens.
16. ASTM D3910 - Standard Practices for Design, Testing, and Construction of Slurry Seal.
17. ASTM D6690 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.
18. ASTM E408-1971(1996) e1 - Standard Test Methods for Total Normal Emittance of Surfaces Using Inspection-Meter Techniques.
19. ASTM E903-1996 - Standard Test Method for Solar Absorptance, Reflectance, and Transmittance of Materials Using Integrating Spheres.
20. ASTM E1918-1997 - Standard Test Method for Measuring Solar Reflectance of Horizontal and Low-Sloped Surfaces in the Field.
21. ASTM E1980-2001 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces.

1.3 SUBMITTALS

A. Product Data:

1. Submit product information for asphalt and aggregate materials.
2. Submit mix design.
 - a. Design mix submittal to follow the format indicated in the Asphalt Institute Manual MS-2, Marshall Stability Method; and include the following:
 - 1) Type/name of the mix.
 - 2) Gradation analysis.
 - 3) Grade of asphalt cement used
 - 4) Marshall Stability (lbs.).
 - 5) Flow and effective asphalt content (percent).

1.4 QUALITY ASSURANCE

A. Mixing Plant: Certified by State.

- B. Obtain materials from same source throughout.
- C. Perform Work in accordance with State, Municipality, and/or Public Work's standard.
- D. Perform work within public rights-of-way in accordance with the rules, regulations and requirements of the Public Agency having control and ownership of such rights-of-way.

1.5 QUALIFICATIONS

- A. Installer: Company specializing in performing work of this section with minimum 5 years documented experience.

1.6 AMBIENT CONDITIONS

- A. Do not place asphalt mixture between November 1 and March 1 without written request and approval from the Owner and Engineer.
- B. Do not place asphalt mixture when ambient air or base surface temperature is less than 40 degrees F, or surface is wet or frozen.
- C. Apply tack coat only when the ambient temperature is above 40°F, and when the temperature has been above 35°F for 12 hours immediately prior to application. Do not apply when base is wet, contains excess moisture, or during rain.
- D. The required temperature of the bituminous pavement mixture, within a tolerance of plus or minus 15°F, when delivered at the site, will be governed by the temperature of the base upon which the mix is placed, as follows:

Base Temperature in Degrees F	Required Material Temperature in Degrees F For Course Thickness in Inches			
	1	1-1/2	2	3 and Greater
35-40	-	305	295	280
41-50	310	300	285	275
51-60	300	295	280	270
61-70	290	285	275	265
71-80	285	280	270	265
81-90	275	270	265	260
91 & over	270	265	260	255

- E. Place asphalt mixture when temperature is not more than 15 degrees F less than initial mixing temperature.

PART 2 PRODUCTS

2.1 ASPHALT PAVING

A. Performance / Design Criteria:

1. Paving: Design for parking areas and residential streets.

B. Asphalt Materials:

1. Asphalt Cement: Comply with AASHTO M-226/ASTM D 3381; Table 2 for grades AC-10, AC-20, or AC-30, AR-8000, viscosity grade, depending on local mean annual air temperature, as follows:

Temperature Condition	Asphalt Grades
Cold, mean annual air temperature < 7 degrees C) 45 degrees F)	AC-10 85/100 pen.
Warm, mean annual air temperature Between 7 degrees C (45 degrees F) And degrees C (75 degrees F)	AC-20 60/70 pen.
Hot, mean annual air temperature > 24 degrees C (75 degrees F)	AC-30

2. Primer: In accordance with State and local Public Work's standards.
3. Tack Coat: diluted emulsified asphalt, one part water to one part emulsified asphalt setting type.
4. Reclaimed Asphalt Pavement (RAP): Processed material obtained by milling or full depth removal of existing asphalt paving.
5. Oil: In accordance with State and local Public Work's standards.

C. Aggregate Materials:

1. Fine Aggregate:
 - a. 100% Natural sand
 - b. 100% Stone sand
 - c. A blend of natural sand and stone sand
 - d. The fine aggregate, as delivered to the mixer, must meet the following gradation requirement:

<u>Sieve</u>	<u>Percent Passing</u>	<u>Minimum</u>	<u>Maximum</u>
3/8 inch	95	95	100
No. 8	70	70	95
No. 50	20	20	40
No. 200	2	2	16

- e. In the fine aggregate sieve analysis (passing No. 8), the amount between two successive sieves (No. 16, 30, 50, and 100) not to exceed 33 percent of the fine aggregate total.
2. Mineral Filler: ASTM D242 or AASHTO M17; Rock or slag dust, Portland cement, or other inert material or finely ground mineral particles, free of foreign matter.

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- D. Reclaimed Asphalt Pavement (RAP): Provide material obtained from the highways or streets by crushing, milling, or planing existing hot mix asphalt pavements.
 - 1. Proportion of RAP to virgin aggregate for base course mixtures and intermediate course mixtures maximum amounts:
 - a. 40% for drum mix plants
 - b. 20% for modified batch plants.
 - c. 10% for surface course mixtures.
- E. Aggregate Subbase: Specified in Section 32 11 23.

2.2 MIXES

- A. Use dry material to avoid foaming. Mix uniformly.
- B. Asphalt-Aggregate Mixture: A minimum stability based on a 50-blow Marshall Method, complying with AASHTO T245 (ASTM D 1559), of 1200 lb. with a flow between 8 and 16. Provide the aggregate gradation and bitumen content, as follows:
 - 1. Air Voids: 3-5%.
 - 2. Allowable variance of percent bitumen by weight of total mix: +0.4 percent.
 - 3. The maximum allowable percentage of wear per Abrasion Test (AASHTO-T96): 35 percent.
 - 4. Sieve analysis of mix percent by weight passing as follows:

Sieve	Base Course	Binder Course	Dense Binder Mix	Standard Top Course	Dense Top Course	Modified Top Course	Sand Mix
2 inch	100						
1 inch	55-80	100				100	
3/4 inch		80-100				95-100	
5/8 inch				100			
1/2 inch	40-65	65-80	100	95-100	100	75-90	
3/8 inch			80-100	80-90	90-100	60-75	100
No. 4	20-45	48-65	55-80	50-76	50-76	40-60	80-100
No. 8	15-33	37-51	48-63	37-54	37-54	32-44	64-85
No. 16			36-49	26-40	26-40	24-34	46-68
No. 30	8-17	17-30	24-38	17-29	17-29	16-26	26-50
No. 50	4-12	10-22	14-27	10-21	10-21	8-18	13-31
No. 100			6-18	5-16	5-16	4-13	7-17
No. 200	0-4	0-6	4-8	2-7	2-7	2-7	3-8
Bitumen	4-5	5-6	7-8	5.5-7.0	5.5-7.0	5.5-6.5	7-8

- C. Hot-Mix Asphalt: Dense, hot-laid, hot-mix asphalt plant mixes approved by MASSDOT Specifications and designed according to procedures in AI MS-2, "Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types".

2.3 ACCESSORIES

- A. Sealant: ASTM D6690, Type I; hot applied type.

2.4 SOURCE QUALITY CONTROL

- A. Submit proposed mix design of each class of mix for review prior to beginning of Work.
- B. Hot-Mix Asphalt: Dense, hot-laid, hot-mix asphalt plant mixes approved by MASSDOT Specifications and designed according to procedures in AI MS-2, "Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types".

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify utilities indicated under paving are installed with excavations and trenches backfilled and compacted.
- B. Verify compacted subbase is dry and ready to support paving and imposed loads.
 - 1. Proof roll subbase with heavy pneumatic-tired equipment in minimum two perpendicular passes to identify soft spots.
 - 2. Remove soft subbase and replace with compacted fill as specified in Section 31 23 23.
- C. Verify gradients and elevations of base are correct.
- D. Verify gutter drainage grilles and frames manhole frames, valve covers, and other utility access covers are installed in correct position and elevation.

3.2 PREPARATION

- A. Coordinate paving operations with all other work, especially underground utility construction, to prevent covering up unfinished or uninspected work and loss of time or labor by improper scheduling.
- B. Apply a uniform coating of an approved tack coat material on vertical surfaces of structures and existing pavement surfaces in contact with new bituminous pavement. Prevent splattering or staining of exposed surfaces above finished grade during the application. Clean, repair or replace exposed surfaces that are stained as a result of incorrect application.
- C. Thoroughly clean with a self-propelled sweeper all existing paved surfaces to be overlaid. Broom sweep until areas inaccessible by power sweeper.

3.3 DEMOLITION

- A. Saw cut and notch existing paving as indicted on Drawings.

- B. Clean existing paving to remove foreign material, excess joint sealant and crack filler from paving surface.
- C. Repair surface defects in existing paving to provide uniform surface to receive new paving.

3.4 COLD MILLING

- A. Clean existing pavement surface of loose and deleterious material immediately before cold milling.
- B. Remove existing asphalt pavement by cold milling to grades and cross sections as indicated on Drawings.
- C. Perform milling by machinery suitable for the type and size of project.

3.5 INSTALLATION

- A. Install pavements in the location and to the grades as indicated on Drawings.
- B. Install pavement courses at thickness as indicated on Drawings.
- C. Subbase:
 - 1. Aggregate Subbase: Install as specified in Section 32 11 23.
- D. Primer:
 - 1. Apply primer in accordance with AI MS-2.
- E. Tack Coat:
 - 1. Apply tack coat on asphalt and concrete surfaces at uniform rate.
 - a. New Surfaces: 1/3-1/2 gal/sq yd.
 - b. Existing Surfaces: 1/3-1/2 gal/sq yd.
 - 2. Apply tack coat to contact surfaces of curbs, gutters and existing pavement.
 - 3. Coat surfaces of manholes, catch basin frames and other covers with oil to prevent bond with asphalt paving. Do not tack coat these surfaces.
- F. Single Course Asphalt Paving:
 - 1. Place asphalt within 24 hours of applying primer or tack coat.
 - 2. Place asphalt wearing course to thickness indicated on Drawings.
 - 3. Compact paving by rolling to specified density. Do not displace or extrude paving from position. Hand compact in areas inaccessible to rolling equipment.
 - 4. Perform rolling with consecutive passes to achieve even and smooth finish without roller marks.
- G. Double Course Asphalt Paving:
 - 1. Place asphalt binder course within 24 hours of applying primer or tack coat.
 - 2. Place binder course to thickness indicated on Drawings.
 - 3. Place wearing course within 24 hours of placing and compacting binder course. When binder course is placed more than 24 hours before placing wearing course, clean surface and apply tack coat before placing wearing course.

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4. Place wearing course to thickness indicated on Drawings.
5. Compact each course by rolling to specified density. Do not displace or extrude paving from position. Hand compact in areas inaccessible to rolling equipment.
6. Perform rolling with consecutive passes to achieve even and smooth finish, without roller marks.

H. Asphalt Paving Overlay

1. Apply tack coat to existing paving surface at rate recommended by geotextile fabric manufacturer.
2. Install geotextile fabric in accordance with manufacturer's instructions to permit asphalt saturation of fabric. Lap fabric edge and end joints 4 inches.
3. Place wearing course to thickness indicated on Drawings.
4. Compact overlay by rolling to specified density. Do not displace or extrude paving from position. Hand compact in areas inaccessible to rolling equipment.
5. Perform rolling with consecutive passes to achieve even and smooth finish, without roller marks.

I. Meeting Existing Pavements

1. Sawcut the existing pavements to produce a uniform, smooth joint surface. Sawcut neat, straight, even lines with straight vertical edges free from irregularities. Do not damage the pavement to remain.

J. Surface Slurry

1. Install uniform thickness surface slurry over existing paving in accordance with ASTM D3910.
2. Allow slurry to cure.
3. Roll paving to achieve uniform surface.

K. Asphalt Berm

1. Clean surface of all loose and deleterious material.
2. Apply tack coat in accordance with the Drawings and MassDOT requirements.
3. Installed as indicated on Drawings.
4. Install asphalt berm with a self-propelled automatic berm machinery.
5. Do not place asphalt berm on wet surfaces, or when weather conditions otherwise prevent the proper handling or finishing of asphalt mixtures.
6. Backfill the back of the berm with top soil within 24 hours after placement.

L. Curbs

1. Install extruded asphalt curbs of 6 inch profile as indicated on Drawings.

3.6 TOLERANCES

- A. Flatness: Maximum variation of 1/4 inch measured with 10 foot straight edge.
- B. Scheduled Compacted Thickness: Within 1/4 inch.
- C. Variation from Indicated Elevation: Within 1/2 inch.

3.7 FIELD QUALITY CONTROL

- A. Asphalt Paving Mix Temperature: Measure temperature at time of placement.
- B. Owner to provide and Independent Testing Laboratory to perform testing of in-place bituminous pavement courses for compliance with requirements for thickness, density and surface smoothness. Top and base courses will be randomly tested with a calibrated nuclear gauge or Engineer approved equal. If density tests are found to be not in conformance with the specifications, additional core samples are to be provided at the same interval listed above for the paved surface for further testing. Pavement samples will be tested for conformance with the mix design. If additional core samples are found to be not in conformance with the specifications, remove and replace pavement at no expense to the Owner. Fill core samples with bituminous or cement concrete.
- C. Compaction: Minimum compacted density of 95% of laboratory Marshall Density in accordance with one of the following standards:
 - 1. Bulk Specific Gravity and Density of Compacted Bituminous Mixture Using Paraffin-Coated Specimens: ASTM D-1188.
 - 2. Bulk Specific Gravity of Compacted Bituminous Mixtures Using Saturated Surface Dry Specimens: ASTM D-2726.
- D. Remove and replace areas of insufficient compaction in compliance with the specifications.

3.8 PROTECTION

- A. No vehicular traffic or loads permitted on the newly completed pavement until adequate stability has been attained, the material has cooled sufficiently to prevent distortion or loss of fines, and the pavement has achieved a maximum temperature of 140 degrees F.
- B. If the climatic or other conditions warrant it, the period of time before opening to traffic may be extended at the discretion of the Engineer.

3.9 FINAL CLEAN UP

- A. Clean all pavement surfaces with proper sweeping machinery.
- B. Except for material indicated to be recycled, remove excavated materials from Project site and legally dispose of them in an approved landfill.

3.10 SCHEDULE – MIX USES

- A. Mix Uses:
 - 1. Top Course: Residential streets.
 - 2. Dense Top Course: Standard for non-residential commercial, steep grades, high traffic.
 - 3. Modified Top Course - Trucking terminals, Interstate Highways, 20,000 VPD.
 - 4. Binder Course: Standard for all pavements.
 - 5. Base Course: Used for heavy duty pavements when specified by Engineer.
 - 6. Dense Mix: Parking lots, sidewalks, bike paths, and driveways.
 - 7. Sand Mix: Playgrounds, tennis courts.

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END OF SECTION

SECTION 32 13 13 - CONCRETE PAVING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Aggregate subbase (base course).
2. Concrete paving for:
 - a. Concrete ramps for boardwalk.
 - b. Concrete pads

B. Related Requirements:

1. Section 03 30 00 – Cast-In-Place Concrete.
2. Section 31 20 00 – Earth Moving.
3. Section 32 11 23 - Aggregate Base Courses.
4. Section 32 12 16 - Asphalt Paving.
5. Section 32 17 23 - Pavement markings.
6. Section 32 91 19 - Landscape Grading.

1.2 REFERENCE STANDARDS

A. American Association of State Highway and Transportation Officials:

1. AASHTO M324 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.

B. American Concrete Institute:

1. ACI 301 - Specifications for Structural Concrete.
2. ACI 304 - Guide for Measuring, Mixing, Transporting, and Placing Concrete.

C. ASTM International:

1. ASTM A184/A184M - Standard Specification for Fabricated Deformed Steel Bar Mats for Concrete Reinforcement.
2. ASTM A185/A185M - Standard Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.
3. ASTM A497/A497M - Standard Specification for Steel Welded Wire Fabric, Deformed, for Concrete Reinforcement.
4. ASTM A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
5. ASTM A706/A706M - Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement.

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6. ASTM A767/A767M - Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement.
7. ASTM A775/A775M - S Standard Specification for Epoxy-Coated Steel Reinforcing Bars.
8. ASTM A884/A884M - Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement.
9. ASTM A934/A934M - Standard Specification for Epoxy-Coated Prefabricated Steel Reinforcing Bars.
10. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field.
11. ASTM C33 - Standard Specification for Concrete Aggregates.
12. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
13. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete.
14. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic Cement Concrete.
15. ASTM C150 - Standard Specification for Portland Cement.
16. ASTM C172 - Standard Practice for Sampling Freshly Mixed Concrete.
17. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
18. ASTM C231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
19. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.
20. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
21. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete.
22. ASTM C595 - Standard Specification for Blended Hydraulic Cements.
23. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.
24. ASTM C979 - Standard Specification for Pigments for Integrally Colored Concrete.
25. ASTM C989 - Standard Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars.
26. ASTM C1017/C1017M - Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
27. ASTM C1064/C1064M - Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete.
28. ASTM C1116 - Standard Specification for Fiber-Reinforced Concrete and Shotcrete.
29. ASTM C1315 - Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
30. ASTM C1371-2004a - Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers.
31. ASTM C1549-2004 - Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer.
32. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
33. ASTM D1752 - Standard Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.
34. ASTM D6690 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.

35. ASTM E408-1971(1996)e1 - Standard Test Methods for Total Normal Emittance of Surfaces Using Inspection-Meter Techniques.
36. ASTM E903-1996 - Standard Test Method for Solar Absorptance, Reflectance, and Transmittance of Materials Using Integrating Spheres.
37. ASTM E1918-1997 - Standard Test Method for Measuring Solar Reflectance of Horizontal and Low-Sloped Surfaces in the Field.
38. ASTM E1980-2001 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces.

1.3 PRE-INSTALLATION MEETINGS

- A. Convene minimum one week prior to commencing work of this section.

1.4 SUBMITTALS

- A. Product Data:
 1. Submit data on concrete materials, joint filler, admixtures and curing compounds.
- B. Design Data:
 1. Submit concrete mix design for each concrete strength. Submit separate mix designs when admixtures are required for the following:
 - a. Hot and cold weather concrete work.
 2. Identify mix ingredients and proportions, including admixtures.
 3. Identify chloride content of admixtures and whether or not chloride was added during manufacture.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 301 and applicable specification sections.
- B. Obtain cementitious materials from same source throughout.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum five years documented experience.
- B. Installer: Company specializing in performing work of this section with minimum five years documented experience.

1.7 MOCKUP

- A. Construct mockup, 10 x 5 feet, including paving, joints and surface texture for the exterior ribbed apron.
- B. Locate where directed by Engineer.
- C. Incorporate accepted mockup as part of Work.

1.8 AMBIENT CONDITIONS

- A. Do not place concrete when base surface temperature is less than 40 degrees F, or surface is wet or frozen.

PART 2 PRODUCTS

2.1 AGGREGATE SUBBASE

- A. Aggregate Subbase: As specified in Section 32 11 23

2.2 CONCRETE PAVING

- A. Performance / Design Criteria:
 - 1. Paving for Pedestrian Loading: Concrete mix design for sidewalks, stairs/steps, pads, and miscellaneous parking area.
- B. Form Materials:
 - 1. Form Materials: Conform to ACI 301.
 - 2. Wood or Steel form material, profiled to suit conditions.
 - 3. Joint Filler: ASTM D1751; Asphalt impregnated fiberboard or felt, 1/4 inch thick.
 - a. Self-expanding cork: ASTM D1752.
 - 4. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
- C. Reinforcement:
 - 1. Reinforcing Steel and Wire Fabric: Type specified in Section 03 20 00.
 - 2. Deformed Reinforcing: Steel: ASTM A615/A615M, 60 ksi yield grade, deformed billet bars, uncoated finish.
 - 3. Deformed Bar Mats: ASTM A184/A184M; fabricated from ASTM A615/A615M; 60 ksi yield strength, steel bars, unfinished.

4. Welded Deformed Wire Fabric: ASTM A497/A497M; in flat sheets or coiled rolls; unfinished.
5. Dowels: ASTM A615/A615M; 60 ksi yield strength, plain steel bars; cut to length indicated on Drawings, square ends with burrs removed; unfinished.
6. Tie Wire: Minimum 16 gage annealed type
7. Epoxy Coating Patching Material: Type as recommended by coating manufacturer.
8. Joint Dowel Bars: Plain steel bars, ASTM A 615/A 615M, Grade 60. Cut bars true to length with ends square and free of burrs.
9. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice."

D. Concrete Materials:

1. Cementitious Material: Use one of the following cementitious materials, of the same type, brand, and source throughout the Project:
 - a. Portland Cement: ASTM C 150, Type I or II. Supplement with the following:
 - 1) Fly Ash: ASTM C 618, Class C or F.
 - 2) Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
2. Normal-Weight Aggregates: ASTM C 33, Class 4S coarse aggregate, uniformly graded. Provide aggregates from a single source.
3. Water: ASTM C 94/C 94M.
4. Air-Entraining Admixture: ASTM C 260.
5. Chemical Admixtures: ASTM C 494/C 494M, of type suitable for application, certified by manufacturer to be compatible with other admixtures and to contain no more than 0.1 percent water-soluble chloride ions by mass of cementitious material.

2.3 FABRICATION

- A. Fabricate reinforcing in accordance with CRSI Manual of Practice.

2.4 MIXES

A. Concrete Mix

1. Prepare design mixtures, proportioned according to ACI 301, with the following properties:
 - a. Compressive Strength (28 Days): 4,000 psi.
 - b. Maximum Water-Cementitious Materials Ratio at Point of Placement: 0.45.
 - c. Slump Limit: 4 inches, plus or minus 1 inch.
 - d. Air Content: 6 percent plus or minus 1.5 percent for 3/4-inch nominal maximum aggregate size.
2. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.

3. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement according to ACI 301 requirements as follows:
 - a. Fly Ash or Pozzolan: 25 percent.
 - b. Ground Granulated Blast-Furnace Slag: 50 percent.
 - c. Combined Fly Ash or Pozzolan, and Ground Granulated Blast-Furnace Slag: 50 percent, with fly ash or pozzolan not exceeding 25 percent.
4. Synthetic Fiber: Uniformly disperse in concrete mix at manufacturer's recommended rate, but not less than 1.0 lb/cu. yd.

B. CONCRETE MIXING

1. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M and ASTM C 1116. Furnish batch certificates for each batch discharged and used in the Work.
 - a. When air temperature is between 85 deg F and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature

2.5 FINISHES

- A. Shop Finishing - Reinforcement:
 1. Galvanized Finish for Steel Bars: ASTM A767/A767M, Class I, hot dip galvanized after fabrication.
 2. Epoxy Coated Finish for Steel Bars: ASTM A775/A775M.
- B. Epoxy Coated Finish for Steel Wire: ASTM A884/A884M; Class A, using ASTM A775/A775M.
- C. Slip-Resistive Aggregate Finish: Factory-graded, packaged, rustproof, nonglazing, abrasive aggregate of fused aluminum-oxide granules or crushed emery with emery aggregate containing not less than 50 percent aluminum oxide and not less than 20 percent ferric oxide; unaffected by freezing, moisture, and cleaning materials.

2.6 ACCESSORIES

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1752, cork or self-expanding cork.
- B. Curing Compound: ASTM C309, Type 1, Class A
- C. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth
- D. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet
- E. Concrete sealant to be a ready-to-use water-based, VOC compliant silane/siloxane water repellent and chloride screen for the protection of concrete and masonry surfaces. Sealant to be low odor and be alkaline stable to protect horizontal and vertical surfaces from moisture intrusion and

chemical attack of chloride salts. Manufacturers to be Saltguard® WB by Prosoco, Sil-Act ATS42 by Advance Chemical Technologies Co., Bayguard 244 by Bay Oil Company, or Engineer approved equal. Product to meet the following performance requirements:

1. NCHRP 244 Series II Reduction of Water Absorption (compared to untreated control) 88%
2. ASTM E 514 Wind-Driven Rain Penetration (percent reduction of control) 91%
3. ASTM C 672 Scaling Resistance Exposure to De-Icing Chemicals and Freeze/Thaw Cycles – no mass loss; no scaling.
4. Resistance to: Sunlight -- Excellent; Alkalinity -- Excellent
5. Surface Appearance (after application) - No change

F. Joint Sealers: ASTM D6690, Type II or Type III; hot applied type.

2.7 SOURCE QUALITY CONTROL

- A. Submit proposed mix design of each class of concrete to appointed firm for review prior to commencement of Work.
- B. Tests on cement, aggregates, and mixes will be performed to ensure conformance with specified requirements.
- C. Test samples in accordance with ACI 301.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify compacted subbase is dry and ready to support paving and imposed loads.
 1. Proof roll subbase with vibratory roller in minimum two perpendicular passes to identify soft spots.
 2. Remove soft subbase and replace with compacted fill.
- B. Verify gradients and elevations of base are correct.
- C. Proceed with paving only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Moisten substrate to minimize absorption of water from fresh concrete.
- B. Remove loose material from compacted subbase surface immediately before placing concrete.
- C. Coat surfaces of manhole, catch basin and other cover frames with oil to prevent bond with concrete paving.

- D. Notify Engineer minimum 24 hours prior to commencement of concreting operations.

3.3 INSTALLATION

A. Subbase:

- 1. Aggregate Subbase: Install as specified in Section 32 11 23.

B. Forms:

- 1. Place and secure forms and screeds to correct location, dimension, profile, and gradient.
- 2. Assemble formwork to permit easy stripping and dismantling without damaging concrete.

C. Reinforcement:

- 1. Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
- 2. Clean reinforcement of loose rust and mill scale, earth, ice or other bonding reducing materials.
- 3. Place reinforcing as indicated on Drawings.
- 4. Interrupt reinforcing at contraction and expansion joints.
- 5. Place dowels and reinforcing to achieve paving and curb alignment as detailed.
- 6. Provide doweled joints at transverse joints and interruptions of concrete with one end of dowel set in capped sleeve to allow longitudinal movement.
- 7. Repair damaged coatings as necessary to match shop finish.

D. Placing Concrete:

- 1. Coordinate installation of snow melting components.
- 2. Place concrete in accordance with ACI 301.
- 3. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.
- 4. Place concrete using the slip form technique.
- 5. Ensure reinforcing, inserts, embedded parts, formed joints and other components are not disturbed during concrete placement.
- 6. Place concrete continuously over the full width of the panel and between predetermined construction joints. Do not break or interrupt successive pours such that cold joints occur.
- 7. Screed pavement surfaces with a straightedge and strike off.
- 8. Commence initial floating using bull floats or darbies to provide an open textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not disturb concrete surfaces before beginning finishing operations or spreading surface treatments.
- 9. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
 - a. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.

- b. Remove snow, ice, or frost from subbase surface before placing concrete. Do not place concrete on frozen surfaces.
 - c. Do not use frozen materials or materials containing ice or snow.
 - d. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mix designs.
10. Hot-Weather Placement: Comply with ACI 301 and as follows when hot-weather conditions exist:
- a. Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated in total amount of mixing water.
 - b. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
 - c. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

E. Joints

- 1. General: Form construction, isolation, and contraction joints and tool edgings true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline, unless otherwise indicated.
- 2. When joining to existing paving, place traverse joints to align with previously placed joints unless otherwise indicated.
- 3. Construction Joints: Set construction joints at side and end terminations of pavement and at locations where pavement operations are stopped for more than one-half hour unless pavement terminates at isolation joints.
- 4. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, walks, other fixed objects, and where indicated.
- 5. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, to match jointing of existing adjacent concrete pavement.
- 6. Edging: Tool edges of pavement and joints in concrete after initial floating with an edging tool to a 1/4-inch radius. Repeat tooling of edges after applying surface finishes. Eliminate tool marks on concrete surfaces.
- 7. Place expansion/contraction joints at 20 foot intervals. Align curb, gutter, and sidewalk joints.
- 8. Place joint filler between paving components and building or other appurtenances. Recess top of filler 1/4 inch for sealant installation.
- 9. Provide scored joints at 5 feet intervals between sidewalks and curbs, between curbs and paving, and against structures.
- 10. Provide keyed joints as indicated.

F. Finishing:

- 1. Float Finishing
 - a. General: Do not add water to concrete surfaces during finishing operations.

- b. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats, or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.
 - 1) Medium-to-Coarse-Textured Broom Finish: Provide a coarse finish by striating float-finished concrete surface 1/16 to 1/8 inch deep with a stiff-bristled broom, perpendicular to line of traffic.
- c. Slip-Resistive Aggregate Finish: Before final floating, spread slip-resistive aggregate finish on pavement surface according to manufacturer's written instructions.
 - 1) Cure concrete with curing compound recommended by slip-resistive aggregate manufacturer. Apply curing compound immediately after final finishing.
 - 2) After curing, lightly work surface with a steel wire brush or abrasive stone and water to expose nonslip aggregate.

G. Curing and Protection

- 1. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- 2. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
- 3. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
- 4. Comply with ACI 306.1 for cold-weather protection.
- 5. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- 6. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.
- 7. Curing Methods: Cure concrete by moisture-retaining-cover curing or curing compound, as follows:
 - a. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
 - b. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

3.4 TOLERANCES

- A. Comply with tolerances of ACI 117 and as follows:

1. Elevation: 1/4 inch.
2. Thickness: Plus 3/8 inch, minus 1/4 inch.
3. Surface: Gap below 10-foot- long, unlevelled straightedge not to exceed 1/4 inch.
4. Joint Spacing: 3 inches.
5. Contraction Joint Depth: Plus 1/4 inch, no minus.
6. Joint Width: Plus 1/8 inch, no minus.

3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Contractor to engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Testing Services: Test composite samples of fresh concrete obtained (ASTM C 172) according to the following requirements:
 1. Testing Frequency: Obtain at least 1 composite sample for each 100 cu. yd. or fraction thereof of each concrete mix placed each day.
 - a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing to be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
 2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mix. Perform additional tests when concrete consistency appears to change.
 3. Air Content: ASTM C 231, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mix.
 4. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.
 5. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.
 6. Compressive-Strength Tests: ASTM C 39/C 39M; test 1 specimen at 7 days and 2 specimens at 28 days.
 7. A compressive-strength test: The average compressive strength from 2 specimens obtained from same composite sample and tested at 28 days.
- C. Strength of each concrete mix will be satisfactory if average of any 3 consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
- D. Report test results in writing to Engineer within 48 hours of testing. Reports of compressive-strength tests to include Project identification, name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
- E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Engineer but will not be used as sole basis for approval or rejection of concrete.

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- F. Additional Tests: Perform additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Engineer.
- G. Remove and replace concrete pavement where test results indicate that it does not comply with specified requirements.
- H. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- I. Prepare test and inspection reports.
- J. Inspect reinforcing placement for size, spacing, location, support.
- K. Testing firm will take cylinders and perform slump and air entrainment tests in accordance with ACI 301.
- L. Strength Test Samples:
 - 1. Sampling Procedures: ASTM C172.
 - 2. Cylinder Molding and Curing Procedures: ASTM C31/C31M, cylinder specimens, standard cured or field cured.
 - 3. Sample concrete and make one set of three cylinders for every 150 cu yds or less of each class of concrete placed each day and for every 5,000 sf of surface area paving.
 - 4. Make one additional cylinder during cold weather concreting, and field cure.
- M. Field Testing:
 - 1. Slump Test Method: ASTM C143/C143M.
 - 2. Air Content Test Method: ASTM C173/C173M or ASTM C231.
 - 3. Temperature Test Method: ASTM C1064/C1064M.
 - 4. Measure slump and temperature for each compressive strength concrete sample.
 - 5. Measure air content in air entrained concrete for each compressive strength concrete sample.
- N. Cylinder Compressive Strength Testing:
 - 1. Test Method: ASTM C39/C39M.
 - 2. Test Acceptance: Average compressive strength of three consecutive test maximum less than specified compressive strength.
 - 3. Test one cylinder at 7 days.
 - 4. Test two cylinders at 28 days.
 - 5. Retain one cylinder for testing when requested by Engineer.
 - 6. Dispose remaining cylinders when testing is not required.
- O. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

3.6 CONCRETE SEALING

- A. Sealant to be applied to all new exposed concrete surfaces. Sealant to be applied in accordance with the manufacturer's requirements, unless otherwise noted in the Drawings. Application thickness to be as required per the manufacturer to ensure product performance.
- B. Application: Prior to application Contractor to review material safety sheets and manufacturer procedures. Do not dilute or alter. Mix well before application.
- C. Cleanup: Contractor to clean tools, equipment and surfaces affected by over spray with soap and warm water.

3.7 REPAIRS AND PROTECTION

- A. Immediately after placement, protect paving from premature drying, excessive hot or cold temperatures, and mechanical injury.
- B. Remove and replace concrete pavement that is broken, damaged, or defective or that does not comply with requirements in this Section.
- C. Drill test cores, where directed by Engineer, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with portland cement concrete bonded to pavement with epoxy adhesive.
- D. Protect concrete from damage. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.
- E. Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material. Sweep concrete pavement not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION

SECTION 32 17 23 - PAVEMENT MARKINGS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Traffic/parking lines and markings.

B. Related Requirements:

1. Section 32 12 16 - Asphalt Paving.
2. Section 32 13 13 - Concrete Paving.

1.2 REFERENCE STANDARDS

A. American Association of State Highway and Transportation Officials:

1. AASHTO M247 - Standard Specification for Glass Beads Used in Traffic Paint.

B. ASTM International:

1. ASTM D34 - Standard Guide for Chemical Analysis of White Pigments.
2. ASTM D126 - Standard Test Methods for Analysis of Yellow, Orange, and Green Pigments Containing Lead Chromate and Chromium Oxide Green.
3. ASTM D562 - Standard Test Method for Consistency of Paints Measuring Krebs Unit (KU) Viscosity Using a Stormer-Type Viscometer.
4. ASTM D711 - Standard Test Method for No-Pick-Up Time of Traffic Paint.
5. ASTM D713 - Standard Practice for Conducting Road Service Tests on Fluid Traffic Marking Materials.
6. ASTM D969 - Standard Test Method for Laboratory Determination of Degree of Bleeding of Traffic Paint.
7. ASTM D1301 - Standard Test Methods for Chemical Analysis of White Lead Pigments.
8. ASTM D1394 - Standard Test Methods for Chemical Analysis of White Titanium Pigments.
9. ASTM D1475 - Standard test Method for Density of Liquid Coatings, Inks, and Related Products.
10. ASTM D1640 - Standard Test Methods for Drying, Curing, or Film Formation of Organic Coatings at Room Temperature.
11. ASTM D2202 - Standard Test Method for Slump of Sealants.
12. ASTM D2371 - Standard Test Method for Pigment Content of Solvent-Reducible Paints.
13. ASTM D2621 - Standard Test Method for Infrared Identification of Vehicle Solids From Solvent-Reducible Paints.
14. ASTM D2743 - Standard Practices for Uniformity of Traffic Paint Vehicle Solids by Spectroscopy and Gas Chromatography.

1.3 SUBMITTALS

- A. Product Data: Submit paint formulation for each type of paint/marketing material and the weather application information for each type.
- B. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.
- C. Test and Evaluation Reports: Submit source and acceptance test results in accordance with AASHTO M247.
- D. Manufacturer's Instructions: Submit instructions for application temperatures, eradication requirements, application rate, line thickness, type of glass beads, bead embedment and bead application rate, and any other data on proper installation.
- E. Proposed schedule of pavement marking with type of equipment to be used and description of colors to be installed at locations within project.

1.4 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.
- B. Applicator: Company specializing in performing work of this section with minimum 3 years documented experience.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Invert containers several days prior to use when paint has been stored more than 2 months. Minimize exposure to air when transferring paint. Seal drums and tanks when not in use.
- B. Glass Beads. Store glass beads in cool, dry place. Protect from contamination by foreign substances.

1.6 AMBIENT CONDITIONS

- A. Do not apply materials when surface and ambient temperatures are outside temperature ranges required by paint product manufacturer.
- B. Do not apply exterior coatings during rain or snow when relative humidity is outside humidity ranges, or moisture content of surfaces exceed those required by paint product manufacturer.
- C. Do not apply paint when temperatures are expected to fall below 50 degrees F for 24 hours after application.
- D. Volatile Organic Content (VOC). Do not exceed State or Environmental Protection Agency maximum VOC on traffic paint.

1.7 WARRANTY

- A. Furnish three year manufacturer's warranty for traffic paints.

PART 2 PRODUCTS

2.1 PAINTED PAVEMENT MARKINGS

A. Manufacturers:

- 1. Franklin Paint Company, Hydrophast Premium Waterbourne Traffic Paint
- 2. Aexcel Corporation, Premium Waterbourne
- 3. Sherwin-Williams Company, Premium Waterbourne

B. Performance / Design Criteria:

- 1. Paint Adhesion: Adhere to road surface forming smooth continuous film one minute after application.
- 2. Paint Drying: Tack free by touch so as not to require coning or other traffic control devices to prevent transfer by vehicle tires within two minutes after application.

C. Paint: Ready mixed, conventional and fast dry waterborne traffic paints, lead-free, non-toxic, NASSHTO Test Deck, minimum retroreflectance of 100 mcads, durability rating of 6 or more after in place for 9 months; within following limits:

- 1. Pigment, percent by weight: 60 plus or minus 2
- 2. Vehicle, percent by weight: 40 plus or minus 2
- 3. Non-Volatile, percent by weight of paint: 76.0
- 4. Weight per gallon, pounds minimum 13.0
- 5. Viscosity: 80-95 Kreh Units at 77 degrees F.
- 6. Grind (Hegeman Gauge), minimum Field Tested no tracking time under ambient conditions: 20-90 seconds.
- 7. Dry Through Time: 15 mils wet at 90 percent relative humidity, 72 degrees F, ASTM D1640: 125 minutes maximum.
- 8. VOC (Volatile Organic Content): One lbs/gal maximum.

D. Glass Beads: AASHTO M247, Type 1, coated to enhance embedment and adherence with paint.

2.2 EQUIPMENT

A. Continuous Longitudinal Line Application Machine: Use application equipment with following capabilities.

- 1. Dual nozzle paint gun to simultaneously apply parallel lines of indicated width in solid or broken patterns or various combinations of those patterns.

2. Pressurized bead-gun to automatically dispense glass beads onto painted surface, at required application rate.
3. Measuring device to automatically and continuously measure length of each line placed, to nearest foot.
4. Device to heat paint for fast dry applications.

B. Machine Calibration:

1. Paint Line Measuring Device: Calibrate automatic line length gauges to maintain tolerance of plus or minus 25 feet per mile.
2. Cycle Length/Paint Line Length Timer: Calibrate cycle length to maintain tolerance of plus or minus 6 inches per 40 feet; calibrate paint line length to maintain tolerance to plus or minus 3 inches per 10 feet.
3. Paint Guns: Calibrate to simultaneously apply paint binder at uniform rates as specified with an allowable tolerance of plus or minus 1 mil.
4. Bead Guns: Calibrate to dispense glass beads simultaneously at specified rate. Check guns by dispensing glass beads into gallon container for predetermined fixed period of time. Verify weight of glass beads.

C. Other Equipment:

1. For application of crosswalks, intersections, stop lines, legends and other miscellaneous items by walk behind stripers, hand spray or stencil trucks, apply with equipment meeting requirements of this section. Do not use hand brushes or rollers. Optionally apply glass beads by hand.

2.3 QUALITY CONTROL

- A. Test and analyze traffic paints in accordance with State Requirements.
- B. Make paints and glass beads available for inspection at manufacturer's factory prior to packaging for shipment. Notify Architect/Engineer and Owner at least seven days before inspection is allowed.
- C. Allow witnessing of factory inspections and test at manufacturer's test facility. Notify Architect/Engineer and Owner at least seven days before inspections and tests are scheduled.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Prior to marking verify that new asphalt is complete, has been accepted by Owner and cured a minimum of 14 days.

- B. Inspect pavement surfaces for conditions and defects that will adversely affect quality of work. Do not place marking paint over unacceptable surfaces. If these conditions exist, immediately notify the Engineer.
- C. Commencement of installation constitutes acceptance of surface as suitable for installation.
- D. Do not apply paint to concrete surfaces until concrete has cured for 28 days.

3.2 PREPARATION

- A. Maintenance and Protection of Traffic:
 - 1. Provide short term traffic control.
 - 2. Prevent interference with marking operations and to prevent traffic on newly applied markings before markings dry.
 - 3. Maintain travel lanes between 7: 00 AM to 9: 00 AM, and between 4: 00 PM and 6: 00 PM.
 - 4. Maintain access to existing businesses and other properties requiring access.
- B. Surface Preparation.
 - 1. Clean and dry paved surface prior to painting.
 - 2. Blow or sweep surface free of dirt, debris, oil, grease or gasoline.
 - 3. Spot location of final pavement markings as specified and as indicated on Drawings by applying pavement spots 25 feet on center. Mark layout of stripes and lines with chalk or paint.
 - 4. Notify Engineer after placing pavement spots and minimum 3 days prior to applying traffic lines.
- C. Provide qualified technician to supervise equipment and application of marking. Layout markings using guide lines, templates and forms. Use stencils and templates made to industry standards.
- D. "Free hand" painting of arrows, symbols, or wording is unacceptable.

3.3 DEMOLITION

- A. Remove existing markings in an acceptable manner.
- B. Do not remove existing pavement markings by painting over with blank paint.
- C. Remove marking paint removal by machine only and in a manner to reduce grooves in the pavement and abraded dust from the road surface to the maximum extent practicable. Remove by methods that will cause least damage to pavement structure or pavement surface. Satisfactorily repair any pavement or surface damage caused by removal methods.
- D. Clean and repair existing remaining or reinstalled lines and legends.

3.4 APPLICATION

- A. Agitate paint for 1-15 minutes prior to application to ensure even distribution of paint pigment.
- B. Dispense paint at proper temperature to wet-film thickness of 15 mils, except dispense edge markings to wet-film thickness of 12 mils.
- C. Apply glass beads at rate of 6 pounds per gallon of paint.
- D. Apply markings in locations and to indicated dimensions at indicated locations.
- E. Prevent splattering and over spray when applying markings. Protect adjacent curbs, walks, fences, and other items from receiving paint.
- F. Unless material is track free at end of paint application convoy, use traffic cones to protect markings from traffic until track free. When vehicle crosses a marking and tracks it or when splattering or over spray occurs, eradicate affected marking and resultant tracking and apply new markings.
- G. Collect and legally dispose of residues from painting operations.

3.5 TOLERANCES

- A. Maximum Variation from Wet Film Thickness: 1 mil.
- B. Maximum Variation from Wet Paint Line Width: Plus or minus 1/8 inch.
- C. Maintain cycle length for skip lines at tolerance of plus or minus 6 inches per 40 feet and line length of plus or minus 3 inches per 10 feet.
- D. Maximum Variation from Specified Application Temperature: Plus or minus 5 degrees F

3.6 FIELD QUALITY CONTROL

- A. Inspect for incorrect location, insufficient thickness, line width, coverage, retention, uncured or discolored material, and insufficient bonding.
- B. Repair lines and markings, which after application and curing do not meet following criteria:
 - 1. Incorrect Location: Remove and replace incorrectly placed patterns.
 - 2. Insufficient Thickness, Line Width, Paint Coverage, Glass Bead Coverage or Retention: Prepare defective material by acceptably grinding or blast cleaning to remove substantial amount of beads and to roughen marking surface. Remove loose particles and debris. Apply new markings on cleaned surface in accordance with this Section.
 - 3. Uncured or Discolored Material, Insufficient Bonding: Remove defective markings in accordance with this Section and clean pavement surface one foot beyond affected area. Apply new markings on cleaned surface in accordance with this Section.

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- C. Replace defective pavement markings as specified throughout 3 year warranted period. Replace markings damaged by anti-skid materials, studded tires, tire chains, chemical deicers, snow plowing or other loss of marking material regardless of cause. When markings are damaged by pavement failure or by Owner's painting, crack sealing, or pavement repair operations, Contractor is released from warranty requirements for damaged work.
- D. A three member team will evaluate warranty provisions. Team will consist of one member from Owner, one member from Contractor, and third person who is mutually acceptable to Owner and Contractor. Any costs for third person will be equally shared between Owner and Contractor. At least once each year, beginning with year after acceptance, team to:
 - 1. Observe Owner taking readings by retroreflectometer or review Owner records of such evaluation. The number of readings will be as large as necessary to ensure that minimum criteria are satisfied. Readings will be during period from March 15 through October, when pavement is clean and dry.
 - 2. Determine color fade, discoloration or pigment loss based on visual color comparison between original sample plates with glass beads and in-place pavement markings.
 - 3. Determine magnitude of material loss.
- E. Prepare list of defective areas and areas requiring additional inspection and evaluation to decide where material may need replaced. Provide traffic control as necessary if markings require more detailed evaluation.
- F. Replace failed or defective markings in entire section of defective markings within 30 days after notification when any of the following exists during warranty period:
 - 1. Average retroreflectivity within any 528 foot section is less than 1225 mcd/m²/1x for white pavement markings and 100 mcd/m²/1x for yellow pavement markings.
 - 2. Marking is discolored or exhibits pigment loss, and is determined to be unacceptable by three member team based on visual comparison with beaded color plates.
 - 3. More than 15 percent of area of continuous line, or more than 15 percent of combined area of skip lines, within any 528 foot section of roadway is missing.
- G. Replace pavement marking material under warranty using original or better type material. Continue warranty to end of original 3 year period even when replacement materials have been installed as specified.
- H. When eradication of existing paint lines is necessary, eradicate by shot blast or water blast method. Do not gouge or groove pavement more than 1/16 inch during removal. Limit area of removal to area of marking plus on all sides. Prevent damage to transverse and longitudinal joint sealers, and repair any damage.
- I. Maintain daily log showing work completed, results of above inspections or tests, pavement and air temperatures, relative humidity, presence of any moisture on pavement, and any material or equipment problems. Make legible entries in log in ink, sign and submit by end of each work day. Enter environmental data into log prior to starting work each day and at two additional times during day.

3.7 PROTECTION

- A. Protect painted pavement markings from vehicular and pedestrian traffic until paint is dry and track free. Follow manufacturer's recommendations or use minimum of 30 minutes. Consider barrier cones as satisfactory protection for materials requiring more than 2 minutes dry time.

