



# Contract Documents & Technical Specifications

For  
**Middle Road Reconstruction 2017**

Prepared for:  
**Town of Falmouth, Maine**



Prepared by:  
Sebago Technics, Inc.  
75 John Roberts Road, Suite 1A  
South Portland, Maine 04106

April 2017  
15399



## TABLE OF CONTENTS

### BIDDING AND CONTRACT REQUIREMENTS

- Notice to Contractors
- Instructions to Bidders
- Bidder's Proposal
- Notice of Award
- Agreement
- Notice to Proceed
- Performance Bond
- Payment Bond
- Application for Payment
- Change Order
- General Conditions
- Supplementary General Conditions

### DIVISION 1 – GENERAL REQUIREMENTS

01010	General Summary of Work
01026	Measurement and Payment
01090	Reference Standards and Definitions
01300	Submittals
01400	Quality Control
01500	Construction Facilities and Temporary Controls
01505	Mobilization
01560	Temporary Controls
01570	Traffic Control and Signage
01600	Material and Equipment
01700	Contract Close-out

### TECHNICAL SPECIFICATIONS

### DIVISION 2 – SITE WORK

02110	Site Clearing
02140	Dewatering
02202	Rock Excavation
02211	Rough Grading
02218	Landscape Grading
02222	Excavation
02223	Backfilling
02224	Boring Information – See Appendix B
02225	Trenching
02260	Filter Fabric
02300	Road and Street Reconstruction
02513	Asphalt Concrete Paving

02525	Slipform Concrete Paving
02660	Water Distribution – See Appendix A
02720	Storm Sewerage Conveyance Systems
02735	Manholes, Structures, Covers, and Frames
02800	Hand Labor and Equipment Rental
02901	Miscellaneous Work Items and Cleanup
02936	Seeding
02950	Sedimentation and Erosion Control Measures

Appendix A – Portland Water District Contract Documents for Water System Alterations

Appendix B – February 11, 2016 Geotechnical Engineering Report by S.W. Cole Engineering, Inc.

END OF TABLE OF CONTENTS

<p style="text-align: center;"><b>Notice to Contractors</b> <b>Middle Road Reconstruction Improvements - 2017</b> <b>Town of Falmouth, Maine</b></p>
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**1. Receipt of Bids**

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The Town of Falmouth, 101 Woods Road, Falmouth, Maine will accept sealed bids at the Public Works Office until 11:00 AM, prevailing local time, on May 11, 2017 at which time the bids will be opened and read aloud.

**2. Project**

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In general, the project involves the full-depth reconstruction improvements to a 3,423 linear foot portion of Middle Road starting at a point 100 feet southerly of the Salty Dog Way (aka Dadileao Road) intersection and extending northerly to the Town of Cumberland municipal line, including approximately 1,200 linear feet of drainage pipe; 3 precast catch basin structures; 1,200 linear feet of concrete curb; 8,800 cubic yards of excavation including pavement removal; 6,200 cubic yards of aggregates; 2,600 tons of Hot Mix Asphalt; the renewal of 230 linear feet of 8-inch water main; the renewal of 650 linear feet of 12-inch water main; and other related items.

**3. Bid Bond**

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A certified check or bank draft payable to the Town of Falmouth or a satisfactory Bid Bond executed by the Bidder and a Surety company in the amount equal to five percent (5%) of the bid shall be submitted with each Bid.

**4. Award of Contract**

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The Owner reserves the right to reject any or all bids, negotiate with the successful bidder for a reduced scope of work, and to waive any irregularities in the bidding process. The successful bidder will be required to furnish the necessary Performance and Payment Bonds and Insurance Certificates. Bonds shall be in the amount of 100 percent of the contract price.

**5. Project Completion**

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The project must be completed within 120 calendar days from the commencement of construction. Project construction can begin on or before June 19, 2017 and no later than July 17, 2017.

**6. Pre-Bid Meeting**

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A pre-bid non-mandatory meeting will be held 11:00 AM, April 26, 2017 at the Town of Falmouth Public Works Office, 101 Woods Road.

**7. Plan Availability**

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The contract documents may be viewed at the following location: Falmouth Public Works Department, 101 Woods Road, Falmouth, Maine.

Copies of the Contract Documents may be obtained only at Sebago Technics, Inc. located at 75 John Roberts Road in South Portland, Maine on or after April 17, 2017 upon payment of \$150.00 non-refundable, for each set picked up. **Checks should be made payable to Sebago Technics, Inc.**



## INSTRUCTION TO BIDDERS

### ***1. Defined Terms***

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Terms used in these Instructions to Bidders which are defined in the General Conditions of the Construction Contract, have the meanings assigned to them in the General Conditions. The term "Successful Bidder" means the lowest, qualified, responsible Bidder to whom Owner on the basis of Owner's evaluation as hereinafter provided) makes an award. The term "Bidding Documents" includes the Invitation to Bid, Instructions to Bidders, the Bid Form, and the proposed Contract Documents (including all Addenda issued prior to receipt of Bids).

### ***2. Copies of Bidding Documents***

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- 2.1. Complete sets of the Bidding Documents may be obtained from the Engineer.
- 2.2. Complete sets of bidding Documents shall be used in preparing bids; neither Owner nor Engineer assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of bidding Documents.
- 2.3. Owner and Engineer in making copies of Bidding Documents available on the above terms do so only for the purpose of obtaining bids on the work and do not confer a license or grant for any other use.

### ***3. Qualifications of Bidders***

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To demonstrate qualifications to perform the Work, each Bidder must be prepared to submit within five days of Owner's request written evidence, such as financial data, previous experience, present commitments and other such data as *may* be requested by the Owner. Each bid must contain evidence of Bidder's qualification to do business in the state where the Project is located or covenant to obtain such qualification prior to award of the contract.

### ***4. Examination of Contract Documents and Site***

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- 4.1. It is the responsibility of each Bidder before submitting a Bid, to:
  - (a) examine the Contract Documents thoroughly;
  - (b) visit the site to become familiar with local conditions that *may* in any manner affect cost, progress, performance or furnishing of the work;
  - (c) consider federal, state and local laws, ordinances, rules and regulations that may in any manner affect cost, progress, performance or furnishing of the Work;
  - (d) study and carefully correlate Bidder's observations with the Contract Documents and

- (e) notify Engineer of all conflicts, errors or discrepancies in the Contract Documents.
- 4.2. Before submitting a Bid, each Bidder will be responsible to make or obtain such explorations, tests and data concerning physical conditions (surface, subsurface and Underground Facilities) at or contiguous to the site, or otherwise which may affect cost, progress, performance or furnishing of the work and which Bidder deems necessary to determine its Bid for performing and furnishing the Work in accordance with the time, price and other terms and conditions of the Contract Documents.
- 4.3. On request in advance, Owner will provide each Bidder access to the site to conduct such explorations and tests as each Bidder deems necessary for submission of a Bid. Bidder shall fill all holes, clean up, and restore the site to its former conditions upon completion of such explorations.
- 4.4. The lands upon which the Work is to be performed, rights-of-way and easements for access thereto and other lands designated for use by Contractor in performing the Work are identified in the Contract Documents. All additional lands and access thereto required for temporary construction facilities or storage materials and equipment are to be provided by Contractor. Easements for permanent structures or permanent changes in existing structures are to be obtained and paid for by Owner unless otherwise provided in the Contract Documents.
- 4.5. The submission of a bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article 4, that without exception the Bid is premised upon performing and furnishing the Work required by the Contract Documents and such means, methods, techniques, sequences or procedures of construction as may be indicated in or required by the Contract Documents, and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance and furnishing of the work.

## **5. Interpretations and Addenda**

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- 5.1. No interpretation of the meaning of the plans, specifications, or other Contract Documents will be made to any bidder orally. Every request for such interpretation should be in writing and emailed electronically to:

Stephen D. Harding, P.E.  
sharding@sebagotechnics.com  
Sebago Technics, Inc.  
John Roberts Road, Suite 1A  
South Portland, Maine 04401

and to be given consideration, must be received by May 3, 2017. Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the specifications which, if issued, will be issued electronically by email,

with return receipt requested, to all prospective bidders, at the respective email addresses furnished for such purposes, not later than by May 5, 2017. Failure of any bidder to receive any such addendum or interpretation shall not relieve any bidder from any obligation under his bid as submitted. All addenda so issued shall become part of the Contract Documents.

## ***6. Bid Security***

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- 6.1. Each bid must be accompanied by Bid Security made payable to Owner in an amount of five percent of the Bidder's maximum Bid price and in the form of a certified or bank check or a bid bond (on form attached) issued by a surety meeting the requirements of Paragraph 5.1 of the General Conditions.
- 6.2. The Bid security of the Successful bidder will be retained until such Bidder has executed the Agreement and furnished the required contract security, whereupon the Bid security will be returned. If the Successful Bidder fails to execute the deliver the Agreement and furnish the required contract security within ten days after the Notice of Award, Owner may annul the Notice of Award and the bid security of that Bidder will be forfeited. The Bid security of other Bidders whom Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of the seventh day after the Effective Date of the Agreement or the thirty-first day after the Bid opening, whereupon bid security furnished by such Bidders will be returned. Bid security with Bids which are not competitive will be returned within seven days after the Bid opening.

## ***7. Contract Time***

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The numbers of days within which, or the dates by which, the work is to be substantially completed and also completed and ready for final payment (the Contract Time) are set forth in the Bid Form and the Agreement.

## ***8. Liquidated Damages***

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Provisions for liquidated damages are set forth in the Agreement.

## ***9. Substitute or "Or-Equal" Items***

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The Contract, if awarded, will be on the basis of material and equipment described in the Drawings or specified in the Specifications without consideration of possible substitute or "or-equal" items. Whenever it is indicated in the Drawings or specified in the Specifications that a substitute "or-equal" items of material or equipment may be furnished or used by Contractor if acceptable to Engineer, application for such acceptance will not be considered by Engineer until after the Effective Date of the Agreement. The procedure for submission of any application by Contractor and consideration by Engineer is set forth in paragraph 6.7 of the General Conditions and may be supplemented in the General Requirements.

## **10. Subcontractors, Suppliers and Others**

- 10.1. The apparent Successful Bidder, and any other Bidder so requested, will within five (5) days after the day of the Bid opening submit to Owner a list of all Subcontractors and other persons and organizations who are to furnish the principal items of material and equipment. Such list shall be accompanied by an experience statement with pertinent information as to similar projects and other evidence of qualification for each such Subcontractor, person and organization. If Owner or Engineer after due investigation has reasonable objection to any proposed Subcontractor, other person or organization, either may before giving the Notice of Award request the apparent Successful bidder to submit an acceptable substitute without an increase in Bid price. If the apparent Successful Bidder declines to make any such substitution, the contract may not be awarded to such Bidder, but his declining to make any substitution will not constitute grounds for sacrificing his Bid Security. Any Subcontractor, other person or organization so listed and to whom Owner or Engineer does not make written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer.
- 10.2. No Contractor shall be required to employ any Subcontractor, other person or organization against whom he has reasonable objection.

## **11. Bid Form**

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- 11.1. The Bid Form is attached hereto; additional copies may be obtained from Engineer.
- 11.2. All blanks on the bid Form must be completed in ink or by typewriter.
- 11.3. Bids by corporations must be executed in the corporate name by the president or a vice-president (or other corporate officer accompanied by evidence of authority to sign) and the corporate seal must be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation shall be shown below the signature.
- 11.4. Bids by partnerships must be executed in the partnership name and signed by a general partner, whose title must appear under the signature and the official address of the partnership must be shown below the signature.
- 11.5. All names must be typed or printed below the signature.
- 11.6. The Bid shall contain an acknowledgment of receipt of all Addenda (the numbers of which shall be filled in on the Bid Form).
- 11.7. The address and telephone number for communications regarding the Bid must be shown.

## **12. Submission of Bids**

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Bids shall be submitted at the time and place indicated in the Invitation to Bid and shall be included in an opaque sealed envelope, marked with the Project Title and name and address of the Bidder and accompanied by the Bid Security and other required documents. If the Bid is sent through the mail or other delivery system the sealed envelope shall be enclosed in a separate envelope with the notation "BID ENCLOSED" on the face of it.

## **13. Modification and Withdrawal of Bids**

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Bids may be modified or withdrawn by an appropriate document duly executed (in the manner that a Bid must be executed) and delivered to the place where Bids are to be submitted at any time prior to the opening of Bids.

## **14. Opening of Bids**

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Bids will be opened and read aloud publicly. An abstract of the amounts of the base Bids and major alternative (if any) will be made available to Bidders after the opening of Bids.

## **15. Bids to Remain Subject to Acceptance**

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All bids shall remain subject to acceptance for sixty (60) days after the day of the Bid opening, but Owner may, in its sole discretion, release any Bid and return the Bid Security prior to that date.

## **16. Award of Contract**

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16.1. Owner reserves the right to reject any and all Bids, to waive any and all informalities not involving price, time or changes in the Work and to negotiate contract terms with the Successful Bidder (not applicable to FHWA Contracts), and the right to disregard all nonconforming, nonresponsive, unbalanced or conditional Bids. Also, Owner reserves the right to reject the bid of any Bidder if Owner believes that it would not be in the best interest of the Project to make an award to that Bidder, whether because the Bid is not responsive or the Bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by Owner. Discrepancies in the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct SUM.

16.2. In evaluating Bids, Owner shall consider the qualifications of the Bidders, whether or not the Bids comply with the prescribed requirements, and alternates and unit prices if requested in the Bid Forms. It is the Owner's intent to accept priorities (if any are accepted) in the order in which they are listed in the Bid Form, but Owner may accept them in any order or combination.

- 16.3 Owner may consider the qualifications and experience of Subcontractors and other persons and organizations (including those who are to furnish the principal items of material or equipment) proposed for those portions of the Work as to which the identity of Subcontractors and other persons and organizations as may be required.
- 16.4. Owner may conduct such investigations as he deems necessary to assist in the evaluation of any Bid and to establish the responsibility, qualifications and financial ability of the Bidders, proposed Subcontractors, Suppliers and other persons and organizations to perform and furnish the Work in accordance with the Contract Documents to Owner's satisfaction within the prescribed time. Owner reserves the right to reject the Bid of any Bidder who does not pass any such evaluation to Owner's satisfaction.
- 16.5. If the Contract is to be awarded, it will be awarded to the lowest bidder whose evaluation by Owner indicates to Owner that the award will be in the best interests of the Project.
- 16.6 If the Contract is to be awarded, Owner will give the Successful Bidder a Notice of Award within sixty (60) days after the day of the Bid opening.

#### **17. Contract Security**

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The Successful Bidder shall furnish a Performance Bond and a Payment Bond, each in the amount of 100% of the contract price with a corporate surety approved by the Owner. When the Successful Bidder delivers the executed Agreement to the Owner it will be accompanied by the required Contract Security. A Maintenance Bond equal to 2% of the value of the completed contract will be required prior to final payment. The Owner reserves the right to change the form of the performance and payment bonds to meet local requirements.

Attorneys-in-fact who sign Bid Bonds or Payment Bonds and Performance Bonds must file with each bond a certified and effective dated copy of their power of attorney.

#### **18. Insurances**

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Contractors should obtain such construction insurance (i.e., fire and extended coverage, workman's compensation, public liability and property damage, and "all risk" builders insurance) as is customary and appropriate. Minimum insurances for which certificates will be required are defined in the general conditions of the contract.

#### **19. Signing of Agreement / Notice to Proceed**

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When Owner gives a Notice of Award to the Successful Bidder, it will be accompanied by at least three unsigned counterparts of the Agreement and all other Contract Documents. Within ten (10) days thereafter Contractor shall sign and deliver at least three counterparts of the Agreement to Owner with all other Contract Documents attached. Within fifteen

(15) days thereafter Owner will deliver one fully signed counterpart to Contractor. Each counterpart is to be accompanied by a complete set of the Drawings with appropriate identification.

Should the Owner not execute the Agreement within such period, the Bidder may by written notice withdraw his signed Agreement. Such notice of withdrawal shall be effective upon receipt of the notice of the Owner.

The Notice to Proceed shall be issued within 10 days of the execution of the Agreement by the Owner. Should there be reasons why the Notice to Proceed cannot be issued with such period, the time may be extended by mutual agreement between the Owner and Contractor. If the Notice to Proceed has not been issued within the 10-day period or within the period mutually agreed upon, the Contractor may terminate the Agreement without further liability on the part of either party.

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**20. Laws and Regulations**

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

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**21. Excessive Unit Quantities**

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The Bidder is advised that the approximate quantities given in the Bid Schedule represent the Engineer's Cost pre-construction estimate for the quantities anticipated under this Contract. In the event that the actual quantities encountered in the field exceed these stated on the Bid Schedule by more than a factor of 1.15, then the Owner reserves the right to negotiate the unit price with the Contractor to achieve a fair and reasonable unit price.

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**22. Regard for Private Property**

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Unless specific easements are obtained, the Contractor shall not enter any private property without the written permission of the property owner. If said permission is granted, the Contractor shall perform the work in a professional manner and leave the property in the state in which it was found. In no circumstances shall the contractor hold the Owner or Engineer liable for any damage to private property. The limits of this contract are the right-of-way lines as shown on the Contract Drawings.

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**23. Disposal of Excess Materials**

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Contractors should be aware that often residents or land owners in the project area may desire the fill material to be generated from the project. The Owner has no objection to the disposal of excess materials in this manner, but the contractor should be aware that it is done so at their risk. All relevant permits, if any, for the disposal of fill are the responsibility of the contractor. The Owner assumes no risk in this process.

**24. Traffic Regulation**

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In general, all roadways shall be opened to a minimum of one-way traffic at all times during school periods and shall abide by MDOT traffic regulation standards; closures outside school shall be at the discretion of the Owner. The contractor is responsible for providing flaggers and traffic control as needed to maintain a safe working environment. As always, emergency vehicles shall be given the necessary right-of-way or assistance in negotiating the construction area.

**25. Coordination with Others**

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The Contractor shall afford each utility owner and other contractor who is a party to such a direct contract (or Owner, if Owner is performing the additional work with Owner's employees) proper and safe access to the site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such work, and shall properly connect and coordinate the Work with theirs.

**26. Observance of Permits**

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Reserved

**27. Bid Bond**

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A certified check or bank draft payable to the OWNER or a satisfactory Bid Bond executed by the Bidder and a Surety Company in the amount equal to five percent (5%) of the Bid shall be submitted with each bid. No bid may be withdrawn for at least 60 days after receipt of bids unless released by the OWNER.

**28. Minority and Women Business Enterprise Requirements**

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Not Applicable

**29. Nondiscrimination in Employment and Labor Standards**

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Reserved

**30. Federal Requirements**

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Not Applicable

**31. Disclaimer**

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Reserved



### ***32. Bonding and Insurance***

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Each bidder must furnish a bid guarantee equivalent to 5 percent of the bid price. In addition the contractor awarded either a design/construct contract or a construction contract must furnish Performance and Payment bonds, each of which shall be in an amount not less than 100 percent of the contract price. Contractors should obtain such construction insurance (e.g., fire and extended coverage, workmen's compensation, public liability and property damage, and "all risk" builders risk) as is customary and appropriate .

### ***33. Manufacturers Experience***

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

### ***34. Sales Tax***

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This project is tax-exempt from State Sales and Use or Excise Taxes to the extent allowed by law.

### ***35. Wage Rates***

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State wage rates do not apply to this project.

### ***36. Safety and Health Regulations***

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This project is subject to all the Safety and Health Regulations (CFR 29 Part 1926 and all subsequent amendments} as promulgated by the US. Department of Labor on June 24, 1974. Contractors are urged to become familiar with the requirements of these regulations.

### ***37. Nondiscrimination in Employment and Labor Standards***

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Reserved

### ***38. Minority and Women Business Enterprise Requirements***

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Not Applicable

### ***39. Occupancy***

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The Owner also reserves the right to occupy certain finished portions of the work before final acceptance. If such right is exercised, the owner will assume all responsibility for his

damage to the structure, but assumption of such responsibility by the Owner in no way relieves the Contractor of his obligation as defined under the General Conditions.

#### ***40. Blasting***

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- 40.1 Blasting, if required, shall be performed only after approval has been given by the Owner for such operation.
- 40.2 All blasting shall be performed in accordance with all pertinent provisions of regulations adopted by the State of Maine. Blasting through the over burden will not be allowed.
- 40.3 The Contractor shall conduct a Pre-Blast Survey of all structures within the Blasting Area and provide the Engineer a written report of the Pre-Blast Survey.
- 40.4 The Contractor shall provide the Engineer with a Blasting Log for the work. The Blasting Log shall contain the following information:
  - 1. Location
  - 2. Time and date
  - 3. Number of holes
  - 4. Amount and type of explosives used per hole
  - 5. The names of persons, companies, corporations, or public utilities contacted, owning, leasing, or occupying property or structures in proximity to the site of the work of the Contractor's intention to use explosives.
- 40.5 Drilling equipment will be equipped with suitable dust control apparatus which must be kept in repair and used during all drilling operations.

#### ***41. Construction Safety Rules and Regulations***

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- 41.1 The operations of the Contractor shall be governed by the construction safety rules and regulations as adopted by the Board of Construction Safety, Augusta, Maine, and in particular parts A to M.
- 41.2 All equipment used on the project must be maintained and operated so as to provide maximum safety for workers and the public. The Contractor will be required to have adequate exhaust silencers on all powered equipment in close proximity to residential structures.
- 41.3 This project is subject to all of the Safety and Health Regulations (CFR 29 Part 1926 and all subsequent amendments) as promulgated by the U.S. Department of Labor on June 24, 1974. Contractors are urged to make themselves familiar with the requirements of these regulations.

#### ***42. Workmanship***

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Workmanship shall, at all times, be of a grade expected from skilled mechanics in each trade. Fitting of all materials shall be done to preserve the strength and durability of the materials and to present a clean, well worked appearance. The standards of all work shall be such as to produce first class results throughout. Where different materials abut, or where it is necessary to cut or pass through one material with another, care must be taken not to injure or deface one material in placing the other. Various trades shall, at all times, cooperate in the installation of their work to complete the whole in a satisfactory, acceptable manner.

#### ***43. Overtime Work***

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If, in the opinion of the Engineer, the progress of the work is such that the completion date of the Contract cannot be met for causes other than those provided in the General Conditions, he may request the Contractor to work additional men, additional hours, or both. The cost of all such overtime shall be borne by the Contractor.

#### ***44. Handling Materials***

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The Contractor, or his subcontractors, shall be responsible for the proper care and protection of all of his materials, equipment, etc., during transportation and after delivery at the site. The Contractor and each subcontractor shall handle all material as directed so that it may be inspected by the Engineer. All materials capable of being injuriously affected by weather shall be protected from injury while being transported to the site as well as while being stored there.

#### ***45. Protection from Inclement Weather***

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The Contractor shall take such action as may be required to protect labor, materials, and equipment including the land, trench, and appurtenances in any way connected with the project, from the effect of extremes of heat and cold, wind and rain; and other climatological conditions. Such actions by the Contractor shall meet the requirements of the Engineer. Special attention will be given to protection of concrete from freezing laying of pipe in frozen ground, protecting the clay subgrades by proper drainage and covering with sand shells in advance of inclement weather, etc.

#### ***46. Protection of Utilities***

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Prior to commencement of work, the Contractor, by careful examination, must make himself familiar with all utilities in the work area, both underground and overhead. The locations shown on the Plan are based on the best information available, but the Owner and the Engineer do not warrant their accuracy in either horizontal or vertical locations, nor do they warrant that all existing utilities are shown. Certain relocation work may be

required by existing utilities to allow installation of the work of this Contract. The Contractor shall make arrangements with such utilities for proper on-site coordination of construction. During construction, the Contractor shall carefully protect all utilities from damage, and will notify appropriate representatives of utilities when work is to be accomplished in proximity to their facilities. The Contractor shall be fully responsible for any damage to existing utilities.

#### ***47. Environmental Requirement***

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- 47.1 The Contractor shall include in the appropriate contract bid items costs for compliance with State and local environmental protection requirements including, but not limited to, the following:
  - 47.1.1 Control of dust from excavations and spillage of materials on highways and dust from rock drilling operations.
  - 47.1.2 Compliance with local ordinances on burning.
  - 47.1.3 Control of erosion and washing of materials from excavated slopes and embankments.
  - 47.1.4 Prevention of stream turbidity from dewatering and general earthwork operation.
- 47.2 In general, construction of necessary temporary erosion and sedimentation control devices will be in conformance with the best management practices adopted by the State of Maine Department of Environmental Protection or subsequent revisions thereto.

#### ***48. Temporary Enclosures and Facilities***

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The Contractor shall provide such temporary enclosures as the work may warrant. In addition, he shall provide the necessary temporary office, heat, utilities, telephone, and sanitary facilities, as required by the job, the Contractor, or the Engineer.

#### ***49. Statutory Requirements in General***

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- 49.1 The Contractor shall keep himself fully informed of all existing and future State and Federal laws and municipal ordinances and regulations in any manner affecting those engaged or employed in the work, or the materials used or employed in the work, or in any way affecting the conduct of the work, and of all such orders and decrees having any jurisdiction or authority over the same and of all provisions required by law to be a part of this Contract, all of which provisions are hereby incorporated by reference and made a part thereof. If any discrepancy or inconsistency is discovered in the Drawings or Specifications or Contract for this

work in relation to any such law, ordinance, regulation, order or decree, he shall report the same to the Engineer in writing.

- 49.2 He shall at all times himself observe and comply with, and shall cause all his agents and employees to observe and comply with all such existing and future laws, ordinances, regulations, orders and decrees; and shall protect and indemnify the owner and Engineer and all of their officers, agents and servants against any claim or liability arising from or based on the violation of such law, ordinance, regulation, order or decree, whether by himself or his employees' subcontractors.

#### **50. Responsibility for Damage Claims**

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- 50.1 The Contractor and his surety shall indemnify and save harmless the Owner, his officers and employees, from all suits, actions, or claims of any character brought because of any injuries or damage received or sustained by any person, persons, or property on account of the operations of the said Contractor; or on account of or in consequence of any neglect in safeguarding the work; or through use of unacceptable materials in construction of the work; or because of any act or omission, neglect, or misconduct of said Contractor; or because of any claims or amounts recovered from any infringements of patent, trademark, or copyright; or from any claims or amounts arising or recovered under the "Workmen's Compensation Act", or of any other law, ordinance, order or decree; and so much of the money due the said Contractor under and by virtue of his contract as shall be considered necessary by the Owner for such purpose, may be retained; or in case no money is due, his surety may be held until such suits or suit, action or actions, claim or claims, for injuries or damages as aforesaid shall have been settled and suitable evidence to that effect furnished to the Owner.
- 50.2 The Contractor shall promptly pay all bills for labor, materials, machinery, water, tools, equipment, trucks, automobiles, freight, fuel, light, and power and for all other things, contracted for or used by him on account of the work herein contemplated, and if at any time during the progress of the work or before final payment of any money due the Contractor under the terms of this Contract, any claim for labor, materials, water, tools, equipment, trucks, automobiles, freight, fuel, light, and power, or for any other things specified as aforesaid, or for damage by reason of any acts, omissions, or neglect of said Contractor in the prosecution of the work, shall be presented to said Owner, the Owner may retain such sum or sums from the monies due the Contractor under this Contract as would be necessary to discharge all claims whether for labor, materials, or damages as aforesaid, and until the validity of such claims shall be established and finally determined, and if determined and finally established as valid, all such claims shall be paid from the amount so retained if it be sufficient for that purpose; otherwise, or if at any time the Owner shall be satisfied that any of such claims are invalid and groundless, any amount so retained shall be paid to said Contractor, or in case of default of Contract to the Contractor's surety, and the said owner shall not be

liable to any individual, firm, or party if he does not hold and retain any money due under this Contract for the purpose of payment of such claim.

- 50.3 If the monies so retained under this Contract are insufficient to pay all such claims presented to said Owner and adjudged by any court of competent jurisdiction to be valid obligations of said Contractor, the Owner may at its discretion pay the same and the Contractor shall repay the Owner all sums so paid. The Owner, at its option, may also use any monies due or to become due under this Contract for the Purpose of Paying any claims Presented to said Owner. Should the Contractor neglect to Pay any undisputed claim, made in writing to the owner, within thirty (30) days after the completion of the work, but continuing unsatisfied for a period of ninety (90) days, the Owner may pay such claim and deduct the amount thereof from the balance due the Contractor.