3.8 MAINTENANCE

- A. Furnish service and maintenance of traffic paints for three years from Date of Substantial Completion.

END OF SECTION

SECTION 32 91 19 - LANDSCAPE GRADING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Final grade topsoil for finish landscaping.

B. Related Sections:

1. Section 31 20 00 – Earth Moving
1. Section 31 25 00 – Erosion and Sediment Controls
2. Section 32 92 19 – Seeding
3. Section 32 93 00 – Plants

1.2 REFERENCES AND STANDARDS

A. AOAC: Association of Official Agricultural Chemists

B. ASTM International: American Society of Testing Materials International

C. American Association of State Highway and Transportation Officials:

1. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.

D. ASTM International:

1. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
2. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)).
3. ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).

E. UMTC: University of Massachusetts Transportation Center, "Manufactured Loam using Compost Material - Phase 1: Feasibility", October 1966 or latest update.

1.3 SUBMITTALS

- A. Topsoil tests: Prior to delivery or spreading, submit a minimum of two (2) approved sample test results of planting soil from each proposed location or source.

- B. Submit topsoil analysis results and recommended soil amendments at least one (1) month before any delivery of material to the following:
1. Landscape Architect
 2. Owner
 3. Landscape Contractor
 4. Seed Supplier
- C. Soil Additives and amendments: Product or testing certificates signed by manufacturers certifying that their products comply with specified requirements:
1. Manufacturers' certified analysis for all products specified.
 2. Analysis for other amendments, such as organic compost, by the University of Massachusetts Agricultural Extension Service or other approved testing laboratory, made according to methods established by the AOAC, where applicable, and as required in this Specification.
 3. Sieve and salt analysis of sand proposed as a planting soil amendment or component.
- D. Organic Material: A letter certifying source and composition of organic material proposed for use as a soil amendment indicating compliance with UMTC "Article 5.4 Standard Compost Specifications for Massachusetts" and meets requirements. Letter must also give description of product and recommendations for use as a planting soil component or amendment.
- E. Samples:
1. Topsoil: Submit, 2 lb sample of soil material to the Landscape Architect or Engineer.
 2. Organic Material (if applicable): Submit, 2 lb sample of each type of organic material to Landscape Architect or Engineer
- F. Materials Source: Submit supplier's name of imported materials source.
- G. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.4 QUALITY ASSURANCE

- A. Furnish each topsoil material from single source throughout the Work.
- B. Soil Samples:
1. Mix and obtain composite top soil samples for testing to ensure the topsoil conform to the specifications. Collect composite samples from the stockpiles and source or material to be delivered to the site. Submit prototype topsoil mixes to Laboratory at least 30 days before intended use on site, to allow for reformulation and retesting if test results are rejected.
 2. Provide samples to both Landscape Architect and testing laboratory and have testing report sent directly to the Landscape Architect.

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- C. Do not order or deliver materials until required samples, certifications, manufacturers' literature and test results have been reviewed by the Landscape Architect or Engineer. Delivered materials must be from the same source as the submitted samples.
- D. The Landscape Architect or Engineer may compare each soil delivery to the site with submission samples. Any deviations from the approved materials identified will require resubmission and further testing be performed. The Landscape Architect or Engineer reserves the right to reject on or after delivery any material that does not meet specifications or match approved samples. Use of unapproved topsoil will result in rejection and removal.
- E. Soil tests: All Tests performed by the University of Massachusetts Cooperative Extension Service in accordance with current standards of AOAC or other testing laboratory as approved by the Landscape Architect. Deliver test samples to laboratory, and have test results sent directly to the Landscape Architect. Testing reports to include the following for the stockpiled topsoil and finished planting soil that may or may not be amended in order to meet the specifications:
 - 1. Mechanical gradation (sieve analysis) and USDA soil classification
 - 2. Percent organic matter
 - 3. Chemical analysis for the following elements:
 - a. Soluble salts.
 - b. Carbon: nitrogen ratio
 - c. Potassium
 - d. Phosphorus
 - e. Magnesium
 - f. Calcium
 - g. Acidity (pH)
 - h. Toxic Elements
 - 4. Testing for heavy metals as required by the USEPA
 - 5. Recommendations for soil additives to correct soils deficiencies as necessary to accomplish planting goals appropriate for the Project.
- F. When tests indicate materials do not meet specified requirements, change material and retest.

1.5 QUALIFICATIONS

- A. Topsoil Supplier: Company specializing in manufacturing Products specified in this section with minimum 3 years documented experience.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Weather Limitations: Proceed with grading only when existing and forecasted weather conditions permit.

PART 2 PRODUCTS

2.1 MATERIAL

A. Topsoil Source:

1. Reuse surface soil stockpiled on-site if adequate stockpile areas are available.
2. Supplement with imported topsoil from off-site sources when on-site reusable quantities are insufficient.
3. Obtain topsoil displaced from naturally well-drained construction or mining sites where topsoil occurs at least four inches deep; do not obtain from agricultural land, bogs or marshes.

B. Topsoil:

1. Reusable excavated and /or Imported borrow
 - a. Fertile, friable, agricultural soil, typical for locality, capable of sustaining vigorous plant growth, taken from drained site; free of subsoil, clay or impurities, plants, weeds and roots;
 - b. Do not reuse topsoil from site where invasive plant species are growing.
2. USDA Textural Classification: Sandy Loam.
3. Acidity range (pH) of 5.5 to 7.0.
4. Containing the minimum of 4 percent and maximum of 10 percent inorganic matter by weight.
5. Soluble salt content (Electrical Conductivity):
 - a. Conductivity not to exceed 900 ppm, 0.9 mmhos/cm in soil.
 - 1) Naturally Stripped Topsoil: .01-.25 mmhos/cm
 - 2) Loam borrow manufactured from organic compost: not to exceed levels recommended for the specific plantings (.01-.75 mmhos/cm)
 - b. Note: Salt content will decrease the longer the soil is spread on site, with rain and aging of the organic components. The salt content must be within approved ranges by the time the soil is spread on site and plants installed, or planting will be delayed or soil rejected and will require replacement with an approved planting soil.
6. Nutrient Ranges:
 - a. Magnesium: 60-200 ppm
 - b. Phosphorus: 10- 100 ppm
 - c. Potassium to exceed 120 – 300 ppm

7. Reasonably free of roots, rocks larger than 1/2 inch subsoil, debris, large weeds, and foreign matter.
 8. Free of other extraneous materials harmful to plant growth.
- C. Organic matter proposed as a soil amendment: Natural or manufactured mature, composted organic material
1. Comply with UMTC "Article 5.4 Standard Compost Specifications for Massachusetts" and that the compost is mature.
 2. Produced by a DEP approved composting vendor of material originating from mature leaf compost, mature composted animal manure, other aged, composted vegetable materials such as brewer's waste, or chemically tested toxin-free processed sludge products (biosolids), composted with wood products, safe for plants, humans and soil organisms (Class A or Type I).
 3. Organic matter manufactured from sludge and other biowaste materials or manure to be aged for at least one (1) year without exception, and have no objectionable biowaste odor.
 4. Do not use raw (uncomposted or unprocessed) or incompletely composted organic matter.
 5. Refer also to requirements included in Article 2.3 Soil Additives for Planting Soil.

2.2 SOURCE QUALITY CONTROL

- A. Testing and Analysis of Topsoil Material.
- B. All topsoil delivered to the site must match the samples approved by the Landscape Architect or Engineer. Additional testing of topsoil delivered to the site will be required if it does not appear to be consistent with previously tested samples.
- C. When tests indicate materials do not meet specified requirements, change material and retest.
- D. Furnish materials of each type from same source throughout the Work.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 31 20 00 – Earth Moving: Verification of rough grading, trench backfilling and subbase has been contoured and compacted before starting work.
- B. Verify compliance with requirements and for conditions affecting performance of work of this Section prior to starting any work. Report any defect, such as incorrect grading, incorrect subgrade elevations, improper compaction, or drainage problems, to the Landscape Architect or Engineer prior to beginning Work. Do not proceed with installation until unsatisfactory conditions have been corrected. Commencement of Work indicates acceptance of filled subgrade areas and responsibility for Work.

1. When conditions detrimental to work are encountered including, but not limited to, incorrect grading, adverse drainage conditions, poor soil conditions, or invasive species problems, immediately notify the Owner and/or Landscape Architect or Engineer before beginning any Work.

C. Verify the location of the irrigation system and protect during operations.

3.2 PREPARATION

- A. Coordinate topsoil placement with other Work of this contract being performed on the Project site.
- B. Protect existing landscaping and other features identified to remain as part of the final Work.
- C. Protect existing structures, fences, sidewalks, utilities, paving, pavers, walls and curbs.
- D. Immediately notify Landscape Architect or Engineer if adjustments in grades and alignments are necessary to avoid interference with unforeseen conditions encountered.
- E. Protect subgrade areas scheduled for planting or drainage infiltration systems from traffic and erosion.

3.3 SUBGRADE PREPARATION

- A. Eliminate uneven areas and low spots.
- B. Remove debris, roots, branches, stones, in excess of 3/4 inch in size. Remove contaminated subsoil.
- C. Loosen subgrade to depth of 6 inches where topsoil is scheduled. Scarify in areas where equipment used for hauling and spreading topsoil has compacted subsoil.

3.4 PLACING TOPSOIL

- A. Place topsoil in seeding and planting areas to thickness required in the Drawings. Place topsoil during dry weather. Do not spread if either the topsoil or subgrade is frozen, muddy, compacted or excessively wet.
- B. Fine grade topsoil to eliminate rough or low areas. Maintain profiles and contour of subgrade. Fill depressions caused by settlement with additional topsoil and regrade and rake until a smooth and even finished grade is created.
- C. Remove roots, weeds, rocks, and foreign material while spreading.
- D. Manually spread topsoil close to plant material or structures to prevent damage.

- E. Lightly compact placed topsoil.
- F. Remove surplus subsoil from site.
- G. Re-spread surplus topsoil in ungraded seed and loam areas.
- H. Leave stockpile area and site clean and raked, ready to receive landscaping.

3.5 COMPACTION

- A. Planting areas to be drill seeded or hydroseeded: Roll and compact bed before seeding. Compact with a roller or other suitable means to achieve a maximum dry density of 88 to 90% for the placed loam in accordance with compaction standards of ASTM D1557, Method D.
- B. Areas to be hand seeded: Smooth surface to meet finished grades with raking and broadcast seed according to requirements specified. Compact with rolling after seeding.
- C. Loosening and re-rolling of the soils will be required in areas of over compaction.

3.6 FIELD VISIT

- A. A field visit is required by Landscape Architect or Engineer of the finished grades for approval.

3.7 TOLERANCES

- A. Top of Topsoil: Plus or minus 1/2 inch.
- B. Evenly grade slopes with smooth lines and grades.

3.8 PROTECTION OF INSTALLED WORK

- A. Prohibit construction traffic over topsoil.

END OF SECTION

SECTION 32 92 19 - SEEDING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fertilizing.
2. Seeding.
3. Hydroseeding.
4. Mulching.
5. Maintenance.

B. Related Sections:

1. Section 31 20 00 – Earth Moving.
2. Section 32 91 19 - Landscape Grading.
3. Section 32 93 00 - Plants.

1.2 REFERENCES

A. ASTM International:

1. ASTM C602 - Standard Specification for Agricultural Liming Materials.

1.3 DEFINITIONS

- A. Weeds: Vegetative species other than specified species to be established in given area.

1.4 SUBMITTALS

- A. Installer qualifications: Include list of completed projects, with project names, addresses, phone numbers, and names and address of designers and clients.
- B. Seed Mix: Product Data and Manufacturer's Certificate of Compliance with the specifications for each type of seed to include the percentages of species and seeding rate applicable to specific project areas. No seed may be sown until the Contractor has submitted the certificates.
- C. Product Data: Submit data for the following:
1. Seed mixes
 2. Fertilizer
 3. Mulch
 4. Lawn herbicides and pesticides
 5. Other accessories

- D. Manufacturer's Certificate: Certify Products meet or exceed specified requirements for the following:
 - 1. Seed mixes
 - a. Guaranteed percentage of purity, weed content and germination of the seed, and the net weight and date of shipment and pounds per acre sowing rate.
 - b. Fertilizer
- E. Maintenance Schedule: Provide watering, fertilizing and mowing schedule to the Owner, Engineer and/or Landscape Architect for approval.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: Include maintenance instructions, cutting method and maximum grass height; types, application frequency, and recommended coverage of fertilizer.
- B. Post construction water schedule

1.6 QUALITY ASSURANCE

- A. Provide seed mixture in containers showing percentage of seed mix, germination percentage, inert matter percentage, weed percentage, year of production, net weight, date of packaging, and location of packaging.
- B. Select compatible products where options are provided.

1.7 QUALIFICATIONS

- A. Seed Supplier: Company specializing in manufacturing Products specified in this section with minimum 3 years documented experience.
- B. Installer: Company specializing in performing work of this section with a minimum 5 Year documented experience and with a record of successful grass establishment.
 - 1. Installer to provide an experienced supervisor on the project site during all times that landscape construction is in progress. Provide written qualification data for firms and persons to be responsible for Work, to demonstrate their capabilities and experience.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable.
- B. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

1.9 MAINTENANCE SERVICE

- A. Maintenance includes the watering, fertilizing, mowing, repairing and/or reseeding of all seeded areas.
- B. Initial maintenance period:
 - 1. Immediately after grass areas are seeded and continue for a minimum of a 90 day active growing period following the completion of all grass construction work. This period will continue in the spring if the 90 days is not completed within the growing season of the year in which the grass was seeded.

1.10 GUARANTEE

- A. Satisfactory Seeded Grass: A healthy, uniform close stand of grass free of surface irregularities with coverage exceeding 90 percent over any 10 sq. ft. scattered bare spots, none of which are larger than 72 square inches, will be allowed up to a maximum of 2% of any lawn area.
- B. Upon completion of the minimum maintenance period, request, in writing, an inspection by the Landscape Architect or Engineer to determine whether satisfactory seed growth has been established. If the seeded areas and workmanship are determined to be satisfactory as defined in the specifications, written notice will be given by the Landscape Architect or Engineer to the Contractor and Owner.
- C. If the grass is determined to be unsatisfactory as defined in the specifications at the time of inspection, repair and/or reseed areas determined to be unacceptable.

1.11 ENVIRONMENTAL REQUIREMENTS

- A. Planting Restrictions: Plant during one of the following periods:
 - 1. All Seed Areas:
 - a. Spring: April 1 - June 1
 - b. Fall: August 15 – October 15
- B. Seeding outside of season to occur only with permission of the Landscape Architect or Engineer, and may result in reseeding the following season until satisfactory seed establishment is provided. Acceptance will not be given to seed outside of season until satisfactory grass has been established. Out-of-season seeding during hot weather will require additional watering and shade mulching with netted hay-type erosion control fabric.
- C. Seeding under frozen condition in either the spring or fall will not be permitted.

PART 2 PRODUCTS

2.1 SEED MIXTURE

- A. Grass Seed to be of the previous year’s crop and the weed seed content is not to exceed 1% by mass.
- B. Use only low maintenance seed mixes.
- C. Suppliers:
 - 1. New England Wetland Plant
820 West Street
Amherst, MA 01002
Phone: (413)-548-8000
- D. Seed Mixtures:
 - 1. Seed Mix Type 1: New England Conservation/Wildlife Mix or approved equivalent.

Andropogon gerardii	Big Bluestem
Panicum virgatum	Switch Grass
Schizachyrium scoparium	Little Bluestem
Elymus virginicus	Virginia Wild Rye
Chamaecrista fasciculata	Partridge Pea
Asclepias syriaca	Common milkweed
Desmodium canadense	Showy Tick-trefoil
Aster novae-angliae	New England Aster
Eupatorium maculatum	Joe Pye Weed
Euthamia graminifolia	Grass-leaved Goldenrod
Festuca rubra	Creeping Red Fescue
Heliopsis helianthoides	Ox-eye sunflower
Panicum clandestinum	Deer tongue
Rudbeckia lacinata	Green headed conflower
Solidago juncea	Early goldenrod
Sorghastrum nutans	Indian Grass
Application rate of 25 lbs/Acre	

- 2. Seed Mix Type 2: New England Semi-shade Grass and Forbs Mix

Elymus virginicus	Virginia Wildrye
Elymus canadensis	Canada Wild Rye
Chamaecrista fasciculata	Partridge Pea
Festuca rubra	Red Fescue
Liatris spicata	Marsh Blazing Star
Onoclea sensibilis	Sensitive Fern

WOMPATUCK STATE PARK – PARKING LOT & TRAIL ACCESS
NORWELL, MA

Aster prenanthoides	Zigzap Aster
Eupatorium fistulosum	Joe Pye Weed
Geum canadense	White Avens
Aquilegia canadensis	Eastern Columbine
Juncus tenuis	Path Rush
Application rate of 30 lbs per Acre	

1. Seed Mix Type 3: New England Wetmix

Carex vulpinoidea	Fox Sedge
Carex lurida	Lurid Sedge
Carex scoparia	Blunt Broom Sedge
Verbena hastata	Blue Berbain
Poa palustris	Fowl Bluegrass
Carex lupulina	Hap Sedge
Scirpus atrovirens	Green Bulrush
Elecharis palustris	Creeping Spike Rush
Carex crinite	Fringed Sedge
Juncus effuses	Soft Rush
Eupatorium maculatum	Spotted Joe Pye Weed
Glyceria canadensis	Rattlesnake Grass
Aster puniceus	Swamp aster
Iris versicolor	Blueflag
Asclepias incarnata	Swamp Milkweed
Mimulus ringens	Square stemmed Monkey Flower
Application rate of 18 lbs per Acre	

2.2 ACCESSORIES

- A. Wood-Cellulose Mulch (Hydromulch): Specially prepared green-dyed and air-dried wood-cellulose fibers, containing no growth or germination inhibiting substances, in packages not exceeding 100 pounds gross, with net weight shown on the package, and meeting the following requirements:
1. Fiber processed from whole wood chips manufactured specifically for standard hydraulic mulching equipment. Not produced from recycled material such as sawdust, paper, or cardboard.
 2. Moisture content of hydromulch not to exceed 10%, plus or minus 3% as defined by the pulp and paper industry standards.
 3. Water holding capacity of not less than 900 grams water per 100 grams fiber.
 4. Nontoxic to plant life or animal life.

5. Non petroleum based organic tackifier and a green dye to allow for easy visual metering during application and not harmful to plant growth.
 6. Fiber to be dispersed into a uniform slurry when mixed with water.
- B. Fertilizer: Granular commercial grade; recommended for grass; of proportion necessary to eliminate deficiencies of topsoil as indicated in analysis.
1. Consist of slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium.
- C. Lime: ASTM C602, Class T agricultural limestone containing a minimum 80 percent calcium carbonate equivalent.
1. Provide lime in form of dolomitic limestone, with a minimum of 95 percent passing a No. 100 sieve, as recommended in the soil analysis.
- D. Water: Clean, fresh and free of substances or matter capable of inhibiting vigorous growth of grass. Connection to a potable source will be provided to the Contractor by the City along with a meter. Contractor will pay for the water and provide all temporary hoses, connections, backflow preventers, valves, others as required to water the grass.
- E. Erosion Control Netting: Jute netting, open weave.
1. See Section 31 25 00 – Erosion and Sedimentation Controls.
- F. Herbicide: As necessary.
- G. Stakes: Softwood lumber, chisel pointed.
- H. String: Inorganic fiber.

2.3 SOURCE QUALITY CONTROL

- A. Analyze to ascertain percentage of nitrogen, phosphorus, potash, soluble salt content, organic matter content, and pH value.
- B. Provide recommendation for fertilizer and lime application rates for specified seed mix as result of testing.
- C. Testing is not required when recent tests and certificates are available for imported topsoil. Submit these test results to testing laboratory. Indicate, by test results, information necessary to determine suitability.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify prepared soil base is ready to receive the Work of this section.

- B. Verify compliance with requirements and for conditions affecting performance of work of this Section prior to starting any work. Report any defect, such as incorrect grading, incorrect subgrade elevations, improper compaction, or drainage problems, to the Landscape Architect to beginning Work. Do not proceed with installation until unsatisfactory conditions have been corrected. Commencement of Work indicates acceptance of filled subgrade areas to and responsibility for Work.
 - 1. When conditions detrimental to work are encountered including, but not limited to, incorrect grading, adverse drainage conditions, poor soil conditions, or invasive species problems, immediately notify the Owner and/or Landscape Architect before beginning any Work

3.2 PREPARATION

- A. Refer to Section 32 91 91 – Landscape Grading.
- B. Correct any grading and drainage problems. Restore areas if erosion has occurred or Project site has been disturbed.
- C. Moisten prepared grass areas before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

3.3 FERTILIZING

- A. Apply lime at application rate recommended by soil analysis. Work lime into topsoil.
- B. Apply fertilizer at application rate recommended by soil analysis but not in excess of 20 pounds per 1,000 square feet.
- C. Apply after smooth raking of topsoil.
- D. Do not apply fertilizer at same time or with same machine used to apply seed.
- E. Spread and thoroughly mix fertilizer thoroughly into upper 3 inches of topsoil by harrowing or as part of hydroseed slurry.
- F. Use no or minimal fertilizer in native grass, wildflower areas or meadow conservation mix seeding areas and only per the soil analysis recommendations. If the soil testing determines the topsoil does not contain appropriate levels of nutrients for establishment of these native species, fertilize these areas at the rates recommended by the test results with organic fertilizers.
- G. Do not apply fertilizers in water protection areas, within existing wetland or in wetland buffer areas under any circumstances.
- H. Lightly water soil to aid dissipation of fertilizer. Irrigate top level of soil uniformly.

3.4 HAND SEEDING

- A. Apply seed mixes by hand broadcast method at specified rates evenly in two direction at right angles to each other
- B. Lightly rake in to ensure ½” soil cover, and lightly roll.
- C. Do not use wet seed or seed that is moldy or otherwise damaged.
- D. Apply seed at rate of per seed mix requirements recommended by the seed manufacturer evenly in two directions at right angles to each other. Rake in lightly into top 1/8 inch of topsoil.
- E. Install jute netting as indicated on the Drawings and Section 31 25 00 – Erosion and Sedimentation Control.
- F. Do not seed areas in excess of that which just netting can be installed in the same day.
- G. Schedule seeding when rain is not expected for 48 hours and within seasonal dates specified. Seed only when soil is in friable condition, not muddy, dried, or frozen.
- H. Do not sow immediately following rain, when ground is too dry, when winds are over 12 mph (19 km/h) or when temperatures are expected to be less than 45 or higher than 75 degrees Fahrenheit during and for two (2) weeks after seeding. .
- I. Apply water with fine spray immediately after installation, saturate to 4 inches of soil.

3.5 HYDROSEEDING

- A. Protect adjacent and adjoining areas from hydroseeding overspray.
- B. Mix specified seed, fertilizer, and premium wood fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.
 - 1. Mix slurry with tackifier.
 - 2. Apply the hydroseeding in the form of slurry consisting of organic soil amendments, commercial fertilizer, and any other recommended additives.
 - 3. Apply slurry uniformly to all areas to be seeded in a one-step process. Spray the area with a visible uniform coat, using the dark color of the cellulose fiber as a visual guide. Apply the slurry in a downward drilling motion via a fan stream nozzle. Ensure that all of the slurry components enter the mix with the soil.
 - 4. Ensure the uniformity of the hydroseed application at a minimum rate of 1,500-lb/acre dry weight but not less than the rate required to obtain specified seed-sowing rate.
 - 5. Exercise special care to prevent any of the slurry from being sprayed onto any hardscape areas including paved surface, fences, walls, buildings, etc. Remove all slurry sprayed onto these surfaces at their own expense.
 - 6. Save all seed and fertilizer tags and fiber mulch bags for the Landscape Architect or Engineer to verify compliance with the Drawings and Specifications.

3.6 SEED PROTECTION

- A. Identify seeded areas with stakes and string around area periphery.
- B. The following are applicable only for areas where hydroseeding is NOT applied.
 - 1. Cover seeded slopes where grade is 3:1 or greater with erosion fabric. Roll fabric onto slopes without stretching or pulling.
 - 2. Lay fabric smoothly on surface, bury top end of each section in 6 inch (150 mm) deep excavated topsoil trench. Overlap edges and ends of adjacent rolls minimum 12 inches (300 mm). Backfill trench and rake smooth, level with adjacent soil.
 - 3. Secure outside edges and overlaps at 36 inch (900 mm) intervals with stakes.
 - 4. Lightly dress slopes with topsoil to ensure close contact between fabric and soil.
 - 5. At sides of ditches, lay fabric laps in direction of water flow. Lap ends and edges minimum (150 mm).

3.7 MAINTENANCE

- A. All dead or unsatisfactory grass areas are to be weeded, top-dressed, repaired, fertilized, and/or bed prepared and re-seeded until satisfactory growth with intended species has occurred, as a condition of completion of all Work at final inspection.
- B. Where trimmed, allow grass to grow to full height (12-36”) and only cut 1-2 times a year to a minimum height of 4 inches.
- C. Water to prevent grass and soil from drying out.
 - 1. Provide all labor and water required to establish all grass areas. Water as required, during maintenance period to ensure the seed bed is thoroughly and evenly watered with a fine spray to penetrate the soil to a depth of at least 4 inches.
 - 2. Keep seeded areas evenly moist until germination and satisfactory establishment.
 - 3. Water in a manner to provide uniform coverage, prevent erosion due to application of excessive quantities over small areas, and prevent damage to the finished surface by the watering equipment.
- D. Roll surface to remove minor depressions or irregularities if required.
- E. Control growth of weeds.
 - 1. Remove plant species not specified for area.
 - 2. Apply herbicides only as necessary and as approved by the Landscape Architect or Engineer. Remedy damage resulting from improper use of herbicides.
- F. Immediately reseed areas showing bare spots.
- G. Overseed as necessary to ensure proper establishment of a satisfactory stand of grass and wildflowers as specified.
- H. Repair washouts or gullies.
- I. Protect seeded areas with warning signs during maintenance period.

- J. Take immediate action to identify potential problems and undertake corrective measures in areas where a decline in the condition of grass seed areas is observed.

3.8 CLEAN UP

- A. Promptly remove soil and debris created by grass work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.
- B. Remove erosion-control measures after satisfactory grass establishment and site stabilization is complete

END OF SECTION

SECTION 32 93 00 - PLANTS

PART 1 GENERAL

1.1 SUMMARY

- A. Furnish all labor, material, equipment, and services required to install and maintain all plant material as specified. Section Includes:
 - 1. Preparation of subsoil and topsoil.
 - 2. Topsoil bedding.
 - 3. Trees, plants, and ground cover.
 - 4. Mulch.
 - 5. Fertilizer.
 - 6. Plant tagging.
 - 7. Staking.
 - 8. Pruning.
 - 9. Maintenance.

- B. Related Sections:
 - 1. Section 31 20 00 – Earth Moving.
 - 2. Section 32 91 19 - Landscape Grading.
 - 3. Section 32 92 19 - Seeding.

1.2 REFERENCES

- A. AAN: "American Standard for Nursery Stock," ANSI Z60.1, latest edition.

- B. TCIA: Pruning Standards: "Standards for Pruning Shade Trees," and "Standards for Pesticide Application Operations" latest editions.

- C. USDA: Agricultural Research Service, "USDA Plant Hardiness Zone Map," Miscellaneous Publication No. 1475, latest edition.

- D. ANSI A300 - Tree Care Operations - Tree, Shrub and Other Woody Plant Maintenance - Standard Practices.

- E. Forest Stewardship Council:
 - 1. FSC Guidelines - Forest Stewardship Council Guidelines.

1.3 DEFINITIONS

- A. Weeds: Vegetative species other than specified species to be established in given area.
- B. Plants: Living trees, plants, and ground cover specified in this Section, and described in ANSI Z60.1.

1.4 SUBMITTALS

- A. Product Data: Submit list of plant material sources, data for fertilizer and other accessories.
- B. Plant Materials:
 - 1. Labels and nursery certificates substantiating that plants, trees and shrubs materials comply with specified requirements set by AAN and others and were grown within USDA hardiness zones specified.
 - 2. Provide complete list of quantity, size, genus, species, variety of trees and shrubs and supplier as indicated on Drawings.
- C. Planting schedule: Proposed dates for planting each type of planting, with consideration for fall-hazard species, work coordination, etc.
- D. Samples:
 - 1. Bark Mulch: Two-pound sample and source for review.
 - 2. Planting soil (if different from topsoil)
 - 3. If applicable, chemicals (tree herbicides, fungicides, and pesticides): Manufacturer's literature and analysis.
- E. Maintenance:
 - 1. Provide watering schedule to the Owner for approval.
 - 2. Instructions: Submit recommended procedures for routine year-round maintenance of plantings. Submit instructions as a condition of Substantial Completion of the Project.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: Include pruning objectives, watering and plant maintenance requirements.

1.6 QUALITY ASSURANCE

- A. Tree Pruning: ANSI A300 Pruning Standards for Woody Plants.

- B. Maintain an experienced supervisor on the project site during all times that landscape construction is in progress.
- C. All plants to comply with applicable requirements of ANSI Z60.1 "American Standard for Nursery Stock." latest edition, published by the American Nursery and Landscape Association Inc.
- D. Locate plant material sources and ensure that plants are shipped in timely fashion for installation. Plant trees during the same planting season they are dug. Do not use balled and burlapped and potted plant materials from cold storage.
- E. Plants to be grown under climatic conditions similar to those in the locality of the project for at least two (2) years. Use healthy nursery grown plants, free of disease, insects, eggs or larvae, and that have a well developed root system.
- F. To extent possible, supply each plant material species or variety from single source.
- G. Measurements: Measure trees according to ANSI Z60.1 with branches and trunks or canes in their normal position. Do not prune to obtain required sizes. Take caliper measurements 6 inches above ground for trees up to 4-inch caliper size, and 12 inches above ground for larger sizes. Measure main body of tree for height and spread; do not measure branches or roots tip-to-tip.
- H. If required, use only herbicides, pre-emergents, fertilizers, fungicides, and pesticides reviewed and approved by the Landscape Architect and permitted by state and local agencies. Applications to be applied by licensed personnel according to manufacturer's recommendations.
- I. Do not use tree paint or tree wound dressing of any type on tree wounds. Allow wound to heal and weather naturally, after trace cutting ragged or loose damaged bark back to live cambium.
- J. Notify the Landscape Architect at a minimum of 48 hours in advance prior to scheduling the following field visits:
 - 1. Plant Layout
 - 2. Completion of the final planting and stabilization

1.7 QUALIFICATIONS

- A. Nursery: Company specializing in growing and cultivating plants with three years experience.
- B. Installer: Company specializing in installing and planting plants with 5 years experience in Landscape Work similar in materials, design, and extent to that indicated for this project and with a record of successful landscape establishment. Provide written qualification data for firms and persons to be responsible for Work, to demonstrate their capabilities and experience. Include lists of completed projects, with project names, addresses, phone numbers, and names and address of designers and clients.
- C. Tree Pruner: Company specializing in performing work of this section.

- D. Maintenance Services: Performed by installer.

1.8 PRE-INSTALLATION MEETINGS

- A. Convene a minimum one week prior to commencing work of this section at the Project site to review landscape construction procedures, site conditions, and submittal requirements required in the Work of this Section before any products are submitted for review and approval, or landscape construction commences.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Do not order or deliver materials until required samples, certifications, manufacturers' literature and test results have been reviewed by the Landscape Architect. Delivered materials must closely match the samples, as determined by the Landscape Architect. If any deviations from specified plant materials are proposed, submit written request explaining differences and reasons for request.
- B. Wrap tree trunks with protective fabric during transport and delivery to storage. Remove wrap after planting to avoid accumulation of moisture on bark, which increases susceptibility to hidden insect infestation, and mold.
- C. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.
- D. Protect and maintain plants until planted.
- E. Deliver plants immediately prior to placement. Plant within one (1) week of delivery. If plants are to be stored at the site prior to planting, the Contractor is responsible to ensure they are properly maintained, watered and remain healthy. Set stored planting materials in shade, protect from weather and mechanical damage, and keep roots moist. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.
- F. Trees: Deliver freshly dug trees. Do not prune before delivery, except as directed by the Landscape Architect. Protect bark, branches, and root systems from sun scald, drying, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy natural shape. Provide protective covering during delivery. Do not drop trees during delivery.
- G. Handle balled and burlapped stock by the root ball.
- H. Plant material damaged as a result of delivery, storage or handling will be rejected.

1.10 ENVIRONMENTAL REQUIREMENTS

- A. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit. Submit to the Landscape Architect in writing the proposed planting schedule. Obtain approval of planting schedule from the Landscape Architect prior to performing any work.
- B. Do not install plants when ambient temperatures may drop below 35 degrees F or rise above 90 degrees F.
- C. Do not install plant life when wind velocity exceeds 30 mph.
- D. Planting Restrictions: Plant during one of the following periods unless otherwise approved by the Landscape Architect. This includes the planting of tubelings.
 - 1. Spring: April 15 to June 1
 - 2. Fall: September 15 to November 15
- E. Planting under frozen conditions in either the spring or fall will not be permitted. Planting before or after the above referenced planting dates will increase the likelihood of plant or grass seed establishment failure. Any deviation from the above referenced planting dates is undertaken at sole risk of the contractor and it is the responsibility of the contractor to provide any additional maintenance and watering which may be required to ensure satisfactory plant and seed establishment.
- F. Summer digging of trees is not permitted. Coordinate schedule for planting, so that summer digging and substitutions of species that are fall hazards (fall digging/planting) does not occur.
- G. Spray evergreens planted in April or July-August, with an organic anti-desiccant as recommended by the manufacturer.

1.11 COORDINATION

- A. Coordinate installation of planting materials to assure installation during normal planting seasons for each type of plant material required and as specified in planting schedule. Plant species designated as “Fall Hazard” by Nursery in the spring, indeterminate of other site and project schedules. Show this information on the planting schedule required by Section 1.5 where applicable.
- B. Coordinate planting with other Work of this contract being performed on site, or work being performed by others.

1.12 WARRANTY

- A. Furnish one year manufacturer warranty for trees, plants, and ground cover against defects including death and unsatisfactory growth, except for defects resulting from lack of adequate maintenance, neglect, or abuse by Owner, or abnormal weather conditions unusual for warranty

period. The date of final acceptance of all completed planting work establishes the end of installation and initial maintenance period and the commencement of the guarantee period.

- B. Remove and replace dead planting materials immediately unless required to plant in the succeeding planting season.
- C. Replace planting materials that are more than 25 percent dead or in an unhealthy condition at end of warranty period.

1.13 MAINTENANCE SERVICE

- A. Maintain plant life for one-year after Date of Substantial Completion.
- B. Maintenance includes:
 - 1. Cultivation and weeding plant beds and tree pits.
 - 2. Irrigating sufficient to saturate root system.
 - 3. Pruning, including removal of dead or broken branches.
 - 4. Disease control.
 - 5. Maintaining wrapping, guys, and stakes.
 - 6. Repair or replace accessories when required.
 - 7. Replacement of mulch.

PART 2 PRODUCTS

2.1 TREES, PLANTS, AND GROUND COVER

- A. All Plants: No. 1 Grad conforming to “American Standard for Nursery Stock” of American Association of Nurserymen (AAN); well-branched, vigorous and balanced root and top growth; free from disease, injurious insects, eggs, larvae, and defects such as injuries, abrasions, root bound or girdling and disfigurement and other defects.
- B. Trees, and Shrubs:
 - 1. Species: In accordance with Standardized Plant Names, official code of American Joint Committee on Horticulture Nomenclature.
 - 2. Identification: Label individual plants or each bundle of plants when tied in bundles.
 - 3. Trees:
 - a. Furnish with reasonably straight trunks, well balanced tops, and single leader.
 - b. Shade Trees: Single-stem trees with straight trunk, well-balanced crown, and intact leader, of height and caliper indicated, conforming to ANSI Z60.1 for type of trees required.
 - c. All trees within 5’-0” of walkways and sidewalks to have a 6’-8” standard branching height.

- d. Provide balled and burlapped trees, unless otherwise indicated on Drawings.
 - 4. Deciduous plants: Furnish in dormant state, except those specified as container grown.
 - 5. Species and size identifiable in plant schedule, grown in climatic conditions similar to those in locality of the Work.
- C. Plugs
- 1. 2” square open-bottomed containers with plug cells at least 3 inches deep with a healthy root system, not “root-bound” in the containers.

2.2 SOIL MATERIALS

- A. Topsoil: As specified in Section 32 19 19.

2.3 SOIL AMENDMENT MATERIALS

- A. When soil tests indicate soil amendment, apply soil conditioners or slow release (6 month minimum) fertilizers to amend soil to specified conditions.
 - 1. Tree Fertilizer: Containing fifty percent of elements derived from organic sources; of proportion necessary to eliminate deficiencies of topsoil ,as indicated in analysis.
- B. Sand: Clean, washed, natural or manufactured sand free of toxic materials.
- C. Bone Meal: Raw, finely ground, commercial grade, minimum of 3 percent nitrogen and 20 percent phosphorous.
- D. Lime: Ground limestone, dolomite type.
- E. Water: Clean, fresh and free of substances or matter capable of inhibiting vigorous growth of grass. Connection to a potable source will be provided to the Contractor by the City along with a meter. Contractor will pay for the water and provide all temporary hoses, connections, backflow preventers, valves, others as required to water the grass.

2.4 CHEMICALS AND INSECTICIDES

- A. Do not use without Owners review and approval.

2.5 MULCH MATERIALS

- A. Organic Mulch: Organic mulch, free from deleterious materials and suitable as a top dressing of trees and shrubs meeting the following requirements.
 - 1. Shredded pine bark aged at least six (6) months and not longer than two (2) years.

2. Dark brown in color, free of chunks and pieces of wood thicker than one quarter inch, stringy material over four (4) inches in length, and chunks over three (3) inches in width.
3. Does not contain an excess of fine particles, overly composted or soggy compost material, as determined by the Landscape Architect.
4. Does not have an unpleasant odor nor have any evidence of fungus growth.

B. Do not use Hemlock mulch.

2.6 ACCESSORIES

A. Wrapping Materials: Burlap.

B. Upright and Guy Stakes: Rough-sawn, sound, new hardwood, redwood, or pressure-preservative-treated softwood, free of knots, holes, cross grain, and other defects, 2 by 2 inches (50 by 50 mm) by length indicated, pointed at one end. Use hardwood stakes installed as shown in the Drawings.

C. Guying and Anchoring Material: Brown or black, heavy duty woven poly-corded guying tape manufactured specifically for tree guying.

1. Do not use cable encased in hose.

D. Flags: Standard surveyor's plastic flagging tape, white, 6 inches (150 mm) long.

2.7 SOURCE QUALITY CONTROL

A. Test and analyze imported and existing topsoil.

B. Analyze to ascertain percentage of nitrogen, phosphorus, potash, soluble salt, organic matter and pH value.

C. Provide recommendation for fertilizer and soil amendment application rates for specified planting as result of testing.

D. Testing is not required when recent tests are available for imported topsoil. Submit these test results to testing laboratory. Indicate, by test results, information necessary to determine suitability.

PART 3 EXECUTION

3.1 EXAMINATION

A. Utilities: Contact all relevant utility companies, public or private, prior to beginning work. Review the locations of utilities with the Landscape Architect before proceeding. Report any

conflicts to the Landscape Architect and the Owner before excavating. Perform all work in a manner which will avoid damage to above and below grade utilities. Hand excavate as required.

- B. Determine the full extent of Work required, including but not limited to the potential need for storing and maintaining plants temporarily and re-handling plants prior to final installation.
- C. Inspect all areas to be planted before starting any landscape Work and report any defect, such as incorrect grading, incorrect subgrade elevations, or drainage problems, etc., to the Landscape Architect prior to beginning Work. Do not proceed with installation until all unsatisfactory conditions have been corrected. Commencement of Work indicates the Contractor's acceptance of site conditions and filled subgrade material in areas to be planted, and the Contractor assumes responsibility for Work.
- D. Verify required underground utilities are available, in proper location, and ready for use.

3.2 PREPARATION OF SUBSOIL

- A. Prepare subsoil to eliminate uneven areas. Maintain profiles and contours. Make changes in grade gradual. Blend slopes into level areas.
- B. Remove foreign materials, weeds and undesirable plants and their roots. Remove contaminated subsoil.
- C. Scarify subsoil to depth of 3 inches where plants are to be placed. Repeat cultivation in areas where equipment, used for hauling and spreading topsoil, has compacted subsoil.
- D. Dig pits and beds three times wider than plant root system.
- E. Maintain grade stakes until removal is approved by the Landscape Architect.

3.3 PLANTING SOIL PREPARATION

- A. Before mixing, clean topsoil of roots, plants, sods, stones, clay lumps, and other extraneous materials harmful to plant growth.
- B. Mix soil amendments and fertilizers with topsoil as specified in the soil analysis. Delay mixing fertilizer if planting does not follow placing of planting soil within a few days.
- C. The planting soil amendments will be based upon the soil analysis.
- D. For tree pit or planting bed backfill, mix planting soil as specified in the soil analysis before backfilling and stockpile at site.
- E. Place planting soil into pits and beds intended for plant root balls, to minimum depth as indicated on Drawings.

- F. Obstructions: Notify Landscape Architect if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.
- G. Grade to eliminate rough, low or soft areas, and to ensure positive drainage.

3.4 PLANTING PREPARATION

- A. All plant layout and actual planting locations are to be field verified by landscape architect prior to planting. Notify the landscape architect at a minimum of 48 hours in advance prior to scheduling any field inspections.

3.5 PLANTING-BALL AND BURLAP

- A. Set balled and burlapped stock plumb and in center of pit or trench with top of ball to match the finish grade within one (1) inch.
- B. Remove burlap and wire baskets from tops of balls and from top half of rootball as indicated on Drawings. Remove pallets, if any, before setting.
- C. Do not use planting stock if ball is cracked or broken before or during planting operation.

3.6 PLANTING – POTTED PLANTS

- A. Remove the plant from the pot and loosen or score the roots before planting to promote outward root growth into the soil.

3.7 PLANTING – PLUGS

- A. Plant upright and not at an angle.
- B. Dig planting holes large enough and deep enough to accommodate the entire root mass.
- C. Plant plugs with no twisted or balled roots and with no roots exposed above the grade line.
- D. Hand pack the soil around the entire plug root mass.

3.8 PLANTING

- A. Plant all trees, and shrubs as indicated on Drawings and as specified below.
- B. Place plants for best appearance for review and final orientation by Landscape Architect/Engineer.
- C. Dig the planting hole to the same depth as the root ball and two to three times wider.

- D. Score all sides of the hole and place the plant in the hole so the top of root ball is even with soil surface.
- E. Set plants vertical.
- F. Place stock on setting layer of compacted planting soil.
- G. Do not use planting stock if ball is cracked or broken before or during planting operation.
- H. Place backfill around plant roots in layers, gently tamping to settle backfill and eliminate voids and air pockets. If soil is extremely poor, replace back fill with good quality top soil. Amend the soil, as necessary.
- I. Place bare root plant materials so roots lay in natural position. Backfill soil mixture in layers. Maintain plant life in vertical position.
- J. Saturate soil with water when pit or bed is half full of soil and again when full. Repeat watering until no more is absorbed. Water again after placing and tamping final layer of backfill.
- K. Create a 2” to 4” saucer around the edge of planting hole with the remaining soil.
- L. Remove all plant tags and flags from the plants.

3.9 PLANT SUPPORT

- A. Use caution when installing wood stake anchors for trees; ensure that stakes do not penetrate utility lines or structures. Installed stakes as indicated on Drawings, securely anchored in undisturbed or compacted subgrade.
- B. Install woven tape tree guys according to manufacturer's instructions, with ties that allow for tree growth (specified, expandable knots) and to allow for some movement and to avoid girdling.
- C. Securely fasten guys to wood stakes with appropriate knots, at an angle to keep guys tight. Install three guys per tree.
- D. If guys are above ground, affix safety flags at four feet typical above finished grade.
- E. Install the tree guying and anchoring systems securely so that tree ball does not rock and tree trunk and canopy remain plumb or nearly plumb in the wind, without holding tree so tight or at such an angle and height that there could be rubbing or structural damage to trunk in strong winds. Install to allow for tightening after installation and during the one-year maintenance period.

3.10 MULCHING

- A. Mulch backfilled surfaces of pits, beds, planted areas, and other areas indicated on Drawings.

- B. Organic Mulch: Apply the following average thickness of organic mulch and finish level with adjacent finish grades.
 - 1. Thickness: 2-3 inches (minimum).
- C. Do not place mulch against trunks or stems.

3.11 CLEANUP AND PROTECTION

- A. During landscape work, keep pavement clean and work area in an orderly condition.
- B. Protect landscape work from damage due to landscape operations and site work by others. Maintain protection during installation and maintenance periods. Repair or replace damaged landscape work as directed by the Landscape Architect.
- C. Repair damage to site or structures to restore them to their original condition.

3.12 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus soil and waste material, including excess topsoil, subsoil, plant material, unsuitable soil, trash, and debris, and legally dispose of it off the Owner's property.

3.13 FIELD QUALITY CONTROL

- A. Plants will be rejected when ball of earth surrounding roots has been disturbed or damaged prior to or during planting.
- B. All plant layout and final plant locations are to be field verified by the Landscape Architect prior to planting.
- C. During the landscape work periodic field visits are to be performed by the Landscape Architect at specific installation milestones as agreed upon during the pre-construction meeting or as indicated on the Drawings.
 - 1. Planting Layout
 - 2. Completion of final planting and stabilization

3.14 ACCEPTANCE OF LANDSCAPE WORK

- A. Submit a written request for review of the completed work to the Landscape Architect at least 48 hours before the anticipated dates of requested field visits.
- B. Request an acceptance of the landscape work only after all aspects of landscape operations are completed and maintained according to specifications, all test results are completed and

acceptable, irrigation system is operating properly (if applicable), and all extraneous equipment, materials and debris are removed from the Project Site.