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***51. Sanitary Regulations***

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- 51.1 Sanitary conveniences, in sufficient numbers, for the use of all persons employed on the work, and properly screened from public observation, shall be provided and maintained at suitable locations, in accordance with State and local ordinances. When no longer required, they shall be removed from the site and the contents shall be removed and disposed of in a satisfactory manner, as the occasion requires. The Contractor shall rigorously enforce the use of the approved sanitary facilities provided.
- 51.2 The Contractor shall supply sufficient drinking water to all his employees from approved sources. He shall obey and enforce other local sanitary regulations and orders, and shall take such precautions against infectious diseases as may be deemed necessary.

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***52. Special Scheduling Requirements***

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Reserved

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***53. Maine Central Railroad Requirements***

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Not Applicable

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***54. Testing and Inspections***

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Contractor shall give the Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except the following:

- a) Tests related to submittals for approval of materials to be used in the project. Such costs for these tests are incidental to the Contract. Such inspections, tests, or approvals shall be performed by organizations acceptable to the Owner and Engineer.
- b) Tests related to quality control for paving.

#### **55. Start of Project**

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The contractor can commence work on or before June 19, 2017, but not later than July 15, 2017.

#### **56. Archaeological Information**

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Given the fact that the roadways to be excavated were already disturbed in the past, discovery of archeological material is regarded as unlikely. However, any recovered artifact will become the property of Town of Falmouth and the contract work in that area shall be halted until further investigation can be completed.

END OF INSTRUCTIONS TO BIDDERS

## BIDDER'S PROPOSAL

PROJECT IDENTIFICATION: Town of Falmouth  
Middle Road Reconstruction - 2017  
For the Town of Falmouth

CONTRACT IDENTIFICATION: Town of Falmouth  
Middle Road Reconstruction - 2017  
For the Town of Falmouth

THIS BID IS SUBMITTED TO: TOWN OF FALMOUTH PUBLIC WORKS DEPARTMENT  
101 WOODS ROAD  
FALMOUTH, MAINE 04105

NAME ADDRESS OF OWNER: TOWN OF FALMOUTH  
271 FALMOUTH ROAD  
FALMOUTH, MAINE 04105

1. The undersigned BIDDER proposes and agrees, if this BID is accepted, to enter into an agreement with the OWNER in the form included in the Contract Documents to perform and furnish all Work as specified or indicated in the Contract Documents for the Contract Price and within the Contract Time indicated in this BID and in accordance with the other terms and conditions of the Contract Documents.
2. BIDDER accepts all of the terms and conditions of the Advertisement or Bid Notice to Contractors and Instructions to Bidders. This Bid will remain subject to acceptance for one hundred twenty days after the day of BID opening. BIDDER will sign and submit the Agreement with the Bonds and other documents required by the Bidding Requirements within fifteen days after the date of OWNER's Notice of Award.
3. In submitting this BID, BIDDER represents, as more fully set forth in the Agreement, that:
  - (a) BIDDER has examined copies of all the Bidding Documents and of the following Addenda (receipt of all which is hereby acknowledged, **if no addenda has been received, write "NONE" below**):

Date	Number
_____	_____
_____	_____
_____	_____
_____	_____

- (b) BIDDER has familiarized itself with the nature and extent of the Contract Documents, work, site, locality, and all local conditions and laws and regulations that in any manner may affect cost, progress, performance or furnishing of the Work.



- (c) BIDDER has studied carefully all drawings of subsurface conditions and drawings of physical conditions and accepts the determination within the contract documents as to the extent of the technical data contained in such drawings upon which BIDDER is entitled to rely.
- (d) BIDDER has obtained and carefully studied (or assumes responsibility for obtaining and carefully studying) all such examinations, investigations, explorations, tests and studies (in addition to or to supplement those referred to in (c) above) which pertain to the subsurface or physical conditions at the site or otherwise may affect the cost, progress, performance or furnishing of the Work as the BIDDER considers necessary for the performance or furnishing of the Work at the contract price, within the contract time and in accordance with the other terms and conditions of the Contract Documents; and no additional examinations, investigations, explorations, tests, reports or similar information or data are or will be required by the BIDDER for such purposes.
- (e) BIDDER has reviewed and checked all information and data shown or indicated on the Contract Documents with respect to existing underground facilities at or contiguous to the site and assumes responsibility for the accurate location of said underground facilities. No additional examinations, investigations, explorations, tests, reports or similar information or data in respect of said underground facilities are or will be required by the BIDDER in order to perform and furnish the Work at the contract price, within the contract time, and in accordance with the other terms and conditions of the Contract Documents.
- (f) BIDDER has correlated the results of all such observations, examinations, investigations, explorations, tests, reports and studies with the terms and conditions of the Contract Documents.
- (g) BIDDER had given ENGINEER written notice of all conflicts, errors or discrepancies that it has discovered in the Contract Documents and the written resolution thereof by the ENGINEER is acceptable to the BIDDER.
- (h) This BID is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; BIDDER has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; BIDDER has not solicited or induced any person, firm or corporation to refrain from bidding; and BIDDER has not sought by collusion to obtain for itself any advantage over any other Bidder over OWNER.
- (i) The Bidder agrees to pay the Owner \$500.00 for each and every contract day that the work remains incomplete beyond the above specified time as provided in the General Conditions.

4. BIDDER will complete the Work for the prices set forth in the following Unit Price Schedule:

BID SCHEDULE  
UNIT PRICE SCHEDULE

NOTE: This Proposal shall be filled in by the Bidder, in ink, with the Unit Prices written in words and numerals and the extensions shall be made by the Bidder. For complete information concerning these items, see the Bidding Documents. Quantities are not guaranteed. Final payment will be based on actual quantities incorporated in or made necessary by the Work covered by the Contract.

Item Nos.	Approx. Quantity	Town of Falmouth Items and Unit Prices Bid	Unit Prices	Amount
1	Lump Sum 1	Mobilization  The Sum of \$ _____ _____ Per Lump Sum		
2	Cubic Yards 160	Trench Rock Excavation  The Sum of \$ _____ _____ Per Cubic Yard		
3	Cubic Yards 200	Mass Rock Excavation  The Sum of \$ _____ _____ Per Cubic Yard		
4	Lump Sum 1	Slope Alterations from Station 38+15 to 38+95 – Left Hand Side  The Sum of \$ _____ _____ Per Lump Sum		
5	Cubic Yards 8,785	Common Excavation  The Sum of \$ _____ _____ Per Cubic Yard		

Item Nos.	Approx. Quantity	Town of Falmouth Items and Unit Prices Bid	Unit Prices	Amount
6	Cubic Yards 5,215	Aggregate Subbase Gravel – MDOT Type D  The Sum of \$ _____ _____ Per Cubic Yard		
7	Cubic Yards 1,015	Aggregate Base Gravel – MDOT Type A  The Sum of \$ _____ _____ Per Cubic Yard		
8	Square Yards 615	Hot Bituminous Pavement Driveway Reconstruction - MDOT 9.5 mm  The Sum of \$ _____ _____ Per Square Yard		
9	Square Yards 720	Shim and Hot Bituminous Pavement Driveway Repair - MDOT 9.5 mm  The Sum of \$ _____ _____ Per Square Yard		
10	Tons 1,600	Hot Bituminous Base Pavement - MDOT 19 mm  The Sum of \$ _____ _____ Per Ton		
11	Tons 960	Hot Bituminous Surface Pavement - MDOT 9.5 mm  The Sum of \$ _____ _____ Per Ton		

Item Nos.	Approx. Quantity	Town of Falmouth Items and Unit Prices Bid	Unit Prices	Amount
12	Linear Feet 100	6-Inch HDPE Type B Perforated Underdrain  The Sum of \$ _____ _____ Per Linear Foot		
13	Linear Feet 341	12-inch HDPE Storm Drain  The Sum of \$ _____ _____ Per Linear Foot		
14	Linear Feet 271	12-inch HDPE Type C Perforated Pipe  The Sum of \$ _____ _____ Per Linear Foot		
15	Linear Feet 283	15-inch HDPE Storm Drain  The Sum of \$ _____ _____ Per Linear Foot		
16	Linear Feet 104	18-inch HDPE Storm Drain  The Sum of \$ _____ _____ Per Linear Foot		
17	Linear Feet 260	24-inch HDPE Storm Drain  The Sum of \$ _____ _____ Per Linear Foot		

Item Nos.	Approx. Quantity	Town of Falmouth Items and Unit Prices Bid	Unit Prices	Amount
18	Each 3	4-Foot Diameter Catch Basin  The Sum of \$ _____ _____ Per Each		
19	Linear Feet 200	Rip Rap Swale  The Sum of \$ _____ _____ Per Linear Foot		
20	Linear Feet 1,226	Vertical Concrete Slip Form Curb - Type 2  The Sum of \$ _____ _____ Per Linear Foot		
21	Lump Sum 1	Clearing including Tree and Stump Removal  The Sum of \$ _____ _____ Per Lump Sum		
22	Lump Sum 1	Plain Riprap  The Sum of \$ _____ _____ Per Lump Sum		
23	Lump Sum 1	Loam and Seed  The Sum of \$ _____ _____ Per Lump Sum		

Item Nos.	Approx. Quantity	Town of Falmouth Items and Unit Prices Bid	Unit Prices	Amount
24	Lump Sum 1	Flaggers  The Sum of \$ _____ _____ Per Lump Sum		
25	Lump Sum 1	Construction Signage and Traffic Control Devices  The Sum of \$ _____ _____ Per Lump Sum		
26	Lump Sum 1	Erosion Control  The Sum of \$ _____ _____ Per Lump Sum		
27	Lump Sum 1	4-inch Wide Double Yellow Centerline and 6-inch Wide White Fog Line (each side) Striping  The Sum of \$ _____ _____ Per Lump Sum		
28	Each 32	Mailbox  The Sum of \$ _____ _____ Per Each		
29	Lump Sum 1	Dust Control  The Sum of \$ _____ _____ Per Lump Sum		

Item Nos.	Approx. Quantity	Town of Falmouth Items and Unit Prices Bid	Unit Prices	Amount
30	Hours 40	Laborer, Straight Time  The Sum of \$ _____ _____ Per Each Hour		
31	Hours 20	Excavator  The Sum of \$ _____ _____ Per Each Hour		
32	Hours 20	Front End Loader  The Sum of \$ _____ _____ Per Each Hour		
33	Hours 20	Dump Truck  The Sum of \$ _____ _____ Per Each Hour		

Item Nos.	Approx. Quantity	Portland Water District Items and Unit Prices Bid	Unit Prices	Amount
W-1	Lump Sum 1	Temporary Water System  The Sum of \$ _____ _____ Per Lump Sum		
W-2	Linear Foot 650	12-Inch DI Water Main  The Sum of \$ _____ _____ Per Linear Foot		
W-3	Linear Foot 230	8-Inch DI Water Main  The Sum of \$ _____ _____ Per Linear Foot		
W-4	Each 3	12-Inch Gate Valve  The Sum of \$ _____ _____ Per Each		
W-5	Each 2	8-Inch Gate Valve  The Sum of \$ _____ _____ Per Each		
W-6	Each 1	12-Inch Cut-In Valve  The Sum of \$ _____ _____ Per Each		



Item Nos.	Approx. Quantity	Portland Water District Items and Unit Prices Bid	Unit Prices	Amount
W-7	Each 2	8-Inch Cut-In Valve  The Sum of \$ _____ _____ Per Each		
W-8	Each 1	1-Inch Copper Service - Short Side  The Sum of \$ _____ _____ Per Each		
W-9	Each 4	1-Inch Copper Service - Long Side  The Sum of \$ _____ _____ Per Each		
W-10	Each 1	1-Inch Air Valve Assembly  The Sum of \$ _____ _____ Per Each		
W-11	Each 2	Hydrant Assembly  The Sum of \$ _____ _____ Per Each		
W-12	Cubic Yard 300	Gravel Borrow  The Sum of \$ _____ _____ Per Cubic Yard		

Item Nos.	Approx. Quantity	Portland Water District Items and Unit Prices Bid	Unit Prices	Amount
W-13	Cubic Yard 500	Rock Removal The Sum of \$ _____ _____ Per Cubic Yard		
W-14	Hour 10	Foreman The Sum of \$ _____ _____ Per Each Hour		
W-15	Hour 20	Laborer The Sum of \$ _____ _____ Per Each Hour		
W-16	Hour 10	Excavator The Sum of \$ _____ _____ Per Each Hour		
W-17	Hour 10	Loader The Sum of \$ _____ _____ Per Each Hour		
W-18	Hour 10	Dump Truck The Sum of \$ _____ _____ Per Each Hour		

**TOTAL AMOUNT**      \$ \_\_\_\_\_

\_\_\_\_\_

*(Total amount of bid in words)*

Note: Should conditions be encountered which will require additional work items to be completed, these items will be compensated to the Contractor in accordance with the unit price bid for each item as in the contract.

5. BIDDER agrees that the Work
  - (a) Will start on or before June 19, 2017 and no later than July 17, 2017 and be substantially complete within the following time limits: 120 calendar days after the date when the Contract Time commences and completed for final payment within 14 calendar days after the punch list is provided to the contractor.
  - (b) Once started will be prosecuted continuously in an orderly progression to completion within the contract time stated above.
6. Communications concerning this BID shall be addressed to:  
  
The address of the BIDDER indicated below.  
  
The following address:
7. The terms used in this BID which are defined in the General Conditions of the Construction Contract included as part of the Contract Documents have the meanings assigned to them in the General Conditions.

Submitted on \_\_\_\_\_, 2017.

If BIDDER is:

*An Individual*

By \_\_\_\_\_  
(Type of Print Individual's Name) (Signature)

(SEAL)

doing business as \_\_\_\_\_

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

Phone No.: \_\_\_\_\_ License No. \_\_\_\_\_  
(If applicable)

*A Partnership*

By \_\_\_\_\_  
(Firm Name)

\_\_\_\_\_  
(General Partner)

(SEAL)

doing business as \_\_\_\_\_

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

Phone No.: \_\_\_\_\_ License No. \_\_\_\_\_  
(If applicable)

*A Corporation*

By \_\_\_\_\_  
(Corporation Name)

\_\_\_\_\_  
(State of Corporation)

By \_\_\_\_\_  
(Type of Print Name of Person Authorized to Sign) (Signature)

\_\_\_\_\_  
(Title)

(Corporate Seal)

Attest \_\_\_\_\_  
(Secretary)

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

\_\_\_\_\_  
Phone No.: \_\_\_\_\_ License No. \_\_\_\_\_  
(If applicable)

*A Joint Venture*

By \_\_\_\_\_  
(Type of Print Name of Person Authorized to Sign) (Signature)

\_\_\_\_\_  
(Address)

By \_\_\_\_\_  
(Type of Print Name of Person Authorized to Sign) (Signature)

\_\_\_\_\_  
(Address)

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

## INFORMATION REQUIRED OF BIDDERS

### LIST OF SUBCONTRACTORS

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The bidder shall list below the name and business address of each subcontractor who will perform work under this Bid in excess of one percent of the CONTRACTOR'S bid Price and shall also list the portion of the WORK which will be done by such subcontractor. After the opening of bids, no changes or substitutions will be allowed except as otherwise provided by law. The listing of more than one subcontractor for each item of the work to be performed with the words "and/or" will not be permitted. The Bidder's attention is directed to provision of paragraph entitled "Subcontractor Limitations" of the Supplementary General Conditions which stipulates the percent of WORK to be performed with the Bidder's own forces. Failure to comply with the requirement will rend the Bid non-responsive and may cause its rejection.

<b>Work to be Performed</b>	<b>License Number</b>	<b>Percent of Total Bid</b>	<b>Subcontractor's Name &amp; Address</b>

NOTE: Attach additional sheets if required.

<b>Notice of Award</b>
------------------------

**Description of Work: Middle Road Reconstruction – 2017**

This project is hereby awarded to:

The Owner has considered the Proposal submitted by your firm for the above project in response to its Notice and Instructions to Bidders dated April 2017.

It is in the best interest of the Owner to accept your proposal in the amount of:

You are hereby notified that your proposal has been accepted.

You are required by the Notice and Instructions to Bidders to execute the contract within ten days from the date of the delivery of this Notice of Award to you.

Dated this \_\_\_\_\_ day of \_\_\_\_\_, 2017

Town of Falmouth  
Owner

by: \_\_\_\_\_

\_\_\_\_\_  
Title

**Acceptance of Notice**

Receipt of the Notice of Award is  
hereby acknowledged:

This \_\_\_\_ day of \_\_\_\_\_, 2017.

by: \_\_\_\_\_

\_\_\_\_\_  
Title

<b>Agreement</b>
------------------

THIS AGREEMENT is dated as of the \_\_\_\_\_ day of \_\_\_\_\_ in the year 2017 by and between the Town of Falmouth (hereinafter called the Owner) and \_\_\_\_\_ (hereinafter called the Contractor). Owner and Contractor in consideration of the mutual covenants hereinafter set forth, agree as follows:

**ARTICLE 1. WORK**

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Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

**ARTICLE 2. ENGINEER**

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The Engineer is to act as Owner's representative, assuming all duties and responsibilities and have the rights and authority assigned to Engineer in the Contract Documents in connection with completion of the Work in accordance with the Contract Documents.

**ARTICLE 3. CONTRACT TIME**

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- 3.1. The Work will be substantially completed within One Hundred Ten (110) days from the date when the Contract Time commences to run as provided in paragraph 2.3 of the General conditions, and completed and ready for final payment in accordance with paragraph 14.13 of the General Conditions within One Hundred Twenty (120) days from the date when the Contract time commences to run.
- 3.2. Liquidated Damages. Owner and Contractor recognize that time is of the essence of the this agreement and the Owner will suffer financial loss if the Work is not complete within the time specified in Article 3.1, plus any extensions of time agreed to by both parties in accordance with Article 12 of the General Conditions. They also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by the Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for each delay (but not as a penalty) Contractor shall pay owner Five Hundred (\$500.00) dollars for each day that expires after the time specified in paragraph 3.1 for completion and readiness for final payment.

**ARTICLE 4 CONTRACT PRICE**

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Owner shall pay Contractor for performance of the Work in accordance with the Contract Documents in current funds as follows:

Lump sum and unit prices as shown on the attachment.



## **ARTICLE 5. PAYMENT PROCEDURES**

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Contractor shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.

5.1. Progress Payments. Owner shall make progress payments on account of the contract Price on the basis of Contractor's Applications for Payment as recommended by Engineer, within 30 days of presentation of an approved partial payment estimate. All progress payments will be on the basis of the progress of the Work measured by the schedule of values and in the case of Unit Price Work based on the number of units completed.

5.1.1. Prior to final completion, progress payments shall be in an amount equal to:

Ninety-five (95) percent of the work completed, and ninety-five (95) percent of materials and equipment not incorporated in the work but delivered and suitably stored, less in each case the aggregate of the payments previously made.

5.1.2. The Owner may at his discretion and at any time, reduce payment to Contractor to ninety percent of the work completed and materials and equipment on hand if Engineer determines that Contractor is not making satisfactory progress.

5.2. Final Payment. Upon final completion and acceptance of the work in accordance with paragraph 14.13 of the General Conditions, Owner shall pay the remainder of the Contract Price, less 2% of the total contract amount, to be held in escrow for a period of one year as project guarantee, as recommended by Engineer as provided in said paragraph 14.13. Owner shall make final payment on account of the Contract Price on the basis of Contractor's Application for Final Payment as recommended by Engineer, within 30 days of submittal of an approved final payment estimate.

## **ARTICLE 6. DELETED**

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## **ARTICLE 7. CONTRACTOR'S REPRESENTATIONS**

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In order to induce Owner to enter into this Agreement, Contractor makes the following representations:

7.1. Contractor has familiarized itself with the nature and extent of the Contract Documents, Work, site, locality, and all local conditions and Laws and Regulations that in any manner may affect cost, progress, performance, or furnishing of the Work.

- 7.2. Contractor has studied carefully all reports of explorations and tests of subsurface conditions and drawings of physical conditions which are identified in the Supplementary Conditions as provided in paragraph 4.2 of the General Conditions, and accepts the determination set forth in paragraph SC-4.2 of the Supplementary Conditions of the extent of the technical data contained in such reports and drawings upon which Contractor is entitled to reply.
- 7.3. Contractor has obtained and carefully studied (or assumes responsibility for obtaining and carefully studying) all such examinations, investigations, explorations, tests, reports and studies (in addition to or to supplement those referred to in paragraph 7.2 above) which pertain to the subsurface or physical conditions at or contiguous to the site or otherwise may affect the cost, progress, performance or furnishing of the Work as Contractor considered necessary for the performance or furnishing of the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of paragraph 4.2 of the General Conditions; and no additional examinations, investigations, explorations, tests, reports, studies or similar information or data are or will be required by Contractor for such purposes.
- 7.4. Contractor has reviewed and checked all information and data shown or indicated on the Contract Documents with respect to existing Underground Facilities at or contiguous to the site and assumes responsibility for the accurate location of said Underground Facilities. No additional examinations, data in respect of said Underground Facilities are or will be required by Contractor in order to perform and furnish the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of paragraph 4.3 of the General Conditions.
- 7.5. Contractor has correlated the results of all observations, examinations, investigations, explorations, tests, reports and studies with the terms and conditions of the Contract Documents.
- 7.6. Contractor has given Engineer written notice of all conflicts, errors or discrepancies that he has discovered in the Contract Documents and the written resolution thereof by Engineer is acceptable to Contractor.

## **ARTICLE 8. CONTRACT DOCUMENTS**

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The Contract Documents which comprise the entire Agreement between the Owner and the Contractor concerning the Work consist of the following:

- 8.1. This Agreement
- 8.2. Exhibits to this Agreement, Project Breakdown Spreadsheet
- 8.3. Performance and Payment Bonds

- 8.4. Notice of Award
- 8.5. General Conditions
- 8.6. Supplementary Conditions
- 8.7. Federal Guidelines and Conditions as may be attached.
- 8.8. Specifications bearing the titles and consisting of the divisions and pages as listed in the Table of Contents: **Middle Road Reconstruction 2017**
- 8.9. Drawings. Sheets 1 through 27 bearing the general title: **Middle Road Reconstruction 2017**
- 8.10. Contractor's Bid Form
- 8.11. Documentation submitted by Contractor prior to Notice of Award: Bid Tabulation.
- 8.12. The following which may be delivered or issued after the Effective Date of this Agreement and are not attached hereto: All Written Amendments and other documents amending, modifying, or supplementing the Contract Documents pursuant to paragraphs 3.4 and 3.5 of the General Conditions.
- 8.13. The documents listed in paragraphs 8.2 et seq. above are attached to this Agreement (except as expressly noted otherwise above.)

There are no Contract Documents other than those listed above in this Article.

#### **ARTICLE 9. MISCELLANEOUS**

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- 9.1. Terms used in this Agreement which are defined in the General Conditions shall have the meanings indicated in the General Conditions.
- 9.2. No assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and specifically without limitation moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.
- 9.3. Owner and Contractor each binds itself, its partners, successors, assigns and legal representatives to the other party hereto, its partners, successors, assigns and legal

representatives in respect of all covenants, agreements and obligations contained in the Contract Documents.

IN WITNESS WHEREOF, OWNER AND CONTRACTOR have signed this Agreement in triplicate. One counterpart each has been-delivered to Owner, Contractor and Engineer. All portions of the Contract Documents have been signed or identified by Owner and Contractor or by Engineer on their behalf.

This Agreement will be effective on \_\_\_\_\_, 2017.

Owner: _____	Contractor: _____
(By)	(By)
_____	_____
(Representing)	(Representing)

Attest: _____	Attest: _____
By: _____	By: _____

Address for giving notices:	Address for giving notices:
_____	_____
_____	_____
_____	_____

<b>Notice to Proceed</b>
--------------------------

**Project:**           **Middle Road Reconstruction 2017**

**To:**

**Date:**           \_\_\_\_\_, 2017

You are hereby notified to commence WORK in accordance with the Agreement dated \_\_\_\_\_, 2017, on or before \_\_\_\_\_, 2017, and you are to complete the

WORK within \_\_\_\_ consecutive calendar days thereafter.

The date of completion of all WORK is therefore set at \_\_\_\_\_, 2017.

\_\_\_\_\_  
Owner

by: \_\_\_\_\_

\_\_\_\_\_  
Title

**Acceptance of Notice**

Receipt of the above Notice to Proceed is hereby acknowledged.

This \_\_\_\_ day of \_\_\_\_\_, 2017.

\_\_\_\_\_  
Contractor

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

\_\_\_\_\_  
Title

**PERFORMANCE BOND**

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

CONTRACTOR (Name and Address):

SURETY (Name and Principal Place of Business):

OWNER (Name and Address):

CONSTRUCTION CONTRACT

Date:

Amount:

Description (Name and Location):

BOND

Date (Not earlier than Construction Contract Date):

Amount:

Modifications to this Bond:

☐ None

☐ See Page \_\_\_\_\_

CONTRACTOR AS PRINCIPAL

SURETY

Company:

Company:

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

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

Name and Title:

Name and Title:

1. The Contractor and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.
2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except to participate in conferences as provided in Subparagraph 3.1.
3. If there is no Owner Default, the Surety's obligation under this Bond shall arise after:
  - 3.1 The Owner has notified the Contractor and the Surety at its address described in Paragraph 10 below that the Owner is considering declaring a Contractor Default and has requested and attempted to arrange a conference with the Contractor and the Surety to be held not later than fifteen days after receipt of such notice to discuss methods of performing the Construction Contract. If the Owner, the Contractor, and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default; and
  - 3.2 The Owner has declared a Contractor Default and formally terminated the Contractor's right to complete the contract. Such Contractor Default shall not be declared earlier than twenty days after the Contractor and Surety have received notice as provided in Subparagraph 3.1; and
  - 3.3 The Owner has agreed to pay the Balance of the Contract Price to the Surety in accordance with the terms of the Construction Contract in accordance with the terms of the contract with the Owner.
4. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:
  - 4.1 Arrange for the Contractor, with consent of the Owner, to perform and complete the Construction Contract; or
  - 4.2 Undertake to perform and complete the Construction Contract itself, through its agents or through independent contractors; or
  - 4.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract

to be prepared for execution by the Owner and the contractor selected with the owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 6 in excess of the Balance of the Contract Price incurred by the Owner resulting from the Contractor's default; or

- 4.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:
- 4.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, tender payment therefor to the Owner; or
- 4.2 Deny liability in whole or in part and notify the Owner citing reasons therefor.
5. If the Surety does not proceed as providing in Paragraph 4 with reasonable promptness, the Surety shall be deemed to be in default on this Bond fifteen days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Subparagraph 4.4, and the Owner refuses the payment tendered or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.
6. After the Owner has terminated the Contractor's right to complete the Construction Contract, and the Surety elects to act under Subparagraph 4.1, 4.2, or 4.3 above, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. To the limit of the amount of this Bond, but subject to commitment by the Owner of the Balance of the Contract Price to mitigation of costs and damages on the Construction Contract, the Surety is obligated without duplication for:
  - 6.1 The responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;
  - 6.2 Additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 4; and
  - 6.3 Liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.
7. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be



reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators or successors.

8. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.
9. Any proceeding, legal or equitable, under this bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.
10. Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the signature page.
11. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted here from and provisions conforming to such statutory or other legal 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.

## 12. DEFINITIONS

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

MODIFICATION TO THIS BOND ARE AS FOLLOWS:

(FOR INFORMATION ONLY - Name, Address, and Telephone)

AGENT OR BROKER:

OWNER'S REPRESENTATIVE (Architect,

**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 Principal Place of Business):

OWNER (Name and Address):

CONSTRUCTION CONTRACT

Date:

Amount:

Description (Name and Location):

BOND

Date (Not earlier than Construction Contract Date):

Amount:

Modifications to this Bond:

☐ None

☐ See Page \_\_\_\_\_

CONTRACTOR AS PRINCIPAL

SURETY

Company:

Company:

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

Name and Title:

Name and Title:

1. The Contractor and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner to pay for labor, materials and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference.
2. With respect to the Owner, this obligation shall be null and void if the Contractor:
  - 2.1 Promptly makes payment, directly or indirectly, for all sums due Claimants, and
  - 2.2 Defends, indemnities and holds harmless the Owner from claims, demands, liens, or suit by any person or entity whose claim, demand, lien, or suit is for the payment for labor, materials or equipment furnished for use in the performance of the Construction Contract, provided the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 12) of any claims, demands, liens or suits and tendered defense of such claims, demands, liens or suits to the Contractor and the Surety, and provided there is no Owner Default.
3. With respect to Claimants, this obligation shall be null and void if the Contractor promptly makes payment, directly or indirectly, for all sums due.
4. The Surety shall have no obligation to Claimants under this Bond until:
  - 4.1 Claimants who are employed by or have a direct contract with the Contractor have given notice to the Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to the Owner, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.
  - 4.2 Claimants who do not have a direct contract with the Contractor:
    - 4.1 Have furnished written notice to the Contractor and sent a copy, or notice thereof, to the 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 were furnished or supplied or for whom the labor was done or performed; and
    - 4.2 Have either received a rejection in whole or in part from the Contractor, or not received within 30 days of finishing the above notice any communication from the Contractor by which the Contractor has indicated the claim will be paid directly or indirectly; and
    - 4.3 Not having been paid within the above 30 days, have sent a written notice to the Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to the Owner, stating that claim is being made under this Bond and enclosing a copy of the previous written notice furnished to the Contractor.