- C. Do not request a field visit for partially completed work.
- D. The Landscape Architect is to review the work with the Contractor present. If in the Landscape Architect's opinion, a substantial amount of planting, materials or landscape work is deficient, the Contractor's maintenance period of all work is extended until plant replacements are made or other deficiencies are corrected.
- E. A written report, or "punch list," is issued by the Landscape Architect indicating remedial items to be corrected before Final Acceptance is authorized.
- F. Acceptance: Acceptable plants are those that are to size and species as indicated on the Drawings or accepted by the Landscape Architect and meet the following requirements:
 - 1. At least 85% live growth with actively growing or possessing live buds.
 - 2. No indication of injury, disease, insect infestation, or decline due to environmental or other factors.
 - 3. Properly planted and installed plumb.
 - 4. Properly mulched.
 - 5. Properly staked and guyed (if just planted).
 - 6. Rootballs moist.
- G. All unsatisfactory plants are to be removed promptly. Replacement plants must conform in all respects to specifications for the originals and must be planted and maintained in same manner until initial acceptance is made.
- H. Repeat field visit request and procedures only when all remedial items included on the "punch list" are completed.
- I. The end of the installation and initial maintenance period and commencement of guarantee is established upon the date of final acceptance of completed remedial work.

3.15 PLANT ESTABLISHMENT PERIOD, GUARANTEE, AND FINAL INSPECTION

- A. Upon commencement of the guarantee period, it should be agreed upon by the Contractor, Owner and Landscape Architect who will be responsible for the oversight of the one (1) year guarantee period as outlined in the specifications.
- B. Complete all items on the "punch list" to the satisfaction of the Landscape Architect and the Owner before the initiation of the one-year plant establishment period (guarantee period) can commence. Guarantee specified herein does not deprive the Owner of other rights it may have under other provisions of Contract Documents and is in addition to, and runs concurrent with, other warranties made by Contractor under requirements of Contract Documents.

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- C. The guarantee period for the plantings is for one (1) year after acceptance. During guarantee period, make monthly inspections of plant material during April through November to document condition of plants and to provide remedial measures. Continue maintenance as specified. Submit inspection reports to the Owner. Dead plants and plants with less than 85% live wood noted in inspections are to be replaced with new plants of same size and species within one (1) month or in first month of next growing season, whichever comes first. Install replacement plants according to the Drawings and Specifications.
- D. Notify the Owner at least ten days in advance of requested date of inspection at end of one-year guarantee period. Submit to the Owner, before inspection, a list of plants replaced during guarantee period with species, location, and replacement dates.
- E. All plants will be inspected by the Owner with the Contractor present one year after final acceptance. All plants must be alive and with satisfactory growth at the end of that time. Reset or replace trees which have settled out of plumb.
- F. The following must be completed at the end of the guarantee period:
 - 1. Remove all guying material from plants.
 - 2. Flatten all saucers.
 - 3. Re-mulched and weed as necessary.
 - 4. Prune and remove plant dead wood.
 - 5. Install plant replacements.
- G. All dead or unsatisfactory grass areas are to be weeded, top-dressed, repaired, fertilized, and/or bed prepared and re-seeded until satisfactory growth with intended species has occurred, as a condition of completion of all Work at final inspection.

END OF SECTION

SECTION 33 47 30 - STORMWATER TREATMENT— BIORETENTION, INFILTRATION BASIN AND
GRASS SWALE WITH STONE CHECK DAMS

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes: all materials, labor, equipment and other incidental items required to furnish, install, and stabilize the bioretention area. Complete work in conjunction with the forebay, spillway and overflow as required in other sections of the specifications
 - 1. Excavation
 - 2. Grading
 - 3. Underdrain.
 - 4. Backfill.
 - 5. Outlet structure.
 - 6. Planting.
 - 7. Slope stabilization.
 - 8. Forebay and outfall drivable grass

- B. Related Sections:
 - 1. Section 31 10 00 – Site Clearing.
 - 2. Section 31 20 00 - Earthmoving.
 - 3. Section 31 25 13 – Erosion and Sedimentation Controls.
 - 4. Section 32 91 13 – Soil Preparation.
 - 5. Section 32 91 19 – Landscape Grading
 - 6. Section 32 92 19 - Seeding
 - 7. Section 32 93 00 – Plants

1.2 DEFINITIONS

- A. Finish Grade: Elevation of finished surface of bioretention soil.

- B. Bioretention Soil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments.

- C. Subgrade: Surface or elevation of subsoil remaining after excavation is complete or top surface of a fill or backfill before bioretention soil is placed.

1.3 SUBMITTALS

- A. Product Data: Submit complete information concerning materials of construction and fabrication.

- B. Materials Source: Submit name of imported materials source.

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- C. Samples: Submit, 2 lb sample of Pea Gravel, Bioretention soil, mulch, and landscape stone to the Engineer for approval.
- D. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:
 - 1. Bioretention Soil Analysis: Furnish soil analysis by a qualified soil-testing laboratory for the following parameters:
 - a. Percent organic matter.
 - b. Gradation and percentages of sand, silt, and clay content.
 - c. pH
 - d. Soluble salts (ppm).
 - e. Magnesium (ppm)
 - f. Phosphorous (ppm)
 - g. Potassium (ppm).
 - 2. Provide a minimum of one test per each soil source. If bioretention areas are to be constructed at different times and more than one soil delivery is required a soil analysis for each delivery must be provided.
- E. Planting Schedule: Plant name (Genus and species), quantity, size and anticipated planting dates.

1.4 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Record actual size and locations of bioretention areas.
- B. Operation and Maintenance Data: Submit watering and maintenance instructions for seeding and plants.

1.5 QUALITY ASSURANCE

- A. Provide an experienced full-time supervisor on the Project site when planting is in progress.
- B. Soil-Testing Laboratory Qualifications: An independent laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.
- C. All plant material must conform, in all respects, to the guidelines of the “American Standard for Nursery Stock”, latest edition, published by the American Nursery & Landscape Association, Inc. and grown under climatic conditions similar to those in the locality of the project for at least 2 years.
- D. Mandatory construction field visits and Engineer approval of construction prior to continuing construction as indicated on Drawings.

- E. Sod (if specified): Harvest, deliver, store, and handle sod according to requirements in Turfgrass Producers International's (TPI) "Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" in its "Guideline Specifications to Turfgrass Sodding."

1.6 QUALIFICATIONS

- A. Installer: A qualified landscape contractor specializing in the installation of stormwater management facilities specified in this section with minimum two years documented experience.
- B. Installer: Company specializing in performing work of this section with minimum two years documented experience

1.7 PRE-INSTALLATION MEETINGS

- A. Administrative Requirements: Pre-installation meeting.
- B. Convene at the Project site a minimum one week prior to commencing work of this section.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Soil, gravel: Deliver soil, gravel, and other bioretention materials to a pre-approved location in separate piles. Surround stockpiles left for extended period (over a week) by containment strawbales or approved other. Completely cover with an approved blanket material to prevent erosion and invasive seed contamination.
- B. Seed: Deliver seed in original sealed, labeled, and undamaged containers.
- C. Deliver plants only after preparations for planting have been completed. Plant immediately upon arrival at the site. If planting is delayed more than 6 hours after delivery, the plants must be properly maintained and watered by the Contractor.

1.9 ENVIRONMENTAL REQUIREMENTS

- A. Conduct operations not to interfere with, interrupt, damage, destroy, or endanger integrity of surface structures or utilities, in immediate or adjacent areas.
- B. Weather limitations: Proceed with bioretention installation only when existing and forecasted weather conditions permit. Do not plant during inclement weather including but not limited to heavy rain, high winds, frost and similar conditions.
- C. Installation to occur during one of the following periods. Coordinate bioretention installation periods with planting periods and initial maintenance periods to provide required maintenance from date of Substantial Completion.

1. Spring Planting: April 1 to June 1.
2. Fall Planting: August 15 to October 15.

1.10 SCHEDULING

- A. Schedule work after excavation and prior to connecting piping work and paving.

1.11 COORDINATION

- A. Coordinate the Work with connection to existing drainage systems, underground recharge chambers, and pavement installation.

PART 2 PRODUCTS

2.1 BIORETENTION SOIL

- A. USDA Unified Soil Classification: loamy sand consisting of a uniform mix, free of noxious weeds and free of stones, stumps, roots or other similar objects larger than 1 inch. A textural analysis is required for conformance to the soil composition criteria listed below.

1. 85-88% medium sand.
2. 8-12% soil fines (< 2% clay).
3. 3% organic matter

- a. Well aged (6-12 months), well aerated, leaf compost or approved equivalent.

- B. Provide a soil test of the bioretention soil for conformance to the following criteria:

1. pH range: 5.2-7.0.
2. Magnesium: minimum 32 ppm.
3. Phosphorous (P₂O₅): not to exceed 69 ppm.
4. Potassium (K₂O): minimum 78 ppm.
5. Soluble salts: not to exceed 500 ppm.

If the soil pH is not within the acceptable range, amend with lime to raise the pH or with iron sulfate to lower the pH, as necessary. All testing should be performed by the same testing facility to maintain consistent results. Submit the soil sample results to the Engineer review and approval prior to delivery to the Project site.

- C. Volume of filter media based on 110% of plan volume to account for settling or compaction.
- D. Do not mix, dump or store any other materials or substances that may be harmful to plant growth or prove a hindrance to the planting maintenance or operations within the bioretention area.

2.2 MULCH

- A. Fine shredded well aged (6 month minimum) hardwood mulch.
 - 1. Hardwood mulch is preferred to prevent floating. If hardwood mulch is not available a finely double shredded, well aged, organic dark pine mulch may be acceptable on a case by case basis per sample submittal and Engineer review.
- B. A mulch sample must be submitted and approved by the Engineer prior to delivery to the Project site.

2.3 FILTER FABRIC

- A. Non-woven geotextile fabric with flow rate of > 110 gallon/minutes/square foot.
- B. Class “C” apparent opening size (ASTM-D-4751).
- C. Grab tensile strength (ATSM-D-4632) burst strength (ASTM-D-4833).

2.4 PEA GRAVEL

- A. 3/8” double washed stone

2.5 UNDERDRAIN GRAVEL

- A. 3/4" crushed double washed stone, clean and free of all fines and meeting AASHTO M-43.

2.6 PIPE

- A. Underdrain:
 - 1. 4” rigid schedule 40 PVC pipe, with 3/8” perforations @ 6” on center, meeting ASTM D 1785 or AASHTO M-278.
 - 2. T’s and Y’s fittings as required for the underdrain configuration indicated on Drawings.
- B. Non Perforated pipe and cleanout pipe:
 - 1. Non perforated pipe schedule 40 PVC pipe, PVC elbow, screw on cap, and all associated fittings required per the Drawings.

2.7 EROSION CONTROL BLANKET (3:1 SIDE SLOPES ONLY)

- A. Woven, 100% biodegradable and natural material jute fiber 7.70 lbs/1000 sqft.
 - 1. Bionet S150BN or approved equivalent.

2.8 PLANTS AND SEEDING

- A. As indicated on Drawings and required in Specifications.

2.9 OUTLET STRUCTURE

- A. Size as indicated on Drawings.
- B. Fiberglass reinforced plastic of size indicated on Drawings. Beehive type frame and grate.

2.10 FOREBAY/OUTFALL SLOPED PERVIOUS PAVER

- A. Performance and Design Criteria:
 - 1. Permeable, Flexible, Drivable Grass Mat System.
 - 2. Manufacturer: Soil Retention or Engineer approved equal.
 - 3. Color: Grey
 - 4. Filter Fabric: As indicated on the drawings
 - 5. Base Aggregate: Crushed permeable base, crushed aggregate base, crushed rock or similar structural material normally used as a base course for pavement systems and meeting the gradation and / or permeability requirements shown on the Drawings.
 - 6. Sand Bedding Course: Planting applications: A minimum thickness of 2 inches minimum.
 - a. Use a thorough mix of 75% sand and 25% granular compost material
 - b. Non Planting applications: .25” to 1” sand
 - 1) Sand: Clean, non-plastic, and free from deleterious or foreign matter and manufactured from crushed rock. Do not use limestone screenings stone dust. Grading requirements (ASTM C33 CSA A23.1-M94).
 - 7. Infill-Surface treatment: Same as the bedding course. Infill not intended to support vegetation consist of medium sand, 3/8” minus stone, decomposed granite, stone dust, etc., depending on application and aesthetic needs. For non-cohesive infills staking is recommended. Consult manufacturer and see specific alternative infill details and instructions.

2.11 GRANITE CHECK DAM

- A. Material: Granite curb in accordance with MASSDOT Section M9.04.1.
- B. Installation: see detail on plans.

2.12 INFILTRATION BASIN

- A. See detail on plans.

2.13 GRASS SWALE AND STONE CHECK DAM

- A. See detail on plans.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify layout and orientation of bioretention area and connections.
- B. Verify excavation base is ready to receive work and excavations, dimensions, and elevations are as indicated on Drawings.

3.2 PREPARATION

- A. Identify required lines, levels, contours, and datum.
- B. Clear and grub the proposed bioretention area.

3.3 EXCAVATION

- A. Work from the sides of the bioretention area and infiltration basin excavation.
- B. Provide excavating equipment with adequate reach to minimize work within in the footprint of the bioretention area. If applicable and as directed by the Engineers, utilize a cell construction approach in larger bioretention basin. Divide the basin into 500 to 1000 square foot temporary cells with a 10 to 15 foot earth bridge in between to allow cells to be excavated from the sides.
- C. Excavate and seal sediment forebays at the size and locations indicated on Drawings to trap sediments prior to bioretention and infiltration construction.
- D. Rough grade the bioretention areas and infiltration basins during general construction. Excavate the bioretention facilities to within 1 foot of underdrain bottom.
- E. If the bioretention area is to be used as a temporary drainage storage basin during the early stages of project construction, the side slopes should be temporarily stabilized and silt fence installed along the toe of the rough graded bioretention slopes to minimize excessive sedimentation of the bioretention floor.
- F. Final excavation to the finished grade should be deferred until all disturbed areas on the watershed have been stabilized or protected. The final phase excavation should remove all accumulated sediment. Relatively light-tracked equipment is recommended for this operation to avoid compaction of the basin floor. After the final grading is completed, the basin provides a well-aerated, highly porous surface texture.

3.4 COMPACTION

- A. Minimize compaction of both the base of the bioretention area and the required backfill. Compaction will significantly contribute to design failure.
- B. Use excavator or backhoes to excavate the bioretention.
- C. If the bioretention area is excavated using a loader, the contractor should use wide track or marsh track equipment, or light equipment with turf type tires to minimize compaction.
- D. Use of equipment with narrow tracks or narrow tires, rubber tires with large lugs, or high pressure tires will cause excessive compaction resulting in reduced infiltration rates and storage volumes and is not acceptable.
- E. Compaction can be alleviated at the base of the bioretention facility by using a primary tilling operation such as a chisel plow, ripper, or subsoiler. These tilling operations are performed to refracture the soil profile through the 12-in compaction zone. Substitute methods must be approved by the Engineer. Rototillers typically do not till deep enough to reduce the effects of compaction from heavy equipment.
- F. Do not compact bioretention soil with mechanical equipment.

3.5 EMBANKMENT/BERM FILL

- A. Construct Embankment/berm in accordance with Section 31 20 00 and as indicated on Drawings.

3.6 INSTALLATION

- A. Do not construct the bioretention area until all disturbed areas within the contributing drainage areas have been graded and stabilized.
- B. Install temporary erosion and sediment controls to divert stormwater away from the bioretention area during final construction and until it is completed. Special protection measures such as erosion control fabrics may be needed to protect vulnerable side slopes from erosion during the construction process.
- C. Remove sediment accumulated along the excavation floor during site construction prior to continuing with the bioretention facility construction.
- D. Form bottom of excavation to correct elevation.
- E. If the bioretention area is designed to infiltrate (no liner), scarify the bottom soils to a depth of six inches to promote greater infiltration.
- F. Install the filter fabric along the excavation side walls as specified in the Drawings. Place the filter fabric on the sides of the bioretention area with a minimum six inch overlap at all joints.

- G. Establish elevations and pipe inverts for inlets and outlets as indicated on Drawings
- H. Install the overflow outlet structure as indicated on Drawings.
- I. Install underdrain, including 4 inch perforated pipe, gravel and filter fabric on top of the underdrain gravel as indicated on Drawings. Place gravel around the underdrain pipe as shown in the details. Provide observation wells and/or clean-out pipes as indicated on Drawings.
- J. Install pea gravel layer as indicted on Drawings.
- K. Deliver approved bioretention Soil and store on adjacent impervious area or plastic sheeting.
- L. Drivable grass: Install per Drawings and in accordance with manufacturer’s requirements.

3.7 BACKFILLING

- A. Backfill with approved bioretention soil to the design grade as specified in the Drawings.
- B. Place soil in 12 inch lifts until desired top elevation of bioretention is achieved. Do not use heavy equipment within the bioretention basin. Heavy equipment can be used around the perimeter of the basin to supply soils and sand. Wait 3 days to check for settlement, and add additional media as needed
- C. Do not compact bioretention soil with mechanical equipment. Place bioretention soil with light equipment such as a compact loader, excavator or a dozer/loader with marsh tracks. Hand grade bioretention soil.
- D. Stabilize remaining disturbed areas and side slopes with seeding, hydroseeding, and/or erosion control blankets as indicated on Drawings.

3.8 PLANTING

- A. Plant bioretention area in accordance with Section 32 93 00.
- B. The primary function of the bioretention area is to improve water quality. Do not add fertilizers or other soil amendments to the bioretention soils unless instructed by the Engineer. The planting soil specifications provide enough organic material to adequately supply nutrients from natural cycling.
- C. Install bioretention plantings as indicated on Drawings. Water during weeks of no rain for the first two months.
- D. Do not plant before the remaining disturbed areas surrounding the facility are stabilized.
- E. Remove any sediment accumulated in the bioretention area during the planting phase.

- F. If satisfactory vegetative cover has not been established along the bioretention side slopes prior to planting, install a silt fence perimeter at the toe of the bioretention slopes to remain in place until an approved vegetative cover has been established.
- G. Install mulch layer as indicated on Drawings. Mix approximately half of the specified mulch layer into the bioretention soil to a depth of approximately 4 inches to help foster a highly organic surface layer.
- H. Remove remaining erosion and sediment controls only after surrounding disturbed areas have been properly stabilized.
- I. Conduct final construction inspection with Engineer.

3.9 FIELD QUALITY CONTROL

A. Mandatory Engineer Field Visits:

- 1. Mandatory field visit notification to and approval by the Engineer is required at the following stages prior to proceeding with next phase of construction.
 - a. Bottom of Bed: Excavate the bioretention area to the bottom invert of the subdrain system and install the filter fabric along the excavation side walls.
 - b. Cover: Install underdrain, perforated pipe, gravel and filter fabric on top of the underdrain gravel as specified in the drawings
 - c. Final inspection: Stabilize, maintain and cleanup all bioretention areas Engineer to inspect the following:
 - 1) 90% mulch and vegetative cover has been achieved in the bottom of bed, and depth of remaining mulch.
 - 2) Winter or salt-killed vegetation. Presence of accumulated sand, sediment and trash in pretreatment cell or filter beds.
 - 3) Evidence of any rill or gully erosion along slopes or upgradient grass filter strip.
 - 4) Evidence of mulch flotation, excessive ponding, dead plants or concentrated flows
 - 5) Sediment accumulation and clogging at inflow points.
 - 6) Bare soil or sediment sources in the contributing drainage area.
- 2. Take appropriate remedial action to repair any deficiencies identified during the above Engineer field visits.

3.10 CLEAN UP

- A. After completion of the work, remove and properly dispose all debris, construction materials, rubbish, excess soil, etc., from the Project site. Promptly repair any identified deficiencies and leave the Project site in a clean and satisfactory condition.

END OF SECTION

APPENDICES



CHARLES D. BAKER
Governor

KARYN E. POLITO
Lt. Governor

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT
DEPARTMENT OF LABOR STANDARDS

Prevailing Wage Rates

As determined by the Director under the provisions of the
Massachusetts General Laws, Chapter 149, Sections 26 to 27H

ROSALIN ACOSTA
Secretary
MICHAEL FLANAGAN
Director

Awarding Authority: Town of Norwell
Contract Number: **City/Town:** NORWELL
Description of Work: Wompatuck State Park - Construction of a parking lot, gravel path and wooden footpath, and associated site work, stormwater management, landscaping, signage, and erosion and sediment control.
Job Location: Grove St (Lot 4)

Information about Prevailing Wage Schedules for Awarding Authorities and Contractors

- This wage schedule applies only to the specific project referenced at the top of this page and uniquely identified by the “Wage Request Number” on all pages of this schedule.
 - An Awarding Authority must request an updated wage schedule from the Department of Labor Standards (“DLS”) if it has not opened bids or selected a contractor within 90 days of the date of issuance of the wage schedule. For CM AT RISK projects (bid pursuant to G.L. c.149A), the earlier of: (a) the execution date of the GMP Amendment, or (b) the bid for the first construction scope of work must be within 90-days of the wage schedule issuance date.
 - The wage schedule shall be incorporated in any advertisement or call for bids for the project as required by M.G.L. c. 149, § 27. The wage schedule shall be made a part of the contract awarded for the project. The wage schedule must be posted in a conspicuous place at the work site for the life of the project in accordance with M.G.L. c. 149 § 27. The wages listed on the wage schedule must be paid to employees performing construction work on the project whether they are employed by the prime contractor, a filed sub-bidder, or any sub-contractor.
 - All apprentices working on the project are required to be registered with the Massachusetts Department of Labor Standards, Division of Apprentice Standards (DLS/DAS). Apprentice must keep his/her apprentice identification card on his/her person during all work hours on the project. An apprentice registered with DAS may be paid the lower apprentice wage rate at the applicable step as provided on the prevailing wage schedule. **Any apprentice not registered with DLS/DAS regardless of whether or not they are registered with any other federal, state, local, or private agency must be paid the journeyworker's rate for the trade.**
 - The wage rates will remain in effect for the duration of the project, except in the case of multi-year public construction projects. For construction projects lasting longer than one year, awarding authorities must request an updated wage schedule. Awarding authorities are required to request these updates no later than two weeks before the anniversary of the date the contract was executed by the awarding authority and the general contractor. For multi-year CM AT RISK projects, awarding authority must request an annual update no later than two weeks before the anniversary date, determined as the earlier of: (a) the execution date of the GMP Amendment, or (b) the execution date of the first amendment to permit procurement of construction services. Contractors are required to obtain the wage schedules from awarding authorities, and to pay no less than these rates to covered workers. The annual update requirement is not applicable to 27F “rental of equipment” contracts.
 - Every contractor or subcontractor which performs construction work on the project is required to submit weekly payroll reports and a Statement of Compliance directly to the awarding authority by mail or email and keep them on file for three years. Each weekly payroll report must contain: the employee’s name, address, occupational classification, hours worked, and wages paid. Do not submit weekly payroll reports to DLS. A sample of a payroll reporting form may be obtained at <http://www.mass.gov/dols/pw>.
 - Contractors with questions about the wage rates or classifications included on the wage schedule have an affirmative obligation to inquire with DLS at (617) 626-6953.
 - Employees not receiving the prevailing wage rate set forth on the wage schedule may report the violation to the Fair Labor Division of the office of the Attorney General at (617) 727-3465.
 - Failure of a contractor or subcontractor to pay the prevailing wage rates listed on the wage schedule to all employees who perform construction work on the project is a violation of the law and subjects the contractor or subcontractor to civil and criminal penalties.
-

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Construction						
(2 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	12/01/2020	\$35.15	\$12.91	\$14.82	\$0.00	\$62.88
	06/01/2021	\$35.95	\$12.91	\$14.82	\$0.00	\$63.68
	08/01/2021	\$35.95	\$13.41	\$14.82	\$0.00	\$64.18
	12/01/2021	\$35.95	\$13.41	\$16.01	\$0.00	\$65.37
(3 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	12/01/2020	\$35.22	\$12.91	\$14.82	\$0.00	\$62.95
	06/01/2021	\$36.02	\$12.91	\$14.82	\$0.00	\$63.75
	08/01/2021	\$36.02	\$13.41	\$14.82	\$0.00	\$64.25
	12/01/2021	\$36.02	\$13.41	\$16.01	\$0.00	\$65.44
(4 & 5 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	12/01/2020	\$35.34	\$12.91	\$14.82	\$0.00	\$63.07
	06/01/2021	\$36.14	\$12.91	\$14.82	\$0.00	\$63.87
	08/01/2021	\$36.14	\$13.41	\$14.82	\$0.00	\$64.37
	12/01/2021	\$36.14	\$13.41	\$16.01	\$0.00	\$65.56
ADS/SUBMERSIBLE PILOT <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2020	\$103.05	\$9.40	\$23.12	\$0.00	\$135.57
For apprentice rates see "Apprentice- PILE DRIVER"						
AIR TRACK OPERATOR <i>LABORERS - ZONE 2</i>	12/01/2020	\$35.41	\$8.60	\$16.06	\$0.00	\$60.07
	06/01/2021	\$36.33	\$8.60	\$16.06	\$0.00	\$60.99
	12/01/2021	\$37.24	\$8.60	\$16.06	\$0.00	\$61.90
	06/01/2022	\$38.14	\$8.60	\$16.06	\$0.00	\$62.80
	12/01/2022	\$38.99	\$8.60	\$16.06	\$0.00	\$63.65
	06/01/2023	\$39.89	\$8.60	\$16.06	\$0.00	\$64.55
	12/01/2023	\$40.79	\$8.60	\$16.06	\$0.00	\$65.45
For apprentice rates see "Apprentice- LABORER"						
AIR TRACK OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY & HIGHWAY)</i>	12/01/2020	\$35.41	\$8.60	\$16.06	\$0.00	\$60.07
	06/01/2021	\$36.33	\$8.60	\$16.06	\$0.00	\$60.99
	12/01/2021	\$37.24	\$8.60	\$16.06	\$0.00	\$61.90
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
ASBESTOS REMOVER - PIPE / MECH. EQUIPT. <i>HEAT & FROST INSULATORS LOCAL 6 (BOSTON)</i>	12/01/2020	\$38.10	\$12.80	\$9.45	\$0.00	\$60.35
ASPHALT RAKER <i>LABORERS - ZONE 2</i>	12/01/2020	\$34.91	\$8.60	\$16.06	\$0.00	\$59.57
	06/01/2021	\$35.83	\$8.60	\$16.06	\$0.00	\$60.49
	12/01/2021	\$36.74	\$8.60	\$16.06	\$0.00	\$61.40
	06/01/2022	\$37.64	\$8.60	\$16.06	\$0.00	\$62.30
	12/01/2022	\$38.49	\$8.60	\$16.06	\$0.00	\$63.15
	06/01/2023	\$39.39	\$8.60	\$16.06	\$0.00	\$64.05
	12/01/2023	\$40.29	\$8.60	\$16.06	\$0.00	\$64.95
For apprentice rates see "Apprentice- LABORER"						
ASPHALT RAKER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY & HIGHWAY)</i>	12/01/2020	\$34.91	\$8.60	\$16.06	\$0.00	\$59.57
	06/01/2021	\$35.83	\$8.60	\$16.06	\$0.00	\$60.49
	12/01/2021	\$36.74	\$8.60	\$16.06	\$0.00	\$61.40
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
ASPHALT/CONCRETE/CRUSHER PLANT-ON SITE <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2020	\$49.98	\$13.50	\$15.70	\$0.00	\$79.18
	06/01/2021	\$51.08	\$13.50	\$15.70	\$0.00	\$80.28
	12/01/2021	\$52.23	\$13.50	\$15.70	\$0.00	\$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
BACKHOE/FRONT-END LOADER <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2020	\$49.98	\$13.50	\$15.70	\$0.00	\$79.18
	06/01/2021	\$51.08	\$13.50	\$15.70	\$0.00	\$80.28
	12/01/2021	\$52.23	\$13.50	\$15.70	\$0.00	\$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BARCO-TYPE JUMPING TAMPER <i>LABORERS - ZONE 2</i>	12/01/2020	\$34.91	\$8.60	\$16.06	\$0.00	\$59.57
	06/01/2021	\$35.83	\$8.60	\$16.06	\$0.00	\$60.49
	12/01/2021	\$36.74	\$8.60	\$16.06	\$0.00	\$61.40
	06/01/2022	\$37.64	\$8.60	\$16.06	\$0.00	\$62.30
	12/01/2022	\$38.49	\$8.60	\$16.06	\$0.00	\$63.15
	06/01/2023	\$39.39	\$8.60	\$16.06	\$0.00	\$64.05
	12/01/2023	\$40.29	\$8.60	\$16.06	\$0.00	\$64.95
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER <i>LABORERS - ZONE 2</i>	12/01/2020	\$35.41	\$8.60	\$16.06	\$0.00	\$60.07
	06/01/2021	\$36.33	\$8.60	\$16.06	\$0.00	\$60.99
	12/01/2021	\$37.24	\$8.60	\$16.06	\$0.00	\$61.90
	06/01/2022	\$38.14	\$8.60	\$16.06	\$0.00	\$62.80
	12/01/2022	\$38.99	\$8.60	\$16.06	\$0.00	\$63.65
	06/01/2023	\$39.89	\$8.60	\$16.06	\$0.00	\$64.55
	12/01/2023	\$40.79	\$8.60	\$16.06	\$0.00	\$65.45
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY & HIGHWAY)</i>	12/01/2020	\$35.41	\$8.60	\$16.06	\$0.00	\$60.07
	06/01/2021	\$36.33	\$8.60	\$16.06	\$0.00	\$60.99
	12/01/2021	\$37.24	\$8.60	\$16.06	\$0.00	\$61.90
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
BOILER MAKER <i>BOILERMAKERS LOCAL 29</i>	01/01/2020	\$46.10	\$7.07	\$17.98	\$0.00	\$71.15

Apprentice - BOILERMAKER - Local 29

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	65	\$29.97	\$7.07	\$11.69	\$0.00	\$48.73
2	65	\$29.97	\$7.07	\$11.69	\$0.00	\$48.73
3	70	\$32.27	\$7.07	\$12.59	\$0.00	\$51.93
4	75	\$34.58	\$7.07	\$13.49	\$0.00	\$55.14
5	80	\$36.88	\$7.07	\$14.38	\$0.00	\$58.33
6	85	\$39.19	\$7.07	\$15.29	\$0.00	\$61.55
7	90	\$41.49	\$7.07	\$16.18	\$0.00	\$64.74
8	95	\$43.80	\$7.07	\$17.09	\$0.00	\$67.96

Notes:

Apprentice to Journeyworker Ratio:1:4

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING) <i>BRICKLAYERS LOCAL 3 (QUINCY)</i>	08/01/2020	\$55.75	\$10.75	\$22.09	\$0.00	\$88.59
	02/01/2021	\$56.39	\$10.75	\$22.09	\$0.00	\$89.23
	08/01/2021	\$57.79	\$10.75	\$22.25	\$0.00	\$90.79
	02/01/2022	\$58.38	\$10.75	\$22.25	\$0.00	\$91.38

Apprentice - BRICK/PLASTER/CEMENT MASON - Local 3 Quincy

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$27.88	\$10.75	\$22.09	\$0.00	\$60.72
2	60	\$33.45	\$10.75	\$22.09	\$0.00	\$66.29
3	70	\$39.03	\$10.75	\$22.09	\$0.00	\$71.87
4	80	\$44.60	\$10.75	\$22.09	\$0.00	\$77.44
5	90	\$50.18	\$10.75	\$22.09	\$0.00	\$83.02

Effective Date - 02/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$28.20	\$10.75	\$22.09	\$0.00	\$61.04
2	60	\$33.83	\$10.75	\$22.09	\$0.00	\$66.67
3	70	\$39.47	\$10.75	\$22.09	\$0.00	\$72.31
4	80	\$45.11	\$10.75	\$22.09	\$0.00	\$77.95
5	90	\$50.75	\$10.75	\$22.09	\$0.00	\$83.59

Notes:

Apprentice to Journeyworker Ratio:1:5

BULLDOZER/GRADER/SCRAPER <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2020	\$49.45	\$13.50	\$15.70	\$0.00	\$78.65
	06/01/2021	\$50.54	\$13.50	\$15.70	\$0.00	\$79.74
	12/01/2021	\$51.68	\$13.50	\$15.70	\$0.00	\$80.88

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

CAISSON & UNDERPINNING BOTTOM MAN <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2020	\$41.05	\$8.60	\$17.47	\$0.00	\$67.12
	06/01/2021	\$42.07	\$8.60	\$17.47	\$0.00	\$68.14
	12/01/2021	\$43.08	\$8.60	\$17.47	\$0.00	\$69.15

For apprentice rates see "Apprentice- LABORER"

CAISSON & UNDERPINNING LABORER <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2020	\$39.90	\$8.60	\$17.47	\$0.00	\$65.97
	06/01/2021	\$40.92	\$8.60	\$17.47	\$0.00	\$66.99
	12/01/2021	\$41.93	\$8.60	\$17.47	\$0.00	\$68.00

For apprentice rates see "Apprentice- LABORER"

CAISSON & UNDERPINNING TOP MAN <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2020	\$39.90	\$8.60	\$17.47	\$0.00	\$65.97
	06/01/2021	\$40.92	\$8.60	\$17.47	\$0.00	\$66.99
	12/01/2021	\$41.93	\$8.60	\$17.47	\$0.00	\$68.00

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CARBIDE CORE DRILL OPERATOR <i>LABORERS - ZONE 2</i>	12/01/2020	\$34.91	\$8.60	\$16.06	\$0.00	\$59.57
	06/01/2021	\$35.83	\$8.60	\$16.06	\$0.00	\$60.49
	12/01/2021	\$36.74	\$8.60	\$16.06	\$0.00	\$61.40
	06/01/2022	\$37.64	\$8.60	\$16.06	\$0.00	\$62.30
	12/01/2022	\$38.49	\$8.60	\$16.06	\$0.00	\$63.15
	06/01/2023	\$39.39	\$8.60	\$16.06	\$0.00	\$64.05
	12/01/2023	\$40.29	\$8.60	\$16.06	\$0.00	\$64.95

For apprentice rates see "Apprentice- LABORER"

CARPENTER <i>CARPENTERS -ZONE 2 (Eastern Massachusetts)</i>	09/01/2020	\$42.94	\$9.40	\$18.95	\$0.00	\$71.29
	03/01/2021	\$43.54	\$9.40	\$18.95	\$0.00	\$71.89
	09/01/2021	\$44.19	\$9.40	\$18.95	\$0.00	\$72.54
	03/01/2022	\$44.79	\$9.40	\$18.95	\$0.00	\$73.14
	09/01/2022	\$45.44	\$9.40	\$18.95	\$0.00	\$73.79
	03/01/2023	\$46.04	\$9.40	\$18.95	\$0.00	\$74.39

Apprentice - CARPENTER - Zone 2 Eastern MA

Effective Date - 09/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.47	\$9.40	\$1.73	\$0.00	\$32.60
2	60	\$25.76	\$9.40	\$1.73	\$0.00	\$36.89
3	70	\$30.06	\$9.40	\$13.76	\$0.00	\$53.22
4	75	\$32.21	\$9.40	\$13.76	\$0.00	\$55.37
5	80	\$34.35	\$9.40	\$15.49	\$0.00	\$59.24
6	80	\$34.35	\$9.40	\$15.49	\$0.00	\$59.24
7	90	\$38.65	\$9.40	\$17.22	\$0.00	\$65.27
8	90	\$38.65	\$9.40	\$17.22	\$0.00	\$65.27

Effective Date - 03/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.77	\$9.40	\$1.73	\$0.00	\$32.90
2	60	\$26.12	\$9.40	\$1.73	\$0.00	\$37.25
3	70	\$30.48	\$9.40	\$13.76	\$0.00	\$53.64
4	75	\$32.66	\$9.40	\$13.76	\$0.00	\$55.82
5	80	\$34.83	\$9.40	\$15.49	\$0.00	\$59.72
6	80	\$34.83	\$9.40	\$15.49	\$0.00	\$59.72
7	90	\$39.19	\$9.40	\$17.22	\$0.00	\$65.81
8	90	\$39.19	\$9.40	\$17.22	\$0.00	\$65.81

Notes:

% Indentured After 10/1/17; 45/45/55/55/70/70/80/80
Step 1&2 \$30.45/ 3&4 \$36.42/ 5&6 \$54.95/ 7&8 \$60.97

Apprentice to Journeyworker Ratio:1:5

CARPENTER WOOD FRAME <i>CARPENTERS-ZONE 3 (Wood Frame)</i>	04/01/2020	\$22.66	\$7.21	\$4.80	\$0.00	\$34.67
	04/01/2021	\$23.16	\$7.21	\$4.80	\$0.00	\$35.17
	04/01/2022	\$23.66	\$7.21	\$4.80	\$0.00	\$35.67
	04/01/2023	\$24.16	\$7.21	\$4.80	\$0.00	\$36.17

Classification

All Aspects of New Wood Frame Work

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - CARPENTER (Wood Frame) - Zone 3

Effective Date - 04/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$13.60	\$7.21	\$0.00	\$0.00	\$20.81
2	60	\$13.60	\$7.21	\$0.00	\$0.00	\$20.81
3	65	\$14.73	\$7.21	\$0.00	\$0.00	\$21.94
4	70	\$15.86	\$7.21	\$0.00	\$0.00	\$23.07
5	75	\$17.00	\$7.21	\$3.80	\$0.00	\$28.01
6	80	\$18.13	\$7.21	\$3.80	\$0.00	\$29.14
7	85	\$19.26	\$7.21	\$3.80	\$0.00	\$30.27
8	90	\$20.39	\$7.21	\$3.80	\$0.00	\$31.40

Effective Date - 04/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$13.90	\$7.21	\$0.00	\$0.00	\$21.11
2	60	\$13.90	\$7.21	\$0.00	\$0.00	\$21.11
3	65	\$15.05	\$7.21	\$0.00	\$0.00	\$22.26
4	70	\$16.21	\$7.21	\$0.00	\$0.00	\$23.42
5	75	\$17.37	\$7.21	\$3.80	\$0.00	\$28.38
6	80	\$18.53	\$7.21	\$3.80	\$0.00	\$29.54
7	85	\$19.69	\$7.21	\$3.80	\$0.00	\$30.70
8	90	\$20.84	\$7.21	\$3.80	\$0.00	\$31.85

Notes:

% Indentured After 10/1/17; 45/45/55/55/70/70/80/80
 Step 1&2 \$17.41/ 3&4 \$19.67/ 5&6 \$26.87/ 7&8 \$29.14

Apprentice to Journeyworker Ratio:1:5

CEMENT MASONRY/PLASTERING BRICKLAYERS LOCAL 3 (QUINCY)	01/01/2020	\$49.07	\$12.75	\$22.41	\$0.62	\$84.85
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Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - CEMENT MASONRY/PLASTERING - Eastern Mass (Quincy)

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.54	\$12.75	\$15.41	\$0.00	\$52.70
2	60	\$29.44	\$12.75	\$17.41	\$0.62	\$60.22
3	65	\$31.90	\$12.75	\$18.41	\$0.62	\$63.68
4	70	\$34.35	\$12.75	\$19.41	\$0.62	\$67.13
5	75	\$36.80	\$12.75	\$20.41	\$0.62	\$70.58
6	80	\$39.26	\$12.75	\$21.41	\$0.62	\$74.04
7	90	\$44.16	\$12.75	\$22.41	\$0.62	\$79.94

Notes:

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

Apprentice to Journeyworker Ratio:1:3

CHAIN SAW OPERATOR <i>LABORERS - ZONE 2</i>	12/01/2020	\$34.91	\$8.60	\$16.06	\$0.00	\$59.57
	06/01/2021	\$35.83	\$8.60	\$16.06	\$0.00	\$60.49
	12/01/2021	\$36.74	\$8.60	\$16.06	\$0.00	\$61.40
	06/01/2022	\$37.64	\$8.60	\$16.06	\$0.00	\$62.30
	12/01/2022	\$38.49	\$8.60	\$16.06	\$0.00	\$63.15
	06/01/2023	\$39.39	\$8.60	\$16.06	\$0.00	\$64.05
	12/01/2023	\$40.29	\$8.60	\$16.06	\$0.00	\$64.95
For apprentice rates see "Apprentice- LABORER"						
CLAM SHELLS/SLURRY BUCKETS/HEADING MACHINES <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2020	\$50.98	\$13.50	\$15.70	\$0.00	\$80.18
	06/01/2021	\$52.08	\$13.50	\$15.70	\$0.00	\$81.28
	12/01/2021	\$53.23	\$13.50	\$15.70	\$0.00	\$82.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
COMPRESSOR OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2020	\$33.00	\$13.50	\$15.70	\$0.00	\$62.20
	06/01/2021	\$33.75	\$13.50	\$15.70	\$0.00	\$62.95
	12/01/2021	\$34.54	\$13.50	\$15.70	\$0.00	\$63.74
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DELEADER (BRIDGE) <i>PAINTERS LOCAL 35 - ZONE 2</i>	01/01/2021	\$52.06	\$8.25	\$22.75	\$0.00	\$83.06

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - PAINTER Local 35 - BRIDGES/TANKS

Effective Date - 01/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$26.03	\$8.25	\$0.00	\$0.00	\$34.28
2	55	\$28.63	\$8.25	\$6.16	\$0.00	\$43.04
3	60	\$31.24	\$8.25	\$6.72	\$0.00	\$46.21
4	65	\$33.84	\$8.25	\$7.28	\$0.00	\$49.37
5	70	\$36.44	\$8.25	\$19.39	\$0.00	\$64.08
6	75	\$39.05	\$8.25	\$19.95	\$0.00	\$67.25
7	80	\$41.65	\$8.25	\$20.51	\$0.00	\$70.41
8	90	\$46.85	\$8.25	\$21.63	\$0.00	\$76.73

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

DEMO: ADZEMAN LABORERS - ZONE 2	12/01/2020	\$40.05	\$8.60	\$17.32	\$0.00	\$65.97
	06/01/2021	\$41.07	\$8.60	\$17.32	\$0.00	\$66.99
	12/01/2021	\$42.08	\$8.60	\$17.32	\$0.00	\$68.00
	06/01/2022	\$43.08	\$8.60	\$17.32	\$0.00	\$69.00
	12/01/2022	\$44.08	\$8.60	\$17.32	\$0.00	\$70.00
	06/01/2023	\$45.08	\$8.60	\$17.32	\$0.00	\$71.00
	12/01/2023	\$46.33	\$8.60	\$17.32	\$0.00	\$72.25

For apprentice rates see "Apprentice- LABORER"

DEMO: BACKHOE/LOADER/HAMMER OPERATOR LABORERS - ZONE 2	12/01/2020	\$41.05	\$8.60	\$17.32	\$0.00	\$66.97
	06/01/2021	\$42.07	\$8.60	\$17.32	\$0.00	\$67.99
	12/01/2021	\$43.08	\$8.60	\$17.32	\$0.00	\$69.00
	06/01/2022	\$44.08	\$8.60	\$17.32	\$0.00	\$70.00
	12/01/2022	\$45.08	\$8.60	\$17.32	\$0.00	\$71.00
	06/01/2023	\$46.08	\$8.60	\$17.32	\$0.00	\$72.00
	12/01/2023	\$47.33	\$8.60	\$17.32	\$0.00	\$73.25

For apprentice rates see "Apprentice- LABORER"

DEMO: BURNERS LABORERS - ZONE 2	12/01/2020	\$40.80	\$8.60	\$17.32	\$0.00	\$66.72
	06/01/2021	\$41.82	\$8.60	\$17.32	\$0.00	\$67.74
	12/01/2021	\$42.83	\$8.60	\$17.32	\$0.00	\$68.75
	06/01/2022	\$43.83	\$8.60	\$17.32	\$0.00	\$69.75
	12/01/2022	\$44.83	\$8.60	\$17.32	\$0.00	\$70.75
	06/01/2023	\$45.83	\$8.60	\$17.32	\$0.00	\$71.75
	12/01/2023	\$47.08	\$8.60	\$17.32	\$0.00	\$73.00

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
DEMO: CONCRETE CUTTER/SAWYER <i>LABORERS - ZONE 2</i>	12/01/2020	\$41.05	\$8.60	\$17.32	\$0.00	\$66.97
	06/01/2021	\$42.07	\$8.60	\$17.32	\$0.00	\$67.99
	12/01/2021	\$43.08	\$8.60	\$17.32	\$0.00	\$69.00
	06/01/2022	\$44.08	\$8.60	\$17.32	\$0.00	\$70.00
	12/01/2022	\$45.08	\$8.60	\$17.32	\$0.00	\$71.00
	06/01/2023	\$46.08	\$8.60	\$17.32	\$0.00	\$72.00
	12/01/2023	\$47.33	\$8.60	\$17.32	\$0.00	\$73.25
For apprentice rates see "Apprentice- LABORER"						
DEMO: JACKHAMMER OPERATOR <i>LABORERS - ZONE 2</i>	12/01/2020	\$40.80	\$8.60	\$17.32	\$0.00	\$66.72
	06/01/2021	\$41.82	\$8.60	\$17.32	\$0.00	\$67.74
	12/01/2021	\$42.83	\$8.60	\$17.32	\$0.00	\$68.75
	06/01/2022	\$43.83	\$8.60	\$17.32	\$0.00	\$69.75
	12/01/2022	\$44.83	\$8.60	\$17.32	\$0.00	\$70.75
	06/01/2023	\$45.83	\$8.60	\$17.32	\$0.00	\$71.75
	12/01/2023	\$47.08	\$8.60	\$17.32	\$0.00	\$73.00
For apprentice rates see "Apprentice- LABORER"						
DEMO: WRECKING LABORER <i>LABORERS - ZONE 2</i>	12/01/2020	\$40.05	\$8.60	\$17.32	\$0.00	\$65.97
	06/01/2021	\$41.07	\$8.60	\$17.32	\$0.00	\$66.99
	12/01/2021	\$42.08	\$8.60	\$17.32	\$0.00	\$68.00
	06/01/2022	\$43.08	\$8.60	\$17.32	\$0.00	\$69.00
	12/01/2022	\$44.08	\$8.60	\$17.32	\$0.00	\$70.00
	06/01/2023	\$45.08	\$8.60	\$17.32	\$0.00	\$71.00
	12/01/2023	\$46.33	\$8.60	\$17.32	\$0.00	\$72.25
For apprentice rates see "Apprentice- LABORER"						
DIRECTIONAL DRILL MACHINE OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2020	\$49.45	\$13.50	\$15.70	\$0.00	\$78.65
	06/01/2021	\$50.54	\$13.50	\$15.70	\$0.00	\$79.74
	12/01/2021	\$51.68	\$13.50	\$15.70	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DIVER <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2020	\$68.70	\$9.40	\$23.12	\$0.00	\$101.22
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2020	\$49.07	\$9.40	\$23.12	\$0.00	\$81.59
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER (EFFLUENT) <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2020	\$73.60	\$9.40	\$23.12	\$0.00	\$106.12
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER/SLURRY (EFFLUENT) <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2020	\$103.05	\$9.40	\$23.12	\$0.00	\$135.57
For apprentice rates see "Apprentice- PILE DRIVER"						
DRAWBRIDGE OPERATOR (Construction) <i>DRAWBRIDGE - SEIU LOCAL 888</i>	07/01/2020	\$26.77	\$6.67	\$3.93	\$0.16	\$37.53
ELECTRICIAN <i>ELECTRICIANS LOCAL 223</i>	09/01/2020	\$43.66	\$10.90	\$14.66	\$0.00	\$69.22

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - ELECTRICIAN - Local 223

Effective Date - 09/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$17.46	\$10.90	\$0.52	\$0.00	\$28.88
2	45	\$19.65	\$10.90	\$0.59	\$0.00	\$31.14
3	50	\$21.83	\$10.90	\$0.65	\$0.00	\$33.38
4	55	\$24.01	\$10.90	\$6.28	\$0.00	\$41.19
5	60	\$26.20	\$10.90	\$6.77	\$0.00	\$43.87
6	65	\$28.38	\$10.90	\$7.24	\$0.00	\$46.52
7	70	\$30.56	\$10.90	\$7.73	\$0.00	\$49.19
8	75	\$32.75	\$10.90	\$8.21	\$0.00	\$51.86

Notes:

Apprentice to Journeyworker Ratio:2:3***

ELEVATOR CONSTRUCTOR ELEVATOR CONSTRUCTORS LOCAL 4	01/01/2021	\$63.47	\$15.88	\$19.31	\$0.00	\$98.66
	01/01/2022	\$65.62	\$16.03	\$20.21	\$0.00	\$101.86

Apprentice - ELEVATOR CONSTRUCTOR - Local 4

Effective Date - 01/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$31.74	\$15.88	\$0.00	\$0.00	\$47.62
2	55	\$34.91	\$15.88	\$19.31	\$0.00	\$70.10
3	65	\$41.26	\$15.88	\$19.31	\$0.00	\$76.45
4	70	\$44.43	\$15.88	\$19.31	\$0.00	\$79.62
5	80	\$50.78	\$15.88	\$19.31	\$0.00	\$85.97

Effective Date - 01/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$32.81	\$16.03	\$0.00	\$0.00	\$48.84
2	55	\$36.09	\$16.03	\$20.21	\$0.00	\$72.33
3	65	\$42.65	\$16.03	\$20.21	\$0.00	\$78.89
4	70	\$45.93	\$16.03	\$20.21	\$0.00	\$82.17
5	80	\$52.50	\$16.03	\$20.21	\$0.00	\$88.74

Notes:

Steps 1-2 are 6 mos.; Steps 3-5 are 1 year

Apprentice to Journeyworker Ratio:1:1

ELEVATOR CONSTRUCTOR HELPER ELEVATOR CONSTRUCTORS LOCAL 4	01/01/2021	\$44.43	\$15.88	\$19.31	\$0.00	\$79.62
	01/01/2022	\$45.93	\$16.03	\$20.21	\$0.00	\$82.17

For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FENCE & GUARD RAIL ERECTOR <i>LABORERS - ZONE 2</i>	12/01/2020	\$34.91	\$8.60	\$16.06	\$0.00	\$59.57
	06/01/2021	\$35.83	\$8.60	\$16.06	\$0.00	\$60.49
	12/01/2021	\$36.74	\$8.60	\$16.06	\$0.00	\$61.40
	06/01/2022	\$37.64	\$8.60	\$16.06	\$0.00	\$62.30
	12/01/2022	\$38.49	\$8.60	\$16.06	\$0.00	\$63.15
	06/01/2023	\$39.39	\$8.60	\$16.06	\$0.00	\$64.05
	12/01/2023	\$40.29	\$8.60	\$16.06	\$0.00	\$64.95
For apprentice rates see "Apprentice- LABORER"						
FENCE & GUARD RAIL ERECTOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY & HIGHWAY)</i>	12/01/2020	\$34.91	\$8.60	\$16.06	\$0.00	\$59.57
	06/01/2021	\$35.83	\$8.60	\$16.06	\$0.00	\$60.49
	12/01/2021	\$36.74	\$8.60	\$16.06	\$0.00	\$61.40
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
FIELD ENG.INST.PERSON-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i>	11/01/2020	\$45.23	\$13.00	\$15.70	\$0.00	\$73.93
	05/01/2021	\$46.38	\$13.00	\$15.70	\$0.00	\$75.08
	11/01/2021	\$47.38	\$13.00	\$15.70	\$0.00	\$76.08
	05/01/2022	\$48.53	\$13.00	\$15.70	\$0.00	\$77.23
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIELD ENG.PARTY CHIEF-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i>	11/01/2020	\$46.74	\$13.00	\$15.70	\$0.00	\$75.44
	05/01/2021	\$47.90	\$13.00	\$15.70	\$0.00	\$76.60
	11/01/2021	\$48.91	\$13.00	\$15.70	\$0.00	\$77.61
	05/01/2022	\$50.07	\$13.00	\$15.70	\$0.00	\$78.77
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIELD ENG.ROD PERSON-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i>	11/01/2020	\$22.73	\$13.00	\$15.70	\$0.00	\$51.43
	05/01/2021	\$23.41	\$13.00	\$15.70	\$0.00	\$52.11
	11/01/2021	\$24.01	\$13.00	\$15.70	\$0.00	\$52.71
	05/01/2022	\$24.68	\$13.00	\$15.70	\$0.00	\$53.38
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIRE ALARM INSTALLER <i>ELECTRICIANS LOCAL 223</i>	09/01/2020	\$43.66	\$10.90	\$14.66	\$0.00	\$69.22
For apprentice rates see "Apprentice- ELECTRICIAN"						
FIRE ALARM REPAIR / MAINTENANCE / COMMISSIONING <i>ELECTRICIANS LOCAL 223</i>	09/01/2020	\$36.86	\$10.90	\$12.45	\$0.00	\$60.21
For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"						
FIREMAN (ASST. ENGINEER) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2020	\$40.75	\$13.50	\$15.70	\$0.00	\$69.95
	06/01/2021	\$41.66	\$13.50	\$15.70	\$0.00	\$70.86
	12/01/2021	\$42.61	\$13.50	\$15.70	\$0.00	\$71.81
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FLAGGER & SIGNALER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY & HIGHWAY)</i>	12/01/2020	\$24.50	\$8.60	\$16.06	\$0.00	\$49.16
	06/01/2021	\$24.50	\$8.60	\$16.06	\$0.00	\$49.16
	12/01/2021	\$24.50	\$8.60	\$16.06	\$0.00	\$49.16
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
FLOORCOVERER <i>FLOORCOVERERS LOCAL 2168 ZONE 1</i>	09/01/2020	\$47.79	\$9.40	\$19.25	\$0.00	\$76.44
	03/01/2021	\$48.59	\$9.40	\$19.25	\$0.00	\$77.24
	09/01/2021	\$49.39	\$9.40	\$19.25	\$0.00	\$78.04
	03/01/2022	\$50.19	\$9.40	\$19.25	\$0.00	\$78.84

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - FLOORCOVERER - Local 2168 Zone I

Effective Date - 09/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.90	\$9.40	\$1.79	\$0.00	\$35.09
2	55	\$26.28	\$9.40	\$1.79	\$0.00	\$37.47
3	60	\$28.67	\$9.40	\$13.88	\$0.00	\$51.95
4	65	\$31.06	\$9.40	\$13.88	\$0.00	\$54.34
5	70	\$33.45	\$9.40	\$15.67	\$0.00	\$58.52
6	75	\$35.84	\$9.40	\$15.67	\$0.00	\$60.91
7	80	\$38.23	\$9.40	\$17.46	\$0.00	\$65.09
8	85	\$40.62	\$9.40	\$17.46	\$0.00	\$67.48

Effective Date - 03/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.30	\$9.40	\$1.79	\$0.00	\$35.49
2	55	\$26.72	\$9.40	\$1.79	\$0.00	\$37.91
3	60	\$29.15	\$9.40	\$13.88	\$0.00	\$52.43
4	65	\$31.58	\$9.40	\$13.88	\$0.00	\$54.86
5	70	\$34.01	\$9.40	\$15.67	\$0.00	\$59.08
6	75	\$36.44	\$9.40	\$15.67	\$0.00	\$61.51
7	80	\$38.87	\$9.40	\$17.46	\$0.00	\$65.73
8	85	\$41.30	\$9.40	\$17.46	\$0.00	\$68.16

Notes: Steps are 750 hrs.
 % After 09/1/17; 45/45/55/55/70/70/80/80 (1500hr Steps)
 Step 1&2 \$32.70/ 3&4 \$39.20/ 5&6 \$58.52/ 7&8 \$65.09

Apprentice to Journeyworker Ratio:1:1

FORK LIFT/CHERRY PICKER <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2020	\$49.98	\$13.50	\$15.70	\$0.00	\$79.18
	06/01/2021	\$51.08	\$13.50	\$15.70	\$0.00	\$80.28
	12/01/2021	\$52.23	\$13.50	\$15.70	\$0.00	\$81.43

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

GENERATOR/LIGHTING PLANT/HEATERS <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2020	\$33.00	\$13.50	\$15.70	\$0.00	\$62.20
	06/01/2021	\$33.75	\$13.50	\$15.70	\$0.00	\$62.95
	12/01/2021	\$34.54	\$13.50	\$15.70	\$0.00	\$63.74

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS) <i>GLAZIERS LOCAL 35 (ZONE 2)</i>	01/01/2021	\$41.56	\$8.25	\$22.75	\$0.00	\$72.56
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Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - GLAZIER - Local 35 Zone 2

Effective Date - 01/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.78	\$8.25	\$0.00	\$0.00	\$29.03
2	55	\$22.86	\$8.25	\$6.16	\$0.00	\$37.27
3	60	\$24.94	\$8.25	\$6.72	\$0.00	\$39.91
4	65	\$27.01	\$8.25	\$7.28	\$0.00	\$42.54
5	70	\$29.09	\$8.25	\$19.39	\$0.00	\$56.73
6	75	\$31.17	\$8.25	\$19.95	\$0.00	\$59.37
7	80	\$33.25	\$8.25	\$20.51	\$0.00	\$62.01
8	90	\$37.40	\$8.25	\$21.63	\$0.00	\$67.28

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

HOISTING ENGINEER/CRANES/GRADALLS	12/01/2020	\$49.98	\$13.50	\$15.70	\$0.00	\$79.18
OPERATING ENGINEERS LOCAL 4	06/01/2021	\$51.08	\$13.50	\$15.70	\$0.00	\$80.28
	12/01/2021	\$52.23	\$13.50	\$15.70	\$0.00	\$81.43

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - OPERATING ENGINEERS - Local 4

Effective Date - 12/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$27.49	\$13.50	\$0.00	\$0.00	\$40.99
2	60	\$29.99	\$13.50	\$15.70	\$0.00	\$59.19
3	65	\$32.49	\$13.50	\$15.70	\$0.00	\$61.69
4	70	\$34.99	\$13.50	\$15.70	\$0.00	\$64.19
5	75	\$37.49	\$13.50	\$15.70	\$0.00	\$66.69
6	80	\$39.98	\$13.50	\$15.70	\$0.00	\$69.18
7	85	\$42.48	\$13.50	\$15.70	\$0.00	\$71.68
8	90	\$44.98	\$13.50	\$15.70	\$0.00	\$74.18

Effective Date - 06/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$28.09	\$13.50	\$0.00	\$0.00	\$41.59
2	60	\$30.65	\$13.50	\$15.70	\$0.00	\$59.85
3	65	\$33.20	\$13.50	\$15.70	\$0.00	\$62.40
4	70	\$35.76	\$13.50	\$15.70	\$0.00	\$64.96
5	75	\$38.31	\$13.50	\$15.70	\$0.00	\$67.51
6	80	\$40.86	\$13.50	\$15.70	\$0.00	\$70.06
7	85	\$43.42	\$13.50	\$15.70	\$0.00	\$72.62
8	90	\$45.97	\$13.50	\$15.70	\$0.00	\$75.17

Notes:

Apprentice to Journeyworker Ratio:1:6

HVAC (DUCTWORK) SHEETMETAL WORKERS LOCAL 17 - A	08/01/2020	\$50.67	\$13.50	\$24.12	\$2.65	\$90.94
	02/01/2021	\$51.67	\$13.65	\$24.57	\$2.70	\$92.59
	08/01/2021	\$53.42	\$13.65	\$24.57	\$2.75	\$94.39
	02/01/2022	\$55.17	\$13.65	\$24.57	\$2.80	\$96.19

For apprentice rates see "Apprentice- SHEET METAL WORKER"

HVAC (ELECTRICAL CONTROLS) ELECTRICIANS LOCAL 223	09/01/2020	\$43.66	\$10.90	\$14.66	\$0.00	\$69.22
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For apprentice rates see "Apprentice- ELECTRICIAN"

HVAC (TESTING AND BALANCING - AIR) SHEETMETAL WORKERS LOCAL 17 - A	08/01/2020	\$50.67	\$13.50	\$24.12	\$2.65	\$90.94
	02/01/2021	\$51.67	\$13.65	\$24.57	\$2.70	\$92.59
	08/01/2021	\$53.42	\$13.65	\$24.57	\$2.75	\$94.39
	02/01/2022	\$55.17	\$13.65	\$24.57	\$2.80	\$96.19

For apprentice rates see "Apprentice- SHEET METAL WORKER"

HVAC (TESTING AND BALANCING - WATER) PLUMBERS & PIPEFITTERS LOCAL 51	08/31/2020	\$44.69	\$10.15	\$19.80	\$0.00	\$74.64
	08/30/2021	\$46.69	\$10.15	\$19.80	\$0.00	\$76.64

For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"

HVAC MECHANIC PLUMBERS & PIPEFITTERS LOCAL 51	08/31/2020	\$44.69	\$10.15	\$19.80	\$0.00	\$74.64
	08/30/2021	\$46.69	\$10.15	\$19.80	\$0.00	\$76.64

For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
HYDRAULIC DRILLS <i>LABORERS - ZONE 2</i>	12/01/2020	\$35.41	\$8.60	\$16.06	\$0.00	\$60.07
	06/01/2021	\$36.33	\$8.60	\$16.06	\$0.00	\$60.99
	12/01/2021	\$37.24	\$8.60	\$16.06	\$0.00	\$61.90
	06/01/2022	\$38.14	\$8.60	\$16.06	\$0.00	\$62.80
	12/01/2022	\$38.99	\$8.60	\$16.06	\$0.00	\$63.65
	06/01/2023	\$39.89	\$8.60	\$16.06	\$0.00	\$64.55
	12/01/2023	\$40.79	\$8.60	\$16.06	\$0.00	\$65.45
For apprentice rates see "Apprentice- LABORER"						
HYDRAULIC DRILLS (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY & HIGHWAY)</i>	12/01/2020	\$35.41	\$8.60	\$16.06	\$0.00	\$60.07
	06/01/2021	\$36.33	\$8.60	\$16.06	\$0.00	\$60.99
	12/01/2021	\$37.24	\$8.60	\$16.06	\$0.00	\$61.90
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
INSULATOR (PIPES & TANKS) <i>HEAT & FROST INSULATORS LOCAL 6 (BOSTON)</i>	09/01/2020	\$49.00	\$13.80	\$17.14	\$0.00	\$79.94
	09/01/2021	\$51.40	\$13.80	\$17.14	\$0.00	\$82.34
	09/01/2022	\$53.85	\$13.80	\$17.14	\$0.00	\$84.79

Apprentice - ASBESTOS INSULATOR (Pipes & Tanks) - Local 6 Boston

Effective Date - 09/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.50	\$13.80	\$12.42	\$0.00	\$50.72
2	60	\$29.40	\$13.80	\$13.36	\$0.00	\$56.56
3	70	\$34.30	\$13.80	\$14.31	\$0.00	\$62.41
4	80	\$39.20	\$13.80	\$15.25	\$0.00	\$68.25

Effective Date - 09/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.70	\$13.80	\$12.42	\$0.00	\$51.92
2	60	\$30.84	\$13.80	\$13.36	\$0.00	\$58.00
3	70	\$35.98	\$13.80	\$14.31	\$0.00	\$64.09
4	80	\$41.12	\$13.80	\$15.25	\$0.00	\$70.17

Notes:

Steps are 1 year

Apprentice to Journeyworker Ratio:1:4

IRONWORKER/WELDER <i>IRONWORKERS LOCAL 7 (BOSTON AREA)</i>	09/16/2020	\$48.66	\$8.10	\$25.10	\$0.00	\$81.86
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Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - IRONWORKER - Local 7 Boston

Effective Date - 09/16/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$29.20	\$8.10	\$25.10	\$0.00	\$62.40
2	70	\$34.06	\$8.10	\$25.10	\$0.00	\$67.26
3	75	\$36.50	\$8.10	\$25.10	\$0.00	\$69.70
4	80	\$38.93	\$8.10	\$25.10	\$0.00	\$72.13
5	85	\$41.36	\$8.10	\$25.10	\$0.00	\$74.56
6	90	\$43.79	\$8.10	\$25.10	\$0.00	\$76.99

Notes:

** Structural 1:6; Ornamental 1:4

Apprentice to Journeyworker Ratio:**

JACKHAMMER & PAVING BREAKER OPERATOR LABORERS - ZONE 2	12/01/2020	\$34.91	\$8.60	\$16.06	\$0.00	\$59.57
	06/01/2021	\$35.83	\$8.60	\$16.06	\$0.00	\$60.49
	12/01/2021	\$36.74	\$8.60	\$16.06	\$0.00	\$61.40
	06/01/2022	\$37.64	\$8.60	\$16.06	\$0.00	\$62.30
	12/01/2022	\$38.49	\$8.60	\$16.06	\$0.00	\$63.15
	06/01/2023	\$39.39	\$8.60	\$16.06	\$0.00	\$64.05
	12/01/2023	\$40.29	\$8.60	\$16.06	\$0.00	\$64.95

For apprentice rates see "Apprentice- LABORER"

LABORER LABORERS - ZONE 2	12/01/2020	\$34.66	\$8.60	\$16.06	\$0.00	\$59.32
	06/01/2021	\$35.58	\$8.60	\$16.06	\$0.00	\$60.24
	12/01/2021	\$36.49	\$8.60	\$16.06	\$0.00	\$61.15
	06/01/2022	\$37.39	\$8.60	\$16.06	\$0.00	\$62.05
	12/01/2022	\$38.24	\$8.60	\$16.06	\$0.00	\$62.90
	06/01/2023	\$39.14	\$8.60	\$16.06	\$0.00	\$63.80
	12/01/2023	\$40.04	\$8.60	\$16.06	\$0.00	\$64.70

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - LABORER - Zone 2

Effective Date - 12/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$20.80	\$8.60	\$16.06	\$0.00	\$45.46
2	70	\$24.26	\$8.60	\$16.06	\$0.00	\$48.92
3	80	\$27.73	\$8.60	\$16.06	\$0.00	\$52.39
4	90	\$31.19	\$8.60	\$16.06	\$0.00	\$55.85

Effective Date - 06/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$21.35	\$8.60	\$16.06	\$0.00	\$46.01
2	70	\$24.91	\$8.60	\$16.06	\$0.00	\$49.57
3	80	\$28.46	\$8.60	\$16.06	\$0.00	\$53.12
4	90	\$32.02	\$8.60	\$16.06	\$0.00	\$56.68

Notes:

Apprentice to Journeyworker Ratio:1:5

LABORER (HEAVY & HIGHWAY)	12/01/2020	\$34.66	\$8.60	\$16.06	\$0.00	\$59.32
LABORERS - ZONE 2 (HEAVY & HIGHWAY)	06/01/2021	\$35.58	\$8.60	\$16.06	\$0.00	\$60.24
	12/01/2021	\$36.49	\$8.60	\$16.06	\$0.00	\$61.15

Apprentice - LABORER (Heavy & Highway) - Zone 2

Effective Date - 12/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$20.80	\$8.60	\$16.06	\$0.00	\$45.46
2	70	\$24.26	\$8.60	\$16.06	\$0.00	\$48.92
3	80	\$27.73	\$8.60	\$16.06	\$0.00	\$52.39
4	90	\$31.19	\$8.60	\$16.06	\$0.00	\$55.85

Effective Date - 06/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$21.35	\$8.60	\$16.06	\$0.00	\$46.01
2	70	\$24.91	\$8.60	\$16.06	\$0.00	\$49.57
3	80	\$28.46	\$8.60	\$16.06	\$0.00	\$53.12
4	90	\$32.02	\$8.60	\$16.06	\$0.00	\$56.68

Notes:

Apprentice to Journeyworker Ratio:1:5

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LABORER: CARPENTER TENDER <i>LABORERS - ZONE 2</i>	12/01/2020	\$34.66	\$8.60	\$16.06	\$0.00	\$59.32
	06/01/2021	\$35.58	\$8.60	\$16.06	\$0.00	\$60.24
	12/01/2021	\$36.49	\$8.60	\$16.06	\$0.00	\$61.15
	06/01/2022	\$37.39	\$8.60	\$16.06	\$0.00	\$62.05
	12/01/2022	\$38.24	\$8.60	\$16.06	\$0.00	\$62.90
	06/01/2023	\$39.14	\$8.60	\$16.06	\$0.00	\$63.80
	12/01/2023	\$40.04	\$8.60	\$16.06	\$0.00	\$64.70
For apprentice rates see "Apprentice- LABORER"						
LABORER: CEMENT FINISHER TENDER <i>LABORERS - ZONE 2</i>	12/01/2020	\$34.66	\$8.60	\$16.06	\$0.00	\$59.32
	06/01/2021	\$35.58	\$8.60	\$16.06	\$0.00	\$60.24
	12/01/2021	\$36.49	\$8.60	\$16.06	\$0.00	\$61.15
	06/01/2022	\$37.39	\$8.60	\$16.06	\$0.00	\$62.05
	12/01/2022	\$38.24	\$8.60	\$16.06	\$0.00	\$62.90
	06/01/2023	\$39.14	\$8.60	\$16.06	\$0.00	\$63.80
	12/01/2023	\$40.04	\$8.60	\$16.06	\$0.00	\$64.70
For apprentice rates see "Apprentice- LABORER"						
LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER <i>LABORERS - ZONE 2</i>	12/01/2020	\$34.75	\$8.60	\$16.12	\$0.00	\$59.47
	06/01/2021	\$35.67	\$8.60	\$16.12	\$0.00	\$60.39
	12/01/2021	\$36.58	\$8.60	\$16.12	\$0.00	\$61.30
	06/01/2022	\$37.48	\$8.60	\$16.12	\$0.00	\$62.20
	12/01/2022	\$38.33	\$8.60	\$16.12	\$0.00	\$63.05
	06/01/2023	\$39.23	\$8.60	\$16.12	\$0.00	\$63.95
	12/01/2023	\$40.13	\$8.60	\$16.12	\$0.00	\$64.85
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER <i>LABORERS - ZONE 2</i>	12/01/2020	\$34.91	\$8.60	\$16.06	\$0.00	\$59.57
	06/01/2021	\$35.83	\$8.60	\$16.06	\$0.00	\$60.49
	12/01/2021	\$36.74	\$8.60	\$16.06	\$0.00	\$61.40
	06/01/2022	\$37.64	\$8.60	\$16.06	\$0.00	\$62.30
	12/01/2022	\$38.49	\$8.60	\$16.06	\$0.00	\$63.15
	06/01/2023	\$39.39	\$8.60	\$16.06	\$0.00	\$64.05
	12/01/2023	\$40.29	\$8.60	\$16.06	\$0.00	\$64.95
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY & HIGHWAY)</i>	12/01/2020	\$34.91	\$8.60	\$16.06	\$0.00	\$59.57
	06/01/2021	\$35.83	\$8.60	\$16.06	\$0.00	\$60.49
	12/01/2021	\$36.74	\$8.60	\$16.06	\$0.00	\$61.40
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
LABORER: MULTI-TRADE TENDER <i>LABORERS - ZONE 2</i>	12/01/2020	\$34.66	\$8.60	\$16.06	\$0.00	\$59.32
	06/01/2021	\$35.58	\$8.60	\$16.06	\$0.00	\$60.24
	12/01/2021	\$36.49	\$8.60	\$16.06	\$0.00	\$61.15
	06/01/2022	\$37.39	\$8.60	\$16.06	\$0.00	\$62.05
	12/01/2022	\$38.24	\$8.60	\$16.06	\$0.00	\$62.90
	06/01/2023	\$39.14	\$8.60	\$16.06	\$0.00	\$63.80
	12/01/2023	\$40.04	\$8.60	\$16.06	\$0.00	\$64.70
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LABORER: TREE REMOVER <i>LABORERS - ZONE 2</i>	12/01/2020	\$34.66	\$8.60	\$16.06	\$0.00	\$59.32
	06/01/2021	\$35.58	\$8.60	\$16.06	\$0.00	\$60.24
	12/01/2021	\$36.49	\$8.60	\$16.06	\$0.00	\$61.15
	06/01/2022	\$37.39	\$8.60	\$16.06	\$0.00	\$62.05
	12/01/2022	\$38.24	\$8.60	\$16.06	\$0.00	\$62.90
	06/01/2023	\$39.14	\$8.60	\$16.06	\$0.00	\$63.80
	12/01/2023	\$40.04	\$8.60	\$16.06	\$0.00	\$64.70
This classification applies to the removal of standing trees, and the trimming and removal of branches and limbs when related to public works construction or site clearance incidental to construction . For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR <i>LABORERS - ZONE 2</i>	12/01/2020	\$34.91	\$8.60	\$16.06	\$0.00	\$59.57
	06/01/2021	\$35.83	\$8.60	\$16.06	\$0.00	\$60.49
	12/01/2021	\$36.74	\$8.60	\$16.06	\$0.00	\$61.40
	06/01/2022	\$37.64	\$8.60	\$16.06	\$0.00	\$62.30
	12/01/2022	\$38.49	\$8.60	\$16.06	\$0.00	\$63.15
	06/01/2023	\$39.39	\$8.60	\$16.06	\$0.00	\$64.05
	12/01/2023	\$40.29	\$8.60	\$16.06	\$0.00	\$64.95
For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY & HIGHWAY)</i>	12/01/2020	\$34.91	\$8.60	\$16.06	\$0.00	\$59.57
	06/01/2021	\$35.83	\$8.60	\$16.06	\$0.00	\$60.49
	12/01/2021	\$36.74	\$8.60	\$16.06	\$0.00	\$61.40
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
MARBLE & TILE FINISHERS <i>BRICKLAYERS LOCAL 3 - MARBLE & TILE</i>	08/01/2020	\$42.57	\$10.75	\$20.27	\$0.00	\$73.59
	02/01/2021	\$43.08	\$10.75	\$20.27	\$0.00	\$74.10
	08/01/2021	\$44.20	\$10.75	\$20.43	\$0.00	\$75.38
	02/01/2022	\$44.67	\$10.75	\$20.43	\$0.00	\$75.85

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

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.29	\$10.75	\$20.27	\$0.00	\$52.31
2	60	\$25.54	\$10.75	\$20.27	\$0.00	\$56.56
3	70	\$29.80	\$10.75	\$20.27	\$0.00	\$60.82
4	80	\$34.06	\$10.75	\$20.27	\$0.00	\$65.08
5	90	\$38.31	\$10.75	\$20.27	\$0.00	\$69.33

Effective Date - 02/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.54	\$10.75	\$20.27	\$0.00	\$52.56
2	60	\$25.85	\$10.75	\$20.27	\$0.00	\$56.87
3	70	\$30.16	\$10.75	\$20.27	\$0.00	\$61.18
4	80	\$34.46	\$10.75	\$20.27	\$0.00	\$65.48
5	90	\$38.77	\$10.75	\$20.27	\$0.00	\$69.79

Notes:

Apprentice to Journeyworker Ratio:1:3

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
MARBLE MASONS, TILELAYERS & TERRAZZO MECH <i>BRICKLAYERS LOCAL 3 - MARBLE & TILE</i>	08/01/2020	\$55.77	\$10.75	\$22.08	\$0.00	\$88.60
	02/01/2021	\$56.41	\$10.75	\$22.08	\$0.00	\$89.24
	08/01/2021	\$57.81	\$10.75	\$22.24	\$0.00	\$90.80
	02/01/2022	\$58.38	\$10.75	\$22.24	\$0.00	\$91.37

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

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$27.89	\$10.75	\$22.08	\$0.00	\$60.72
2	60	\$33.46	\$10.75	\$22.08	\$0.00	\$66.29
3	70	\$39.04	\$10.75	\$22.08	\$0.00	\$71.87
4	80	\$44.62	\$10.75	\$22.08	\$0.00	\$77.45
5	90	\$50.19	\$10.75	\$22.08	\$0.00	\$83.02

Effective Date - 02/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$28.21	\$10.75	\$22.08	\$0.00	\$61.04
2	60	\$33.85	\$10.75	\$22.08	\$0.00	\$66.68
3	70	\$39.49	\$10.75	\$22.08	\$0.00	\$72.32
4	80	\$45.13	\$10.75	\$22.08	\$0.00	\$77.96
5	90	\$50.77	\$10.75	\$22.08	\$0.00	\$83.60

Notes:

Apprentice to Journeyworker Ratio:1:5

MECH. SWEEPER OPERATOR (ON CONST. SITES) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2020	\$49.45	\$13.50	\$15.70	\$0.00	\$78.65
	06/01/2021	\$50.54	\$13.50	\$15.70	\$0.00	\$79.74
	12/01/2021	\$51.68	\$13.50	\$15.70	\$0.00	\$80.88

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

MECHANICS MAINTENANCE <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2020	\$49.45	\$13.50	\$15.70	\$0.00	\$78.65
	06/01/2021	\$50.54	\$13.50	\$15.70	\$0.00	\$79.74
	12/01/2021	\$51.68	\$13.50	\$15.70	\$0.00	\$80.88

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

MILLWRIGHT (Zone 2) <i>MILLWRIGHTS LOCAL 1121 - Zone 2</i>	01/04/2021	\$39.72	\$9.40	\$20.45	\$0.00	\$69.57
	01/03/2022	\$40.97	\$9.40	\$20.45	\$0.00	\$70.82
	01/02/2023	\$42.22	\$9.40	\$20.45	\$0.00	\$72.07

Apprentice - MILLWRIGHT - Local 1121 Zone 2

Effective Date - 01/04/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$21.85	\$9.40	\$5.58	\$0.00	\$36.83
2	65	\$25.82	\$9.40	\$16.90	\$0.00	\$52.12
3	75	\$29.79	\$9.40	\$17.92	\$0.00	\$57.11
4	85	\$33.76	\$9.40	\$18.93	\$0.00	\$62.09

Effective Date - 01/03/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$22.53	\$9.40	\$5.58	\$0.00	\$37.51
2	65	\$26.63	\$9.40	\$16.90	\$0.00	\$52.93
3	75	\$30.73	\$9.40	\$17.92	\$0.00	\$58.05
4	85	\$34.82	\$9.40	\$18.93	\$0.00	\$63.15

Notes: Step 1&2 Appr. indentured after 1/1/2020 receive no pension, but do receive annuity. (Step 1 \$5.58, Step 2 \$6.50)
Steps are 2,000 hours

Apprentice to Journeyworker Ratio:1:5

MORTAR MIXER LABORERS - ZONE 2	12/01/2020	\$34.91	\$8.60	\$16.06	\$0.00	\$59.57
	06/01/2021	\$35.83	\$8.60	\$16.06	\$0.00	\$60.49
	12/01/2021	\$36.74	\$8.60	\$16.06	\$0.00	\$61.40
	06/01/2022	\$37.64	\$8.60	\$16.06	\$0.00	\$62.30
	12/01/2022	\$38.49	\$8.60	\$16.06	\$0.00	\$63.15
	06/01/2023	\$39.39	\$8.60	\$16.06	\$0.00	\$64.05
	12/01/2023	\$40.29	\$8.60	\$16.06	\$0.00	\$64.95

For apprentice rates see "Apprentice- LABORER"

OILER (OTHER THAN TRUCK CRANES, GRADALLS) OPERATING ENGINEERS LOCAL 4	12/01/2020	\$23.20	\$13.50	\$15.70	\$0.00	\$52.40
	06/01/2021	\$23.75	\$13.50	\$15.70	\$0.00	\$52.95
	12/01/2021	\$24.33	\$13.50	\$15.70	\$0.00	\$53.53

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

OILER (TRUCK CRANES, GRADALLS) OPERATING ENGINEERS LOCAL 4	12/01/2020	\$27.97	\$13.50	\$15.70	\$0.00	\$57.17
	06/01/2021	\$28.61	\$13.50	\$15.70	\$0.00	\$57.81
	12/01/2021	\$29.29	\$13.50	\$15.70	\$0.00	\$58.49

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

OTHER POWER DRIVEN EQUIPMENT - CLASS II OPERATING ENGINEERS LOCAL 4	12/01/2020	\$49.45	\$13.50	\$15.70	\$0.00	\$78.65
	06/01/2021	\$50.54	\$13.50	\$15.70	\$0.00	\$79.74
	12/01/2021	\$51.68	\$13.50	\$15.70	\$0.00	\$80.88

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

PAINTER (BRIDGES/TANKS) PAINTERS LOCAL 35 - ZONE 2	01/01/2021	\$52.06	\$8.25	\$22.75	\$0.00	\$83.06
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Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

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

Effective Date - 01/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.51	\$8.25	\$0.00	\$0.00	\$28.76
2	55	\$22.56	\$8.25	\$6.16	\$0.00	\$36.97
3	60	\$24.61	\$8.25	\$6.72	\$0.00	\$39.58
4	65	\$26.66	\$8.25	\$7.28	\$0.00	\$42.19
5	70	\$28.71	\$8.25	\$19.39	\$0.00	\$56.35
6	75	\$30.77	\$8.25	\$19.95	\$0.00	\$58.97
7	80	\$32.82	\$8.25	\$20.51	\$0.00	\$61.58
8	90	\$36.92	\$8.25	\$21.63	\$0.00	\$66.80

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER / TAPER (BRUSH, NEW) * 01/01/2021 \$41.56 \$8.25 \$22.75 \$0.00 \$72.56

* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used. PAINTERS LOCAL 35 - ZONE 2

Apprentice - PAINTER - Local 35 Zone 2 - BRUSH NEW

Effective Date - 01/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.78	\$8.25	\$0.00	\$0.00	\$29.03
2	55	\$22.86	\$8.25	\$6.16	\$0.00	\$37.27
3	60	\$24.94	\$8.25	\$6.72	\$0.00	\$39.91
4	65	\$27.01	\$8.25	\$7.28	\$0.00	\$42.54
5	70	\$29.09	\$8.25	\$19.39	\$0.00	\$56.73
6	75	\$31.17	\$8.25	\$19.95	\$0.00	\$59.37
7	80	\$33.25	\$8.25	\$20.51	\$0.00	\$62.01
8	90	\$37.40	\$8.25	\$21.63	\$0.00	\$67.28

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER / TAPER (BRUSH, REPAINT) 01/01/2021 \$39.62 \$8.25 \$22.75 \$0.00 \$70.62

PAINTERS LOCAL 35 - ZONE 2

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - PAINTER Local 35 Zone 2 - BRUSH REPAINT

Effective Date - 01/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.81	\$8.25	\$0.00	\$0.00	\$28.06
2	55	\$21.79	\$8.25	\$6.16	\$0.00	\$36.20
3	60	\$23.77	\$8.25	\$6.72	\$0.00	\$38.74
4	65	\$25.75	\$8.25	\$7.28	\$0.00	\$41.28
5	70	\$27.73	\$8.25	\$19.39	\$0.00	\$55.37
6	75	\$29.72	\$8.25	\$19.95	\$0.00	\$57.92
7	80	\$31.70	\$8.25	\$20.51	\$0.00	\$60.46
8	90	\$35.66	\$8.25	\$21.63	\$0.00	\$65.54

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

Painter Traffic Markings (Heavy/Highway)	12/01/2020	\$34.66	\$8.60	\$16.06	\$0.00	\$59.32
LABORERS - ZONE 2 (HEAVY & HIGHWAY)	06/01/2021	\$35.58	\$8.60	\$16.06	\$0.00	\$60.24
	12/01/2021	\$36.49	\$8.60	\$16.06	\$0.00	\$61.15
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
PANEL & PICKUP TRUCKS DRIVER	12/01/2020	\$34.98	\$12.91	\$14.82	\$0.00	\$62.71
TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	06/01/2021	\$35.78	\$12.91	\$14.82	\$0.00	\$63.51
	08/01/2021	\$35.78	\$13.41	\$14.82	\$0.00	\$64.01
	12/01/2021	\$35.78	\$13.41	\$16.01	\$0.00	\$65.20
PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK)	08/01/2020	\$49.07	\$9.40	\$23.12	\$0.00	\$81.59
PILE DRIVER LOCAL 56 (ZONE 1)						
For apprentice rates see "Apprentice- PILE DRIVER"						
PILE DRIVER	08/01/2020	\$49.07	\$9.40	\$23.12	\$0.00	\$81.59
PILE DRIVER LOCAL 56 (ZONE 1)						

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - PILE DRIVER - Local 56 Zone 1

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.54	\$9.40	\$23.12	\$0.00	\$57.06
2	60	\$29.44	\$9.40	\$23.12	\$0.00	\$61.96
3	70	\$34.35	\$9.40	\$23.12	\$0.00	\$66.87
4	75	\$36.80	\$9.40	\$23.12	\$0.00	\$69.32
5	80	\$39.26	\$9.40	\$23.12	\$0.00	\$71.78
6	80	\$39.26	\$9.40	\$23.12	\$0.00	\$71.78
7	90	\$44.16	\$9.40	\$23.12	\$0.00	\$76.68
8	90	\$44.16	\$9.40	\$23.12	\$0.00	\$76.68

Notes:

% Indentured After 10/1/17; 45/45/55/55/70/70/80/80
 Step 1&2 \$34.01/ 3&4 \$41.46/ 5&6 \$62.80/ 7&8 \$69.25

Apprentice to Journeyworker Ratio:1:5

PIPELAYER LABORERS - ZONE 2	12/01/2020	\$34.91	\$8.60	\$16.06	\$0.00	\$59.57
	06/01/2021	\$35.83	\$8.60	\$16.06	\$0.00	\$60.49
	12/01/2021	\$36.74	\$8.60	\$16.06	\$0.00	\$61.40
	06/01/2022	\$37.64	\$8.60	\$16.06	\$0.00	\$62.30
	12/01/2022	\$38.49	\$8.60	\$16.06	\$0.00	\$63.15
	06/01/2023	\$39.39	\$8.60	\$16.06	\$0.00	\$64.05
	12/01/2023	\$40.29	\$8.60	\$16.06	\$0.00	\$64.95

For apprentice rates see "Apprentice- LABORER"

PIPELAYER (HEAVY & HIGHWAY) LABORERS - ZONE 2 (HEAVY & HIGHWAY)	12/01/2020	\$34.91	\$8.60	\$16.06	\$0.00	\$59.57
	06/01/2021	\$35.83	\$8.60	\$16.06	\$0.00	\$60.49
	12/01/2021	\$36.74	\$8.60	\$16.06	\$0.00	\$61.40

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

PLUMBER & PIPEFITTER PLUMBERS & PIPEFITTERS LOCAL 51	08/31/2020	\$44.69	\$10.15	\$19.80	\$0.00	\$74.64
	08/30/2021	\$46.69	\$10.15	\$19.80	\$0.00	\$76.64

Apprentice - PLUMBER/PIPEFITTER - Local 51

Effective Date - 08/31/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$17.88	\$10.15	\$2.50	\$0.00	\$30.53
2	50	\$22.35	\$10.15	\$2.50	\$0.00	\$35.00
3	60	\$26.81	\$10.15	\$8.73	\$0.00	\$45.69
4	70	\$31.28	\$10.15	\$10.60	\$0.00	\$52.03
5	80	\$35.75	\$10.15	\$17.45	\$0.00	\$63.35

Effective Date - 08/30/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$18.68	\$10.15	\$2.50	\$0.00	\$31.33
2	50	\$23.35	\$10.15	\$2.50	\$0.00	\$36.00
3	60	\$28.01	\$10.15	\$8.73	\$0.00	\$46.89
4	70	\$32.68	\$10.15	\$10.60	\$0.00	\$53.43
5	80	\$37.35	\$10.15	\$17.45	\$0.00	\$64.95

Notes:

Steps 2000hrs. Prior 9/1/05; 40/40/45/50/55/60/65/75/80/85

Apprentice to Journeyworker Ratio:1:3

PNEUMATIC CONTROLS (TEMP.) <i>PLUMBERS & PIPEFITTERS LOCAL 51</i>	08/31/2020	\$44.69	\$10.15	\$19.80	\$0.00	\$74.64
	08/30/2021	\$46.69	\$10.15	\$19.80	\$0.00	\$76.64

For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"

PNEUMATIC DRILL/TOOL OPERATOR <i>LABORERS - ZONE 2</i>	12/01/2020	\$34.91	\$8.60	\$16.06	\$0.00	\$59.57
	06/01/2021	\$35.83	\$8.60	\$16.06	\$0.00	\$60.49
	12/01/2021	\$36.74	\$8.60	\$16.06	\$0.00	\$61.40
	06/01/2022	\$37.64	\$8.60	\$16.06	\$0.00	\$62.30
	12/01/2022	\$38.49	\$8.60	\$16.06	\$0.00	\$63.15
	06/01/2023	\$39.39	\$8.60	\$16.06	\$0.00	\$64.05
	12/01/2023	\$40.29	\$8.60	\$16.06	\$0.00	\$64.95

For apprentice rates see "Apprentice- LABORER"

PNEUMATIC DRILL/TOOL OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY & HIGHWAY)</i>	12/01/2020	\$34.91	\$8.60	\$16.06	\$0.00	\$59.57
	06/01/2021	\$35.83	\$8.60	\$16.06	\$0.00	\$60.49
	12/01/2021	\$36.74	\$8.60	\$16.06	\$0.00	\$61.40

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

POWDERMAN & BLASTER <i>LABORERS - ZONE 2</i>	12/01/2020	\$35.66	\$8.60	\$16.06	\$0.00	\$60.32
	06/01/2021	\$36.58	\$8.60	\$16.06	\$0.00	\$61.24
	12/01/2021	\$37.49	\$8.60	\$16.06	\$0.00	\$62.15
	06/01/2022	\$38.39	\$8.60	\$16.06	\$0.00	\$63.05
	12/01/2022	\$39.24	\$8.60	\$16.06	\$0.00	\$63.90
	06/01/2023	\$40.14	\$8.60	\$16.06	\$0.00	\$64.80
	12/01/2023	\$41.04	\$8.60	\$16.06	\$0.00	\$65.70

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
POWDERMAN & BLASTER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY & HIGHWAY)</i>	12/01/2020	\$35.66	\$8.60	\$16.06	\$0.00	\$60.32
	06/01/2021	\$36.58	\$8.60	\$16.06	\$0.00	\$61.24
	12/01/2021	\$37.49	\$8.60	\$16.06	\$0.00	\$62.15
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
POWER SHOVEL/DERRICK/TRENCHING MACHINE <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2020	\$49.98	\$13.50	\$15.70	\$0.00	\$79.18
	06/01/2021	\$51.08	\$13.50	\$15.70	\$0.00	\$80.28
	12/01/2021	\$52.23	\$13.50	\$15.70	\$0.00	\$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (CONCRETE) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2020	\$49.98	\$13.50	\$15.70	\$0.00	\$79.18
	06/01/2021	\$51.08	\$13.50	\$15.70	\$0.00	\$80.28
	12/01/2021	\$52.23	\$13.50	\$15.70	\$0.00	\$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (DEWATERING, OTHER) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2020	\$33.00	\$13.50	\$15.70	\$0.00	\$62.20
	06/01/2021	\$33.75	\$13.50	\$15.70	\$0.00	\$62.95
	12/01/2021	\$34.54	\$13.50	\$15.70	\$0.00	\$63.74
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
READY-MIX CONCRETE DRIVER <i>TEAMSTERS 653 - Southeastern Concrete (Weymouth)</i>	08/01/2020	\$23.50	\$12.41	\$6.90	\$0.00	\$42.81
	05/01/2021	\$24.00	\$12.41	\$6.90	\$0.00	\$43.31
	08/01/2021	\$24.00	\$12.91	\$6.90	\$0.00	\$43.81
	05/01/2022	\$24.50	\$12.91	\$6.90	\$0.00	\$44.31
	08/01/2022	\$24.50	\$13.41	\$6.90	\$0.00	\$44.81
	05/01/2023	\$25.00	\$13.41	\$6.90	\$0.00	\$45.31
	08/01/2023	\$25.00	\$13.91	\$6.90	\$0.00	\$45.81
RECLAIMERS <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2020	\$49.45	\$13.50	\$15.70	\$0.00	\$78.65
	06/01/2021	\$50.54	\$13.50	\$15.70	\$0.00	\$79.74
	12/01/2021	\$51.68	\$13.50	\$15.70	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
RIDE-ON MOTORIZED BUGGY OPERATOR <i>LABORERS - ZONE 2</i>	12/01/2020	\$34.91	\$8.60	\$16.06	\$0.00	\$59.57
	06/01/2021	\$35.83	\$8.60	\$16.06	\$0.00	\$60.49
	12/01/2021	\$36.74	\$8.60	\$16.06	\$0.00	\$61.40
	06/01/2022	\$37.64	\$8.60	\$16.06	\$0.00	\$62.30
	12/01/2022	\$38.49	\$8.60	\$16.06	\$0.00	\$63.15
	06/01/2023	\$39.39	\$8.60	\$16.06	\$0.00	\$64.05
	12/01/2023	\$40.29	\$8.60	\$16.06	\$0.00	\$64.95
For apprentice rates see "Apprentice- LABORER"						
ROLLER/SPREADER/MULCHING MACHINE <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2020	\$49.45	\$13.50	\$15.70	\$0.00	\$78.65
	06/01/2021	\$50.54	\$13.50	\$15.70	\$0.00	\$79.74
	12/01/2021	\$51.68	\$13.50	\$15.70	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
ROOFER (Inc.Roofers Waterproofing &Roofers Damproofing) <i>ROOFERS LOCAL 33</i>	08/01/2020	\$46.60	\$11.75	\$16.15	\$0.00	\$74.50
	02/01/2021	\$48.03	\$11.75	\$16.15	\$0.00	\$75.93
	08/01/2021	\$49.46	\$11.75	\$16.15	\$0.00	\$77.36
	02/01/2022	\$50.89	\$11.75	\$16.15	\$0.00	\$78.79

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - ROOFER - Local 33

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.30	\$11.75	\$3.81	\$0.00	\$38.86
2	60	\$27.96	\$11.75	\$16.15	\$0.00	\$55.86
3	65	\$30.29	\$11.75	\$16.15	\$0.00	\$58.19
4	75	\$34.95	\$11.75	\$16.15	\$0.00	\$62.85
5	85	\$39.61	\$11.75	\$16.15	\$0.00	\$67.51

Effective Date - 02/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.02	\$11.75	\$3.81	\$0.00	\$39.58
2	60	\$28.82	\$11.75	\$16.15	\$0.00	\$56.72
3	65	\$31.22	\$11.75	\$16.15	\$0.00	\$59.12
4	75	\$36.02	\$11.75	\$16.15	\$0.00	\$63.92
5	85	\$40.83	\$11.75	\$16.15	\$0.00	\$68.73

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

Apprentice to Journeyworker Ratio:**

ROOFER SLATE / TILE / PRECAST CONCRETE	08/01/2020	\$46.85	\$11.75	\$16.15	\$0.00	\$74.75
ROOFERS LOCAL 33	02/01/2021	\$48.28	\$11.75	\$16.15	\$0.00	\$76.18
	08/01/2021	\$49.71	\$11.75	\$16.15	\$0.00	\$77.61
	02/01/2022	\$51.14	\$11.75	\$16.15	\$0.00	\$79.04

For apprentice rates see "Apprentice- ROOFER"

SHEETMETAL WORKER	08/01/2020	\$50.67	\$13.50	\$24.12	\$2.65	\$90.94
SHEETMETAL WORKERS LOCAL 17 - A	02/01/2021	\$51.67	\$13.65	\$24.57	\$2.70	\$92.59
	08/01/2021	\$53.42	\$13.65	\$24.57	\$2.75	\$94.39
	02/01/2022	\$55.17	\$13.65	\$24.57	\$2.80	\$96.19

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - SHEET METAL WORKER - Local 17-A

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	42	\$21.28	\$13.50	\$5.89	\$0.00	\$40.67
2	42	\$21.28	\$13.50	\$5.89	\$0.00	\$40.67
3	47	\$23.81	\$13.50	\$11.13	\$1.45	\$49.89
4	47	\$23.81	\$13.50	\$11.13	\$1.45	\$49.89
5	52	\$26.35	\$13.50	\$12.08	\$1.56	\$53.49
6	52	\$26.35	\$13.50	\$12.33	\$1.57	\$53.75
7	60	\$30.40	\$13.50	\$13.70	\$1.73	\$59.33
8	65	\$32.94	\$13.50	\$14.65	\$1.83	\$62.92
9	75	\$38.00	\$13.50	\$16.56	\$2.04	\$70.10
10	85	\$43.07	\$13.50	\$17.96	\$2.24	\$76.77

Effective Date - 02/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	42	\$21.70	\$13.65	\$5.89	\$0.00	\$41.24
2	42	\$21.70	\$13.65	\$5.89	\$0.00	\$41.24
3	47	\$24.28	\$13.65	\$11.13	\$1.48	\$50.54
4	47	\$24.28	\$13.65	\$11.13	\$1.48	\$50.54
5	52	\$26.87	\$13.65	\$12.08	\$1.58	\$54.18
6	52	\$26.87	\$13.65	\$12.33	\$1.59	\$54.44
7	60	\$31.00	\$13.65	\$13.70	\$1.76	\$60.11
8	65	\$33.59	\$13.65	\$14.65	\$1.88	\$63.77
9	75	\$38.75	\$13.65	\$16.56	\$2.08	\$71.04
10	85	\$43.92	\$13.65	\$17.96	\$2.28	\$77.81

Notes:

Steps are 6 mos.