5. If a notice required by Paragraph 4 is given by the Owner to the Contractor or to the Surety that is sufficient compliance.
6. When the Claimant has satisfied the conditions of Paragraph 4, the Surety shall promptly and at the Surety's expense take the following actions:
  - 6.1 Send an answer to the Claimant, with a copy to the Owner, within 45 days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed.
  - 6.2 Pay or arrange for payment of any undisputed amounts.
7. The 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 the Surety.
8. Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any Construction Performance Bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and the Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.
9. The Surety shall not be liable to the Owner, Claimants or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.
10. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.
- II. 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 Subparagraph 4.1 or Clause 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 Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the signature page. Actual receipt of notice by Surety, the Owner or the Contractor, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.
13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted here from and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.
14. Upon request by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor shall promptly furnish a copy of this Bond or shall permit a copy to be made.

## 15 DEFINITIONS

- 15.1 Claimant: An individual or entity having a direct contract with the Contractor or with a subcontractor of the 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 Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.
- 15.2 Construction Contract: The agreement between the Owner and the Contractor identified on the signature page, including all Contract Documents and changes thereto.
- 15.3 Owner Default: Failure of the Owner, which has neither been remedied nor waived, to pay the Contractor as required by the Construction Contract or to perform and complete or comply with the other terms thereof.

MODIFICATIONS TO THIS BOND ARE AS FOLLOWS:

FOR INFORMATION ONLY - Name, Address, and Telephone)

AGENT OR BROKER:  
Engineer or other party)

OWNER'S REPRESENTATIVE (Architect,

**00844**  
**APPLICATION FOR PAYMENT**



**Contractor's Application for Payment No.**

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

**Application For Payment  
Change Order Summary**

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

**Contractor's Certification**

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

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

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

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

**Contractor Signature**

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

Payment of:	\$	
		(Line 8 or other - attach explanation of the other amount)
is recommended by:		
		(Engineer)
		(Date)
Payment of:	\$	
		(Line 8 or other - attach explanation of the other amount)
is approved by:		
		(Owner)
		(Date)
Approved by:		
		Funding or Financing Entity (if applicable)
		(Date)



## APPLICATION FOR PAYMENT

## Contractor's Application

[illegible]

00844  
APPLICATION FOR PAYMENT

### Progress Estimate

## Contractor's Application

[illegible]

## 00844

## Contractor's Application

[illegible]

## Change Order #

**Project:** Middle Road Reconstruction Improvements - 2017

**Owner:** Town of Falmouth

**Contractor:**

**Engineer:** Sebago Technics, Inc.

**Date of Issuance:**

=====

The contractor is directed to make the following changes in the Contract Documents:

**Description:**

**Purpose of Change Order:**

**Attachments:**

=====

Change in Contract Price	Change in Contract Time
Original Contract Price \$	Original Contract Time _____ calendar days
Previous Change Orders No. ____ To No. ____ (at unit pricing)	Net Change from Previous Change Orders _____ calendar days
Contract Price Prior to this Change Order \$	Contract Time Prior to This Change Order _____ calendar days
Net Increase (Decrease) of this Change Order \$ (at unit pricing)	Net Increase (Decrease) of this Change Order _____ calendar days
Contract Price with all Approved Change Orders \$	Contract Time with All Approved Change Orders _____ calendar days

=====

**Recommended:**

**Approved:**

**Approved:**

By \_\_\_\_\_

By \_\_\_\_\_

By \_\_\_\_\_

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Engineer

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Owner

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Contractor

## **GENERAL CONDITIONS**

<b>ARTICLE 1 - DEFINITIONS</b>
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Wherever used in these General Conditions or in the other Contract Documents, the following terms have the meanings indicated which are applicable to both the singular and plural thereof:

**Addenda** - Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the bidding documents or the Contract Documents.

**Agreement** - The written agreement between OWNER and CONTRACTOR covering the Work to be performed, other Contract Documents are attached to the Agreement and made a part thereof as provided therein.

**Application for Payment** - The form accepted by ENGINEER which is to be used by CONTRACTOR in requesting progress or final payments and which is to include such supporting documentation as is required by the Contract Documents.

**Bid** - The offer or proposal of the bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

**Bonds** - Bid, performance, and payment bonds and other instruments of security.

**Change Order** - A document recommended by ENGINEER, which is signed by CONTRACTOR and OWNER and authorizes an addition, deletion, or revision in the Work, or an adjustment in the Contract Price or the Contract Time, issued on or after the Effective Date of the Agreement.

**Contract Documents** - The Agreement, Addenda (which pertain to the Contract Documents), CONTRACTOR'S bid (including documentation accompanying the Bid and any post - Bid documentation submitted prior to the Notice of Award) when attached as an exhibit to the Agreement, the Bonds, these General Conditions, the Supplementary Conditions, the Specifications, and the Drawings as the same are more specifically identified in the Agreement, together with all amendments, modifications and supplements issued pursuant to paragraphs 3.4 and 3.5 on or after the Effective Date of the Agreement.

**Contract Price** - The moneys payable by OWNER to CONTRACTOR under the Contract Documents as stated in the Agreement (subject to the provisions of paragraph 11.9.1 in the case of Unit Price Work).

**Contract Time** - The number of days (computed as provided in paragraph 17.2) or the date stated in the Agreement for the completion of the Work.

**Contractor** - The person, firm, or corporation with whom OWNER has executed the Agreement.

**Defective** - An adjective which when modifying the word Work refers to Work that is unsatisfactory, faulty or deficient or does not conform to the Contract Documents, or does not

meet the requirements of any inspection, reference standard, test or approval referred to in the Contract Documents, or has been damaged prior to ENGINEER's recommendation of final payment (unless responsibility for the protection thereof has been assumed by OWNER at Substantial Completion in accordance with paragraph 14.8 or 14.10).

**Drawings** - The drawings which show the character and scope of the Work to be performed and which have been prepared or approved by ENGINEER and are referred to in the Contract Documents.

**Effective Date of the Agreement** - The date indicated in the Agreement on which it becomes effective, but if no such date is indicated it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

**ENGINEER** - The person, firm or corporation named as such in the Agreement.

**Field Order** - A written order issued by ENGINEER which orders minor changes in the Work in accordance with paragraph 9.5 but which does not involve a change in the Contract Price or the Contract Time.

**General Requirements** - Sections of Division 1 of the Specifications.

**Laws and Regulations** - Laws or Regulations - Laws, rules' regulations, ordinances, codes and or orders.

**Notice of Award** - The written notice by OWNER to the apparent successful bidder stating that upon compliance by the apparent successful bidder with the conditions precedent enumerated therein, within the time specified, OWNER will sign and deliver the Agreement.

**Notice to Proceed** - A written notice given by OWNER to CONTRACTOR (with a copy to ENGINEER) fixing the date on which the Contract Time will commence to run and on which CONTRACTOR shall start to perform CONTRACTOR'S obligations under the Contract Documents.

**OWNER** - The public body or authority, corporation, association, firm or person with whom CONTRACTOR has entered into the Agreement and for whom the Work is to be provided.

**Partial Utilization** - Placing a portion of the Work in service for the purpose for which it is intended (or a related purpose) before reaching Substantial Completion for all the Work.

**Project** - The total construction of which the Work to be provided under the Contract Documents may be the whole, or a part as indicated elsewhere in the Contract Documents.

**Resident Project Representative** - The authorized representative of ENGINEER who is assigned to the site of his part thereof.

**Shop Drawings** - All drawings, diagrams, illustrations, schedules and other data which are specifically prepared by or for CONTRACTOR to illustrate some portion of the Work and all illustrations, brochures, standard schedules, performance charts, instructions, diagrams and

other information prepared by a Supplier and submitted by CONTRACTOR to illustrate material or equipment for some portion of the Work.

Specifications - Those portions of the Contract Documents consisting of written technical descriptions of materials, equipment, construction systems, standards and workmanship as applied to the Work and certain administrative details applicable thereto.

Subcontractor - An individual, firm or corporation having a direct contract with CONTRACTOR or with any other Subcontractor for the performance of a part of the Work at the site.

Substantial Completion - The Work (or a specified part thereof) has progressed to the point where, in the opinion of ENGINEER as evidenced by ENGINEER's definitive certificate of Substantial Completion, it is sufficiently complete, in accordance with the Contract Documents, so that the Work (or specified part) can be utilized for the purposes for which it is intended: or if there be no such certificate issued, when final payment is due in accordance with paragraph 14.13. The terms "substantially complete" and "substantially completed" as applied to any Work refer to Substantial Completion thereof.

Supplementary Conditions - The part of the Contract Documents which amends or supplements these General Conditions.

Supplier - A manufacturer, fabricator, supplier, distributor, material man or vendor.

Underground Facilities - All pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels or other such facilities or attachments, and any encasements containing such facilities which have been installed underground to furnish any of the following services or materials: electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, sewage and drainage removal, traffic or other control systems or water.

Unit Price Work - Work to be paid for on the basis of unit prices.

Work - The entire completed construction or the various separately identifiable parts thereof required to be furnished under the Contract Documents. Work is the result of performing services, furnishing labor and furnishing and incorporating materials and equipment into the construction, all as required by the Contract Documents.

Work Directive Change - A written directive to CONTRACTOR, issued on or after the Effective Date of the Agreement and signed by OWNER and recommended by ENGINEER, ordering an addition, deletion or revision in the Work, or responding to differing or unforeseen physical conditions under which the Work is to be performed as provided in paragraph 4.2 or 4.3 or to emergencies under paragraph 6.22. A Work Directive Change may not change the Contract Price or the Contract Time, but is evidence that the parties expect that the change directed or documented by a Work Directive Change will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Time as provided in paragraph 10.2.



Written Amendment - A written amendment of the Contract Documents, signed by OWNER and CONTRACTOR on or after the Effective Date of the Agreement and normally dealing with the non-engineering or non-technical rather than strictly Work-related aspects of the Contract Documents.

ARTICLE 2 -- PRELIMINARY MATTERS
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Delivery of Bonds:

- 2.1. When CONTRACTOR delivers the executed Agreements to OWNER, CONTRACTOR shall also deliver to OWNER such Bonds as CONTRACTOR may be required to furnish in accordance with paragraph 5.1.

Copies of Documents:

- \*2.2. OWNER shall furnish to CONTRACTOR up to ten copies (unless otherwise specified in the Supplementary Conditions) of the Contract Documents as are reasonably necessary for the execution of the Work. Additional copies will be furnished, upon request, at the cost of reproduction.

Commencement of Contract Time; Notice to Proceed:

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

Starting the Project:

- 2.4. CONTRACTOR shall start to perform the Work on the date when the contract Time commences to run, but no Work shall be done at the site prior to the date on which the Contract Time commences to run.

\* See Supplementary General Conditions

Before Starting Construction

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- 2.5. Before undertaking each part of the Work, CONTRACTOR shall carefully study and compare the Contract Documents and check and verify pertinent figures shown thereon and all applicable field measurements. CONTRACTOR shall promptly report in writing to ENGINEER any conflict, error or discrepancy which CONTRACTOR may discover and shall obtain a written interpretation or clarification from ENGINEER before proceeding with any Work affected thereby; however, CONTRACTOR shall not be liable to OWNER or ENGINEER for

failure to report any conflict, error or discrepancy in the Contract Documents, unless CONTRACTOR had actual knowledge thereof or should reasonably have known thereof.

2.6. Within ten days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), CONTRACTOR shall submit to ENGINEER for review:

2.6.1. An estimated progress schedule indicating the starting and completion dates of the various stages of the Work:

2.6.2. A preliminary schedule of Shop Drawing submissions; and

2.6.3. A preliminary schedule of values for all of the Work which will include quantities and prices of items aggregating the Contract Price and will subdivide the Work into component parts in sufficient detail to serve as the basis for progress payments during construction. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work which will be confirmed in writing by CONTRACTOR at the time of submission.

2.7 Before any Work at the site is started, CONTRACTOR shall deliver to OWNER, with a copy to ENGINEER, certificates (and other evidence of insurance requested by OWNER) which CONTRACTOR is required to purchase and maintain in accordance with paragraphs 5.3 and 5.4 and OWNER shall deliver to CONTRACTOR certificates (and other evidence of insurance requested by CONTRACTOR) which OWNER is required to purchase and maintain in accordance with paragraphs 5.6 and 5.7.

#### Pre-construction Conference

2.8. Within twenty days after the Effective Date of the Agreement, but before CONTRACTOR starts the Work at the site, a conference attended by CONTRACTOR, ENGINEER and others as appropriate will be held to discuss the schedules referred to in paragraph 2.6., to discuss procedures for handling Shop Drawings and other submittals and for processing Applications for Payment, and to establish a working understanding among the parties as to the Work.

#### Finalizing Schedules

2.9. At least ten days before submission of the first Application for Payment a conference attended by CONTRACTOR, ENGINEER and others as appropriate will be held to finalize the schedules submitted in accordance with paragraph 2.6. The finalized progress schedule will be acceptable to ENGINEER as providing an orderly progression of the Work to completion within the Contract Time, but such acceptance will neither impose on ENGINEER responsibility for the progress or scheduling of the Work nor relieve CONTRACTOR from full responsibility therefor. The finalized schedule of Shop Drawing submissions will be acceptable to ENGINEER as providing a workable arrangement for processing the submissions. The finalized schedule of values will be acceptable to ENGINEER as to form and substance.