Apprentice to Journeyworker Ratio:1:4

SPECIALIZED EARTH MOVING EQUIP < 35 TONS <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	12/01/2020	\$35.44	\$12.91	\$14.82	\$0.00	\$63.17
	06/01/2021	\$36.24	\$12.91	\$14.82	\$0.00	\$63.97
	08/01/2021	\$36.24	\$13.41	\$14.82	\$0.00	\$64.47
	12/01/2021	\$36.24	\$13.41	\$16.01	\$0.00	\$65.66
SPECIALIZED EARTH MOVING EQUIP > 35 TONS <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	12/01/2020	\$35.73	\$12.91	\$14.82	\$0.00	\$63.46
	06/01/2021	\$36.53	\$12.91	\$14.82	\$0.00	\$64.26
	08/01/2021	\$36.53	\$13.41	\$14.82	\$0.00	\$64.76
	12/01/2021	\$36.53	\$13.41	\$16.01	\$0.00	\$65.95
SPRINKLER FITTER <i>SPRINKLER FITTERS LOCAL 550 - (Section A) Zone 1</i>	01/01/2021	\$61.45	\$10.00	\$20.75	\$0.00	\$92.20
	03/01/2021	\$63.47	\$10.00	\$20.75	\$0.00	\$94.22

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - SPRINKLER FITTER - Local 550 (Section A) Zone 1

Effective Date - 01/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$21.51	\$10.00	\$11.81	\$0.00	\$43.32
2	40	\$24.58	\$10.00	\$12.50	\$0.00	\$47.08
3	45	\$27.65	\$10.00	\$13.19	\$0.00	\$50.84
4	50	\$30.73	\$10.00	\$13.93	\$0.00	\$54.66
5	55	\$33.80	\$10.00	\$14.56	\$0.00	\$58.36
6	60	\$36.87	\$10.00	\$15.25	\$0.00	\$62.12
7	65	\$39.94	\$10.00	\$15.94	\$0.00	\$65.88
8	70	\$43.02	\$10.00	\$16.63	\$0.00	\$69.65
9	75	\$46.09	\$10.00	\$17.31	\$0.00	\$73.40
10	80	\$49.16	\$10.00	\$18.00	\$0.00	\$77.16

Effective Date - 03/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$22.21	\$10.00	\$11.81	\$0.00	\$44.02
2	40	\$25.39	\$10.00	\$12.50	\$0.00	\$47.89
3	45	\$28.56	\$10.00	\$13.19	\$0.00	\$51.75
4	50	\$31.74	\$10.00	\$13.93	\$0.00	\$55.67
5	55	\$34.91	\$10.00	\$14.56	\$0.00	\$59.47
6	60	\$38.08	\$10.00	\$15.25	\$0.00	\$63.33
7	65	\$41.26	\$10.00	\$15.94	\$0.00	\$67.20
8	70	\$44.43	\$10.00	\$16.63	\$0.00	\$71.06
9	75	\$47.60	\$10.00	\$17.31	\$0.00	\$74.91
10	80	\$50.78	\$10.00	\$18.00	\$0.00	\$78.78

Notes: Apprentice entered prior 9/30/10:
40/45/50/55/60/65/70/75/80/85
Steps are 850 hours

Apprentice to Journeyworker Ratio:1:3

STEAM BOILER OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2020	\$49.45	\$13.50	\$15.70	\$0.00	\$78.65
	06/01/2021	\$50.54	\$13.50	\$15.70	\$0.00	\$79.74
	12/01/2021	\$51.68	\$13.50	\$15.70	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TAMPERS, SELF-PROPELLED OR TRACTOR DRAWN <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2020	\$49.45	\$13.50	\$15.70	\$0.00	\$78.65
	06/01/2021	\$50.54	\$13.50	\$15.70	\$0.00	\$79.74
	12/01/2021	\$51.68	\$13.50	\$15.70	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TELECOMMUNICATION TECHNICIAN <i>ELECTRICIANS LOCAL 223</i>	09/01/2020	\$36.86	\$10.90	\$12.45	\$0.00	\$60.21

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - TELECOMMUNICATION TECHNICIAN - Local 223

Effective Date - 09/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00

Notes: See Electrician Apprentice Wages

Telecom Apprentice Wages shall be the same as the Electrician Apprentice Wages

Apprentice to Journeyworker Ratio:2:3***

TERRAZZO FINISHERS BRICKLAYERS LOCAL 3 - MARBLE & TILE	08/01/2020	\$54.69	\$10.75	\$22.09	\$0.00	\$87.53
	02/01/2021	\$55.33	\$10.75	\$22.09	\$0.00	\$88.17
	08/01/2021	\$56.73	\$10.75	\$22.25	\$0.00	\$89.73
	02/01/2022	\$57.32	\$10.75	\$22.25	\$0.00	\$90.32

Apprentice - TERRAZZO FINISHER - Local 3 Marble & Tile

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$27.35	\$10.75	\$22.09	\$0.00	\$60.19
2	60	\$32.81	\$10.75	\$22.09	\$0.00	\$65.65
3	70	\$38.28	\$10.75	\$22.09	\$0.00	\$71.12
4	80	\$43.75	\$10.75	\$22.09	\$0.00	\$76.59
5	90	\$49.22	\$10.75	\$22.09	\$0.00	\$82.06

Effective Date - 02/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$27.67	\$10.75	\$22.09	\$0.00	\$60.51
2	60	\$33.20	\$10.75	\$22.09	\$0.00	\$66.04
3	70	\$38.73	\$10.75	\$22.09	\$0.00	\$71.57
4	80	\$44.26	\$10.75	\$22.09	\$0.00	\$77.10
5	90	\$49.80	\$10.75	\$22.09	\$0.00	\$82.64

Notes:

Apprentice to Journeyworker Ratio:1:3

TEST BORING DRILLER LABORERS - FOUNDATION AND MARINE	12/01/2020	\$41.30	\$8.60	\$17.47	\$0.00	\$67.37
	06/01/2021	\$42.32	\$8.60	\$17.47	\$0.00	\$68.39
	12/01/2021	\$43.33	\$8.60	\$17.47	\$0.00	\$69.40

For apprentice rates see "Apprentice- LABORER"

TEST BORING DRILLER HELPER LABORERS - FOUNDATION AND MARINE	12/01/2020	\$40.02	\$8.60	\$17.47	\$0.00	\$66.09
	06/01/2021	\$41.04	\$8.60	\$17.47	\$0.00	\$67.11
	12/01/2021	\$42.05	\$8.60	\$17.47	\$0.00	\$68.12

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TEST BORING LABORER <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2020	\$39.90	\$8.60	\$17.47	\$0.00	\$65.97
	06/01/2021	\$40.92	\$8.60	\$17.47	\$0.00	\$66.99
	12/01/2021	\$41.93	\$8.60	\$17.47	\$0.00	\$68.00
For apprentice rates see "Apprentice- LABORER"						
TRACTORS/PORTABLE STEAM GENERATORS <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2020	\$49.45	\$13.50	\$15.70	\$0.00	\$78.65
	06/01/2021	\$50.54	\$13.50	\$15.70	\$0.00	\$79.74
	12/01/2021	\$51.68	\$13.50	\$15.70	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TRAILERS FOR EARTH MOVING EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	12/01/2020	\$36.02	\$12.91	\$14.82	\$0.00	\$63.75
	06/01/2021	\$36.82	\$12.91	\$14.82	\$0.00	\$64.55
	08/01/2021	\$36.82	\$13.41	\$14.82	\$0.00	\$65.05
	12/01/2021	\$36.82	\$13.41	\$16.01	\$0.00	\$66.24
TUNNEL WORK - COMPRESSED AIR <i>LABORERS (COMPRESSED AIR)</i>	12/01/2020	\$52.13	\$8.60	\$17.92	\$0.00	\$78.65
	06/01/2021	\$53.15	\$8.60	\$17.92	\$0.00	\$79.67
	12/01/2021	\$54.16	\$8.60	\$17.92	\$0.00	\$80.68
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) <i>LABORERS (COMPRESSED AIR)</i>	12/01/2020	\$54.13	\$8.60	\$17.92	\$0.00	\$80.65
	06/01/2021	\$55.15	\$8.60	\$17.92	\$0.00	\$81.67
	12/01/2021	\$56.16	\$8.60	\$17.92	\$0.00	\$82.68
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR <i>LABORERS (FREE AIR TUNNEL)</i>	12/01/2020	\$44.20	\$8.60	\$17.92	\$0.00	\$70.72
	06/01/2021	\$45.22	\$8.60	\$17.92	\$0.00	\$71.74
	12/01/2021	\$46.23	\$8.60	\$17.92	\$0.00	\$72.75
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR (HAZ. WASTE) <i>LABORERS (FREE AIR TUNNEL)</i>	12/01/2020	\$46.20	\$8.60	\$17.92	\$0.00	\$72.72
	06/01/2021	\$47.22	\$8.60	\$17.92	\$0.00	\$73.74
	12/01/2021	\$48.23	\$8.60	\$17.92	\$0.00	\$74.75
For apprentice rates see "Apprentice- LABORER"						
VAC-HAUL <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	12/01/2020	\$35.44	\$12.91	\$14.82	\$0.00	\$63.17
	06/01/2021	\$36.24	\$12.91	\$14.82	\$0.00	\$63.97
	08/01/2021	\$36.24	\$13.41	\$14.82	\$0.00	\$64.47
	12/01/2021	\$36.24	\$13.41	\$16.01	\$0.00	\$65.66
WAGON DRILL OPERATOR <i>LABORERS - ZONE 2</i>	12/01/2020	\$34.91	\$8.60	\$16.06	\$0.00	\$59.57
	06/01/2021	\$35.83	\$8.60	\$16.06	\$0.00	\$60.49
	12/01/2021	\$36.74	\$8.60	\$16.06	\$0.00	\$61.40
	06/01/2022	\$37.64	\$8.60	\$16.06	\$0.00	\$62.30
	12/01/2022	\$38.49	\$8.60	\$16.06	\$0.00	\$63.15
	06/01/2023	\$39.39	\$8.60	\$16.06	\$0.00	\$64.05
	12/01/2023	\$40.29	\$8.60	\$16.06	\$0.00	\$64.95
For apprentice rates see "Apprentice- LABORER"						
WAGON DRILL OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY & HIGHWAY)</i>	12/01/2020	\$34.91	\$8.60	\$16.06	\$0.00	\$59.57
	06/01/2021	\$35.83	\$8.60	\$16.06	\$0.00	\$60.49
	12/01/2021	\$36.74	\$8.60	\$16.06	\$0.00	\$61.40
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
WASTE WATER PUMP OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2020	\$49.98	\$13.50	\$15.70	\$0.00	\$79.18
	06/01/2021	\$51.08	\$13.50	\$15.70	\$0.00	\$80.28
	12/01/2021	\$52.23	\$13.50	\$15.70	\$0.00	\$81.43

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
WATER METER INSTALLER <i>PLUMBERS & PIPEFITTERS LOCAL 51</i>	08/31/2020	\$44.69	\$10.15	\$19.80	\$0.00	\$74.64
	08/30/2021	\$46.69	\$10.15	\$19.80	\$0.00	\$76.64
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER"						
Outside Electrical - East						
CABLE TECHNICIAN (Power Zone) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	08/30/2020	\$29.67	\$9.25	\$1.89	\$0.00	\$40.81
For apprentice rates see "Apprentice- LINEMAN"						
CABLEMAN (Underground Ducts & Cables) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	08/30/2020	\$42.03	\$9.25	\$10.27	\$0.00	\$61.55
For apprentice rates see "Apprentice- LINEMAN"						
DRIVER / GROUNDMAN CDL <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	08/30/2020	\$34.62	\$9.25	\$10.07	\$0.00	\$53.94
For apprentice rates see "Apprentice- LINEMAN"						
DRIVER / GROUNDMAN -Inexperienced (<2000 Hrs) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	08/30/2020	\$27.20	\$9.25	\$1.82	\$0.00	\$38.27
For apprentice rates see "Apprentice- LINEMAN"						
EQUIPMENT OPERATOR (Class A CDL) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	08/30/2020	\$42.03	\$9.25	\$14.35	\$0.00	\$65.63
For apprentice rates see "Apprentice- LINEMAN"						
EQUIPMENT OPERATOR (Class B CDL) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	08/30/2020	\$37.09	\$9.25	\$10.87	\$0.00	\$57.21
For apprentice rates see "Apprentice- LINEMAN"						
GROUNDMAN <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	08/30/2020	\$22.25	\$9.25	\$1.67	\$0.00	\$33.17
For apprentice rates see "Apprentice- LINEMAN"						
GROUNDMAN -Inexperienced (<2000 Hrs.) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	08/30/2020	\$27.20	\$9.25	\$1.82	\$0.00	\$38.27
For apprentice rates see "Apprentice- LINEMAN"						
JOURNEYMAN LINEMAN <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	08/30/2020	\$49.45	\$9.25	\$17.48	\$0.00	\$76.18

Apprentice - LINEMAN (Outside Electrical) - East Local 104

Effective Date - 08/30/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$29.67	\$9.25	\$3.39	\$0.00	\$42.31
2	65	\$32.14	\$9.25	\$3.46	\$0.00	\$44.85
3	70	\$34.62	\$9.25	\$3.54	\$0.00	\$47.41
4	75	\$37.09	\$9.25	\$5.11	\$0.00	\$51.45
5	80	\$39.56	\$9.25	\$5.19	\$0.00	\$54.00
6	85	\$42.03	\$9.25	\$5.26	\$0.00	\$56.54
7	90	\$44.51	\$9.25	\$7.34	\$0.00	\$61.10

Notes:

Apprentice to Journeyworker Ratio:1:2

TELEDATA CABLE SPLICER <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	02/04/2019	\$30.73	\$4.70	\$3.17	\$0.00	\$38.60
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Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TELEDATA LINEMAN/EQUIPMENT OPERATOR <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	02/04/2019	\$28.93	\$4.70	\$3.14	\$0.00	\$36.77
TELEDATA WIREMAN/INSTALLER/TECHNICIAN <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	02/04/2019	\$28.93	\$4.70	\$3.14	\$0.00	\$36.77

Additional Apprentice Information:

Minimum wage rates for apprentices employed on public works projects are listed above as a percentage of the pre-determined hourly wage rate established by the Commissioner under the provisions of the M.G.L. c. 149, ss. 26-27D. Apprentice ratios are established by the Division of Apprenticeship Training pursuant to M.G.L. c. 23, ss. 11E-11L.

All apprentices must be registered with the Division of Apprenticeship Training in accordance with M.G.L. c. 23, ss. 11E-11L.

All steps are six months (1000 hours.)

Ratios are expressed in allowable number of apprentices to journeymen or fraction thereof, unless otherwise specified.

** Multiple ratios are listed in the comment field.

*** APP to JM; 1:1, 2:2, 2:3, 3:4, 4:4, 4:5, 4:6, 5:7, 6:7, 6:8, 6:9, 7:10, 8:10, 8:11, 8:12, 9:13, 10:13, 10:14, etc.

**** APP to JM; 1:1, 1:2, 2:3, 2:4, 3:5, 4:6, 4:7, 5:8, 6:9, 6:10, 7:11, 8:12, 8:13, 9:14, 10:15, 10:16, etc.

Property Address: Grove Street, Norwell, MA

ASSENT AGREEMENT

Agreement made in duplicate this ____ day of _____, 2020, by and between **MASSACHUSETTS ELECTRIC COMPANY**, a Massachusetts corporation, having a usual place of business at 40 Sylvan Road, Waltham, Massachusetts 02451 (hereinafter referred to as "Grantor"), and the **TOWN OF NORWELL**, a Massachusetts municipal corporation having its principal place of business at 345 Main Street, Norwell, Massachusetts 020601 (hereinafter referred to as "Grantee").

WITNESSETH:

WHEREAS, Grantor is the owner of certain perpetual rights and easements in, over, across, under, through, and upon certain lands in Norwell, Massachusetts, being more particularly described in that certain grant of easement from George W. Davis, dated January 5, 1910, and recorded with the Plymouth District Registry of Deeds ("Registry") in Book 1037, Page 564; (hereinafter referred to as the "Easement"); and

WHEREAS, Grantee is the owner of a certain parcel of land in Norwell, Massachusetts, more particularly described in a deed from Anita E. Bennett, Trustee of The Bennett 2012 Hingham Realty Trust u/d/t dated March 27, 2012, daed December 16, 2015, and recorded with the Registry in Book 46437, Page 93 (hereinafter the "Site"), which Site is subject, in part, to the Easement; and

WHEREAS, Grantee proposes to construct, install, repair, operate, use, and maintain certain improvements and conduct certain activities (hereinafter together referred to as the "Improvements") within the Easement, all as shown on a plan entitled: "WOMPATUCK STATE PARKING LOT & TRAIL ACCESS, NORWELL, MASSACHUSETTS" Sheets C-1 thru C-8, inclusive, and Sheets LA-9 and LA-10, prepared by Horsley Witten Group, Inc., 90 Route 6A, Sandwich, MA 02563, issued May 2020 (hereinafter referred to as the "Site Plan"), a copy of which Site Plan is in the possession of the parties and a reduced copy of the Site Plan is attached hereto as Exhibit A, incorporated herein by reference and made a part hereof; and

WHEREAS, Grantee has requested that Grantor assent to the construction, installation, repair, operation, use and maintenance of the Improvements within the Easement in accordance with this Assent Agreement; and

After recording return to: Grace Walsh. National Grid 40 Sylvan Road Waltham, MA 02451-1120

WHEREAS, the parties have reached an agreement as to the terms and conditions under which Grantor is willing to grant said assent and desire to hereby record their agreement as to such.

NOW, THEREFORE, in consideration of the mutual covenants and agreements contained herein and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged under seal, the parties hereto hereby covenant and agree as follows:

1. Preamble

A. The preamble to this Assent Agreement and each recitation therein are hereby made a part of this Assent Agreement.

2. Grantor Assent

A. Grantor assents to Grantee's construction, installation, repair, operation, use and maintenance of the Improvements within the Easement subject to the conditions, covenants and agreements contained herein which are hereby acknowledged and agreed to by Grantee.

3. Improvements

A. Grantee covenants and agrees with Grantor that the Improvements shall be constructed and maintained in strict compliance with the Site Plan, this Assent Agreement, and in strict compliance with all applicable federal, state and municipal laws, regulations, codes and ordinances.

B. Grantee agrees to provide Grantor with a final "as built" plan, which shall be certified by a qualified licensed professional, indicating the exact location of the Improvements and all final grades within the Easement and certifying that the Improvements have been located in strict compliance with the Site Plan, within thirty (30) days of substantial completion of the improvements.

C. Grantor's assent to the construction, installation, repair, operation, use and maintenance of the Improvements within the Easement is granted and applies to only those Improvements shown on the Site Plan. Any improvements not shown on the Site Plan are not authorized by Grantor to be located within the Easement by this Assent Agreement by implication or otherwise.

D. Grantee shall immediately remove any existing improvement not assented to at Grantee's sole cost and expense.

E. Grantee agrees that all utilities, except as otherwise shown on the Site Plan, shall be: (i) located within the driveway or roadway layout (if applicable); and (ii) installed within underground conduits.

4. Applicable Laws

A. Grantee covenants and agrees with Grantor that Grantee and its agents, employees, licensees, contractors and invitees shall comply with all applicable provisions of federal, state, and municipal laws, regulations, codes, rules, statutes and ordinances, and any successor laws, regulations, codes, rules, statutes and ordinances thereto, which regulate activities within the Easement including, without limitation, those listed in Section 5 below (collectively "Applicable Laws"). If any provision of this Assent Agreement is less restrictive than the Applicable Laws, then Grantee shall comply with

the more restrictive Applicable Laws.

5. Compliance and Safety

- A. Grantee covenants and agrees with Grantor that Grantee and its agents, employees, licensees, contractors and invitees shall take all necessary precautions for the safety of their respective agents, employees, licensees, contractors and invitees, within or with respect to the Easement and shall at all times comply with all Applicable Laws and, specifically, without limitation, to prevent accidents or injury to persons and property on, about or adjacent to the Easement, and without limiting the generality of the foregoing, but specifically including:
- (i). National Electrical Safety Code, Installation and Maintenance of Electric Transmission Lines (220 CMR 125.00);
 - (ii). MGL Chapter 166, Section 21A, "Coming into close proximity to high voltage lines" except that the required clearance of six (6) feet is insufficient. Instead, the minimum clearance allowed by OSHA shall be maintained; and
 - (iii). OSHA regulations governing working clearances from energized lines, including without limitation, OSHA Standard 29 CFR 1926, Subpart CC, and 29 CFR 1926.1501, which, although specific to equipment that can hoist, lower, and horizontally move a suspended load, such as, but not limited to cranes, backhoes, excavators, forklifts, pile drivers and drill-rigs, shall apply as the minimum clearance from energized lines for all vehicles and equipment used by Grantee within the Easement, unless a more restrictive standard applies, in which instance Grantee shall comply with the more restrictive standards for working clearances from energized lines.
- B. Grantee covenants and agrees with Grantor that all vehicles and equipment, including, without limitation, all fencing and all sections of steel guardrail, will at all times be adequately grounded at Grantee's sole cost and expense in accordance with all Applicable Laws, including, without limitation, IEEE Standard 80.

6. Protection of Transmission Line Facilities

- A. Grantee shall, at all times, protect Grantor's facilities and structures from damage. In addition to compliance with all Applicable Laws, Grantee shall comply with the following:
- (i). Grantee covenants and agrees with Grantor that Grantee shall not conduct any work or operate any equipment or vehicles within fifty feet (50') horizontally of any of Grantor's structures or facilities within the Easement and at least fifty feet (50') feet horizontally away from any transmission line pole, tower, guy wire, or guy anchor, except as otherwise shown on the Site Plan;
 - (ii). When making a rough cut during excavation, Grantee shall disturb no earth within an area bounded by a line drawn twenty-five feet (25') feet plus 2.5 times the depth of the cut from the nearest transmission line pole, tower leg, guy wire, or guy anchor, but not less than fifty feet (50'), except as otherwise shown on the Site Plan. Upon completion of the rough cut, the slopes of the bank shall be graded on a slope no steeper than a ratio of one vertical to five horizontal and stabilized with vegetation or rip-rap. The top of the slope shall be at least fifty

- feet (50') from the nearest pole, tower leg, guy wire, or guy anchor, except as otherwise shown on the Site Plan;
- (iii). Grantee shall not store or use explosives within the Easement;
 - (iv). Grantee shall not store, stockpile or dispose of snow, construction materials or debris, excavated soils, vehicles or other trash of any kind within the Easement;
 - (v). No oil, hazardous wastes or other substances shall be stored or disposed of within the Easement;
 - (vi). Grantee shall not unload or load vehicles or equipment on the Easement;
 - (vii). Grantee shall not place above or below ground structures on the Easement, including, but not limited to, streetlights, signs, dumpsters, sheds, fences, septic systems, retention or detention ponds or basins, and swimming pools, except as otherwise shown on the Site Plan;
 - (viii). Grantee shall not use the Easement as a staging or marshalling yard for contractors, employees, equipment or materials; and
 - (ix). Grantee shall not use the Easement to park or store vehicles of any kind, including but not limited to, automobiles, trucks, construction vehicles and equipment, all-terrain vehicles (ATV's), four-wheel vehicles, trailer, storage container, or boats, except as otherwise shown on the Site Plan.
 - (x). Grantee shall locate all ground wires buried in areas to be excavated and shall protect them against damage.
 - (xi). Grantee shall ensure that Improvements do not continuously occupy more than one hundred feet (100') along any line drawn longitudinally along the Easement, except as otherwise shown on the Site Plan.

7. Access to Easement and Right-of-way

- A. Grantee covenants and agrees that Grantee shall ensure that Grantor shall have, at all times, access to the Easement, its facilities and structures located on the Easement and Grantee, its agents, employees, licensees, contractors and invitees shall not interfere with, block or impede Grantor's access to or along the Easement or its facilities and structures. Grantee further agrees that Grantor may, to the extent reasonably necessary, utilize any Improvements depicted as roads or trails as shown on the Site Plan to access its Easement.
- B. Grantee covenants and agrees not to damage roads or trails used by Grantor to gain access to or along the Easement. Grantee further covenants and agrees with Grantor, that Grantee shall, at its sole cost and expense, construct, install, maintain and repair the Improvements depicted as roads or trails within the Easement as shown on the Site Plan.
- C. If Grantor's access to or along the Easement is blocked or obstructed in any manner, including, without limitation, by trucks, truck trailers, automobiles, equipment or construction materials parked or stored thereon ("Obstruction"), Grantee covenants and agrees to immediately remove the Obstruction at Grantee's sole cost and expense. If Grantee fails to remove any Obstruction, Grantor may remove the same without any notice to Grantee and without any liability to Grantor. Grantee shall reimburse Grantor for any and all indirect and direct costs associated therewith upon demand.

8. Preservation of Rights and Future Use

- A. Grantee covenants and agrees with Grantor that the construction, installation, repair, operation, use and maintenance of the Improvements pursuant to this Assent Agreement shall be subject to the Easement and shall not be deemed or construed as an abandonment or release of any of the Grantor's rights and easements. Grantor specifically reserves said rights and easements, including, by way of example and without limitation, the rights to clear and keep cleared the Easement of all vegetation, obstructions and structures, to pass and repass with vehicles and equipment, to reconstruct, maintain, operate, repair, renew, replace, add to and otherwise change any lines, structures, guys, anchors or other facilities to meet the needs of its business, as deemed appropriate by Grantor in its sole discretion, to place future structures and facilities or relocate existing structures and facilities anywhere within the Easement, and to enter upon the Easement for all the above purposes.
- B. Grantee covenants and agrees that Grantee and its employees, agents, licensees and contractors will not hinder or interfere with any of the rights and easements reserved by Grantor herein.
- C. Grantor reserves the right to determine any area(s) where future improvements will not be permitted due to its need for these area(s) for its future facilities. This includes the bisector of angles in the right-of-way and generally includes areas adjacent to existing structures.
- D. The rights and interests conferred upon Grantee by this Assent Agreement are subject to any existing rights, restrictions, easements, agreements, encumbrances or covenants affecting the Easement.

9. Protection of Interests

- A. Grantor shall not be held liable for any damage to the Grantee's improvements and/or activities within the Easement when such damage is the result of construction, maintenance, or operation or other use of Grantor's existing or future facilities.
- B. Grantee acknowledges and understands that electrostatic currents ("Currents") may occur in proximity to electric transmission lines under certain circumstances. Although people may experience annoying shocks due to these Currents when touching conductive objects, the Grantor is not able to eliminate the Currents. The steady-state current due to these electrostatic effects is within the limits established by the National Electrical Safety Code.

10. Additional Conditions

- A. Grantee shall mark all pipelines, cables, or other underground facilities installed by Grantee by (i) providing warning tape in the trench for all and tracer cable for non-metallic pipes or conduits when located within the Easement; and (ii) installing suitable three-sided markers (specifications will be provided to Grantee, upon request), extending a minimum of three (3') feet above ground, at the point of entrance, at each change of direction (point of intersection), and at the point of exit to the right-of-way; and all such warning tape, tracer cable and markers shall be shown on the Site Plan.
- B. Grantee shall notify Grantor of any survey monument, marker or stake that has become dislodged, lost or misplaced during installation of Grantee's facilities. Grantor will

resurvey the Easement and replace any such survey monument. Resurvey expense shall be reimbursed by Grantee to Grantor.

- C. In the event Grantor determines that injury or damage to, or interference with, its facilities or structures may occur as a result of loss of metal from Grantee's or a third party's facilities due to corrosion or electrolysis caused or hastened by the installation of Grantee's facilities or by Grantee's activities, Grantor may require the following protective measures to be taken by Grantee:
 - (i). Grantee shall cover said facilities and shall install and maintain cathodic protection devices, all subject to prior approval of Grantor;
 - (ii). Grantee shall keep accurate records of each such cathodic protection device, furnish Grantor with a copy of such records; and
 - (iii). Grantee shall from time to time take such other and further protective measures as Grantor may require.
- D. Grantee shall install, maintain and provide adequate drainage facilities so that there will not be a collecting or pooling of surface or run-off waters upon the Easement or Property resulting from the installation, construction, maintenance and operation of Grantee's Improvements and use.
- E. Grantee shall ensure that all underground utilities, pipes, conduits, and all proposed bituminous and/or concrete drive surfaces and underground utilities shall be designed and constructed to minimally withstand and meet AASHTO Standard Specifications for Bridges and Highways HS-25 highway class design criteria for vehicular loading when located within the Easement, unless increased load requirements are specified herein.
- F. Grantee is hereby notified that other underground physical occupations of the subject Easement may exist that do not appear upon the attached Site Plan and/or maps and property records maintained by Grantor. Accordingly, Grantee is cautioned to excavate carefully and comply with all Applicable Laws with respect thereto.
- G. **Other Conditions** if none, insert (Intentionally Left Blank)

11. Grade

- A. Grantee covenants and agrees with Grantor that Grantee shall not make any changes in the existing grade of the Easement, except as shown on the Site Plan.

12. Vegetation

- A. Grantee covenants and agrees with Grantor that the mature height of any vegetation shall not exceed eight feet (8'), if vegetation is shown on the Site Plan.

13. Approvals

- A. Grantee covenants and agrees with Grantor that it is Grantee's sole responsibility to obtain all permits, easements, licenses, agreements and any other property interests needed by Grantee to construct, install, maintain, repair, operate and use the Improvements within the Easement.

14. Indemnification

- A. Grantee covenants and agrees with Grantor to pay, protect, defend, indemnify and save harmless Grantor, its parent corporation, affiliates, officers, agents, employees and their successors and assigns, from and against any and all liabilities, damages, costs,

expenses (including any and all attorneys' fees and expenses of Grantor), causes of action, suits, claims, demands or judgments of any nature whatsoever arising from the rights reserved by Grantor herein or the exercise of this Assent Agreement and (i) any work, act or omission to act done in, on or about the Easement or any part thereof, by or on behalf of or any person claiming under Grantee, or the employees, agents, tenants, contractors, licensees, invitees or visitors of Grantee, or any such person; (ii) injury to, or the death of, persons or damage to property on the Easement, or upon adjoining property or in any way growing out of or connected with the use, non-use, condition, possession, operation, maintenance, repair, or management of the Improvements within the Easement; (iii) any breach of the covenants, warranties and representations made herein; or (iv) any violation of any agreement or condition of this Assent Agreement or of any Applicable Laws, or other requirements affecting the Easement, or the facilities, or the ownership, occupancy or use thereof. The foregoing indemnification shall not include injury or damage directly caused by the gross negligence or willful misconduct of the Grantor. The provisions of this paragraph shall survive the termination or release of this Assent Agreement.

15. Insurance

- A. Grantee shall provide to Grantor, prior to exercise of rights hereby granted, and keep in force during the term of this Agreement, unless waived in writing by Grantor, a general Public Liability insurance policy which shall include contractual coverage. Such policy(ies) shall be written and contain language and policy limits to be approved by Grantor.
- B. The type of policy, nature of special endorsements, if any, and amount of coverage shall be as set forth in Exhibit "B", Insurance Requirements for Real Estate Agreements.

16. Expenses

- A. Grantee covenants and agrees to pay to Grantor on demand any and all costs incurred by Grantor which, in the sole discretion of Grantor, are necessitated by or related to Grantee's exercise of this Assent Agreement, including but not limited to any and all costs for repairs of, or modifications to, any structures, guys, anchors, grounds, counterpoises (buried ground wires), culverts, access roads or any other facility, structure or equipment located in the Easement.

17. Notice Delivery

- A. All notices required or permitted under this Assent Agreement shall be in writing and either delivered in hand or mailed (a) by registered or certified mail (return receipt requested) with the United States Postal Service, or (b) by Federal Express or other overnight mail carrier furnishing evidence of receipt, to Grantor at National Grid, Attention: Manager, Right of Way and Survey Engineering, 280 Melrose Street, Providence, Rhode Island 02907, with a copy to Assistant General Counsel-Real Estate, 40 Sylvan Road, Waltham, Massachusetts 02451, and to Grantee at the address as set forth on the first page of this Assent Agreement.
- B. Any party may change the address at which it is to receive notices by giving notice as provided above. Any notice or other communication in connection with this Assent Agreement shall be deemed duly served when received (or upon attempted delivery if

delivery is not accepted).

18. Construction Notice

A. Grantee covenants and agrees to notify Grantor's Manager of Transmission & Distribution Construction, Marc Bristol, 40 Sylvan Road, Waltham, Massachusetts 02451, phone number (781) 907-3567, or his successor as designated by Grantor, in writing at least twenty-four (24) hours in advance of any construction, installation, repair or maintenance work commenced within the Easement.

19. Damage Notice

A. Grantee understands that there may be buried ground wires and/or counterpoises within the Easement and Grantee covenants and agrees that Grantee shall immediately notify National Grid, Director of Transmission Line Engineering, 40 Sylvan Road, Waltham, Massachusetts 02451, (781) 907-2455, and cease any and all activities within the Easement when a buried wire or counterpoise is damaged. The provisions of this paragraph shall survive the termination or release of this Assent Agreement.

20. Taxes

A. It is understood and agreed by Grantor and Grantee that the Improvements and all appurtenances thereto shall remain the property of Grantee and its successors, and that Grantee shall pay any and all taxes thereon.

21. Release

A. Grantee covenants and agrees with Grantor that neither Grantor, nor its parent corporation or affiliates, nor any agent or employee of any of them, shall be liable to Grantee or its successors or agents for, any and all liabilities, damages, costs, expenses (including any and all attorneys' fees and expenses of Grantee), causes of action, suits, claims, demands or judgments of any nature whatsoever arising from any damage to the Improvements and/or the Site resulting from or in anyway connected with: (i) the rights herein reserved or granted including damage caused by voltage, fault current or ground current; (ii) the construction, installation, maintenance, repair, operation and use of Grantor's existing structures and facilities; (iii) the construction, installation, repair, operation, use and maintenance of additional structures or facilities by Grantor; or (iv) the removal of an Obstruction. Grantee further releases all of said parties from and against any and all such claims or demands. The foregoing release shall not include injury or damage directly caused by the sole gross negligence or willful misconduct of Grantor. The provisions of this paragraph shall survive the termination or release of this Assent Agreement.

22. Authorized Action

A. Grantee represents to Grantor that the execution, acknowledgment and delivery of this Assent Agreement and the performance of its obligations hereunder have been duly authorized by Grantee and that the person signing has the authority to sign and deliver this Assent Agreement on its behalf and to thereby bind Grantee to the same.

B. The terms and provisions of this Assent Agreement shall be appurtenant to the Site, shall run with the land and shall be binding upon and inure to the respective heirs and

successors in title, and any party by accepting an interest in the Site shall be deemed to have agreed to be bound by, assumed and received the benefit and burden of all of the terms and conditions of this Assent Agreement.

- C. (If applicable) See the Grantee's Clerk's Certificate recorded herewith as Exhibit C.

23. Termination

- A. Notwithstanding any other provision of this agreement, in the event that Grantor notifies Grantee that Grantee is in default under the terms and conditions of this Assent Agreement, Grantee shall immediately cure said default as quickly as is commercially reasonable (hereinafter "Cure Period"), however said Cure Period shall not exceed Thirty (30) days from the date Grantee receives the notice of default. In the event Grantee does not cure the default within the Cure Period Grantor may immediately terminate this Assent Agreement.
- B. Upon termination of this Assent Agreement Grantee shall, at its sole expense, immediately:
 - (i). Remove the Improvements and restore the property to its original condition prior to the construction of the Improvements, and;
 - (ii). Cease the use.
- C. Upon termination, if Grantee does not remove the Improvements within said Cure Period the Grantor shall have the right to remove the Improvements at Grantee's sole expense, including attorney's fees and legal expenses of Grantor.

24. Miscellaneous

- A. This Assent Agreement (i) contains the entire agreement of the parties with respect to the subject matter which it covers; (ii) supersedes all prior or other negotiations, representations, understandings and agreements of, by or between the parties, which shall be deemed fully merged herein; and (iii) may not be modified or amended in any manner other than by a written agreement signed by both parties hereto. This Assent Agreement may be executed in any number of counterparts, each of which shall be deemed to be an original and all of which shall constitute one and the same instrument. The captions herein are inserted only as a matter of convenience and for reference and in no way define, limit, construe or describe the scope of this Assent Agreement or the meaning or intent of any provision hereof. The failure of Grantor to insist in any one or more instances upon the performance of any of the covenants, agreements, terms, provisions or conditions of this Assent Agreement, or to exercise any election or option contained herein, shall not be construed as a waiver or relinquishment, in the future or in any other instance, of such covenant, agreement, term, provisions, condition, election or option. If any provision hereof is deemed to be invalid, the balance of this Assent Agreement shall remain in full force and effect and shall be enforceable in accordance with its terms. This Assent Agreement shall be construed and governed by the laws of the state in which the Site is located.

IN WITNESS WHEREOF, the parties have executed this Assent Agreement under seal as of the day and year first above written.

MASSACHUSETTS ELECTRIC COMPANY

Name: _____

Its: _____

COMMONWEALTH OF MASSACHUSETTS

_____, ss.

On this ____ day of _____, 2020, before me, the undersigned notary public, personally appeared Michael Guerin, proved to me through satisfactory evidence of identification, which was photographic identification with signature issued by a federal or state governmental agency, oath or affirmation of a credible witness, personal knowledge of the undersigned, to be the person whose name is signed on the preceding or attached document(s), and acknowledged to me that he signed it voluntarily for its stated purpose as Authorized Representative of Massachusetts Electric Company.

(official seal)

Before me,

(type or print name)

Notary Public

My commission expires:

TOWN OF NORWELL

Name: _____

Its: _____

COMMONWEALTH OF MASSACHUSETTS

_____, ss.

On this ____ day of _____ 2020, before me, the undersigned notary public, personally appeared _____, proved to me through satisfactory evidence of identification, which was photographic identification with signature issued by a federal or state governmental agency, oath or affirmation of a credible witness, personal knowledge of the undersigned, to be the person whose name is signed on the preceding or attached document(s), and acknowledged to me that he/she signed it voluntarily for its stated purpose as _____ of _____.

(official seal)

Before me,

(type or print name)

My commission expires:

Notary Public

Exhibit A- Site Plan

EXHIBIT B

INSURANCE REQUIREMENTS

1. **Insurance Requirements.** From the commencement of the Agreement, through final expiration or longer where specified below, Grantee shall provide and maintain, at its own expense, insurance policies, intended to be primary (with no right of contribution by any other coverage available to National Grid USA, its direct and indirect parents, subsidiaries and affiliates including, without limitation, Grantor (collectively, the “Insured Entities”)), covering all operations, work and services to be performed under or in connection with this Agreement, issued by reputable insurance companies with an A.M. Best Rating of at least B+, which at least meet or exceed the requirements listed herein:

- (a) **Workers’ Compensation and Employers Liability insurance** as required by the State in which the work activities under this Agreement will be performed. The employer’s liability limit shall be at least \$500,000 each per accident, per person disease, and disease by policy limit.
- (b) **Commercial General Liability (CGL) Insurance**, covering all operations to be performed by or on behalf of Grantee under or in connection with this Agreement, with **minimum** limits of:

Combined Single Limit	- \$1,000,000 per occurrence
General Aggregate & Product Aggregate	- \$2,000,000 each

Coverage shall include: contractual liability (with this Agreement being included under the definition of “Insured Contract” thereunder), products/completed operations, and if applicable, explosion, collapse and underground (XC&U), additional insured as required in Section 5 below, and shall contain a separation of insureds condition. If the products-completed operations coverage is written on a claims-made basis, the retroactive date shall not precede the effective date of this Agreement and coverage shall be maintained continuously for the duration of this Agreement and for at least two years thereafter.

- (c) **Automobile Liability**, covering all owned, non-owned and hired vehicles used in connection with all operations, work or services to be performed by or on behalf of Grantee under or in connection with this Agreement with **minimum** limits of:

Combined Single Limit	- \$1,000,000 per occurrence
-----------------------	------------------------------

Additional insured as required in Section 5 below.

- (d) **Umbrella Liability or Excess Liability** coverage, with a **minimum** per occurrence limit of \$4,000,000. This coverage shall run concurrent to the CGL required in Section 1(b) above, shall apply excess of the required automobile, CGL and employer’s liability coverage

required in this Exhibit, and shall provide additional insured status as required in Section 5 below.

- (e) **Commercial Property Insurance**, on an “all risk” basis, covering all personal property of every description owned or brought onto the Site by Grantee, its employees, agents, contractors, tenants, subtenants or assignees, including stock-in-trade, furniture, fittings, trade fixtures, in an amount not less than one hundred percent (100%) of the full replacement cost thereof.
- (f) **Watercraft Liability**, if used in connection with this Agreement, with the same **minimum** limits of liability as outlined in Section 1(b) above, and naming the Insured Entities, including their officers and employees, as additional insured as required in Section 5 below.
- (g) **Aircraft Liability**, if used in connection with this Agreement, with a limit of liability of not less than \$10,000,000 combined single limit per occurrence, and naming the Insured Entities, including their officers and employees, as additional insured as required in Section 5 below. Such coverage shall not include a per-passenger or per seat coverage limit.
- (h) **Contractors Pollution Liability (CPL)** covering any sudden and accidental pollution liability which may arise out of, under, or in connection with this Agreement, including all operations to be performed by or on behalf of Grantee or that arise out of the Grantee’s use of any owned, non-owned or hired vehicles, with a **minimum** liability limit of not less than \$1,000,000 combined single limit per occurrence.

This requirement may be satisfied by providing either this CPL policy, which would include naming the Insured Entities, including their officers and employees, as additional insured’s as outlined in Section 5 below; **OR** by providing coverage for sudden and accidental pollution liability under the CGL and commercial automobile insurance policies required above, limited solely by the Insurance Services Organization (ISO) standard pollution exclusion, or its equivalent.

In the event Grantee is unable to secure and/or maintain any or all of this sudden and accidental pollution liability coverage, Grantee agrees to indemnify and hold the Insured Entities harmless against any and all liability resulting from any coverage deficiency that is out of compliance with this insurance requirement.

- 2. **Homeowners/Sole Proprietors Insurance:** In the event that Grantee is either a homeowner or sole proprietor, the requirements in Sections 1(a) and (d) above do not apply. However, these requirements do apply to any contractors that have been hired by Grantee to perform any work activities on the premises as defined in this Agreement.

In addition, if a homeowners insurance company will not provide the additional insured status to the Insured Entities as required in Section 5, Grantee agrees to indemnify and hold harmless the Insured Entities for any liability that would have otherwise been covered had the insurance carrier recognized the additional insured status.

3. **Limits:** Any combination of Commercial General Liability, Automobile Liability and Umbrella Liability policy limits can be used to satisfy the limit requirements in Sections 1(b), (c) and (d) above.
4. **Self-Insurance:** Proof of qualification as a qualified self-insurer, if approved in advance in writing by an Insured Entities' representative, will be acceptable in lieu of securing and maintaining one or more of the coverages required in this Agreement. Such acceptance shall become a part of this insurance provision by reference herein.

For Workers' Compensation, such evidence shall consist of a copy of a current self-insured certificate for the State in which the work will be performed.

5. **Additional Insured and Loss Payee:** The intent of the Additional Insured requirement under the CGL, Auto, CPL, Umbrella/Excess, Aircraft and Watercraft policies is to include the Insured Entities, their directors, officers and employees, as Additional Insured for liabilities associated with, or arising out of, all operations, work or services to be performed by or on behalf of Grantee, including ongoing and completed operations, under this Agreement. The following language should be used when referencing the additional insured status: **National Grid USA, its direct and indirect parents, subsidiaries and affiliates shall be named as additional insured.**

To the extent Grantee's insurance coverage does not provide the full Additional insured coverage as required herein, Grantee agrees to indemnify and hold harmless the Insured Entities against any and all liability resulting from any deficiency in Grantee's insurance coverage that may be out of compliance with this insurance requirement.

6. **Waiver of Recovery:** Grantee and its insurance carrier(s) shall waive all rights of recovery against the Insured Entities and their directors, officers and employees, for any loss or damage covered under those policies referenced in this Agreement, or for any required coverage that may be self-insured by Grantee. To the extent Grantee's insurance carriers will not waive their right of subrogation against the Insured Entities, Grantee agrees to indemnify the Insured Entities for any subrogation activities pursued against them by Grantee's insurance carriers. However, this waiver shall not extend to the gross negligence or willful misconduct of the Insured Entities or their employees, sub-contractors or agents.
7. **Contractors:** In the event Grantee uses contractors in connection with this Agreement, it is expressly agreed that Grantee shall have the sole responsibility to make certain that all contractors are in compliance with these insurance requirements and remains in compliance throughout the course of this Agreement, and thereafter as required. Grantee shall remain liable for the performance of the contractor, and such subcontract relationship shall not relieve Grantee of its obligations under this agreement.

Unless agreed to in writing by the Risk & Insurance Department of National Grid USA, any deductible or self-insured retentions maintained by any contractor, which shall be for the account of the contractor, and shall not exceed \$100,000. In addition, contractor shall name both the Grantee and the Insured Entities as additional insureds under the Commercial General

Liability and Umbrella/Excess Liability insurance. If requested by a representative of the Insured Entities, Grantee shall provide the Insured Entities with an insurance certificate from its contractor evidencing this coverage.

In the event any contractor is unable to maintain all of the same insurance coverage as required in this Agreement, Grantee agrees to indemnify and hold the Insured Entities harmless against any and all liability resulting from any deficiency in contractor's insurance coverage that may be out of compliance with these insurance requirements.

8. **Insurance Certification:** Upon execution of this Agreement, Grantee shall promptly provide the Insured Entities with (a) **Certificate(s) of Insurance** for all coverages required herein at the following address:

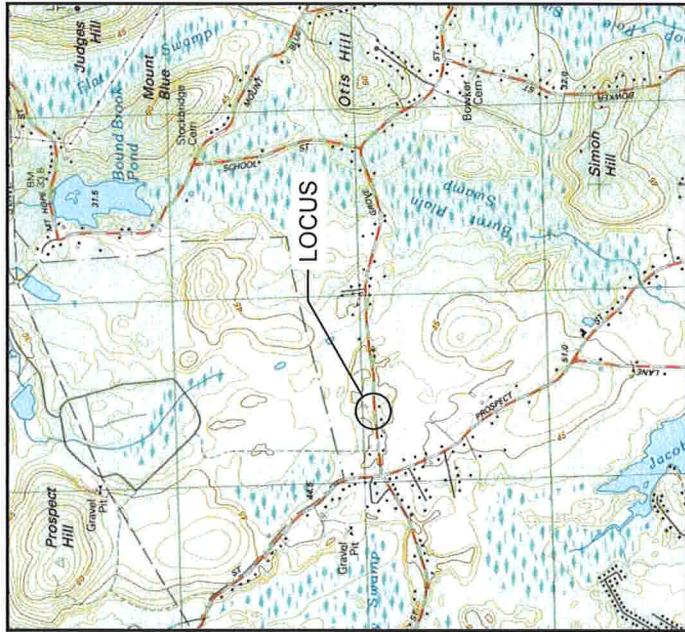
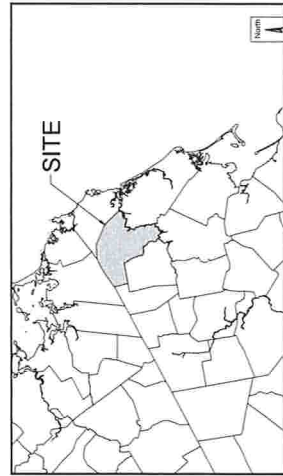
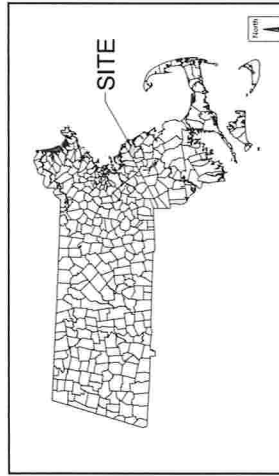
National Grid
Attn: Risk & Insurance, Bldg. A-4
300 Erie Boulevard West
Syracuse, NY 13202

Grantee shall provide the Insured Entities with at least 30 days prior written notice at the above address of any cancellation or diminution of the insurance coverage required in this Agreement.

9. **Insurance Obligation:** If any insurance coverage is not secured, maintained or is cancelled and Grantee fails immediately to procure other insurance as specified, Grantor has the right, but not the obligation, to procure such insurance and to invoice Grantee for said coverage.
10. **Incident Reports:** Grantee shall furnish the Risk & Insurance Department of National Grid USA at the address referenced in Section 8 above with copies of any non-privileged accident or incident report(s)(collectively, the "Documents") sent to Grantee's insurance carriers covering accidents, incidents or events occurring as a result of the performance of all operations, work and services to be performed by or on behalf of Grantee under or in connection with this Agreement, excluding any accidents or incidents occurring on Grantee's property. If any of the Insured Entities are named in a lawsuit involving the operations and activities of Grantee associated with this Agreement, Grantee shall promptly provide copies of all insurance policies relevant to this accident or incident if requested by Grantor. However, in the event such Documents are deemed privileged and confidential (Attorney/Client Privilege), Grantee shall provide the relevant facts of the accident or incident in a format that does not violate such Attorney/Client Privilege.
11. **Other Coverage:** These requirements are in addition to any which may be required elsewhere in this Agreement. In addition, Grantee shall comply with any governmental site specific insurance requirements even if not stated herein.
12. **Coverage Limitation:** Nothing contained in this article is to be construed as limiting the extent of the Grantee's responsibility for payment of damages resulting from all operations, work and services to be performed by or on behalf of Grantee under or in connection with this Agreement,

or limiting, diminishing, or waiving Grantee's obligation to indemnify, defend, and save harmless the Insured Entities in accordance with this Agreement.

WOMPATUCK STATE PARK PARKING LOT & TRAIL ACCESS NORWELL, MASSACHUSETTS CONSTRUCTION DRAWINGS MAY 2020



Sheet Number	Sheet Title
1	COVER
2	NOTES AND LEGEND
3	EXISTING CONDITIONS
4	SITE PLAN
5	ACCESS ROAD - PLAN & PROFILE
6	BOARDWALK PATH - PLAN & PROFILE
7	DETAILS (1)
8	DETAILS (2)
9	LANDSCAPE PLAN
10	LANDSCAPE DETAILS

**WOMPATUCK STATE PARK
PARKING LOT & TRAIL ACCESS
NORWELL, MASSACHUSETTS**

Town of Norwell Planning Department
345 Main Street
Norwell, MA 02061
(781) 659-8021

Prepared By: [Signature]

Checked By: [Signature]

Drawn By: [Signature]

Scale: 1" = 1000'

Project Number: 17150

Sheet Number: 1 of 10

Project Name: C-1

Project Location: 131-142 Maple Street, Norwell, MA 02061

Project Contact: [Name], [Phone], [Email]

Project Website: www.horsholm.com

Project Description: [Text]

Project Date: [Date]


Project Status: [Text]

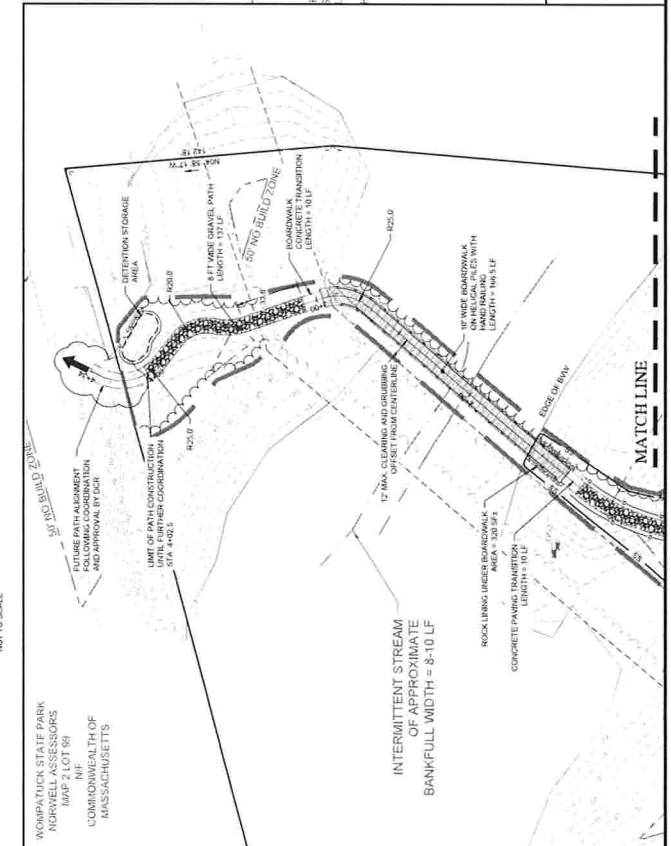
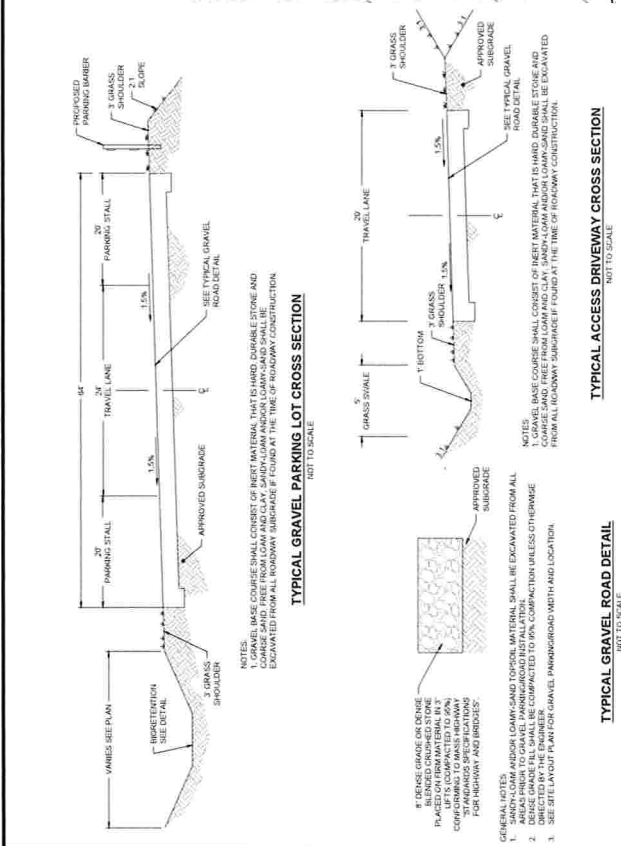
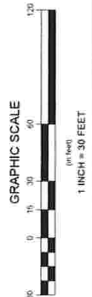
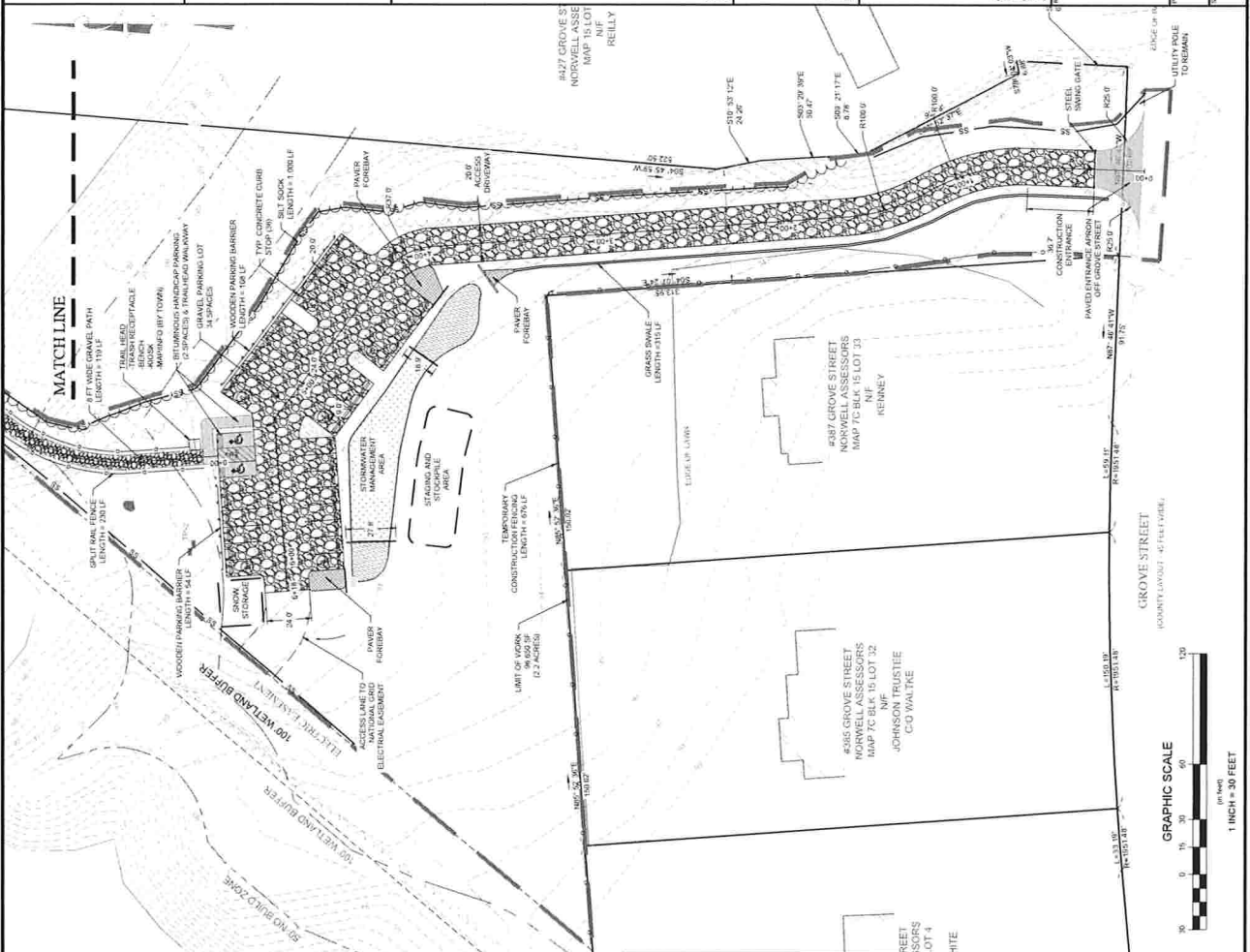
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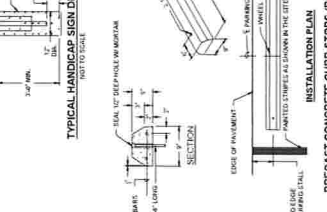
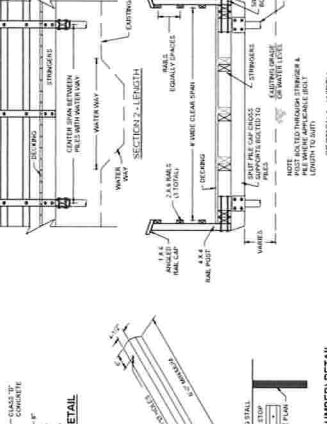
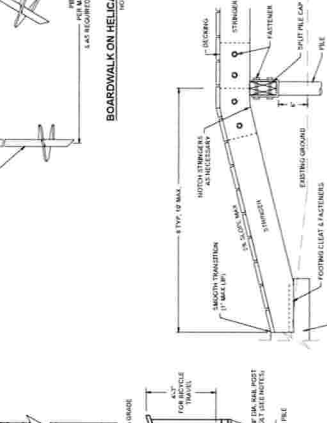
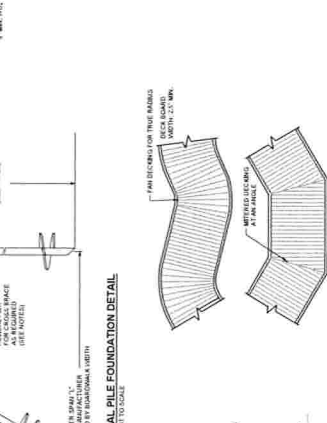
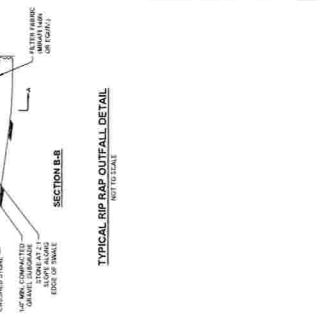
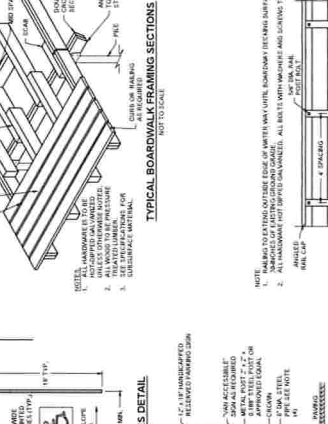
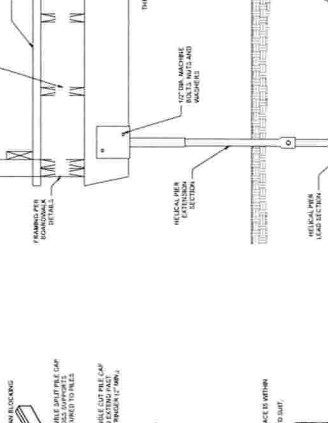
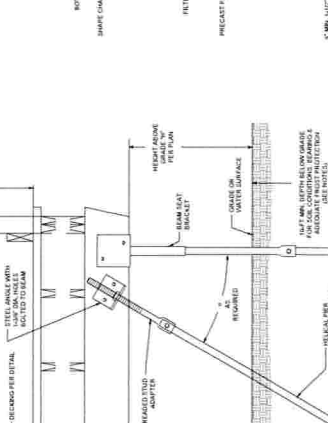
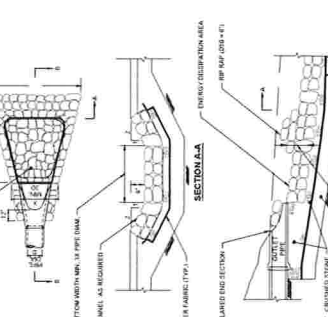
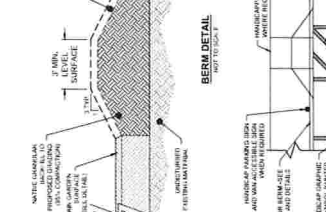
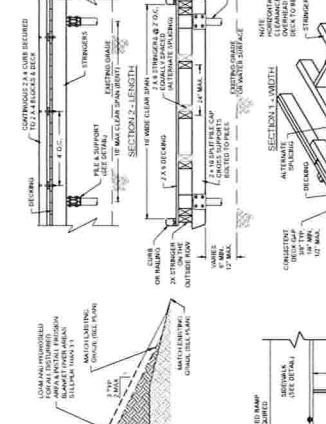
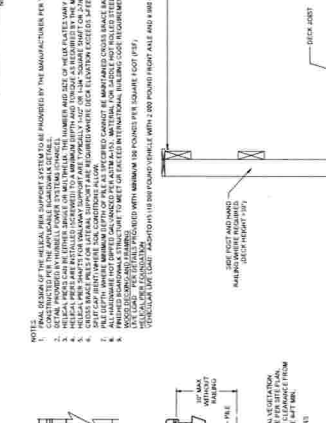
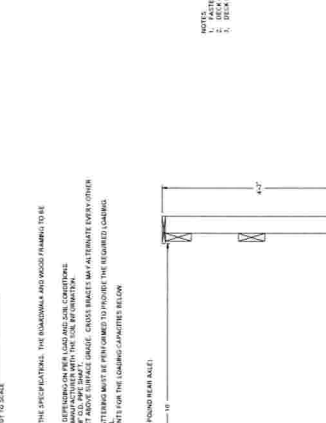
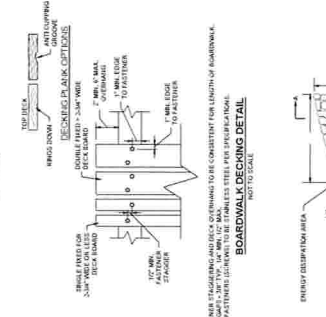
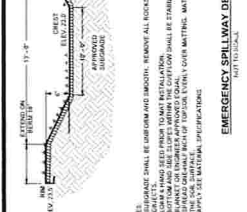
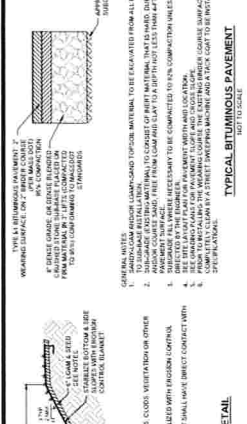
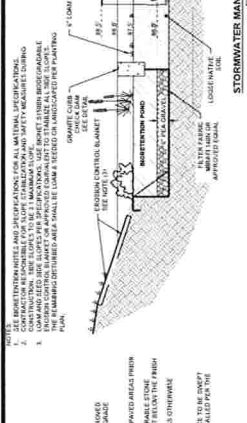
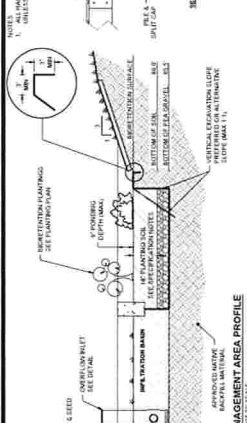
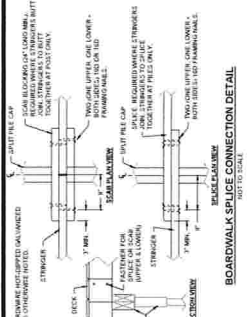
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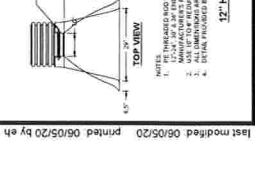
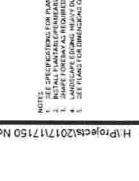
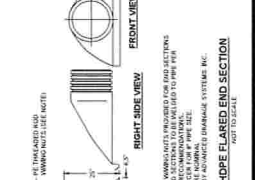
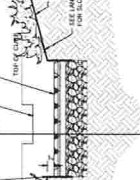
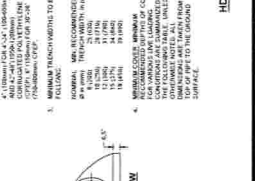
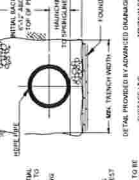
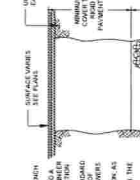
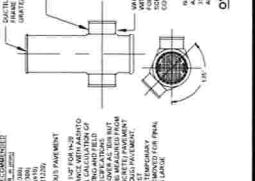
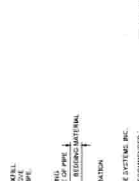
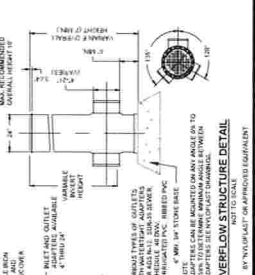
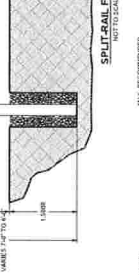
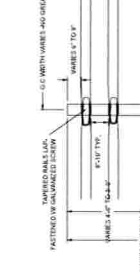
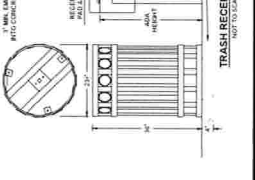
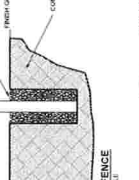
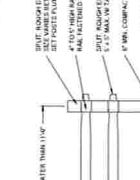
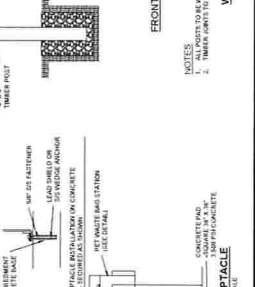
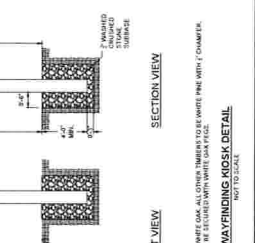
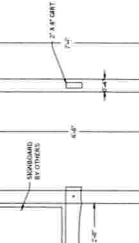
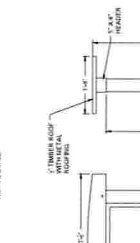
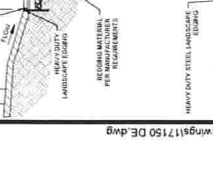
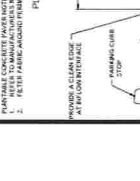
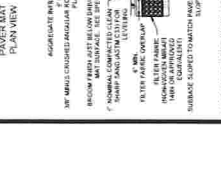
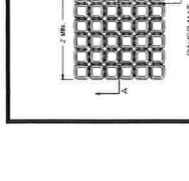
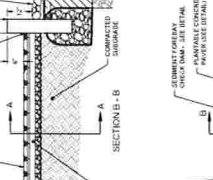
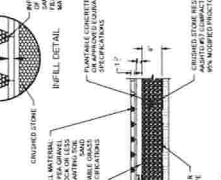
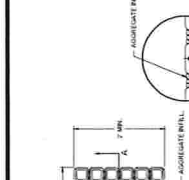
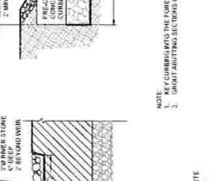
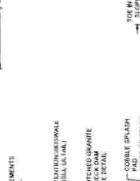
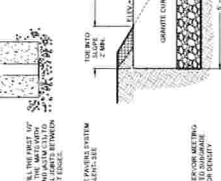
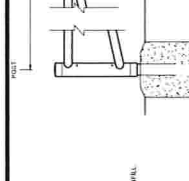
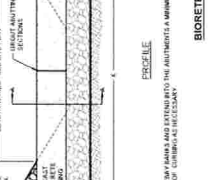
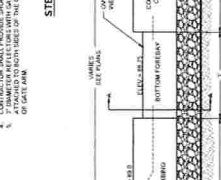
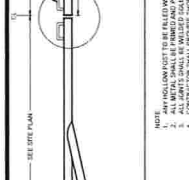
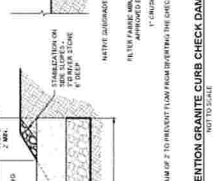
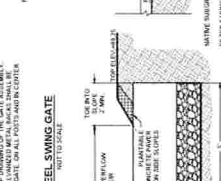
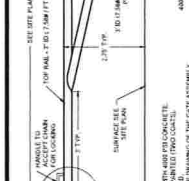
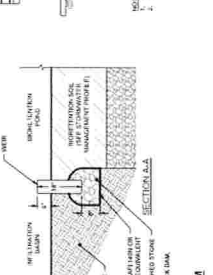
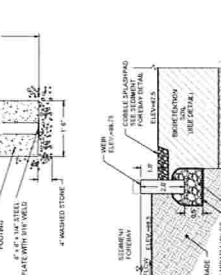
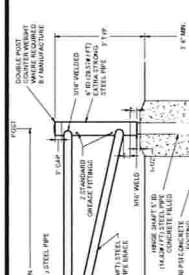
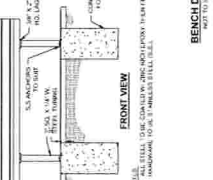
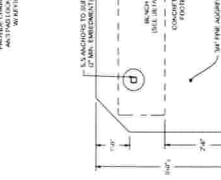
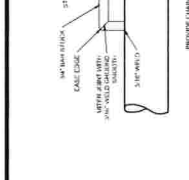
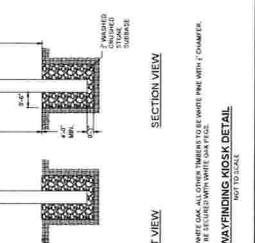
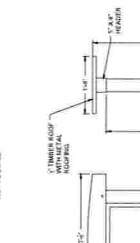
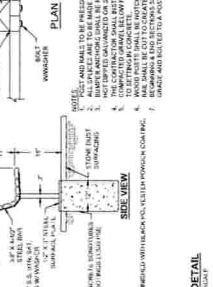
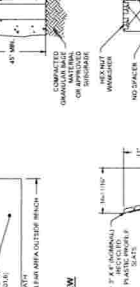
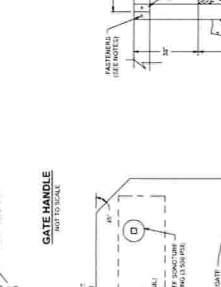
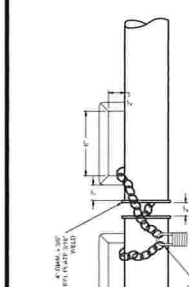
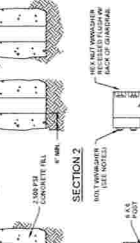
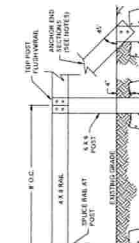
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10	[Text]

		Date: 05/20/20 Project: 17150 Sheet: 4 of 10
WOMPATUCK STATE PARK PARKING LOT & TRAIL ACCESS NORWELL, MASSACHUSETTS		
Prepared by: Horsley Witten Group, Inc. 100 WELAND DRIVE SUITE 100 NORWELL, MA 02061 PH: 508-853-1500 WWW.HORSLEYWITTEN.COM		
Checked by: _____ Drawn by: _____ Date: _____		
REVISIONS		



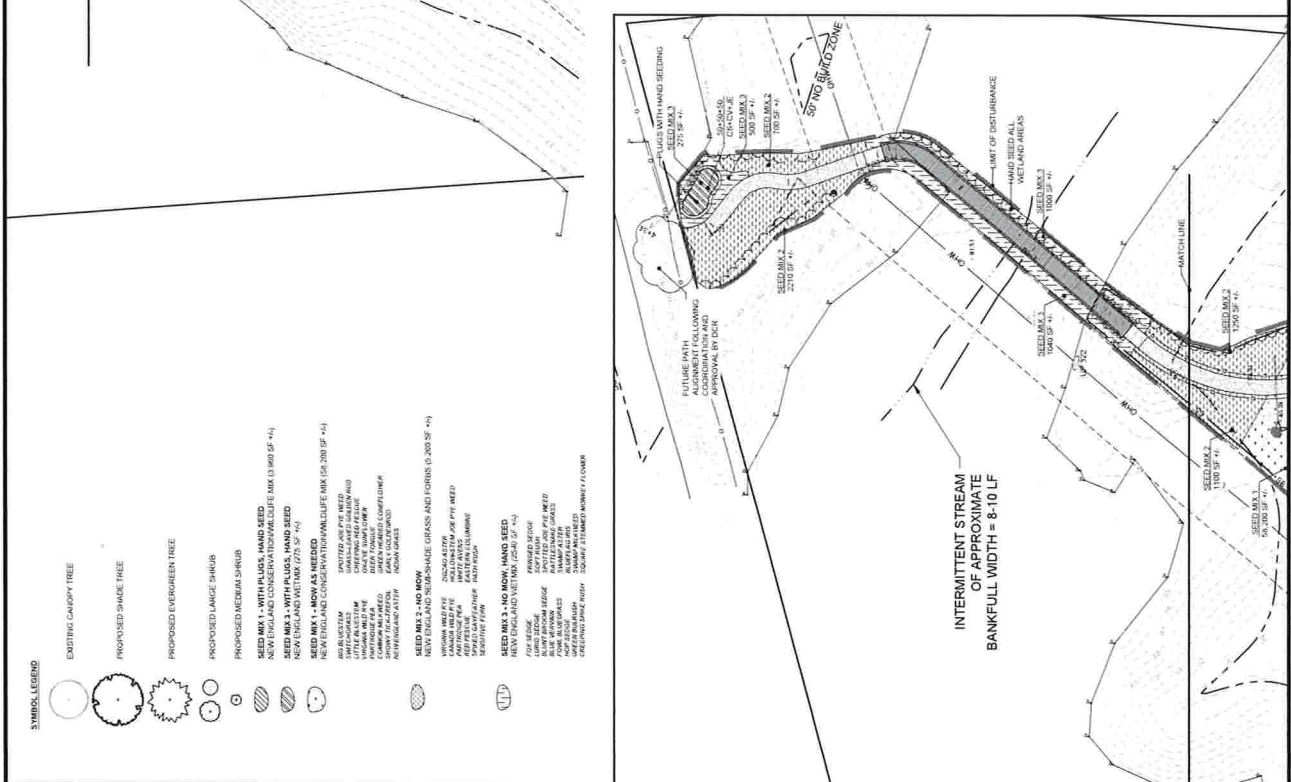


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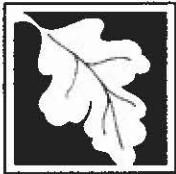
LANDSCAPE PLAN
 WOMPATUCK STATE PARK
 PARKING LOT & TRAIL ACCESS
 NORWELL, MASSACHUSETTS

Rev.	By	Date	Description
1	AW	12/01/17	Initial Landscape Plan
2	AW	12/01/17	Revised Plant Schedule
3	AW	12/01/17	Revised Site Plan
4	AW	12/01/17	Revised Stream Bank
5	AW	12/01/17	Revised Seed Mixes
6	AW	12/01/17	Revised Plant Schedule
7	AW	12/01/17	Revised Site Plan
8	AW	12/01/17	Revised Stream Bank
9	AW	12/01/17	Revised Seed Mixes
10	AW	12/01/17	Revised Plant Schedule
11	AW	12/01/17	Revised Site Plan
12	AW	12/01/17	Revised Stream Bank
13	AW	12/01/17	Revised Seed Mixes
14	AW	12/01/17	Revised Plant Schedule
15	AW	12/01/17	Revised Site Plan
16	AW	12/01/17	Revised Stream Bank
17	AW	12/01/17	Revised Seed Mixes
18	AW	12/01/17	Revised Plant Schedule
19	AW	12/01/17	Revised Site Plan
20	AW	12/01/17	Revised Stream Bank
21	AW	12/01/17	Revised Seed Mixes
22	AW	12/01/17	Revised Plant Schedule
23	AW	12/01/17	Revised Site Plan
24	AW	12/01/17	Revised Stream Bank
25	AW	12/01/17	Revised Seed Mixes
26	AW	12/01/17	Revised Plant Schedule
27	AW	12/01/17	Revised Site Plan
28	AW	12/01/17	Revised Stream Bank
29	AW	12/01/17	Revised Seed Mixes
30	AW	12/01/17	Revised Plant Schedule
31	AW	12/01/17	Revised Site Plan
32	AW	12/01/17	Revised Stream Bank
33	AW	12/01/17	Revised Seed Mixes
34	AW	12/01/17	Revised Plant Schedule
35	AW	12/01/17	Revised Site Plan
36	AW	12/01/17	Revised Stream Bank
37	AW	12/01/17	Revised Seed Mixes
38	AW	12/01/17	Revised Plant Schedule
39	AW	12/01/17	Revised Site Plan
40	AW	12/01/17	Revised Stream Bank
41	AW	12/01/17	Revised Seed Mixes
42	AW	12/01/17	Revised Plant Schedule
43	AW	12/01/17	Revised Site Plan
44	AW	12/01/17	Revised Stream Bank
45	AW	12/01/17	Revised Seed Mixes
46	AW	12/01/17	Revised Plant Schedule
47	AW	12/01/17	Revised Site Plan
48	AW	12/01/17	Revised Stream Bank
49	AW	12/01/17	Revised Seed Mixes
50	AW	12/01/17	Revised Plant Schedule



PLANT SCHEDULE

Key	Botanical Name	Common Name	Size	Spacing	Notes
AK1	Asplenium platyneuron	Rock Fern	2' x 2'	10'	AK1 Fern
AK2	Asplenium adnigrum	Rock Fern	2' x 2'	10'	AK2 Fern
AK3	Asplenium platyneuron	Rock Fern	2' x 2'	10'	AK3 Fern
AK4	Asplenium adnigrum	Rock Fern	2' x 2'	10'	AK4 Fern
AK5	Asplenium platyneuron	Rock Fern	2' x 2'	10'	AK5 Fern
AK6	Asplenium adnigrum	Rock Fern	2' x 2'	10'	AK6 Fern
AK7	Asplenium platyneuron	Rock Fern	2' x 2'	10'	AK7 Fern
AK8	Asplenium adnigrum	Rock Fern	2' x 2'	10'	AK8 Fern
AK9	Asplenium platyneuron	Rock Fern	2' x 2'	10'	AK9 Fern
AK10	Asplenium adnigrum	Rock Fern	2' x 2'	10'	AK10 Fern
AK11	Asplenium platyneuron	Rock Fern	2' x 2'	10'	AK11 Fern
AK12	Asplenium adnigrum	Rock Fern	2' x 2'	10'	AK12 Fern
AK13	Asplenium platyneuron	Rock Fern	2' x 2'	10'	AK13 Fern
AK14	Asplenium adnigrum	Rock Fern	2' x 2'	10'	AK14 Fern
AK15	Asplenium platyneuron	Rock Fern	2' x 2'	10'	AK15 Fern
AK16	Asplenium adnigrum	Rock Fern	2' x 2'	10'	AK16 Fern
AK17	Asplenium platyneuron	Rock Fern	2' x 2'	10'	AK17 Fern
AK18	Asplenium adnigrum	Rock Fern	2' x 2'	10'	AK18 Fern
AK19	Asplenium platyneuron	Rock Fern	2' x 2'	10'	AK19 Fern
AK20	Asplenium adnigrum	Rock Fern	2' x 2'	10'	AK20 Fern
AK21	Asplenium platyneuron	Rock Fern	2' x 2'	10'	AK21 Fern
AK22	Asplenium adnigrum	Rock Fern	2' x 2'	10'	AK22 Fern
AK23	Asplenium platyneuron	Rock Fern	2' x 2'	10'	AK23 Fern
AK24	Asplenium adnigrum	Rock Fern	2' x 2'	10'	AK24 Fern
AK25	Asplenium platyneuron	Rock Fern	2' x 2'	10'	AK25 Fern
AK26	Asplenium adnigrum	Rock Fern	2' x 2'	10'	AK26 Fern
AK27	Asplenium platyneuron	Rock Fern	2' x 2'	10'	AK27 Fern
AK28	Asplenium adnigrum	Rock Fern	2' x 2'	10'	AK28 Fern
AK29	Asplenium platyneuron	Rock Fern	2' x 2'	10'	AK29 Fern
AK30	Asplenium adnigrum	Rock Fern	2' x 2'	10'	AK30 Fern
AK31	Asplenium platyneuron	Rock Fern	2' x 2'	10'	AK31 Fern
AK32	Asplenium adnigrum	Rock Fern	2' x 2'	10'	AK32 Fern
AK33	Asplenium platyneuron	Rock Fern	2' x 2'	10'	AK33 Fern
AK34	Asplenium adnigrum	Rock Fern	2' x 2'	10'	AK34 Fern
AK35	Asplenium platyneuron	Rock Fern	2' x 2'	10'	AK35 Fern
AK36	Asplenium adnigrum	Rock Fern	2' x 2'	10'	AK36 Fern
AK37	Asplenium platyneuron	Rock Fern	2' x 2'	10'	AK37 Fern
AK38	Asplenium adnigrum	Rock Fern	2' x 2'	10'	AK38 Fern
AK39	Asplenium platyneuron	Rock Fern	2' x 2'	10'	AK39 Fern
AK40	Asplenium adnigrum	Rock Fern	2' x 2'	10'	AK40 Fern
AK41	Asplenium platyneuron	Rock Fern	2' x 2'	10'	AK41 Fern
AK42	Asplenium adnigrum	Rock Fern	2' x 2'	10'	AK42 Fern
AK43	Asplenium platyneuron	Rock Fern	2' x 2'	10'	AK43 Fern
AK44	Asplenium adnigrum	Rock Fern	2' x 2'	10'	AK44 Fern
AK45	Asplenium platyneuron	Rock Fern	2' x 2'	10'	AK45 Fern
AK46	Asplenium adnigrum	Rock Fern	2' x 2'	10'	AK46 Fern
AK47	Asplenium platyneuron	Rock Fern	2' x 2'	10'	AK47 Fern
AK48	Asplenium adnigrum	Rock Fern	2' x 2'	10'	AK48 Fern
AK49	Asplenium platyneuron	Rock Fern	2' x 2'	10'	AK49 Fern
AK50	Asplenium adnigrum	Rock Fern	2' x 2'	10'	AK50 Fern



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
Order of Conditions - WPA Form 5
 Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
 SE52-1193
 MassDEP File #
 NCC# 8(20)
 eDEP Transaction #
 Norwell
 City/Town

A. General Information PROJECT: Wompatuck State Park Access
Driveway, Parking, Trailhead & Path

1. From: Town of Norwell
Conservation Commission

2. This issuance is for (check one):
 a. Order of Conditions b. Amended Order of Conditions

3. To: Applicant:

Town of Norwell b. Last Name
 a. First Name
Norwell Pathway Committee
 c. Organization
345 Main Street
 d. Mailing Address
Norwell MA 02061
 e. City/Town f. State e. Zip Code

4. Property Owner (if different from applicant):

Town of Norwell b. Last Name
 a. First Name
Conservation Commission
 c. Organization
345 Main St, Rm 112
 d. Mailing Address
Norwell MA 02061
 e. City/Town f. State g. Zip Code

5. Project Location:

Grove Street (Lot 4) Norwell
 a. Street Address b. City/Town
Map 7C Bl. 15, Lot 34
 c. Assessors Map/Plat Number d. Parcel/Lot Number

Latitude and Longitude, if known: d m s d m s
 d. Latitude e. Longitude



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
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 Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
 SE52-1193
 MassDEP File #
 NCC# 8(20)
 eDEP Transaction #
 Norwell
 City/Town

A. General Information (cont.)

6. Property recorded at the Registry of Deeds for (attach additional information if more than one parcel):
 Plymouth
 a. County Plymouth b. Certificate Number (if registered land) _____
 Bk. 46437 Pg. 93
 c. Book _____ d. Page _____
7. Dates: 3/3/2020 4/7/2020 _____
 a. Date Notice of Intent Filed b. Date Public Hearing Closed c. Date of Issuance
8. Final Approved Plans and Other Documents (attach additional plan or document references as needed):
 "Wompatuck State Park / Parking Lot & Trail Access / Norwell, MA" (plan set, C1-LA10)
 a. Plan Title
 Horsley Witten Group, Inc. Richard A. Claytor, P.E.
 b. Prepared By c. Signed and Stamped by
 Rcvd March 3, 2020 by NCC Various
 d. Final Revision Date e. Scale
 Nol and narrative, Email, correspondence, site photos, GIS, misc Various
 f. Additional Plan or Document Title g. Date

B. Findings

1. Findings pursuant to the Massachusetts Wetlands Protection Act:
 Following the review of the above-referenced Notice of Intent and based on the information provided in this application and presented at the public hearing, this Commission finds that the areas in which work is proposed is significant to the following interests of the Wetlands Protection Act (the Act). Check all that apply:
- a. Public Water Supply b. Land Containing Shellfish c. Prevention of Pollution
 d. Private Water Supply e. Fisheries f. Protection of Wildlife Habitat
 g. Groundwater Supply h. Storm Damage Prevention i. Flood Control
2. This Commission hereby finds the project, as proposed, is: (check one of the following boxes)

Approved subject to:

- a. the following conditions which are necessary in accordance with the performance standards set forth in the wetlands regulations. This Commission orders that all work shall be performed in accordance with the Notice of Intent referenced above, the following General Conditions, and any other special conditions attached to this Order. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, these conditions shall control.