ARTICLE 3 -- CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE
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## Intent

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- 3.1. The Contract Documents comprise the entire agreement between OWNER and CONTRACTOR concerning the Work. The Contract Documents are complementary: what is called for by one is as binding as if called for by all. The Contract Documents will be construed in accordance with the law of the place of the Project.
- 3.2 It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any Work, materials or equipment that may reasonably be inferred from the Contract Documents as being required to produce the intended result will be supplied whether or not specifically called for. When words which have a well-known technical or trade meaning are used to describe Work, materials or equipment such words shall be interpreted in accordance with that meaning. Reference to standard specifications, manuals, or codes of any technical society, organization or association, or to the Laws or Regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard specification, manual, code or Laws or Regulations in effect at the time of opening of Bids for, on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated. However, no provision of any referenced standard specification, manual or code (whether or not specifically incorporated by reference in the Contract Documents) shall be effective to change the duties and responsibilities of OWNER, CONTRACTOR or ENGINEER, or any of their consultants, agents or employees from those set forth in the Contract Documents, nor shall it be effective to assign to ENGINEER, or any of ENGINEER'S consultants, agents, or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 9.15 or 9.16. Clarifications and interpretations of the Contract Documents shall be issued by ENGINEER as provided in paragraph 9.4.
- 3.3 If, during the performance of the Work, CONTRACTOR finds a conflict, error or discrepancy in the Contract Documents, CONTRACTOR shall so report to ENGINEER in writing at once and before proceeding with the Work affected thereby shall obtain a written interpretation or clarification from ENGINEER; however, CONTRACTOR shall not be liable to OWNER or ENGINEER for failure to report any conflict, error or discrepancy in the Contract Documents unless CONTRACTOR had actual knowledge thereof or should reasonably have known thereof.

## Amending and Supplementing Contract Documents

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- 3.4. The Contract Documents may be amended to provide for additions, deletions and revisions in the Work or to modify the terms and conditions thereof in one or more of the following ways:

3.4.1.A formal Written Amendment.

3.4.2.A Change Order (pursuant to paragraph 10.4), or

3.4.3. A Work Directive Change (pursuant to paragraph 10.1).

As indicated in paragraphs 11.2 and 12.1. Contract Price and Contract Time may only be changed by a Change Order or a Written Amendment.

- 3.5 In addition, the requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, in one or more of the following ways:

3.5.1 A Field Order (pursuant to paragraph 9.5),

3.5.2. ENGINEER's approval of a Shop Drawing or sample (pursuant to paragraphs 6.26 and 6.27), or

3.5.3. ENGINEER's written interpretation or clarification (pursuant to paragraph 9.4).

#### Reuse of Documents

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- 3.6. Neither CONTRACTOR nor any Subcontractor or Supplier or other person or organization performing or furnishing any of the Work under a direct or indirect contract with OWNER shall have or acquire any title to or ownership rights in any of the Drawings, Specifications or other documents (or copies of any thereof) prepared by or bearing the seal of ENGINEER; and they shall not reuse any of them on extensions of the Project or any other project without a written consent of OWNER and ENGINEER and specific written verification or by ENGINEER.

ARTICLE 4 -- AVAILABILITY OF LANDS; PHYSICAL CONDITIONS; REFERENCE POINTS
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#### Availability of Lands

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- 4.1. OWNER shall furnish, as indicated in the Contract Documents, the lands upon which the Work is to be performed, rights-of-way and easements for access thereto, and such other lands which are designated for the use of CONTRACTOR. Easements for permanent structures or permanent changes in existing facilities will be obtained and paid for by OWNER, unless otherwise provided in the Contract Documents. IF CONTRACTOR believes that any delay in OWNER's furnishing these lands, rights-of-way or easements entitles CONTRACTOR to an extension of the Contract Time. CONTRACTOR may make a claim therefor as provided in Article 12. CONTRACTOR shall provide for all additional lands and access

thereto that may be required for temporary construction facilities or storage of materials and equipment.

## Physical Conditions

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\*4.2.1. Explorations and Reports: Reference is made to the Supplementary Conditions for identification of those reports of explorations and tests of subsurface conditions at the site that have been utilized by ENGINEER in preparation of the Contract Documents. CONTRACTOR may rely upon the accuracy of the technical data contained in such reports, but not upon nontechnical data, interpretations or opinions contained therein or for the completeness thereof for CONTRACTOR's purposes. Except as indicated in the immediately preceding sentence and in paragraph 4.2.6. CONTRACTOR shall have full responsibility with respect to subsurface conditions at the site.

4.2.2 Existing Structures: Reference is made to the Supplementary Conditions for identification of those drawings of physical conditions in or relating to existing surface and subsurface structures (except Underground Facilities referred to in paragraph 4.3) which are at or contiguous to the site that have been utilized by ENGINEER in preparation of the Contract Documents. CONTRACTOR may rely upon the accuracy of the technical data contained in such drawings, but not for the completeness thereof for CONTRACTOR'S purposes. Except as indicated in the immediately preceding sentence and in paragraph 4.2.6 CONTRACTOR shall have full responsibility with respect to physical conditions in or relating to such structures.

\* See Supplementary General Conditions

4.2.3. Report of Differing Conditions: If CONTRACTOR believes that:

4.2.3.1. Any technical data on which CONTRACTOR is entitled to rely as provided in paragraphs 4.2.1 and 4.2.2 is inaccurate, or

4.2.3.2. Any physical condition uncovered or revealed at the site differs materially from that indicated, reflected or referred to in the Contract Documents.

CONTRACTOR shall, Promptly after becoming aware thereof and before performing any Work in connection therewith (except in an emergency as permitted by paragraph 6.22, notify OWNER and ENGINEER in writing about the inaccuracy or difference.

4.2.4. ENGINEER's Review: ENGINEER will promptly review the pertinent conditions, determine the necessity of obtaining additional explorations or tests with respect thereto and advise OWNER in writing (with a copy to CONTRACTOR) of ENGINEER's findings and conclusions.

- 4.2.5. Possible Document Change: If ENGINEER concludes that there is a material error in the Contract Documents or that because of newly discovered conditions a change in the Contract Documents is required, a Work Directive Change or a Change Order will be issued as provided in Article 10 to reflect and document the consequences of the inaccuracy or difference.
- 4.2.6. Possible Price and Time Adjustments: In each such case, an increase or decrease in the Contract Price or an extension or shortening of the Contract Time, or any combination thereof, will be allowable to the extent that they are attributable to any such inaccuracy or difference. If OWNER and CONTRACTOR are unable to agree as to the amount or length thereof, a claim may be made therefor as provided in Articles 11 and 12.

#### Physical Conditions - Underground Facilities

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- 4.3.1. Shown or Indicated: The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the site is based on information and data furnished to OWNER or ENGINEER by the owners of such Underground Facilities or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:
  - 4.3.1.1. OWNER and ENGINEER shall not be responsible for the accuracy or completeness of any such information or data: and.
  - 4.3.1.2. CONTRACTOR shall have full responsibility for reviewing and checking all such information and data, for locating all Underground Facilities shown or indicated in the Contract Documents, for coordination of the Work with the owners of such Underground Facilities during construction, for fine safety and protection thereof as provided in paragraph 6.20 and repairing any damage hereto resulting from the Work, the cost of all of which will be considered as have been included in the Contract Price.
- 4.3.2. Not Shown or Indicated. If an Underground Facility is uncovered or revealed at or contiguous to the site which was not shown or indicated in the Contract Documents and which CONTRACTOR could be reasonably have been expected to be aware of, CONTRACTOR shall, promptly after becoming aware thereof and before performing any Work affected thereby (except in an emergency as permitted by paragraph 6.22), identify the owner of such Underground Facility and give written notice thereof to that owner and to OWNER and ENGINEER. ENGINEER will promptly review the Underground Facility to determine the extent to which the Contract Documents should be modified to reflect and document the consequences of the existence of the Underground Facility, and the Contract Documents will be amended or supplemented to the extent necessary. During such time, CONTRACTOR shall be responsible for the safety and protection of such Underground Facility as provided in paragraph 6.20. CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, to the extent that they are attributable to the existence of any Underground Facility

that was not shown or indicated in the Contract Documents and which CONTRACTOR could not reasonably have been expected to be aware of. If the parties are unable to agree as to the amount or length thereof, CONTRACTOR may make a claim therefor as provided in Articles 11 and 12.

#### Reference Points

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- 4.4. 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 (unless otherwise specified in the General Requirements), shall protect and preserve the established reference points and shall make no changes or relocations without the prior written approval of OWNER. CONTRACTOR shall report to ENGINEER whenever any reference point 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 by professionally qualified personnel.

ARTICLE 5 - BONDS AND INSURANCE
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#### Performance and Other Bonds

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- 5.1. CONTRACTOR shall furnish performance and payment Bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all CONTRACTOR's obligations under the Contract Documents. These Bonds shall remain in effect at least until one year after the date when final payment becomes due, except as otherwise provided by Law or Regulation or by the Contract Documents. CONTRACTOR shall also furnish such other Bonds as are required by the Supplementary Conditions. All bonds shall be in the forms prescribed by Law or Regulation or by the contract Documents and be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Audit Staff Bureau of Accounts, U.S. Treasury Department. All bonds signed by an agent must be accompanied by a certified copy of the authority to act.
- 5.2. If the surety on any Bond furnished by CONTRACTOR is declared a bankrupt or becomes insolvent in its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of paragraph 5.1, CONTRACTOR shall within five days thereafter substitute another Bond and Surety, both of which must be acceptable to OWNER.

#### Contractor's Liability Insurance

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- \*5.3. CONTRACTOR shall purchase and maintain such comprehensive general liability and other insurance as is appropriate for the Work being performed and furnished and as will provide protection from claims set forth below which may arise out of or result from CONTRACTOR's performance and furnishing of the Work and CONTRACTOR's other obli-

gations under the Contract Documents, whether it is to be performed or furnished by CONTRACTOR, by any Subcontractor, by anyone directly or indirectly employed by any of them to perform or furnish any of the Work, or by anyone for whose acts any of them may be liable:

- \*5.3.1. Claims under workers' or workmen's compensation, disability benefits, and other similar employee benefit acts;
- \*5.3.2. Claims for damages because of bodily injury, occupational sickness or disease, or death of any person other than CONTRACTOR's employees;
- \*5.3.3. Claims for damages because of bodily injury, sickness or disease, or death of any person other than the CONTRACTOR's employees;

\* See Supplementary General Conditions

- \*5.3.4. Claims for damages insured by personal injury liability coverage which are sustained (a) by any person as a result of an offense directly or indirectly related to the employment of such person by CONTRACTOR, or (b) by any other person for any other reason;
- \*5.3.5. Claims for damages, other than the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom:
- \*5.3.6. Claims arising out of operation of Laws or Regulations for damages because of bodily injury or death of any person or for damage to property; and
- \*5.3.7. 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 insurance required by this paragraph 5.3 shall include the specific coverages and be written for not less than the limits of liability and coverages provided in the Supplementary Conditions, or required by law, whichever is greater. The comprehensive general liability insurance shall include completed operations insurance. All of the policies of insurance so required to be purchased and maintained (or the certificates or other evidence thereof) shall contain a provision or endorsement that the coverage afforded will not be canceled, materials changed, or renewal refused until at least thirty days' prior written notice has been given to OWNER and ENGINEER by certified mail. All such insurance shall remain in effect until final payment and at all times thereafter when CONTRACTOR may be correcting, removing, or replacing defective Work in accordance with paragraph 13.12. In addition, CONTRACTOR shall maintain such completed operations insurance for at least two years after final payment and furnish OWNER with evidence of continuation of such insurance at final payment and one year thereafter.



#### Contractual Liability Insurance

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- 5.4. The comprehensive general liability insurance required by paragraph 5.3 will include contractual liability insurance applicable to CONTRACTOR's obligations under paragraphs 6.30 and 6.31.

#### Owner's Liability Insurance

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- \*5.5 OWNER shall be responsible for purchasing and maintaining OWNER's own liability insurance and, at OWNER's option, may purchase and maintain such insurance as will protect OWNER against claims which may arise from operations under the Contract Documents.

\* See Supplementary General Conditions

#### Property Insurance

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- \*5.6 Unless otherwise provided in the Supplementary Conditions, OWNER shall purchase and maintain property insurance upon the Work at the site to the full insurable value thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall include the interests of OWNER, CONTRACTOR, Subcontractors, ENGINEER and ENGINEER's consultants in the Work, all of whom shall be listed as insureds or additional insured parties, shall insure against the perils of fire and extended coverage and shall include "all risk" insurance for physical loss and damage including theft, vandalism and malicious mischief, collapse and water damage, and such other perils as may be provided in the Supplementary Conditions, and shall include damages, losses and expenses arising out of or resulting from any insured loss or incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers, architects, attorneys and other professionals). If not covered under the "all risk" insurance or otherwise provided in the Supplementary Conditions, CONTRACTOR shall purchase and maintain similar property insurance on portions of the Work stored on and off the site or in transit when such portions of the Work are to be included in an Application for Payment.
- \*5.7 OWNER shall purchase and maintain such boiler and machinery insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of OWNER, CONTRACTOR, Subcontractors, ENGINEER AND ENGINEER's consultants in the Work, all of whom shall be listed as insured or additional insured parties.
- \*5.8 All the policies of insurance (or the certificates or other evidence thereof) required to be purchased and maintained by OWNER in accordance with paragraphs 5.6 and 5.7 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least thirty days' prior written notice has

been given to CONTRACTOR by certified mail and will contain waiver provisions in accordance with paragraph 5.11.2.

- \*5.9. OWNER shall not be responsible for purchasing and maintaining any property insurance to protect the interests of CONTRACTOR, Subcontractors or others in the Work to the extent of any deductible amounts that are provided in the Supplementary Conditions. The risk of loss within the deductible amount, will be borne by CONTRACTOR, Subcontractor or others suffering any such loss and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.
- \*5.10. If CONTRACTOR requests in writing that other special insurance be included in the property insurance policy, OWNER shall, if possible, include such insurance, and the cost thereof will be charged to CONTRACTOR by appropriate Change Order or Written Amendment. Prior to commencement of the Work at the site, OWNER shall in writing advise CONTRACTOR whether or not such other insurance has been procured by OWNER.

#### Waiver of Rights

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- \*5.11.1. OWNER and CONTRACTOR waive all rights against each other for all losses and damages caused by any of the perils covered by the policies of insurance provided in response to paragraphs 5.6 and 5.7 and any other property insurance applicable to the Work, and also waive all such rights against the Subcontractors, ENGINEER, ENGINEER's consultants and all other parties named as insured in such policies for losses and damages so caused. As required by paragraph 6.11, each subcontract between CONTRACTOR and a Subcontractor will contain similar waiver provisions by the Subcontractor in favor of OWNER, CONTRACTOR, ENGINEER, ENGINEER's consultant and all other parties named as insured. None of the above waivers shall extend to the rights that any of the insured parties may have to the proceeds of insurance held by OWNER as trustee or otherwise payable under any policy so issued.
- \*5.11.2. OWNER and CONTRACTOR intend that any policies provided in response to paragraphs 5.6 and 5.7 shall protect all of the parties insured and provide primary coverage for all losses and damages caused by the perils covered thereby. Accordingly, all such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any of the parties named as insured or additional insured, and if the insurers require separate waiver forms to be signed by ENGINEER or ENGINEER's consultant OWNER will obtain the same and if such waiver forms are required of any Subcontractor, CONTRACTOR will obtain the same.

#### Receipt and Application of Proceeds

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- \*5.12. Any insured loss under the policies of insurance required by paragraphs 5.6 and 5.7 will be adjusted with OWNER and made payable to OWNER as trustee for the insured, as their

interests may appear, subject to the requirements of any applicable mortgage clause and of paragraph 5.13. OWNER shall deposit in a separate account any money so received, and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof and the Work and the cost thereof covered by an appropriate Change Order or Written Amendment.

- \*5.13. OWNER as trustee shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within fifteen days after the occurrence of loss to OWNER's exercise of this power. If such objection be made, OWNER as trustee shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If required in writing by any party in interest, OWNER as trustee shall upon the occurrence of an insured loss, give bond for the proper performance of such duties.

\* See Supplementary General Conditions

#### Acceptance of Insurance

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- 5.14. If OWNER has any objection to the coverage afforded by or other provisions of the insurance required to be purchased and maintained by CONTRACTOR in accordance with paragraphs 5.3 and 5.4 on the basis of its not complying with the Contract Documents, OWNER shall notify CONTRACTOR in writing thereof within ten days of the date of delivery of such certificates to OWNER in accordance with paragraph 2.7. If CONTRACTOR has any objection to the coverage afforded by or other provisions of the policies of insurance required to be purchased and maintained by OWNER in accordance with paragraphs 5.6 and 5.7 on the basis of their not complying with the contract Documents. CONTRACTOR shall notify OWNER in writing thereof within ten days of the date of delivery of such certificates to CONTRACTOR in accordance with paragraph 2.7. OWNER and CONTRACTOR shall each provide to the other such additional information in respect of insurance provided by each as the other may reasonably requires. Failure by OWNER or CONTRACTOR to give any such notice of objection within the time provided shall constitute acceptance of such insurance purchased by the other as complying with the Contract Documents.

#### Partial Utilization - Property Insurance

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- 5.15. If OWNER finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, such use or occupancy may be accomplished in accordance with paragraph 14.10: provided that no such use or occupancy shall commence before the insurers providing the property insurance have acknowledged notice thereof and in writing effected the changed in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or lapse on account of any such partial use or occupancy.

ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES
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#### Supervision and Superintendence

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- 6.1. CONTRACTOR shall supervise 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, but CONTRACTOR shall not be responsible for the negligence of others in the design or selection of a specific means, method, technique, sequence or procedure of construction which is indicated in and required by the Contract Documents. CONTRACTOR shall be responsible to see that the finished Work complies accurately with the Contract Documents.
- 6.2. CONTRACTOR shall keep on the Work at all times during its progress a competent resident superintendent, who shall not be replaced without written notice to OWNER and ENGINEER except under extraordinary circumstances. The superintendent will be CONTRACTOR's representative at the site and shall have authority to act on behalf of CONTRACTOR. All communications given to the superintendent shall be as binding as if given to CONTRACTOR.

#### Labor, Materials and Equipment

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- 6.3. 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. Except in connection with the safety or protection of Persons or the Work or property at the site or adjacent thereto, and except as otherwise indicated in the Contract Documents, all Work at the site shall be performed during regular working hours, and CONTRACTOR will not permit overtime work or the performance of Work on Saturday, Sunday or any legal holiday without OWNER's written consent given after prior written notice to ENGINEER.
- 6.4. Unless otherwise specified in the General Requirements, CONTRACTOR shall furnish and assume full responsibility for all 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 furnishing, performance, testing start up and completion of the Work.
- 6.5. All materials and equipment shall be of good quality and new, except as otherwise provided in the Contract Documents. If required by ENGINEER, CONTRACTOR shall furnish satisfactory evidence (including reports of required tests) as to the kind and quality of materials and equipment. All materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the instructions of the applicable Supplier except as otherwise provided in the Contract Documents; but no

provision of any such instructions will be effective to assign to ENGINEER, or any of ENGINEER's consultants agents of employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 9.15 or 9.16.

#### Adjusting Progress Schedule

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- 6.6. CONTRACTOR shall submit to ENGINEER for acceptance (to the extent indicated in Paragraph 2.9) adjustments to the progress schedule to reflect the impact thereon of new developments; these will conform generally to the progress schedule then in effect and additionally will comply with any provisions of the General Requirements applicable thereto.

#### Substitutes or "Or-Equal" Items

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- 6.7.1. Whenever materials or equipment are specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier the naming of the item is intended to establish the type, function and quality required. Unless the name is followed by words indicating that no substitution is permitted, materials or equipment of other Suppliers may be accepted by ENGINEER if sufficient information is submitted by CONTRACTOR to allow ENGINEER to determine that the material or equipment proposed is equivalent or equal to that named. The procedure for review by ENGINEER will include the following as supplemented in the General Requirements. Requests for review of substitute items of material and equipment will not be accepted by ENGINEER from anyone other than CONTRACTOR. If CONTRACTOR wishes to furnish or use a substitute item of material equipment, CONTRACTOR shall make written application to ENGINEER for acceptance thereof, certifying that the proposed substitute will perform adequately the functions and achieve the results called for by the general design, be similar and of equal substance to that specified and be suited to the same use as that specified. The application will state that the evaluation and acceptance of the proposed substitute will not prejudice CONTRACTOR's achievement of Substantial Completion on time, whether or not acceptance of the substitute for use 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 work on the Project) to adapt the design to the proposed substitute and whether or not incorporation or use of the substitute in connection with the Work is subject to payment of any license fee or royalty. All variations of the proposed substitute from that specified will be identified in the application and available maintenance, repair and replacement service will be indicated. The application will also contain an itemized estimate of all costs that will result directly or indirectly from acceptance of such substitute, including costs of redesign and claims of other contractors affected by the resulting change, all of which shall be considered by ENGINEER in evaluating the proposed substitute. ENGINEER may require CONTRACTOR to furnish at CONTRACTOR's expense additional data about the proposed substitute.

- 6.7.2. If a specific means, method, technique, sequence or procedure of construction is indicated in or required by the Contract Documents, CONTRACTOR may furnish or utilize a substitute means, method, sequence, technique or procedure of construction acceptable to ENGINEER, if CONTRACTOR submits sufficient information to allow ENGINEER to determine that the substitute proposed is equivalent to that indicated or required by the Contract Documents. The procedure for review by ENGINEER will be similar to that provided in paragraph 6.7.1 as applied by ENGINEER and as may be supplemented in the General Requirements.
- 6.7.3. ENGINEER will be allowed a reasonable time within which to evaluate each proposed substitute. ENGINEER will be the sole judge of acceptability, and no substitute will be ordered, installed or utilized without ENGINEER's prior written acceptance which will be evidenced by either a Change Order or an approved Shop Drawing. OWNER may require CONTRACTOR to furnish at CONTRACTOR's expense a special performance guarantee or other surety with respect to any substitute. ENGINEER will record time required by ENGINEER and ENGINEER's consultants in evaluating substitutions proposed by CONTRACTOR and in making changes in the Contract Documents occasioned thereby. Whether or not ENGINEER accepts a proposed substitute, CONTRACTOR shall reimburse OWNER for the charges of ENGINEER and ENGINEER's consultants for evaluating each proposed substitute.

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#### Concerning Subcontractors, Suppliers and Others

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- 6.8.1. CONTRACTOR shall not employ any Subcontractor, Supplier or other person or organization (including those acceptable to OWNER and ENGINEER as indicated in paragraph 6.8.2), whether initially or as a substitute, against whom OWNER or ENGINEER may have reasonable objection. CONTRACTOR shall not be required to employ any Subcontractor, Supplier or other person or organization to furnish or perform any of the Work against whom CONTRACTOR has reasonable objection.
- 6.8.2. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers or other persons or organizations (including those who are to furnish the principal items of materials and equipment) to be submitted to OWNER in advance of the specified date prior to the Effective Date of the Agreement for acceptance by OWNER and ENGINEER and if CONTRACTOR has submitted a list thereof in accordance with the Supplementary Conditions, OWNER and ENGINEER's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the bidding documents or the Contract Documents) of any such Subcontractor, Supplier or other person or organization so identified may be revoked on the basis of reasonable objection after due investigation, in which case CONTRACTOR shall submit an acceptable substitute, the Contract Price will be increased by the difference in the cost occasioned by such substitution and an appropriate Change Order will be issued or Written Amendment signed. No acceptance by OWNER or ENGINEER of any such Subcontractor, Supplier or other person or organization shall constitute a waiver of any right of OWNER or ENGINEER to reject defective Work.

- 6.9. CONTRACTOR shall be fully responsible to OWNER and ENGINEER for all acts and omissions of the Subcontractors. Suppliers and other persons and organizations performing or furnishing any of the Work under a direct or indirect contract with CONTRACTOR just as CONTRACTOR is responsible for CONTRACTOR's own acts and omissions. Nothing in the Contract Documents shall create any contractual relationship between OWNER and ENGINEER and any such Subcontractor, Supplier or other person or organization, nor shall it create any obligation on the part of OWNER or ENGINEER to pay or to see to the payment of any moneys due any such Subcontractor, Supplier or other person or organization except as may otherwise be required by Laws and Regulations.
- 6.10. 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.
- 6.11. All Work performed for CONTRACTOR by a Subcontractor will be pursuant to an appropriate agreement between CONTRACTOR and the Subcontract which specifically binds the Subcontractor to the applicable terms and conditions of the Contract Documents for the benefit of OWNER and ENGINEER and contains waiver provisions as required by paragraph 5.11. CONTRACTOR shall pay each Subcontractor a just share of any insurance moneys received by CONTRACTOR on account of losses under policies issued pursuant to paragraphs 5.6 and 5.7.

#### Patent Fees and Royalties

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- 6.12 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 the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by OWNER in the Contract Documents. CONTRACTOR shall indemnify and hold harmless OWNER and ENGINEER and anyone directly or indirectly employed by either of them from and against all claims, damages, losses and expenses (including attorneys' fees and court and arbitration costs) arising out of 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, and shall defend all such claims in connection with any alleged infringement of such rights.

#### Permits

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- 6.13. Unless otherwise provided in the Supplementary Conditions, CONTRACTOR shall obtain and pay for all construction permits and licenses, OWNER shall assist CONTRACTOR, when necessary, in obtaining such permits and licenses. CONTRACTOR shall pay all governmen-

tal charges and inspection fees necessary for the prosecution of the Work, which are applicable at the time of opening of Bids, or if there are no Bids on the Effective Date of the Agreement. CONTRACTOR shall pay all charges of utility owners for connections to the Work, and OWNER shall pay all charges of such utility owners for capital costs related thereto such as plant investment fees.

#### Laws and Regulations

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- 6.14.1. CONTRACTOR shall give all notices and comply with all Laws and Regulations applicable to furnishing and 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.
- 6.14.2. If CONTRACTOR observes that the Specifications or Drawings are at variance with any Laws or Regulations, CONTRACTOR shall give ENGINEER prompt written notice thereof, and any necessary changes will be authorized by one of the methods indicated in paragraph 3.4. If CONTRACTOR performs any Work knowing or having reason to know that it is contrary to such Laws or Regulations, and without such notice to ENGINEER, CONTRACTOR shall bear all costs, arising therefrom: however, it shall not be CONTRACTOR's primary responsibility to make certain that the Specifications and Drawings are in accordance with such Laws and Regulations.

#### Taxes

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- 6.15. 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 Project which are applicable during the performance of the Work.

#### Use of Premises

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- 6.16. CONTRACTOR shall confine construction equipment, the storage of materials and equipment and the operations of workers to the Project site and land and areas identified in and permitted by the Contract Documents and other land and areas permitted by Laws and Regulations, rights-of-way, permits and easements, and shall not unreasonably encumber premises with construction equipment or other materials or equipment. CONTRACTOR shall assume full responsibility for any damage to any such land or areas contiguous thereof, resulting from the performance of the Work. Should any claim be made against OWNER or ENGINEER by any such

owner or occupant because of the performance of the Work, CONTRACTOR shall promptly attempt to settle with such other party by agreement or otherwise resolve the claim by arbitration or at law. CONTRACTOR shall, to the fullest extent permitted by Laws and Regulations, indemnify and hold OWNER and ENGINEER harmless from and against all claims, damages, losses and expenses (including, but not limited to, fees of engineers, architects, attorneys and other professionals and court and arbitration costs) arising



directly, indirectly or consequently out of any action, legal or equitable, brought by any such other party against OWNER or ENGINEER to the extent based on a claim arising out of CONTRACTOR's performance of the Work.

- 6.17. During the progress of the Work, CONTRACTOR shall keep the premises free from accumulations of waste materials, rubbish and other debris resulting from the Work. At the completion of the Work CONTRACTOR shall remove all waste materials, rubbish and debris from and about the premises as well as all tools, appliances, construction equipment and machinery, and surplus materials, and shall leave the site clean and ready for occupancy by OWNER. CONTRACTOR shall restore to original condition all property not designated for alteration by the Contract Documents.
- 6.18. CONTRACTOR shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall CONTRACTOR subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

#### Record Documents

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- 6.19. CONTRACTOR shall maintain in a safe place at the site one record copy of all Drawings, Specifications, Addenda, Written Amendments, Change Orders, Work Directive Changes, Field Orders and written interpretations and clarifications (issued pursuant to paragraph 9.4) in good order and annotated to show all changes made during construction. These record documents together with all approved samples and a counterpart of all approved Shop Drawings will be available to ENGINEER for reference. Upon completion of the Work, these record documents, samples and Shop Drawings will be delivered to ENGINEER for OWNER.

#### Safety and Protection

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- 6.20. CONTRACTOR shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. CONTRACTOR shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:
- 6.20.1. All employees on the Work and other persons and organizations who may be affected thereby:
- 6.20.2. All the Work and materials and equipment to be incorporated therein, whether in storage on or off the site; and
- 6.20.3. Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures utilities and Underground Facilities not designated for removal, relocation or replacement in the course of construction.