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 City/Town

B. Findings (cont.)

Denied because:

- b. the proposed work cannot be conditioned to meet the performance standards set forth in the wetland regulations. Therefore, work on this project may not go forward unless and until a new Notice of Intent is submitted which provides measures which are adequate to protect the interests of the Act, and a final Order of Conditions is issued. **A description of the performance standards which the proposed work cannot meet is attached to this Order.**
- c. the information submitted by the applicant is not sufficient to describe the site, the work, or the effect of the work on the interests identified in the Wetlands Protection Act. Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides sufficient information and includes measures which are adequate to protect the Act's interests, and a final Order of Conditions is issued. **A description of the specific information which is lacking and why it is necessary is attached to this Order as per 310 CMR 10.05(6)(c).**
3. Buffer Zone Impacts: Shortest distance between limit of project disturbance and the wetland resource area specified in 310 CMR 10.02(1)(a) a. linear feet

Inland Resource Area Impacts: Check all that apply below. (For Approvals Only)

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
4. <input type="checkbox"/> Bank	a. linear feet	b. linear feet	c. linear feet	d. linear feet
5. <input checked="" type="checkbox"/> Bordering Vegetated Wetland	120 a. square feet	120 b. square feet	301 c. square feet	301 Mitigation d. square feet
6. <input type="checkbox"/> Land Under Waterbodies and Waterways	a. square feet e. c/y dredged	b. square feet f. c/y dredged	c. square feet	d. square feet
7. <input type="checkbox"/> Bordering Land Subject to Flooding	a. square feet	b. square feet	c. square feet	d. square feet
Cubic Feet Flood Storage	e. cubic feet	f. cubic feet	g. cubic feet	h. cubic feet
8. <input type="checkbox"/> Isolated Land Subject to Flooding	a. square feet	b. square feet		
Cubic Feet Flood Storage	c. cubic feet	d. cubic feet	e. cubic feet	f. cubic feet
9. <input type="checkbox"/> Riverfront Area	a. total sq. feet	b. total sq. feet		
Sq ft within 100 ft	c. square feet	d. square feet	e. square feet	f. square feet
Sq ft between 100-200 ft	g. square feet	h. square feet	i. square feet	j. square feet



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B. Findings (cont.)

Coastal Resource Area Impacts: Check all that apply below. (For Approvals Only)

	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
10. <input type="checkbox"/> Designated Port Areas	Indicate size under Land Under the Ocean, below			
11. <input type="checkbox"/> Land Under the Ocean	<u> </u> a. square feet	<u> </u> b. square feet		
	<u> </u> c. c/y dredged	<u> </u> d. c/y dredged		
12. <input type="checkbox"/> Barrier Beaches	Indicate size under Coastal Beaches and/or Coastal Dunes below			
13. <input type="checkbox"/> Coastal Beaches	<u> </u> a. square feet	<u> </u> b. square feet	<u> </u> c. nourishment	<u> </u> d. nourishment
14. <input type="checkbox"/> Coastal Dunes	<u> </u> a. square feet	<u> </u> b. square feet	<u> </u> c. nourishment	<u> </u> d. nourishment
15. <input type="checkbox"/> Coastal Banks	<u> </u> a. linear feet	<u> </u> b. linear feet		
16. <input type="checkbox"/> Rocky Intertidal Shores	<u> </u> a. square feet	<u> </u> b. square feet		
17. <input type="checkbox"/> Salt Marshes	<u> </u> a. square feet	<u> </u> b. square feet	<u> </u> c. square feet	<u> </u> d. square feet
18. <input type="checkbox"/> Land Under Salt Ponds	<u> </u> a. square feet	<u> </u> b. square feet		
	<u> </u> c. c/y dredged	<u> </u> d. c/y dredged		
19. <input type="checkbox"/> Land Containing Shellfish	<u> </u> a. square feet	<u> </u> b. square feet	<u> </u> c. square feet	<u> </u> d. square feet
20. <input type="checkbox"/> Fish Runs	Indicate size under Coastal Banks, Inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above			
	<u> </u> a. c/y dredged	<u> </u> b. c/y dredged		
21. <input type="checkbox"/> Land Subject to Coastal Storm Flowage	<u> </u> a. square feet	<u> </u> b. square feet		



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B. Findings (cont.)

* #22. If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.5.c (BVW) or B.17.c (Salt Marsh) above, please enter the additional amount here.

22. Restoration/Enhancement *:
- | | |
|-----------------------|------------------------------|
| a. square feet of BVW | b. square feet of salt marsh |
|-----------------------|------------------------------|
23. Stream Crossing(s):
- | | |
|-----------------------------------|---|
| 0-raised boardwalk on pilings | No impact to the actual stream |
| a. number of new stream crossings | b. number of replacement stream crossings |

C. General Conditions Under Massachusetts Wetlands Protection Act

The following conditions are only applicable to Approved projects.

1. Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order.
2. The Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.
3. This Order does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state, or local statutes, ordinances, bylaws, or regulations.
4. The work authorized hereunder shall be completed within three years from the date of this Order unless either of the following apply:
 - a. the work is a maintenance dredging project as provided for in the Act; or
 - b. the time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance. If this Order is intended to be valid for more than three years, the extension date and the special circumstances warranting the extended time period are set forth as a special condition in this Order.
5. This Order may be extended by the issuing authority for one or more periods of up to three years each upon application to the issuing authority at least 30 days prior to the expiration date of the Order.
6. If this Order constitutes an Amended Order of Conditions, this Amended Order of Conditions does not extend the issuance date of the original Final Order of Conditions and the Order will expire on Jun 2, 2023 unless extended in writing by the Department.
7. Any fill used in connection with this project shall be clean fill. Any fill shall contain no trash, refuse, rubbish, or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles, or parts of any of the foregoing.
8. This Order is not final until all administrative appeal periods from this Order have elapsed, or if such an appeal has been taken, until all proceedings before the Department have been completed.



Massachusetts Department of Environmental Protection
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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

9. No work shall be undertaken until the Order has become final and then has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of the registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done. The recording information shall be submitted to the Conservation Commission on the form at the end of this Order, which form must be stamped by the Registry of Deeds, prior to the commencement of work.
10. A sign shall be displayed at the site not less than two square feet or more than three square feet in size bearing the words,

"Massachusetts Department of Environmental Protection" [or, "MassDEP"]
"File Number SE52-1193 "
11. Where the Department of Environmental Protection is requested to issue a Superseding Order, the Conservation Commission shall be a party to all agency proceedings and hearings before MassDEP.
12. Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to the Conservation Commission.
13. The work shall conform to the plans and special conditions referenced in this order.
14. Any change to the plans identified in Condition #13 above shall require the applicant to inquire of the Conservation Commission in writing whether the change is significant enough to require the filing of a new Notice of Intent.
15. The Agent or members of the Conservation Commission and the Department of Environmental Protection shall have the right to enter and inspect the area subject to this Order at reasonable hours to evaluate compliance with the conditions stated in this Order, and may require the submittal of any data deemed necessary by the Conservation Commission or Department for that evaluation.
16. This Order of Conditions shall apply to any successor in interest or successor in control of the property subject to this Order and to any contractor or other person performing work conditioned by this Order.
17. Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by the Conservation Commission.



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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

18. All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited in a wetland or water body. During construction, the applicant or his/her designee shall inspect the erosion controls on a daily basis and shall remove accumulated sediments as needed. The applicant shall immediately control any erosion problems that occur at the site and shall also immediately notify the Conservation Commission, which reserves the right to require additional erosion and/or damage prevention controls it may deem necessary. Sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by this Order.

NOTICE OF STORMWATER CONTROL AND MAINTENANCE REQUIREMENTS

19. **The work associated with this Order (the "Project") is (1) is not (2) subject to the Massachusetts Stormwater Standards. If the work is subject to the Stormwater Standards, then the project is subject to the following conditions:**

a) All work, including site preparation, land disturbance, construction and redevelopment, shall be implemented in accordance with the construction period pollution prevention and erosion and sedimentation control plan and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Construction General Permit as required by Stormwater Condition 8. Construction period erosion, sedimentation and pollution control measures and best management practices (BMPs) shall remain in place until the site is fully stabilized.

b) No stormwater runoff may be discharged to the post-construction stormwater BMPs unless and until a Registered Professional Engineer provides a Certification that:

- i.* all construction period BMPs have been removed or will be removed by a date certain specified in the Certification. For any construction period BMPs intended to be converted to post construction operation for stormwater attenuation, recharge, and/or treatment, the conversion is allowed by the MassDEP Stormwater Handbook BMP specifications and that the BMP has been properly cleaned or prepared for post construction operation, including removal of all construction period sediment trapped in inlet and outlet control structures;
- ii.* as-built final construction BMP plans are included, signed and stamped by a Registered Professional Engineer, certifying the site is fully stabilized;
- iii.* any illicit discharges to the stormwater management system have been removed, as per the requirements of Stormwater Standard 10;
- iv.* all post-construction stormwater BMPs are installed in accordance with the plans (including all planting plans) approved by the issuing authority, and have been inspected to ensure that they are not damaged and that they are in proper working condition;
- v.* any vegetation associated with post-construction BMPs is suitably established to withstand erosion.



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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

- c) The landowner is responsible for BMP maintenance until the issuing authority is notified that another party has legally assumed responsibility for BMP maintenance. Prior to requesting a Certificate of Compliance, or Partial Certificate of Compliance, the responsible party (defined in General Condition 18(e)) shall execute and submit to the issuing authority an Operation and Maintenance Compliance Statement ("O&M Statement") for the Stormwater BMPs identifying the party responsible for implementing the stormwater BMP Operation and Maintenance Plan ("O&M Plan") and certifying the following: *i.*) the O&M Plan is complete and will be implemented upon receipt of the Certificate of Compliance, and *ii.*) the future responsible parties shall be notified in writing of their ongoing legal responsibility to operate and maintain the stormwater management BMPs and implement the Stormwater Pollution Prevention Plan.
- d) Post-construction pollution prevention and source control shall be implemented in accordance with the long-term pollution prevention plan section of the approved Stormwater Report and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Multi-Sector General Permit.
- e) Unless and until another party accepts responsibility, the landowner, or owner of any drainage easement, assumes responsibility for maintaining each BMP. To overcome this presumption, the landowner of the property must submit to the issuing authority a legally binding agreement of record, acceptable to the issuing authority, evidencing that another entity has accepted responsibility for maintaining the BMP, and that the proposed responsible party shall be treated as a permittee for purposes of implementing the requirements of Conditions 18(f) through 18(k) with respect to that BMP. Any failure of the proposed responsible party to implement the requirements of Conditions 18(f) through 18(k) with respect to that BMP shall be a violation of the Order of Conditions or Certificate of Compliance. In the case of stormwater BMPs that are serving more than one lot, the legally binding agreement shall also identify the lots that will be serviced by the stormwater BMPs. A plan and easement deed that grants the responsible party access to perform the required operation and maintenance must be submitted along with the legally binding agreement.
- f) The responsible party shall operate and maintain all stormwater BMPs in accordance with the design plans, the O&M Plan, and the requirements of the Massachusetts Stormwater Handbook.



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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

- g) The responsible party shall:
1. Maintain an operation and maintenance log for the last three (3) consecutive calendar years of inspections, repairs, maintenance and/or replacement of the stormwater management system or any part thereof, and disposal (for disposal the log shall indicate the type of material and the disposal location);
 2. Make the maintenance log available to MassDEP and the Conservation Commission ("Commission") upon request; and
 3. Allow members and agents of the MassDEP and the Commission to enter and inspect the site to evaluate and ensure that the responsible party is in compliance with the requirements for each BMP established in the O&M Plan approved by the issuing authority.
- h) All sediment or other contaminants removed from stormwater BMPs shall be disposed of in accordance with all applicable federal, state, and local laws and regulations.
- i) Illicit discharges to the stormwater management system as defined in 310 CMR 10.04 are prohibited.
- j) The stormwater management system approved in the Order of Conditions shall not be changed without the prior written approval of the issuing authority.
- k) Areas designated as qualifying pervious areas for the purpose of the Low Impact Site Design Credit (as defined in the MassDEP Stormwater Handbook, Volume 3, Chapter 1, Low Impact Development Site Design Credits) shall not be altered without the prior written approval of the issuing authority.
- l) Access for maintenance, repair, and/or replacement of BMPs shall not be withheld. Any fencing constructed around stormwater BMPs shall include access gates and shall be at least six inches above grade to allow for wildlife passage.

Special Conditions (if you need more space for additional conditions, please attach a text document):

For Additional Conditions, please see attached Local Order of Conditions

(NCC# 8(20)).



Massachusetts Department of Environmental Protection
 Bureau of Resource Protection - Wetlands
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Provided by MassDEP:
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D. Findings Under Municipal Wetlands Bylaw or Ordinance

1. Is a municipal wetlands bylaw or ordinance applicable? Yes No
2. The Town of Norwell hereby finds (check one that applies):
Conservation Commission
- a. that the proposed work cannot be conditioned to meet the standards set forth in a municipal ordinance or bylaw, specifically:

1. Municipal Ordinance or Bylaw _____ 2. Citation _____

Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides measures which are adequate to meet these standards, and a final Order of Conditions is issued.

- b. that the following additional conditions are necessary to comply with a municipal ordinance or bylaw:

Norwell Wetland Bylaw _____ XVIa
 1. Municipal Ordinance or Bylaw _____ 2. Citation _____

3. The Commission orders that all work shall be performed in accordance with the following conditions and with the Notice of Intent referenced above. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, the conditions shall control.
- The special conditions relating to municipal ordinance or bylaw are as follows (if you need more space for additional conditions, attach a text document):

For Additional Conditions, please see attached Local Order of Conditions (NCC# 8(20)).



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
Order of Conditions - WPA Form 5
 Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
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G. Recording Information

Prior to commencement of work, this Order of Conditions must be recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land subject to the Order. In the case of registered land, this Order shall also be noted on the Land Court Certificate of Title of the owner of the land subject to the Order of Conditions. The recording information on this page shall be submitted to the Conservation Commission listed below.

Norwell Conservation Commission
 Conservation Commission

Detach on dotted line, have stamped by the Registry of Deeds and submit to the Conservation Commission.

To:

Norwell Conservation Commission
 Conservation Commission

Please be advised that the Order of Conditions for the Project at:

Grove Street (Wompatuck State Park Access) SE52-1193
 MassDEP File Number

Has been recorded at the Registry of Deeds of:

Plymouth
 County Book Page

for: Property Owner

and has been noted in the chain of title of the affected property in:

Book Page

In accordance with the Order of Conditions issued on:

Date

If recorded land, the instrument number identifying this transaction is:

Instrument Number

If registered land, the document number identifying this transaction is:

Document Number

Signature of Applicant

**Town of Norwell Conservation Commission -
Norwell Wetlands Bylaw XVI-a
Order of Conditions**

**WPA Form 5 – Order of Conditions (see also)
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40**

Provided by MassDEP:
SE52-1193
MassDEP File #

eDEP Transaction #
NCC# 8(20)
Norwell CC #

Page
1

**A. General Information Project: Wompatuck State Park Access
Driveway, Parking, Trailhead & Path**

1. From: Norwell Conservation Commission
Conservation Commission

2. This issuance is for (check one):
a. Order of Conditions b. Amended Order of Conditions

3. To: Applicant:

Town of Norwell
a. First Name
Norwell Pathway Committee
c. Organization
345 Main Street
d. Mailing Address
Norwell MA 02061
e. City/Town e. State e. Zip

4. Property Owner (if different from applicant):

Town of Norwell
a. First Name
Conservation Commission
c. Organization
345 Main Street
d. Mailing Address
Norwell MA 02061
e. City/Town e. State e. Zip

5. Project Location:

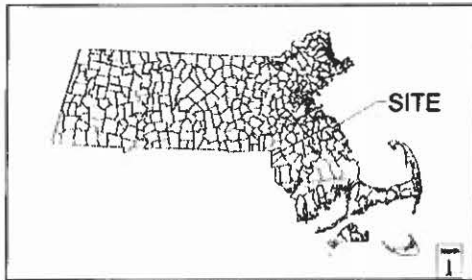
Grove Street (Lot 4) @ Wompatuck State Park
b. City/Town
Map 7C
c. Assessors Map/Plat Number
Norwell
b. City/Town
Bl. 15, Lot 34
d. Parcel/Lot Number
Latitude and Longitude, if known: d m s d m s
d. Latitude e. Longitude

6. Property recorded at the Registry of Deeds for (attach additional information if more than one parcel):

Plymouth
a. County
Bk. 46437
c. Book
Norwell
b. Certificate Number (if registered land)
Pg. 93
d. Page

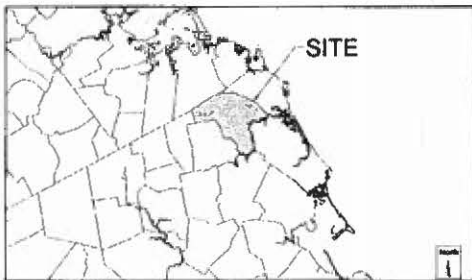
7. Dates: 3/3/2020 4/7/2020
a. Date Notice of Intent Filed b. Date Public Hearing Closed c. Date of Issuance

WOMPATUCK STATE PARK PARKING LOT & TRAIL ACCESS NORWELL, MASSACHUSETTS MARCH 2020 PERMITTING PLANS



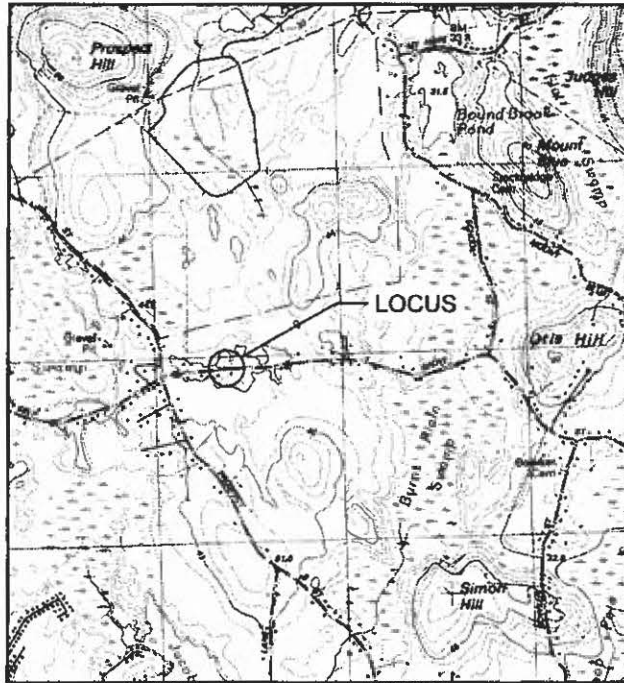
MASSACHUSETTS

Graphic Scale
1" = 100 Miles



TOWN OF NORWELL



Graphic Scale
1" = 1 Mile



VICINITY MAP

Graphic Scale
1" = 1000 feet

Sheet List Table	
Sheet Number	Sheet Title
1	COVER
2	NOTES AND LEGEND
3	EXISTING CONDITIONS
4	SITE PLAN
5	ACCESS ROAD - PLAN & PROFILE
6	BOARDWALK PATH - PLAN & PROFILE
7	DETAILS (1)
8	DETAILS (2)
9	LANDSCAPE PLAN
10	LANDSCAPE DETAILS

<p>Plan Set</p> <h2>WOMPATUCK STATE PARK PARKING LOT & TRAIL ACCESS NORWELL, MASSACHUSETTS</h2>		
<p>Prepared For</p> <p>Town of Norwell Planning Department 345 Main Street Norwell, MA 02061 (781) 659-8021</p> 		
<p>Prepared By</p> <p>Horsley Witten Group, Inc. Sustainable Environmental Solutions www.horsleywitten.com</p> 		
<p>Headquarters 80 Federal St Salem, MA 01970 (508) 633-6900 ext 200 (508) 633-3199 fax</p>	<p>110 Water Street 6th Floor Boston, MA 02109 (617) 363-8100 ext 200 (617) 674-4788 fax</p>	<p>95 Devonian Street Sturis, MA 02703 Plymouth, MA 02550 (401) 272-1117 ext 200 (401) 438-4388 fax</p>
<p>Project Number</p> <p>17150</p>	<p>Sheet Number</p> <p>1 of 10</p>	<p>Drawing Title</p> <p>C - 1</p>

lead: msc/lead 03/02/20, project: 030220 by: JP, H:\projects\2017\17150 Norwell Wompatuck Park\Drawings\17150 CV.dwg



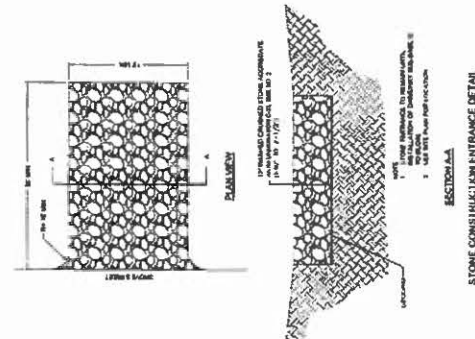
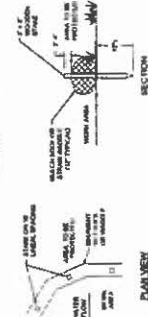
Drawn by: **Horley Wren Group, Inc.**
100 Main Street
North Andover, MA 01858
Phone: 978-851-8888
Fax: 978-851-8881
Date: December 1, 2011

Project: **WOMPATUCK STATE PARK
PARKING LOT & TRAIL ACCESS
NORWELL, MASSACHUSETTS**

Notes and Legend

Table with 2 columns: Symbol and Description. Includes symbols for stone, concrete, and various construction details.

NOTES:
1. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE AND FEDERAL AGENCIES.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE AND FEDERAL AGENCIES.
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GENERAL CONTRACTOR'S OBLIGATION & MAINTENANCE
1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE AND FEDERAL AGENCIES.
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TEMPORARY CONSTRUCTION FENCE
1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE AND FEDERAL AGENCIES.
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STONE CONSTRUCTION ENTRANCE DETAIL
1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE AND FEDERAL AGENCIES.
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PERMANENT ROCK DETAIL
1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE AND FEDERAL AGENCIES.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE AND FEDERAL AGENCIES.
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5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE AND FEDERAL AGENCIES.

DRAFT
FOR REVIEW
CONSTRUCTION

Horley Wren Group, Inc.
100 Park Street
Norwell, MA 02061
Tel: (781) 224-1100
Fax: (781) 224-1101
Date: December 1, 2017

Town of Norwell Planning
Department
100 Park Street
Norwell, MA 02061
Tel: (781) 224-1100
Fax: (781) 224-1101

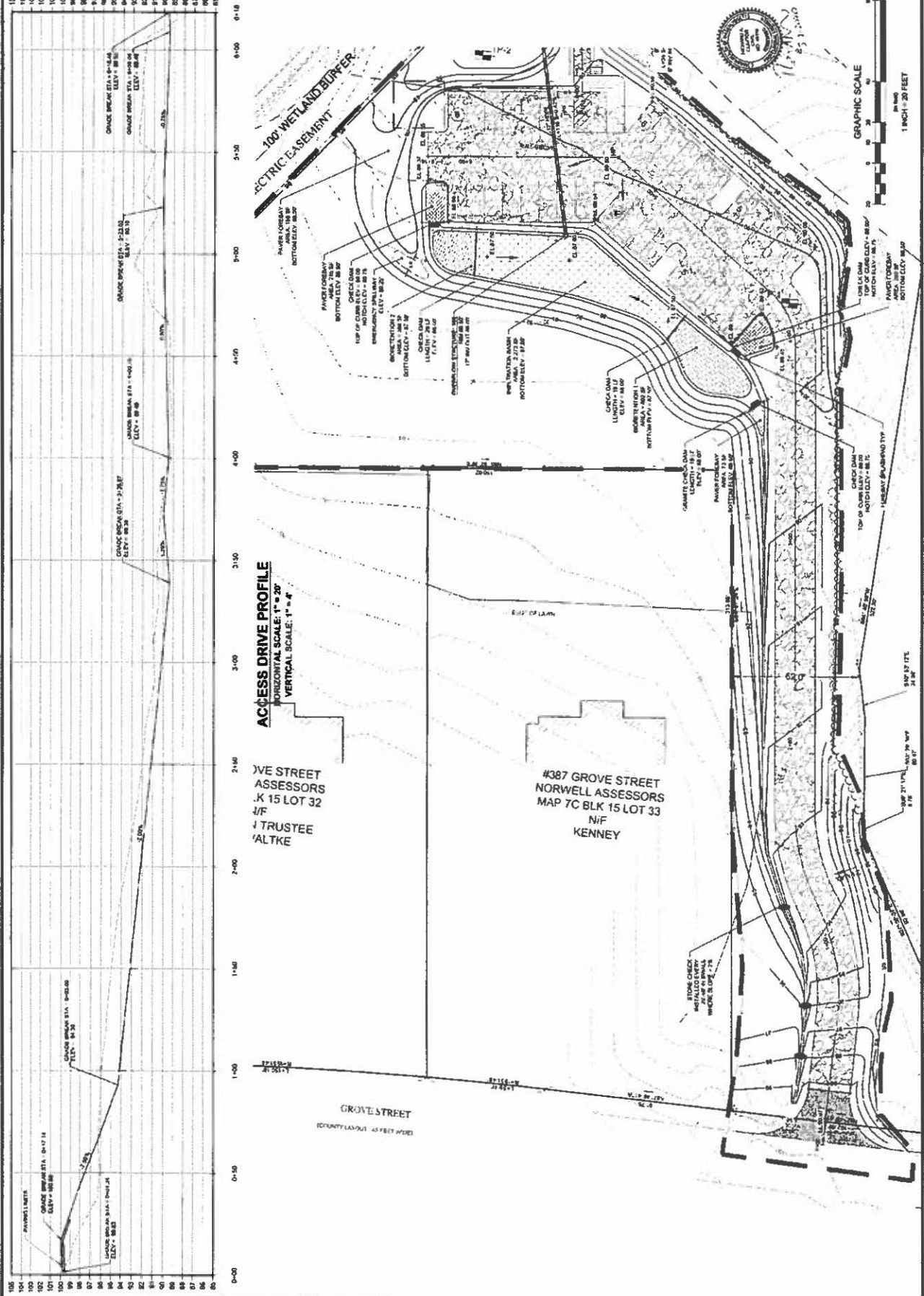
**WOMPATUCK STATE PARK
PARKING LOT & TRAIL ACCESS
NORWELL, MASSACHUSETTS**

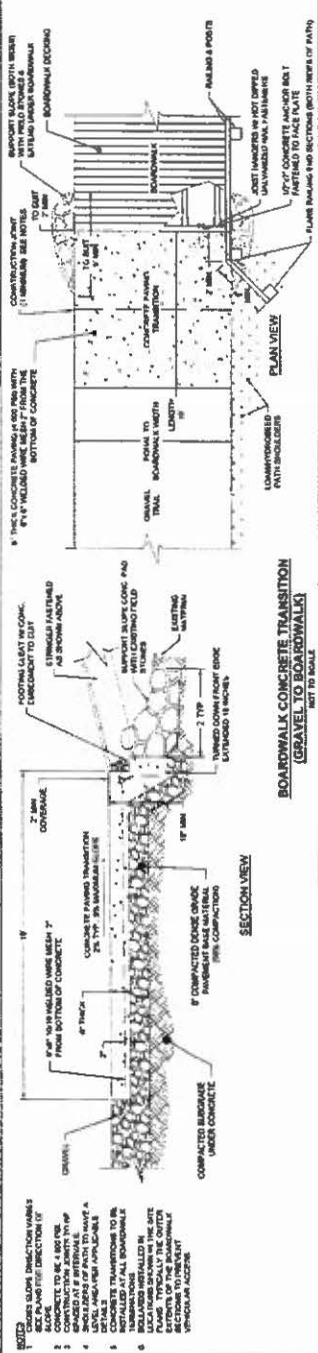
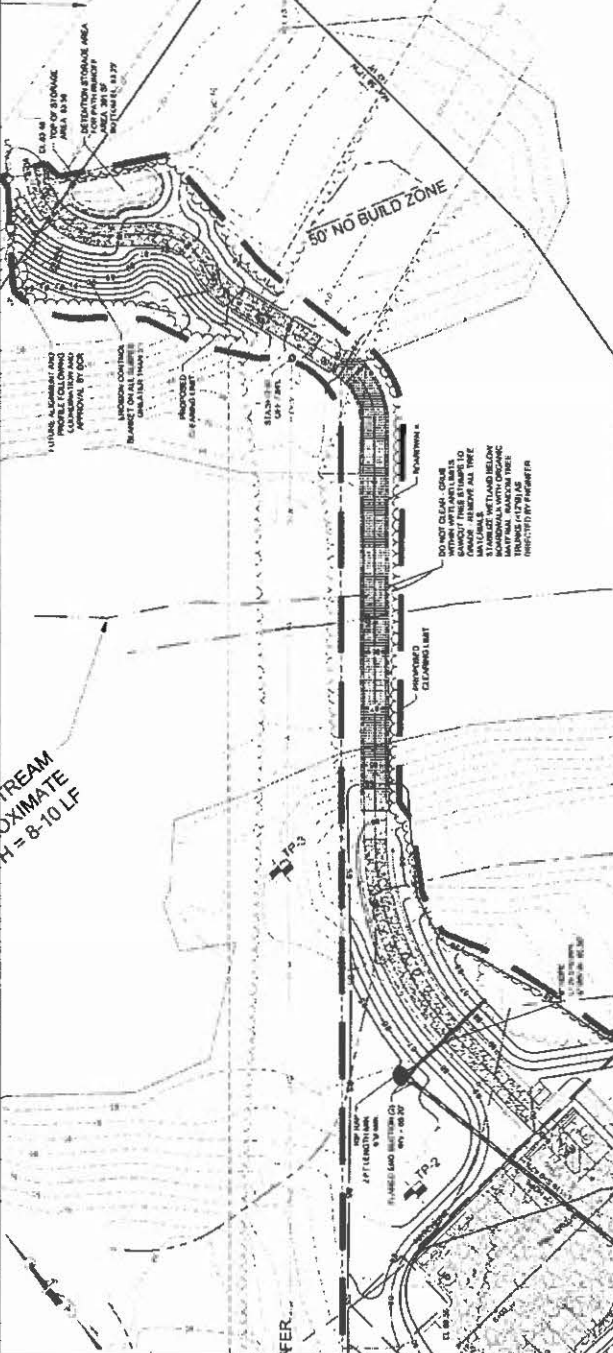
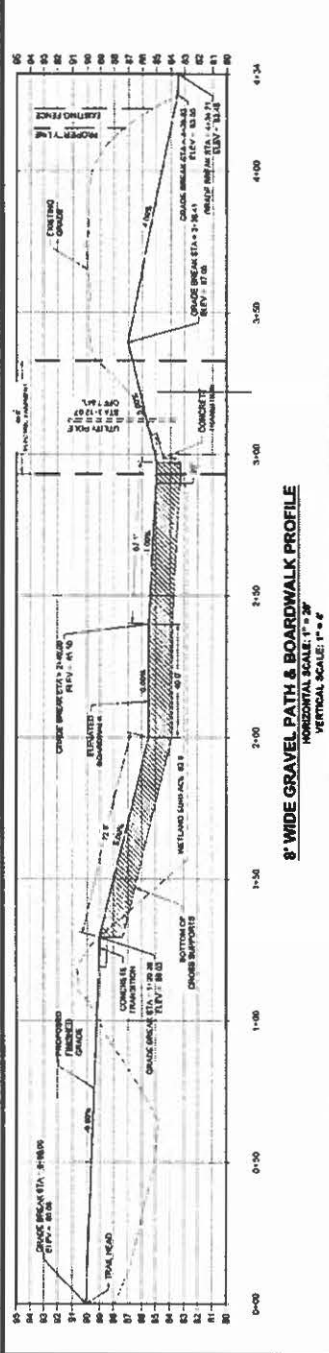
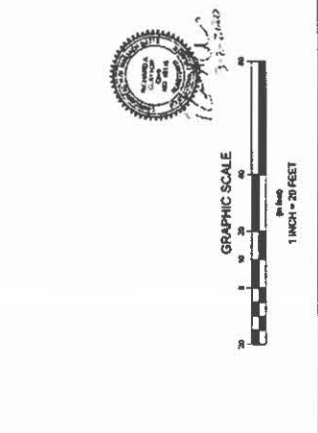
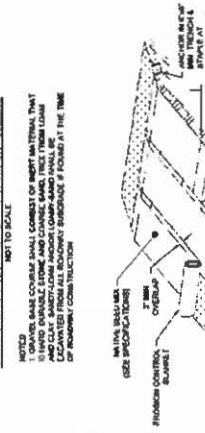
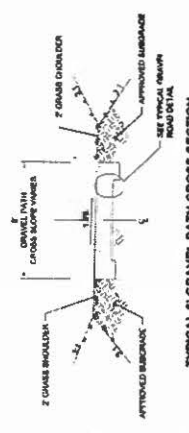
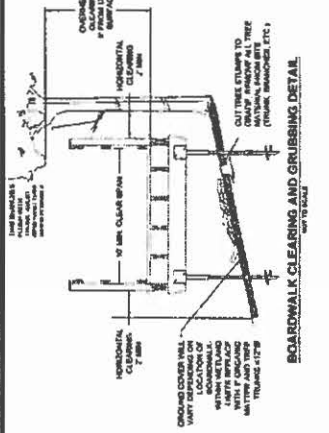
ACCESS ROAD - PLAN & PROFILE

Horley Wren Group, Inc.
100 Park Street
Norwell, MA 02061
Tel: (781) 224-1100
Fax: (781) 224-1101
Date: December 1, 2017

Project No. 17150
Drawing No. C-5
Scale: 1" = 20'

REV	DATE	DESCRIPTION
01	12/01/17	ISSUED FOR PERMIT
02	12/01/17	REVISED TO REFLECT COMMENTS
03	12/01/17	REVISED TO REFLECT COMMENTS
04	12/01/17	REVISED TO REFLECT COMMENTS
05	12/01/17	REVISED TO REFLECT COMMENTS
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51	12/01/17	REVISED TO REFLECT COMMENTS







Prepared by: Robert J. DeGroot
 Date: 08/20/2017
 Checked by: Robert J. DeGroot
 Date: 08/20/2017
 Drawn by: Robert J. DeGroot
 Date: 08/20/2017

Department: Norman Planting
 Project: Wompatuck State Park
 Location: Wompatuck State Park
 Drawing No.: 17150

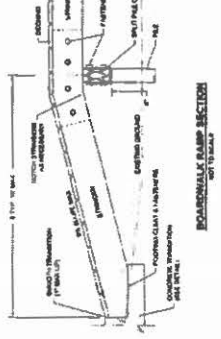
**WOMPATUCK STATE PARK
 PARKING LOT & TRAIL ACCESS
 NORWELL, MASSACHUSETTS**

Prepared by: Norman Planting
 Date: 08/20/2017
 Checked by: Robert J. DeGroot
 Date: 08/20/2017
 Drawn by: Robert J. DeGroot
 Date: 08/20/2017

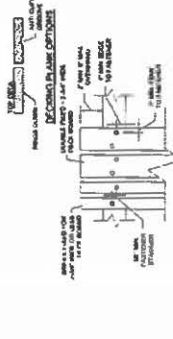
Revisions

No.	Description	Date
1	Issue for Construction	08/20/2017

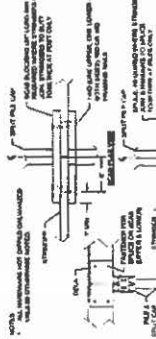
BOARDWALK RAMP SECTION
 SEE PLAN



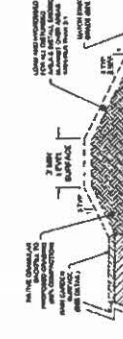
BOARDWALK DECKING DETAIL
 SEE PLAN



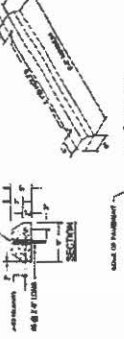
BOARDWALK SECTION DETAIL
 SEE PLAN



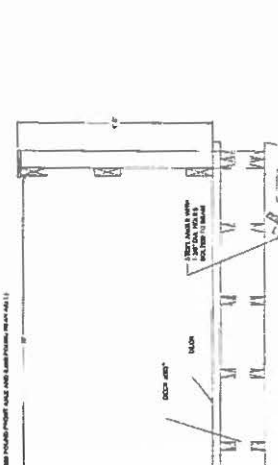
FOUNDATION DETAIL
 SEE PLAN



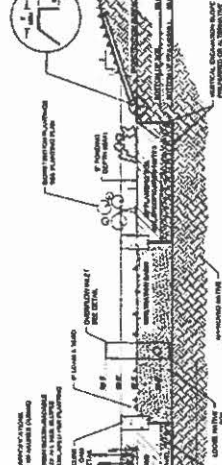
NEGATIVE CONCRETE CURB DETAIL
 SEE PLAN



BOARDWALK IMPICAL PILE FOUNDATION DETAIL
 SEE PLAN



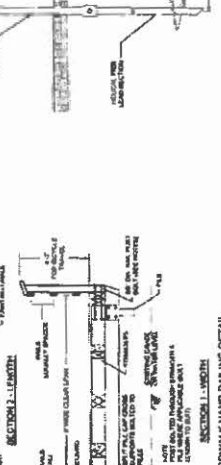
STORMWATER MANAGEMENT STRUCTURE DETAIL
 SEE PLAN



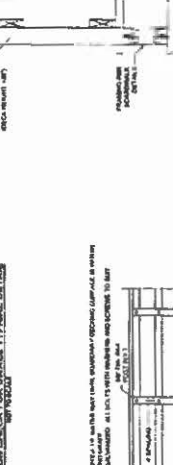
STORMWATER MANAGEMENT STRUCTURE DETAIL
 SEE PLAN



BOARDWALK HAND RAILING DETAIL
 SEE PLAN



SECTION 1 - LENGTH



SECTION 2 - LENGTH



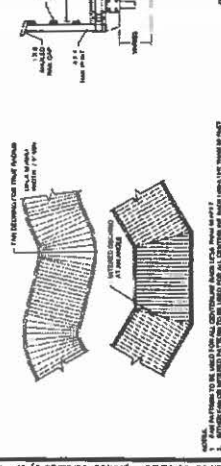
SECTION 3 - LENGTH



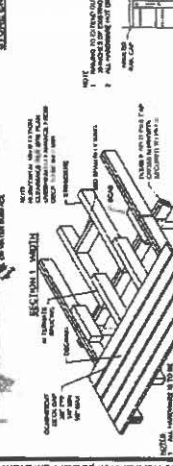
SECTION 4 - LENGTH



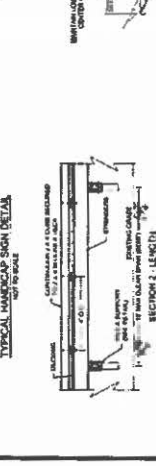
EXCISING PATTERNS FOR CHANGING DIRECTION
 SEE PLAN



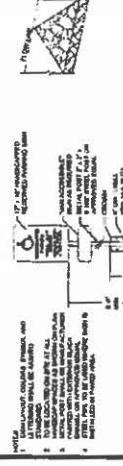
TYPICAL BOARDWALK FINISHING SECTIONS
 SEE PLAN



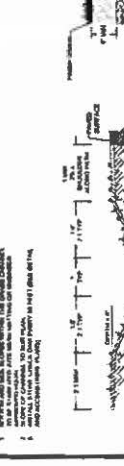
TYPICAL BOARDWALK FINISHING SECTIONS
 SEE PLAN



TYPICAL BOARDWALK FINISHING SECTIONS
 SEE PLAN



TYPICAL BOARDWALK FINISHING SECTIONS
 SEE PLAN





Drawn by: [Name]
Checked by: [Name]
Date: 03/20/20

Project: Wompatuck State Park
Location: Norwell, Massachusetts

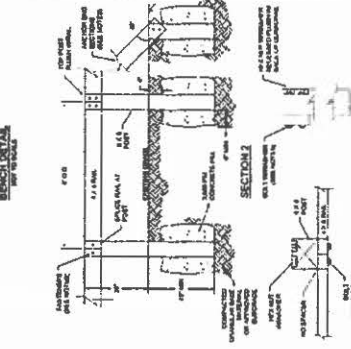
WOMPATUCK STATE PARK
PARKING LOT & TRAIL ACCESS
NORWELL, MASSACHUSETTS

DETAILS (2)

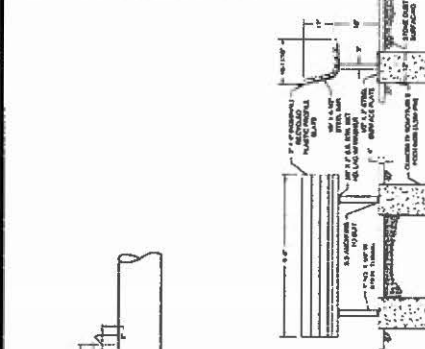
Revision table with columns for No., Description, and Date.



WOOD PARKING BARRIER SECTION
PLAN
1. BARRIER SHALL BE 42" HIGH TO TOP OF RAILING.
2. BARRIER SHALL BE 4" THICK.
3. BARRIER SHALL BE 12" ON CENTER.



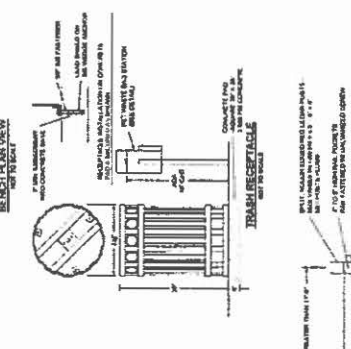
BENCH PLAN VIEW
SECTION
1. BENCH SHALL BE 48" HIGH TO TOP OF SEAT.
2. BENCH SHALL BE 18" WIDE.



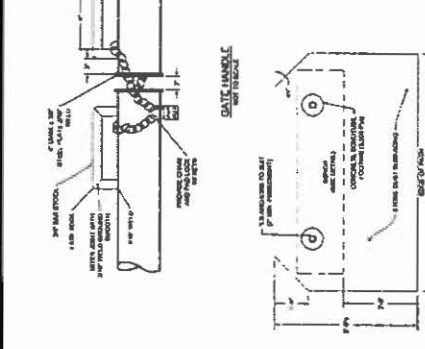
DATE HANDLES SECTION
PLAN
1. HANDLE SHALL BE 1/2" DIA.
2. HANDLE SHALL BE 12" ON CENTER.



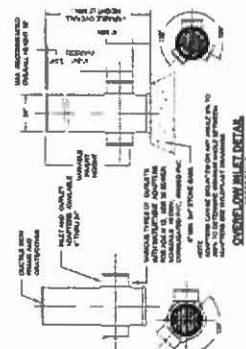
CONCRETE CURB DETAIL SECTION
PLAN
1. CURB SHALL BE 4" HIGH TO TOP OF FINISH.
2. CURB SHALL BE 12" WIDE.



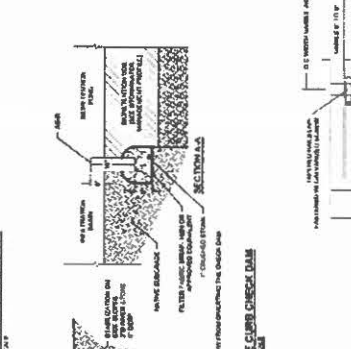
REINFORCED GRANITE CURB CHECK DAM SECTION
PLAN
1. DAM SHALL BE 18" HIGH TO TOP OF FINISH.
2. DAM SHALL BE 12" WIDE.



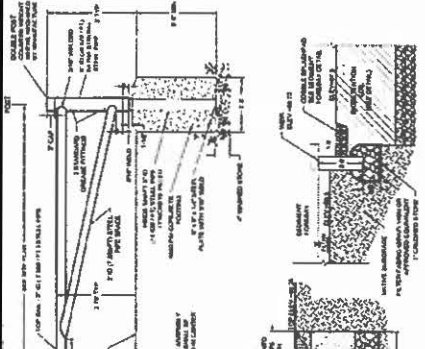
SEMI-FLEXIBLE CURB DETAIL SECTION
PLAN
1. CURB SHALL BE 4" HIGH TO TOP OF FINISH.
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SEMI-FLEXIBLE CURB DETAIL SECTION
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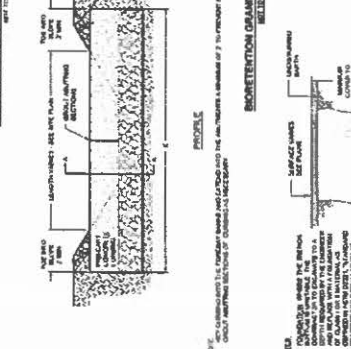
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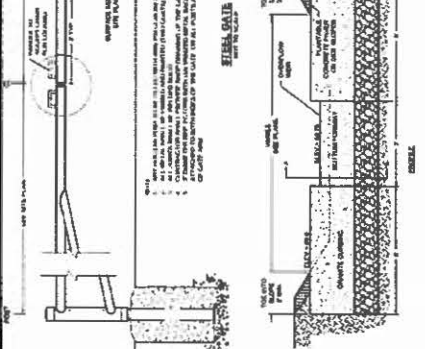
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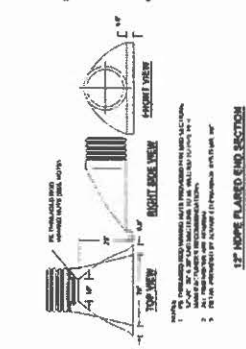
SEMI-FLEXIBLE CURB DETAIL SECTION
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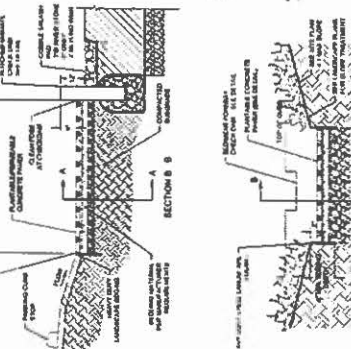
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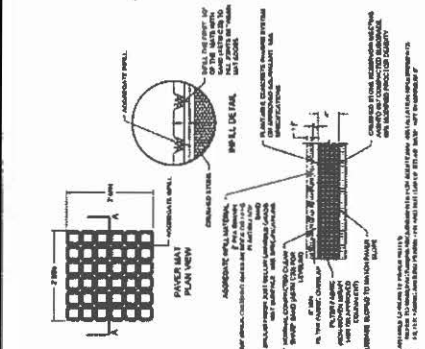
SEMI-FLEXIBLE CURB DETAIL SECTION
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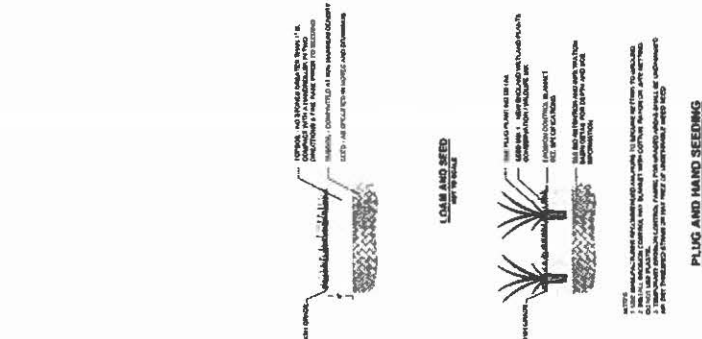
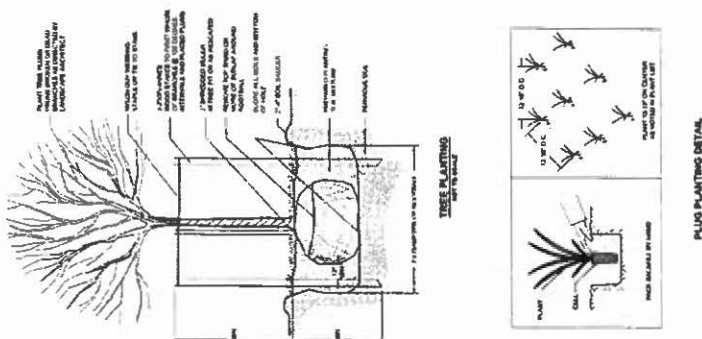
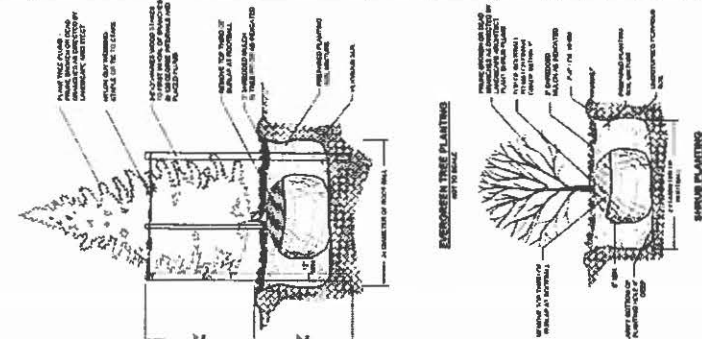
SEMI-FLEXIBLE CURB DETAIL SECTION
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17150
 10 of 10

WOMPATUCK STATE PARK
 PARKING LOT & TRAIL ACCESS
 NORWELL, MASSACHUSETTS

Horsey Wilson Group, Inc.
 1000 North Main Street
 Norwell, MA 02061
 781-255-4444
 www.horseywilson.com

Rev	Description	Date
1	Issue for Bidding	03/22/20
2	Revised	03/22/20
3	Revised	03/22/20
4	Revised	03/22/20
5	Revised	03/22/20
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100	Revised	03/22/20



GENERAL INSTRUCTIONS:

1. HAVING RECEIVED THE SAMPLES OF THE TOPSOIL TO A TESTING LABORATORY FOR ENHANCED SOIL ANALYSIS AS DESCRIBED IN THE SPECIFICATIONS, SUBMIT THE RESULTS TO THE LANDSCAPE ARCHITECT FOR REVIEW AND APPROVAL. THE RESULTS OF THE SOIL ANALYSIS SHALL BE SUBMITTED TO THE LANDSCAPE ARCHITECT FOR REVIEW AND APPROVAL. THE RESULTS OF THE SOIL ANALYSIS SHALL BE SUBMITTED TO THE LANDSCAPE ARCHITECT FOR REVIEW AND APPROVAL.
2. ALL AREAS THAT ARE DESIGNATED AS PLANTING AREAS SHALL BE PREPARED TO RECEIVE PLANTING MATERIALS AND PLANTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PREPARATION OF THE PLANTING AREAS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PREPARATION OF THE PLANTING AREAS.
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GENERAL INSTRUCTIONS:

1. PROVIDE PROPER PLANT CARE, MAINTENANCE AND WATERING ON SITE UNTIL SUCH TIME AS THE LANDSCAPE ARCHITECT IS SATISFIED WITH THE RESULTS OF THE PLANTING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PREPARATION OF THE PLANTING AREAS.
2. ESTABLISH AN APPROPRIATE WATERING SCHEDULE FOR ALL PLANT MATERIALS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PREPARATION OF THE PLANTING AREAS.
3. AT A MINIMUM THE HOLES SHOULD BE PREPARED TO RECEIVE PLANTING MATERIALS AND PLANTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PREPARATION OF THE PLANTING AREAS.

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**Town of Norwell Conservation Commission -
 Norwell Wetlands Bylaw XVI-a
 Order of Conditions
 WPA Form 5 – Order of Conditions (see also)
 Massachusetts Wetlands Protection Act M.G.L. c. 131, §40**

Provided by MassDEP:
 SE52-1193
 MassDEP File #
 eDEP Transaction #
 NCC# 8(20)
 Norwell CC #

A. General Information (cont.)

8. Final Approved Plans and Other Documents (attach additional plan or document references as needed):

"Wompatuck State Park / Parking Lot & Trail Access / Norwell, MA" (plan set, C1-LA10)

a. Plan Title

Horsley Witten Group, Inc.

Richard A. Claytor, P.E.

b. Prepared By

c. Signed and Stamped by

March 3, 2020 rcvd

Various

d. Final Revision Date

e. Scale

Stormwater Management Report (Horsley Witten Group)

March 2020

f. Additional Plan or Document Title

g. Date

h. Additional Plan or Document Title

i. Date

narrative, Nol, email, correspondence, photos, GIS, misc

various

j. Additional Plan or Document Title

k. Date

B. Findings

1. Findings pursuant to the Town of Norwell Wetlands Bylaw:

Following the review of the above-referenced Notice of Intent and based on the information provided in this application and presented at the public hearing, this Commission finds that the areas in which work is proposed is significant to the following interests of the Norwell Wetland Bylaw. Check all that apply:

- | | | |
|---|--|--|
| a. <input checked="" type="checkbox"/> Public Water Supply | b. <input checked="" type="checkbox"/> Sedimentation Control | c. <input checked="" type="checkbox"/> Wildlife Habitats |
| d. <input checked="" type="checkbox"/> Private Water Supply | e. <input checked="" type="checkbox"/> Erosion Control | f. <input type="checkbox"/> Fisheries |
| g. <input checked="" type="checkbox"/> Groundwater | h. <input checked="" type="checkbox"/> Storm Damage Prevention | i. <input checked="" type="checkbox"/> Public Safety |
| j. <input checked="" type="checkbox"/> Water Pollution Prevention | k. <input type="checkbox"/> Land Containing Shellfish | l. <input type="checkbox"/> Recreation |
| m. <input checked="" type="checkbox"/> Water Quality | n. <input type="checkbox"/> Rare Plant and Animal Species | o. <input type="checkbox"/> Aesthetics |
| p. <input checked="" type="checkbox"/> Flood Control | q. <input type="checkbox"/> Fish and Shellfish habitat | r. <input type="checkbox"/> |

2. This Commission hereby finds the project, as proposed, is: (check one of the following boxes)

Approved subject to:

- a. the following conditions which are necessary in accordance with the performance standards set forth in the wetlands bylaw and regulations. This Commission orders that all work shall be performed in accordance with the Notice of Intent referenced above, the following General Conditions, and any other special conditions attached to this Order. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, these conditions shall control.

B. Findings (cont.)

Denied because:

- b. the information submitted by the applicant is not sufficient to describe the site, the work, or the effect of the work on the interests identified in the Norwell Wetland Bylaw. Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides sufficient information and includes measures which are adequate to protect the interests of the bylaw and regulations, and a final Order of Conditions is issued. **A description of the specific information which is lacking and why it is necessary is attached to this Order.**
3. Buffer Zone Impacts: Shortest distance between limit of project disturbance and the wetland resource area specified in 310 CMR 10.02(1)(a) XX
a. linear feet

Resource Area Impacts: Check all that apply below. These are in addition to those impacts listed in the WPA OoC (For Approvals Only)

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
4. <input type="checkbox"/> Bank	a. linear feet	b. linear feet	c. linear feet	d. linear feet
5. <input checked="" type="checkbox"/> Bordering Vegetated Wetland	120 a. square feet	120 b. square feet	301 c. square feet	301mitigation d. square feet
6. <input type="checkbox"/> Land Under Waterbodies and Waterways	a. square feet	b. square feet	c. square feet	d. square feet
	e. c/y dredged	f. c/y dredged		
7. <input type="checkbox"/> Bordering Land Subject to Flooding	a. square feet	b. square feet	c. square feet	d. square feet
Cubic Feet Flood Storage	e. cubic feet	f. cubic feet	g. cubic feet	h. cubic feet
8. <input type="checkbox"/> Isolated Land Subject to Flooding And/or inundation	a. square feet	b. square feet		
Cubic Feet Flood Storage	c. cubic feet	d. cubic feet	e. cubic feet	f. cubic feet
9. <input type="checkbox"/> Riverfront Area	a. total sq. feet	b. total sq. feet	c. square feet	d. square feet
10. <input checked="" type="checkbox"/> No New Disturb 50 foot resource buffer	1000 a. square feet	1000 b. square feet	c. square feet	d. square feet
	e. square feet	f. square feet	g. square feet	h. square feet
	i. square feet	j. square feet		

FINDINGS

Town of Norwell Wetlands Protection Bylaw, Article XVI-a

The Norwell Conservation Commission has reviewed all documents and plans submitted, relevant to the Notice of Intent for **Grove St – New access to Wompatuck State Park -** Page
4

The Commission finds:

- 1- The Commission finds that the delineation is accurate in regards to BVW, Bank and Stream Channell**
- 2- The Commission finds that this new public access project that will allow residents and visitors a new access point to the thousands of acres of woodlands and trails through Norwell off Grove St, was designed to minimize environmental impacts through use of a raised boardwalk that avoids impacts to the stream channel and minimizes disturbance to BVW.
- 3- Mitigation plantings and care of edge areas damaged by maintenance of the utility easement along which this boardwalk runs will offset impacts due to helical pilings and to Norwell Wetland Bylaw 50 ft resource buffer.

STATEMENT OF REASON

The Commission voted unanimously on April 7, 2020 to approve the project as presented and conditioned by Order of Conditions. At this time due to the Covid 19 State of Emergency, signatures are electronic only. These will be replaced with in person signatures once the State of Emergency has been lifted and in person hearings can resume.

The Commission unanimously agreed that not only were environmental and ecological impacts avoided and minimized, but the benefit to the public at large by providing a new DCR – Wompatuck State Park Entry Point was a significant benefit.

SPECIAL CONDITIONS UNDER THE NORWELL WETLANDS BYLAW – PROJECT SPECIFIC

SC#1 The final site plan is to be signed by the Commission or Agent on their behalf and must be recorded at the Registry of Deeds or Land Court along with this Order of Conditions prior to the start of any work on site.

DUE TO THE COVID STATE OF EMERGENCY SOME REGISTRIES ARE NOT ACCEPTING ELECTRONIC SIGNATURES. IF THIS IS THE CASE, ALL OTHER CONDITIONS, INCLUDING THE PRESTART OF WORK MUST BE COMPLETED, HOWEVER, RECORDING MAY BE DONE AS SOON AS THE SoE IS LIFTED AND PROOF SUBMITTED TO THE CONSERVATION OFFICE.

SELECTED BOILERPLATE CONDITIONS

PRIOR TO THE START OF WORK AND/OR CONSTRUCTION:

1. A project monitor is to be selected by the Commission and paid for by the applicant. A deposit sufficient to cover project monitoring is to be determined by the Commission. The project monitoring fees are to be paid by the applicant in advance of the start of the project
 - a. The monitor works for the Commission at the discretion of the Commission
 - b. During active phases of the project that require work in the 100 foot buffer
 - c. To implement any or all conditions of this Order as determined by the project scope and details, site conditions and Commission discretion. Weekly reports shall be submitted To the Commission/Office until all work within buffer zones is completed and/or the area is stabilized and work has ceased.
 - d. The monitor must conduct inspections for the following milestones:
 - i. Before excavation or erosion control installation work begins to inspect site flagging;
 - ii. Pre-construction site-inspection
 - iii. Before construction of the bio-retention and future infiltration basins. During construction of basins to confirm each phase of construction.
 - iv. Post construction of basins to verify correct function.
 - v. After each stage of grading work is completed to inspect finished elevations
 - vi. the bottom of the excavation, the placement of gravel and the placement of the infiltration units.
 - vii. Inspection of plant material including location & installation ~~inspection~~
 - viii. During planting and seeding and after the first month of the growing season to inspect propagation techniques;
 - ix. After one growing season to observe vegetation development and regulatory compliance;
 - x. After two growing seasons to determine vegetation development and regulatory compliance
 - xi. As part of a certificate of compliance or partial certificate of compliance request(s).
2. All bio-retention basins and infiltration basins must be constructed first and must demonstrate that they function prior to any other lot construction.
3. A Phasing plan is to be submitted designed to guide the construction process and minimize clearing of the buffer zone to the greatest extent practicable at any one time.
4. No work permitted by this Order may begin unless and until the applicant receives subsurface sewage disposal permits from the Norwell Board of Health.
5. The issuance of this Order of Conditions does not guarantee the buildability of any individual lots associated with this plan.
6. **The applicant must notify the Norwell Conservation Commission in writing of the name, address, email, cell phone, business and home telephone numbers of the project supervisor or contractor who will be responsible for ensuring compliance with the conditions in this Order and shall notify the Commission, in writing, at least 48 hours prior to the pre-construction inspection with the Conservation Agent. Written notification must reference project address and file number.**
7. This document shall be included in all construction contracts and subcontracts dealing with the work proposed, and shall supersede other contract requirements.
8. The contractor, site engineer, or other individual in charge of work on the site shall have a copy of this Order available on the site at all times.
9. **Prior to the start of any excavation or construction, there shall be a pre-construction conference on the site between the contractor responsible for the work, the project engineer, the project monitor and an agent of the Conservation Commission to ensure that the requirements of this Order are understood. A copy of all**

required state and federal permits as well as the SWPPP are required to be submitted prior to this meeting.

10. Prior to any work on the site, the proposed limit of work must be clearly marked with stakes or flags and must be confirmed by the Conservation Commission. Such markers will be maintained until all construction on the site's perimeter is complete. **Workers must be informed that no construction activity is to occur beyond this line at any time.**
11. A staked mulch sock minimum 18 inches diameter must be used during all phases of construction to prevent erosion and sedimentation into wetlands and surface waters.
 - a. Erosion control devices must be staked securely. The Norwell Conservation Commission must be notified when installation is complete. No work shall commence until the Commission agrees that the installation of the erosion control devices are installed correctly.
12. If a limit of work is identified separately from the erosion control line, the limit of work shall be located in the field and construction fencing or approved alternative must be used to create a highly visible barrier to prevent encroachment beyond limit of work.
13. Prior to the pre-construction meeting and commencement of any activity on this site, the boundary flags of all wetland resource areas shown on the approved site plan(s) shall be inspected and replaced by field survey if decayed or missing so that each flag is clearly visible in the field. Flagging used to identify wetland resource areas shall be of a color different from any other flagging used on the site. Flags shall be checked regularly and replaced as necessary until work is completed.
14. Prior to commencing any activity on the site, the applicant must submit the following to the Conservation Commission:
 - a. A set of photographs depicting the project site in pre-activity condition.
 - b. A clearing plan showing areas to be cleared and left in a natural state
 - c. A project/construction-sequencing plan
 - d. A statement signed by the applicant, owner of the property and the person responsible for the construction of the project that such individuals understand the terms and conditions as specified in the Order and that such persons agree to comply with the provisions of the Wetlands Protection Act, local Bylaw and this Order.
15. Prior to construction the general contractor must designate a construction staging area, located outside all resource areas and buffer zones. All construction trailers, portable sanitary facilities, material storage and overnight parking of equipment shall be in the staging area. The perimeter of the staging area shall be protected as necessary with silt fence and the ground surface shall be protected with washed stone or another suitable non-erosive material.
16. Prior to commencing any work on the site the applicant shall install a clean stone construction entrance (tracking pad) not less than 20' wide and not less than 30' in length of a stone size, on the average of 1" to 4".

GENERAL CONDITIONS

17. Any person performing work on the activity that is the subject of this Order is individually responsible for understanding and complying with the requirements of this Order, the Act, 310 CMR 10.00 (and Town Wetland Bylaw and Wetland Bylaw Regulations).
18. Issuance of these conditions does not in any way imply or certify that the site or downstream areas will not be subject to flooding, storm damage, or any other form of damage due to wetness.

19. No material of any kind may be buried, placed or dispersed in areas within the jurisdiction of the Commission by activities that are the subject of this Order, except as are expressly permitted by this Order or the plans approved herein. Any fill used in connection with this project must be clean fill. Any fill shall not contain no trash, refuse, rubbish, or debris, including but not limited to lumber, asphalt, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles, or parts of any of the foregoing.
20. There will be no pumping of water from wetland resource areas.
21. All waste products, grubbed stumps, slash, construction materials, etc. shall be deposited at least 100 feet from wetland resource areas, unless specified in this Order.
22. No trash dumpsters will be allowed within 100 feet of areas subject to protection under the Massachusetts Wetlands Protection Act or the Town's Bylaw.
23. No water resulting from dewatering may be discharged into the Resource Area.
24. No water may be discharged into the stormwater structures until those structures have been fully stabilized (Growth has been established)
25. Any pre-existing violations must be repaired.
26. Reasonable precaution shall be taken to protect trees, specifically minimizing work in the drip line and existing root systems.
27. The work undertaken at each location will be minimized to the extent possible while still achieving the goals of flood control and pollution prevention.
28. Work will be scheduled to avoid periods of high groundwater or high flow rates.
29. Where evidence of excessive sedimentation from storm drains is apparent, a sediment forebay (and possibly a check-dam) may be constructed to prevent sediments from reaching resource areas in the future. This area would be vegetated appropriately and/or reinforced with minimal stone rip-rap, turf-reinforcing mats, or similar methods.
30. The Commission Monitor must be notified weekly of any work scheduled for the following week. This will enable the commissioners or staff to view each site and relay any additional concerns or requirements for work at that site.
31. Mulchbales shall be used for sediment control where flowing water would otherwise transport sediments downstream during the construction or maintenance operations. Mulchbales must be removed after work is complete so that they do not impede the flow of surface water.
32. Appropriate siltation fence and/or staked Mulch Sock/bales shall be installed around any excavation, and elsewhere as needed regardless of whether or not they are shown on the plan.
33. All maintenance conditions specified in this Order shall be ongoing and shall not expire at the end of the project construction or with the issuance with the Certificate of Compliance. It shall be the responsibility of the property owner to see that the maintenance conditions are complied with as required.

DURING CONSTRUCTION:

34. During all phases of construction, all disturbed or exposed areas must be brought to finished grade and either a) loamed and seeded for permanent stabilization, or b) stabilized in another way approved by the Norwell Conservation Commission.
35. Exposure of soils and clear cutting is to be phased and kept to a minimum per a phasing plan to be approved by the Commission prior to the start of work.
36. If soils are to be disturbed for longer than one month or the site is to be inactive for more than a week, a temporary cover of rye or other grass, or an equivalent method such as jute netting, mulch, to be approved by the agent and Commission monitor should be established to prevent erosion and sedimentation. If the season is not appropriate for plant growth, exposed surfaces must be stabilized by straw, or jute netting.
37. Any debris, which falls into the wetland area or 50 foot buffer, must be removed immediately (by hand).
38. There shall be no stockpiling of soil or other materials within 50 feet of any resource area.
39. Any dewatering activities on the project in which water will be released to wetlands or storm drains shall make use of a silting pond, dewatering bag, or similar device to remove sediment before the water is released.
40. No vehicle or other machinery, refueling, lubrication or maintenance shall not take place within 100 feet of any wetland resource area.
41. Any proposed or executed changes in the plans approved under this Order must require the applicant to file a new Notice of Intent, or to inquire of the Norwell Conservation Commission in writing whether the change or changes are substantial enough to require a new filing or an Amendment of the Order of Conditions. Approval from other Town Agents or Inspectors does not relieve the applicant from obtaining approval from the Norwell Conservation Commission for any work or changes related to construction conditioned by this Order. Before executing any change from the Plan of record, the applicant must have the Norwell Conservation Commission's written approval.
42. Any errors found in the plans or information submitted by the applicant shall be considered as changes and procedures outlined above for changes shall be followed.
43. The Conservation Commission, its employees, and its agents shall have a right of entry to inspect for compliance with the terms of the Order of Conditions.
44. Any runoff resulting from the washing of trucks or construction equipment shall not be directed to, nor dumped in, any on-site drainage system or in any area subject to protection under the Mass. Wetlands Protection Act. Any such washing shall occur in a designated area, protected by washed stone, outside of all resource areas and buffer zones. All construction vehicles exiting the property must be cleaned of soil prior to traveling on public streets.
45. Any leakage or spillage of oil, hydraulic fluid, gasoline, or other pollutants must be cleaned up immediately and disposed of off the site. All fueling of equipment must be performed outside of wetland resource areas and buffer zones. The Commission must be notified immediately in the event of any spillage.
46. All equipment shall be inspected regularly for leaks. Any leaking hydraulic lines, cylinders or any other components must be fixed immediately.
47. No alteration or activity may occur beyond the limit of work or the erosion controls shown on the approved plan(s).
48. Any de-watering of trenches or other excavations required during construction shall be conducted so as to prevent siltation of wetland resource areas. All discharges from de-watering activities shall be filtered through Mulchbale sediment traps, silt filter bags or other means approved by the Norwell Conservation Commission or it's Agent or the Commissions Monitor.

49. Cement trucks must not be washed out in any wetland resource or buffer zone area, nor into any drainage system. Any deposit of cement or concrete products into a buffer zone or wetland resource area must be immediately removed.
50. Erosion and sedimentation control devices must be inspected after each storm event and repaired or replaced as necessary. Any accumulated silt adjacent to the barriers must be removed.
 - a. Erosion control devices shall be inspected regularly. Any entrapped silt shall be removed to an area outside the buffer zone and wetland resource areas. Any erosion controls or other devices must be kept in good repair and must be replaced as necessary.
 - b. Erosion control devices must remain in place until all disturbed surfaces have been stabilized with final vegetative cover or the Commission has authorized their removal
51. At the end of each workday, the applicant shall mechanically sweep or manually sweep sediments from the adjacent streets, unless tracking and sediment is not evident on the streets.
52. A Registered Professional Engineer shall inspect and document the following. The Commission shall hire a Professional Engineer, to be paid for by the applicant, to either monitor implementation of this condition in coordination with the Agent, or to perform the duties of this condition in coordination with the Agent and Project Proponent's representatives. The goal is to ensure proactive protection of resources, buffer zones and other properties. The Commission Engineer/Monitor and Agent have the authority, when necessary, to stop the project. The private Engineer/Monitor shall also be granted this authority in writing by the project owner.
 - a. The bottom of excavation of all infiltration systems shall be inspected prior to the placement of any fill or any drainage structures.
 - b. Document the condition of the excavation by photographs and provide a certification letter that there is at least a 2-foot separation between the bottom of the infiltration system and seasonal high groundwater.
 - c. Confirm that sub-soils on which the infiltration system will be placed are consistent with the plan requirements and the assumptions of the hydrologic analysis.
 - d. Any material used as fill beneath or along the sides of the infiltration system will conform with the requirements for septic system sand in accordance with the specification of 310 CMR 15.255(3). The design engineer shall provide a certification as to the quality of any fill used.
 - e. Any stone used beneath or along the sides of an infiltration system must be in conformance with the specification for Base Aggregate as stipulated in 310 CMR 15.247(1). The engineer must provide a written certification as to the quality of the stone.
 - f. The components of the infiltration basin shall not be backfilled until the engineer has confirmed the proper elevation of the bottom of the chamber and all associated inverts have been achieved.
53. Where plastic (PVC or ABS) pipe is used for connections to infiltration systems, magnetic tape must be laid over the pipe prior to backfilling to allow for future location of the pipe.

EROSION CONTROL

54. A minimum 50 foot vegetated buffer must be maintained between any work and nearby streets, wetlands, resource areas, property boundaries on at least 80% of the project site. A 50 foot vegetated buffer has been shown to be one of the most effective erosion control measures.
55. The use of hay in construction areas is prohibited as hay is known to carry invasive seeds that will germinate in exposed and disturbed project area.
56. Control trenches shall be dug around the perimeter of all stockpiles that may erode.

57. Berm/swale combinations to control erosion are to be used around the project perimeter where ever feasible.

58. The area of construction must remain in a stable condition at the close of each construction day. Erosion controls should be inspected at this time, and repaired, reinforced or replaced as necessary.

GRADING/LANDSCAPING

Page
10

59. Site grading, construction and clearing shall be phased on ALL projects to minimize the extent of exposed soils on site at any one time to the greatest extent possible. The best preventative measure to avoid erosion and sedimentation is to not have unnecessarily exposed soils to begin with.

60. Site grading and construction shall be scheduled to avoid periods of high surface water. Once begun, grading and construction shall continue in an expeditious manner to minimize the opportunity for erosion.

61. Grading must be accomplished so that runoff must not be directed to the property of others.

62. The seed stock to be used to restore disturbed areas shall complement or contain native flora and be of proven value to local wildlife.

63. Once the site has been stabilized, the Applicant/Owner/Assignee shall remove and properly dispose of all erosion controls. Removal of said erosion controls shall be accomplished utilizing the least invasive means possible. The Mulch may then be scattered and the erosion tube sliced and scattered, but the siltation fence and stakes must be removed and disposed of properly; The Commission will not issue a Certificate of Compliance until erosion controls are removed.

64. A final landscape plan showing location, density, size, species and numbers of plants shall be submitted and approved by the Commission or its designee prior to the start of work.

- a. The final landscape plan must meet a 75% survival criteria 2 years after planting (unless otherwise specified in this order).
- b. Survival must be across the board, ex; 75% deciduous trees, 75% evergreen trees 75% ground cover, 75% shrub evergreen/deciduous, etc.

65. Conservation Bounds are to be installed along the 50 foot no-disturb buffer and are to meet the following criteria unless specific alternative design is approved by the Commission and described in either the final plan or this order.

- a. The Bounds shall be stone or concrete monuments with a sign no less than 10" in width that reads "Norwell Conservation Commission Restricted Area".
- b. The text shall be facing the home and primary use area.
- c. The monuments must be a minimum of 4 feet off the ground.
- d. The monuments shall be spaced no more than 25' apart and there shall be no less than 5 in number.

POST CONSTRUCTION:

66. There must be no application of road salt or deicing chemicals onto the driveway because of the importance of the site and wetlands to the groundwater supply.

67. The use of chemicals, including pesticides and fertilizers, must be prohibited on this property, because of the importance of the site and wetlands to the groundwater supply.

68. A letter from a Registered Professional Engineer certifying compliance of the property with this Order of Conditions, and detailing any deviations that exist, and their potential effect on the project. A statement that the work is in "substantial compliance" with no detailing of the deviations shall not be accepted.
69. An "As-Built" plan signed and stamped by a Registered Professional Engineer or Land Surveyor showing post-construction conditions within all areas under the jurisdiction of the Massachusetts Wetlands Protection Act and the [name of municipality] Wetlands Protection Bylaw. This plan must include at a minimum:
- All wetland resource area boundaries with associated buffer zones and regulatory setback areas taken from the plan(s) approved in this Order of Conditions;
 - Locations and elevations of all stormwater management conveyances, structures and best management designs, including foundation drains, constructed under this Order within any wetland resource area or buffer zone;
 - Distances from any structures constructed under this Order to wetland resource areas - "structures" include, but are not limited to, all buildings, septic system components, wells, utility lines, fences, retaining walls, and roads/driveways;
 - A line delineating the limit of work - "work" includes any filling, excavating and/or disturbance of soils or vegetation approved under this Order;
 - Wetland resource replication areas constructed under this Order.
 - The Commission requires that an Infiltration As-Built plan must specify the size and type of all piping components and drainage structures and the beginning and end inverts of all pipes and the location of all covers, access and inspection ports.. The as-built must include the location of all roof drain connections and a certification by the engineer/land surveyor that all roof drainage connections shown on the approved plans have been made.
70. Post-construction photographs demonstrating compliance with this Order, including established vegetation where required
71. No Certificate of Compliance will be issued without first removing with the approval of the monitor and agent all erosion control on site.
72. Prior to the issuance of a Certificate of Compliance permanent boundary markers shall be installed to mark the 50-foot no disturbance buffer zone. The type of permanent markers shall be approved by the Conservation Commission or its agent. These shall be shown on the as-built plan and clearly marked on the plan with a note indicating no work shall be performed beyond this point without permission from the Conservation Commission.
73. This Order must apply to all successors in interest and successors in control of the property described in the Notice of Intent and accompanying plans.
74. The maintenance or repair, by the property owner of record or designee, of detention basins, supporting drainage systems, stormwater management best management practices, other than those in the public way shall be the responsibility of the applicant/property owner. The design capacity, storm water management treatment capacity and structural integrity of these facilities must be maintained.
75. Stabilized slopes must be maintained as designed and constructed by the property owner of record, whether "bioengineered" or mechanically-stabilized slopes.

LONG TERM MONITORING-CULVERT /SWALE CLEANING

76. Accumulated sediments from drainage culverts, stream channels, and swales, is to be removed thereby restoring the hydraulic capacities of those structures so that they can continue to prevent flooding, protect public health and property, and prevent pollution and sedimentation of wetland resource areas.

77. The work undertaken at each location will be minimized to the extent possible while still achieving the goals of flood control and pollution prevention.
78. Work will be scheduled to avoid periods of high groundwater or high flow rates.
79. Silts and sediments may be removed either by hand, or by a suction line.
- ~~80. Excavation of sediments shall be limited to the historic limits of the swale or channel. Over excavation beyond the bottom of the pipe or culvert will not be allowed.~~
- ~~81. Where evidence of scour or erosion is apparent, stone rip rap may be added to shore up the earth and prevent further erosion.~~
- ~~82. Where evidence of scour or erosion is apparent at the end of a drainage pipe, a flared end section of similar material may be installed to dissipate energy and prevent erosion.~~
- ~~83. Where evidence of excessive sedimentation from storm drains is apparent, a sediment forebay (and possibly a check dam) may be constructed, with approval of the Conservation Commission to prevent sediments from reaching resource areas in the future. This area would be vegetated appropriately and/or reinforced with stone rip rap, turf reinforcing mats, or similar methods.~~
84. There shall be no increase in impervious area beyond that permitted. There shall be no loss of wetland resource area or degradation of resource area values. Swales and stream channels shall not be paved. Natural stream banks shall not be replaced with man-made structures.
85. Vegetation removal will only be done where the vegetation interferes with the performance or maintenance of the stormwater/drainage structure. Plant and tree roots will be left in place for erosion control and bank stabilization unless they would otherwise be removed along with sediments.

Stormwater Management

86. All construction and post-construction stormwater management must be conducted in accordance with supporting documents submitted with the Notice of Intent, the Department of Environmental Protection Stormwater Management Policy and as approved by the Commission in this Order of Conditions
87. An annual maintenance report shall be provided to the Conservation Commission by June 1st of each year reporting on the maintenance and operation procedures, which have been met for that year. This reporting requirement will follow the issuance of a Certificate of Compliance.
88. The installation of all stormwater/drainage structures shall be witnessed by a Registered Professional Engineer (Civil). The engineer shall submit documentation to the Conservation Commission stating that he witnessed the installation of the drainage components and that each was installed correctly and in accordance with the manufacturer's specifications.
89. In the event that groundwater is encountered during the installation of the infiltration structures, the applicant must contact the Conservation Commission immediately to discuss alternative designs/solutions.
90. There shall be no increase in the post-development discharges from the storm drainage system or any other changes in post-development conditions that alter the post-development watershed boundaries as currently

depicted in the notice of Intent and approved by this Order of Conditions, unless specifically approved in writing by the Commission.

91. There must be no sedimentation into wetlands or water bodies from discharge pipes or surface runoff leaving the site.
92. Forebay – Forebays shall be inspected and cleaned at least four times annually, beginning in the early spring after snow melt. Accumulated sediments, leaves, branches, and other debris shall be removed and disposed of in accordance with all applicable federal, state, and local laws. Vegetated and rip-rapped surfaces and flared end sections shall be repaired or replaced as needed to prevent erosion and sedimentation and slumping of berms. Vegetation shall be mowed at least once a year to prevent the growth of woody species.
93. Bioretention infiltration basin – The basin shall be inspected and cleaned at least twice annually, in the early spring after snow melt and in the fall. Accumulated sediments, leaves, branches, and other debris shall be removed and disposed of in accordance with all applicable federal, state, and local laws. Vegetated and rip-rapped surfaces and flared end sections shall be repaired or replaced as needed to prevent erosion and sedimentation and slumping of berms. Vegetation shall be mowed at least once a year to prevent the growth of woody species. At least once a year, the basin shall be monitored during a heavy rain storm to determine whether it is meeting the intended detention times, sediment removal, and infiltration functions.
94. Outlet control structure and spillway – The outlet structures for the detention basin shall be inspected at least twice annually for evidence of clogging, scouring, slumping, erosion or other problems and shall be cleaned and repaired as needed to maintain proper functioning. The outlet shall also be inspected at least annually during a heavy rain storm to detect any problems in function. Any problems shall be corrected.
95. The Conservation Commission and the Conservation agent shall have the right to enter the roadway parcel and drainage easement area to inspect for compliance with these conditions.
96. All infiltration systems shall include suitable access points, brought to finish grade, to provide for the inspection and cleaning of the infiltration system. Access ports shall have a minimum diameter of 12-inches.
97. The Applicant and subsequent owners must operate and maintain all stormwater BMPs in accordance with the design plans and the O&M Plan. This condition must remain in perpetuity, and must be recorded as such on the Certificate of Compliance.
 - a. The Applicant/owner must maintain an operation and maintenance log of inspections, repairs, maintenance and/or replacement of the stormwater management system or any part thereof, and disposal (for disposal the log shall indicate the type of material and the disposal location)
 - b. The Applicant/owner shall submit to the Commission, the maintenance log for the first year of operation after construction is complete. The Commission will not issue a full Certificate of Compliance until the Conditions is complied with.

INVASIVE PLANT CONTROL

98. Because invasive species establish and thrive in disturbed areas, to the extent feasible, all soil and vegetation disturbance on site must be minimized, and existing native vegetation must remain intact.
99. All fill brought on site must be clean, debris free, and devoid of invasive plants or their parts or seeds.
100. Introduction of invasives or spread of invasives on site must be the responsibility of the contractor to remediate.

101. The location of haybales on site is prohibited. Erosion controls may include staked weed-free products, subject to approval by the Commission.
102. Any soil areas which will remain exposed for longer than 30 days must be mulched or covered with a short-lived (incapable of reseeding) annual herbaceous cover crop.
103. Any soil stockpiles that will remain on site for longer than two weeks must either be fully covered with an impermeable material, or seeded with a short-lived (incapable of reseeding) annual herbaceous cover crop.
104. In addition to erosion controls, orange construction fencing is strongly encouraged to protect existing vegetated areas.
105. No plants listed on the latest Massachusetts Department of Agricultural Resources Prohibited Plant List (available at http://www.mass.gov/agr/farmproducts/Prohibited_Plant_Index2.htm) may be brought onto or planted anywhere on the property.
106. All construction vehicles must be cleaned of accumulated soil or plant matter from other sites prior to entering the site, through washing, brooming, or another method approved in advance by the Conservation Commission.
107. In order to prevent the spread of invasive species from one portion of the project site to another, construction vehicles may not enter locations infested with invasive species. If this is unavoidable, vehicles must be washed or broomed clean prior to leaving the infested portion of the site.

VERNAL POOL PROTECTION

HABITAT PROTECTION

CONDITIONS TO EXIST IN PERPETUITY

108. Conditions numbered 76-111 shall apply in perpetuity and do not expire with the issuance of a Certificate of Compliance.
109. Only slow-release organic granular type fertilizers shall be used within the wetland buffer zone. This condition shall survive the expiration of this Order, and shall be included as a continuing condition in perpetuity on the Certificate of Compliance.
110. Dumping Prohibited: There must be no dumping of leaves, grass clippings, brush, or other debris into the wetland or stream/body of water. This condition must survive the expiration of this Order, and must be included as a continuing condition in perpetuity on the Certificate of Compliance.
111. Additional Alteration Prohibited: There must be no additional alterations of areas under Conservation Commission jurisdiction without the required review and permit(s). This condition must survive the expiration of this Order, and must be included as a continuing condition in perpetuity on the Certificate of Compliance.

MITIGATION AND REPLICATION CONDITIONS

112. The wetland mitigation shall be performed in accordance with the Plans referenced above, including the Planting Plan dated Mar 9, 2020, unless specified otherwise in this Order. The Commission reserves the right to require additional plantings to ensure achievement of 75% cover of wetland plant species within two full growing seasons, as specified in 310 CMR 10.55 (4) (b) and (section of local bylaw and regulations).

- ~~113. The wetland resource areas to be altered shall not be altered until development of the replication area is in progress and the proposed replication area is excavated to the proposed base grade. The wetland replication area shall be brought to the approximate surface elevation of the existing adjacent wetland area with ___ inches of organic soil removed from the area of filling or a clean A Horizon loam.~~
- ~~114. Replication of vegetation shall be 'in-kind', i.e. generally similar to the area lost in terms of species composition, and cover and structure of dominant species, unless modified by the Commission. Only native plant species found on the site may be placed in the replacement area.~~
- ~~115. The Commission must be given 48 hours notice prior to the beginning of construction of the replacement area. The project proponents must meet with the wetland specialists/peer review/monitor to discuss the requirement and to ensure compliance with all mitigation and replication plans and special conditions.~~
- ~~116. The replication area shall be constructed in the following manner:~~
- ~~a. Prior to excavation of the proposed replication area, proposed grades shall be staked by licensed land surveyors, indicating cuts necessary to achieve grades as shown on the plans. The extent of cut should include necessary over excavation to allow for backfill of organic or clean loam materials.~~
 - ~~b. Plants from the altered wetland areas shall be transplanted in their original organic material to the replacement area. Wetland plants shall be carefully dug with attention given to the root system, balled and/or burlapped in a professional manner, and temporarily stored in a shady area and watered on a daily basis.~~
 - ~~c. The topsoil from the replication area shall be stockpiled separately from other soils for reuse in the replication area.~~
 - ~~d. The area shall be excavated and graded to a depth of at least ___ inches below the proposed contours shown on the site plan.~~
 - ~~e. The adjacent slopes shall be graded as shown on the plan with the topsoil again stockpiled.~~
 - ~~f. All stockpiled soils shall be isolated from wetland resource areas and protected with plastic or canvas from erosion or drying.~~
 - ~~g. Stockpiled organic soils shall then be placed on the replication site. (Ideally, wetland soils shall be placed in the replication area in such a way as to reproduce the original soil horizons.)~~
 - ~~h. Prior to planting or seeding, final grades shall be approved by the replication monitor and surveyed by licensed land surveyors to ensure that grades have been achieved as shown on the plan.~~
 - ~~i. The upper layer of the replacement area shall consist of soil, plants, plant propagules removed from the wetland to be filled, and other approved plant materials as described on a re-vegetation plan.~~
- ~~117. Mitigation activities must be supervised by a wetland specialist who shall be a professional with experience in wetland replication, wetland hydrology and a working knowledge of botany. Such a person shall be retained to supervise and monitor mitigation until the area meets the requirements of this Order of Conditions.~~
- ~~118. Siltation barriers shall be placed at the perimeter of the replication area and at the top of any unstabilized adjacent slope. These will remain in place and be maintained until all areas are completely stabilized.~~
- ~~119. The siltation barriers shall serve as a limit of work delineation for project activities. No disturbance to adjacent wetland resource areas resulting from work on the project shall occur during or after construction of the replication area.~~
- ~~120. Following construction of the replication area and prior to other work on the site, the wetland specialist shall~~

~~certify to the Commission that the area has been constructed in compliance with the Order of Condition. Such certification shall be accompanied by a plan showing the limits of the replication area and final grades as surveyed by a licensed land surveyor, which meet grades shown on the plans approved in this Order of Conditions.~~

- ~~121. Quantitative data indicating the status of the project with respect to the performance standards and pertinent conditions of the Order of Conditions, shall be submitted to the Commission at 3 month intervals until a Certificate of Compliance is issued. The initial report shall also include: excavation date and process, wetland soil depth, any planting and replanting dates. (3 months allows for repair or replanting if needed during the process, so that the final approved replication area is not delayed)~~ Page 16
- ~~122. Seasonal monitoring reports shall be prepared for each wetland replication area. Monitoring reports shall describe, using narratives, plans, and color photographs, the physical characteristics of the wetland replication areas with respect to stability, soil characteristics, survival of vegetation and plant mortality, aerial extent and distribution, species diversity and vertical stratification (i.e. herb, shrub and tree layers). A total of four monitoring reports for each replication area shall be submitted over a two year period. The monitoring reports shall be submitted for the growing season.~~
- ~~123. Written reports shall be submitted to the Conservation Commission one week following the construction of the replacement wetland and restoration area and at regular intervals of at least every three months until a Certificate of Compliance is issued. The reports shall describe the hydrologic conditions of the restoration area, wetland vegetation (species, coverage, and vigor) and any remedial work that may be necessary.~~
124. Any damage caused as a direct result of this project to any wetland resource areas shall be the responsibility of the **CONTRACTOR** to repair, restore and/or replace. Sedimentation or erosion into these areas shall be considered damage to wetland resource areas. If sediment reaches these areas the Commission shall be contacted and a plan for abatement of the problem and proposed restoration/mitigation measures shall be submitted for approval and implementation.
125. 75% of the surface area of the replacement area be re-established with indigenous wetland plant species within two growing seasons. This requirement is across species, (ex tree, shrub, ground cover and deciduous, evergreen) If monitoring data indicates that this objective cannot be met, a corrective plan of action must be submitted to the Commission for approval, and implemented under the supervision of a wetland specialist.
126. The Commission reserves the right to impose additional conditions on portions of this project to mitigate any impacts which in advertently result from wetland alteration or replication activities.
127. Under this Order of Conditions 120 sq. ft. of wetland will be altered and 301 sq. ft. of wetland is to be restored and replanted with wetlands vegetation upon completion.
128. If the growing season when the wetland restoration is to be done has passed, the area shall be heavily mulched. In the event that the seed base within the soil does not readily germinate (within one month during the growing season), the area must be seeded with a wetland plant seed mix, which must contain native plant seeds and be approved by the Conservation Commission or its agent.

This entire document must be recorded simultaneously. Proof of recording must be submitted to the Conservation Office prior to the commencement of any work associated with this Order.

Signature Date: approved by unanimous vote April 7, 2020, signatures are electronic and will be replaced with in-person signatures once the covid state of emergency is lifted.

Signatures:

DocuSigned by:

Bob McMackin

B261AD5F443349D...

DocuSigned by:

Ellen Markham

1350B1235E8C43F...

DocuSigned by:

[Signature]

by hand delivery on _____

Date

DocuSigned by:

Marynet Wahl

A50109E5034342F...

DocuSigned by:

Robert Woodill

DF4D2861BEDB4D8...

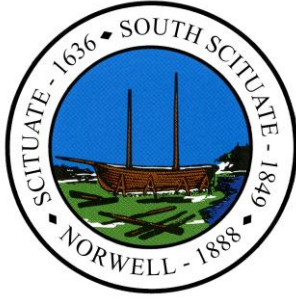
emailed 5/15/2020

by certified mail, return receipt requested, on _____

Date

F. Appeals

Appeals of any decision under the Norwell Wetlands Protection Bylaw, Article XVI-a shall be made to the Superior Court within 60 days of the issuance of the Order of Conditions. This is a separate appeal procedure from the Department of Environmental Protection (DEP). See WPA Form 5 for information on appeals under the Wetlands Protection Act.



**TOWN OF NORWELL
CONSERVATION COMMISSION**

345 Main Street
Norwell, MA 02061-0295
(781) 659 - 8022

February 10, 2021

To: Ken Kirkland
Norwell Town Planner

**RE: Request for Minor Modification to the Order of Conditions (SE52-1193: NCC# 8{20})
Wompatuck State Park Access**

The Norwell Conservation Commission reviewed the suggested revisions to the January 2021 plans from Horsley Witten Group, Inc. requesting a site modification to the approved Wompatuck State Park Access Driveway, Parking, Trailhead, and Path. The Minor Modification consists of grading the path leading up to and away from the wetland crossing to meet AAB standards. The Commission voted during their special joint meeting with the Norwell Pathway Committee of February 8, 2021 to approve the modification as a minor change.

The Commission considers this a minor change that does not require an Amended Order of Conditions. The changes must be depicted on the As-Built Plan you will submit to the Commission upon completion of this project. The As-Built will be necessary to acquire a Certificate of Compliance.

If you have any further requests, questions or concerns, please contact me at 781-659-8022 or at wsaunders@townofnorwell.net.

Sincerely,

Will Saunders
Norwell Conservation Agent