CONTRACTOR shall comply with all applicable Laws and Regulations of any public body having jurisdiction for the safety of persons or property or to protect them

from damage, injury or loss; and shall erect and maintain all necessary safeguards for such safety and protection. CONTRACTOR shall notify owners of adjacent property and of Underground Facilities and utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation and replacement of their property. All damage, injury or loss to any property referred to in paragraph 6.20.2 or 6.20.3 caused, directly or indirectly, in whole or in part, by CONTRACTOR, any Subcontractor, Supplier or any other person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, shall be remedied by CONTRACTOR (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of OWNER or ENGINEER or anyone employed by either of them or anyone for whose acts either of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of CONTRACTOR). CONTRACTOR's duties and responsibilities for the safety and protection of the Work shall continue until such time as all the Work is completed and ENGINEER has issued a notice to OWNER and CONTRACTOR in accordance with paragraph 14.13 that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

- 6.21. CONTRACTOR shall designate a responsible representative at the site whose duty shall be the prevention of accidents. This person shall be CONTRACTOR's superintendent unless otherwise designated in writing by CONTRACTOR to OWNER.

#### Emergencies

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- 6.22. In emergencies affecting the safety or protection of persons or the work or property at the site or adjacent thereto, CONTRACTOR, without special instruction or authorization from ENGINEER or OWNER, 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. If ENGINEER determines that a change in the Contract Documents is required because of the action taken in response to an emergency, a Work Directive Change or Change Order will be issued to document the consequences of the changes or variations.

#### Shop Drawings and Samples

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- 6.23. After checking and verifying all field measurements and after complying with applicable procedures specified in the General Requirements, CONTRACTOR shall submit to ENGINEER for review and approval in accordance with the accepted schedule of Shop Drawing submissions (see paragraph 2.9), or for other appropriate action if so indicated in the Supplementary Conditions, five copies (unless otherwise specified in the General Requirements) of all Shop Drawings, which will bear a stamp or specific written indication that CONTRACTOR has satisfied CONTRACTOR's responsibilities under the Contract

Documents with respect to the review of the submission. All submissions will be identified as ENGINEER may require. The data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials and similar data to enable ENGINEER to review the information as required.

- 6.24. CONTRACTOR shall also submit to ENGINEER for review and approval with such promptness as to cause no delay in Work, all samples required by the Contract Documents. All samples will have been checked by and accompanied by a specific written indication that CONTRACTOR has satisfied CONTRACTOR's responsibilities under the Contract Documents with respect to the review of the submission and will be identified clearly as to material. Supplier, pertinent data such as catalog numbers and the use for which intended.
- 6.25.1. Before submission of each Shop Drawing or sample CONTRACTOR shall have determined and verified all quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers and similar data with respect thereto and reviewed or coordinated each Shop Drawing or sample with other Shop Drawings and samples and with the requirements of the Work and the Contract Documents.
- 6.25.2. At the time of each submission, CONTRACTOR shall give ENGINEER specific written notice of each variation that the Shop Drawings or samples may have from the requirements of the Contract Documents. In addition, shall cause a specific notation to be made on each Shop Drawing submitted to ENGINEER for review and approval of each such variation.
- 6.26. ENGINEER will review and approve with reasonable promptness Shop Drawings and samples, but ENGINEER's review and approval will be only for conformance with the design concept of the Project and for compliance with the information given in the Contract Documents and shall not extend to means, methods, techniques, sequences or procedures of construction (except where a specific means, method, technique, sequence or procedure of construction is indicated in or required by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in **which** the item functions. CONTRACTOR shall make corrections required by ENGINEER, and shall return the required number of corrected copies of Shop Drawings and submit as required new samples for review and approval. CONTRACTOR shall direct specific attention in writing to revisions other than the corrections called for by ENGINEER on previous submittals.
- 6.27. ENGINEER's review and approval of Shop Drawings or samples shall not relieve CONTRACTOR from responsibility for any variation from the requirements of the Contract Documents unless CONTRACTOR has in writing called ENGINEER's attention to each such variation at the time of submission as required by paragraph 6.25.2 and ENGINEER has given written approval of each such variation by a specific written approval of each such variation by a specific written notation thereof incorporated in or accompanying the Shop

Drawing or sample approval; nor will any approval by ENGINEER relieve CONTRACTOR from responsibility for errors or omissions in the Shop Drawings or from the responsibility for having complied with the provisions of paragraph 6.25.1.

- 6.28. Where a Shop Drawing or sample is required by the Specifications, any related Work performed prior to ENGINEER's review and approval of the pertinent submission will be the sole expense and responsibility of CONTRACTOR.

#### Continuing the Work

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- 6.29. CONTRACTOR shall carry on the Work and adhere to the progress schedule during all disputes or disagreements with OWNER. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by paragraph 15.5 or as CONTRACTOR and OWNER may otherwise agree in writing.

#### Indemnification

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- 6.30. To the fullest extent permitted by Laws and Regulations CONTRACTOR shall indemnify and hold harmless OWNER and ENGINEER and their consultants, agents and employees from and against all claims, damages, losses and expenses, direct, indirect or consequential (including but not limited to fees and charges of engineers, architects, attorneys and other professional and court and arbitration costs arising out of or resulting from the performance of the Work, provided that any such claim, damage, loss or expense (a) 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 and (b) is caused in whole or in part by any negligent act or omission of CONTRACTOR, any Subcontractor, any person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder or arises by or is imposed by Law and Regulations regardless of the negligence of any such party.
- 6.31. In any and all claims against OWNER or ENGINEER or any of their consultants, agents or employees by any employee of CONTRACTOR, any Subcontractor, any person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, the indemnification obligation under paragraph 6.30 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 or other person or organization under workers' or workmen's compensation acts, disability benefit acts or other employee benefit acts.
- 6.32. The obligations of CONTRACTOR under paragraph 6.30 shall not extend to the liability of ENGINEER. ENGINEER's consultants, agents or employees arising out of the preparation or approval of maps, drawings, opinions, reports surveys, Change Orders, designs or specifications.

## ARTICLE 7 - OTHER WORK

### Related Work at Site

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- 7.1. OWNER may perform other work related to the Project at the site by OWNER's own forces, have other work performed by utility owners or let other direct contracts therefor which shall contain General Conditions similar to these. If the fact that such other work is to be performed was not noted in the Contract Documents, written notice thereof will be given to CONTRACTOR prior to starting any such other work; and, if CONTRACTOR believes that such performance will involve additional expense to CONTRACTOR or requires additional time and the parties are unable to agree as to the extent thereof, CONTRACTOR may make a claim therefor as provided in Articles 11 and 12.
- 7.2. CONTRACTOR shall afford each utility owner and other contractor who is a party to such a direct contract (or OWNER, if OWNER is performing the additional work with OWNER's employees) proper and safe access to the site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such work, and shall properly connect and coordinate the Work with theirs. CONTRACTOR shall do all cutting, fitting and patching of the WORK that may be required to make its several parts come together properly and integrate with such other work. CONTRACTOR shall not endanger any work of others by cutting, excavating or otherwise altering their work and will only cut or alter their work with the written consent of ENGINEER and the others whose work will be affected. The duties and responsibilities of CONTRACTOR under this paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of CONTRACTOR in said direct contracts between OWNER and such utility owners and other contractors.
- 7.3. If any part of CONTRACTOR's Work depends for proper excavation or results upon the work of any such other contractor or utility owner (or OWNER), CONTRACTOR shall inspect and promptly report to ENGINEER in writing any delays, defects or deficiencies in such work that render it unavailable or unsuitable for such proper excavation and results. Contractor's failure so to report will constitute an acceptance of the other work as fit and proper for integration with CONTRACTOR's Work except for latent or nonapparent defects and deficiencies in the other work.

### Coordination

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- 7.4. If OWNER contracts with others for the performance of other work on the Project at the site, the person or organization who will have authority and responsibility for coordination of the activities among the various prime contractors will be identified in the Supplementary Conditions, and the specific matters to be covered by such authority and responsibilities will be provided, in the Supplementary Conditions. Unless otherwise provided in the Supplementary Conditions, neither OWNER nor ENGINEER shall have any authority or responsibility in respect of such coordination.

ARTICLE 8 – OWNER’S RESPONSIBILITIES
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- 8.1. OWNER shall issue all communications to CONTRACTOR through ENGINEER.
- 8.2. In case of termination of the employment of ENGINEER, OWNER shall appoint an engineer against whom CONTRACTOR makes no reasonable objection, whose status under the Contract Documents shall be that of the former ENGINEER. Any dispute in connection with such appointment shall be subject to further legal action.
- 8.3. OWNER shall furnish the data required of OWNER under the Contract Documents promptly and shall make payments to CONTRACTOR promptly after they are due as provided in paragraphs 14.4 and 14.13.
- 8.4. OWNER's duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in paragraphs 4.1 and 4.4. Paragraph 4.2 refers to OWNER's identifying and making available to CONTRACTOR copies of reports of explorations and tests of subsurface conditions at the site and in existing structures which have been utilized by ENGINEER in preparing the Drawings and Specifications.
- 8.5. OWNER's responsibilities in respect of purchasing and maintaining liability and property insurance are set forth in paragraphs 5.5 through 5.8.
- 8.6. OWNER is obligated to execute Change Orders as indicated in paragraph 10.4.
- 8.7. OWNER's responsibility in respect of certain inspections, tests and approvals is set forth in paragraph 13.4.
- 8.8. In connection with OWNER's right to stop Work or suspend Work, see paragraphs 13.10 and 15.1. Paragraph 15.2 deals with OWNER's right to terminate services of CONTRACTOR under certain circumstances.

## ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION

### Owner's Representative

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- 9.1. ENGINEER will be OWNER's representative during the construction period. The duties and responsibilities and the limitations of authority of ENGINEER as OWNER's representative during construction are set forth in the Contract Documents and shall not be extended without written consent of OWNER and ENGINEER.

### Visits to Site

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- 9.2. ENGINEER will make visits to the site at intervals appropriate to the various stages of construction to observe the progress and quality of the executed Work and to determine, in general, if the Work is proceeding in accordance with the Contract Documents. ENGINEER will not be required to make exhaustive or continuous on site inspections 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 to the Contract Documents. On the basis of such visits and on site observations as an experienced and qualified design professional, ENGINEER will keep OWNER informed of the progress of the Work and will endeavor to guard OWNER against defects and deficiencies in the Work.

### Project Representation

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- \*9.3. If OWNER and ENGINEER agree, ENGINEER will furnish a Resident Project Representative to assist ENGINEER in observing the performance of the Work. The duties, responsibilities and limitations of authority of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions. If OWNER designates another agent to represent OWNER at the site who is not ENGINEER's agent or employee, the duties, responsibilities and limitations of authority of such other person will be as provided in the Supplementary Conditions.

### Clarifications and Interpretations

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- 9.4. ENGINEER will issue with reasonable promptness such written clarifications or interpretations of the requirements of the Contract Documents (in the form of Drawings or otherwise) as ENGINEER may determine necessary, which shall be consistent with or reasonably inferable from the overall intent of the Contract Documents. If CONTRACTOR believes that a written clarification or interpretation justifies an increase in the Contract Price or an extension of the Contract Time and the parties are unable to agree to the amount or extent thereof, CONTRACTOR may make a claim therefore as provided in Article 11 and Article 12.

#### Authorized Variations in Work

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- 9.5. ENGINEER may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Time and are consistent with the overall intent of the Contract Documents. These may be accomplished by a Field Order and will be binding on OWNER, and also on CONTRACTOR who shall perform the Work involved promptly. If CONTRACTOR believes that a Field Order justifies an increase in the Contract Price or an extension of the Contract Time and the parties are unable to agree as to the amount or extent thereof, CONTRACTOR may make a claim therefor as provided in Article 11 and 12.

#### Rejecting Defective Work

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- 9.6. ENGINEER will have authority to disapprove or reject Work which ENGINEER believes to be defective, and will also have authority to require special inspection or testing of the Work as provided in paragraph 13.9, whether or not the Work is fabricated, installed or completed.

#### Shop Drawings, Change Orders and Payments

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- 9.7. In connection with ENGINEER's responsibility for Shop Drawings and samples, see paragraphs 6.23 through 6.29 inclusive.
- 9.8. In connection with ENGINEER's responsibilities as to Change Orders, see Articles 10, 11 and 12.
- 9.9. In connection with ENGINEER's responsibilities in respect of Applications for Payment, etc., see Article 14.

#### Determinations for Unit Prices

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- 9.10. ENGINEER will determine the actual quantities and classifications of Unit Price Work performed by CONTRACTOR. ENGINEER will review with CONTRACTOR 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 decisions thereon will be final and binding upon OWNER and CONTRACTOR, unless, within ten days after the date of any such decision, either OWNER or CONTRACTOR delivers to the other party to the Agreement and to ENGINEER written notice of intention to appeal from such a decision.

\* See Supplementary General Conditions

#### Decisions on Disputes

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- 9.11. ENGINEER will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. Claims, disputes and other



matters relating to the acceptability of the Work or the interpretation of the requirements of the Contract Documents pertaining to the performance and furnishing of the Work and claims under Articles 11 and 12 in respect of changes in the Contract Price or Contract time will be referred initially to ENGINEER in writing with a request for a formal decision in accordance with this paragraph, which ENGINEER will render in writing within a reasonable time. Written notice of each such claim, dispute and other matter will be delivered by the claimant to ENGINEER and the other party to the Agreement promptly (but in no event later than thirty days) after the occurrence of the event giving rise thereto, and written supporting data will be submitted to ENGINEER and the other party within sixty days after such occurrence unless ENGINEER allows an additional period of time to ascertain more accurate data in support of the claim.

- 9.12. When functioning as interpreter and Judge under Paragraphs 9.10 and 0.11. ENGINEER will not show partiality to OWNER or CONTRACTOR and will not be liable in connection with any interpretation or decision rendered in good faith in such Capacity. The rendering of a decision by ENGINEER pursuant to paragraphs 9.10 and 9.11 with respect to any such claim, dispute or other matter (except any which have been waived by the making or acceptance of final payment as provided in paragraph 14.16) will be a condition precedent to any exercise by OWNER or CONTRACTOR of such rights or remedies as either may otherwise have under the Contract Documents or by Laws or Regulations in respect of any such claim, dispute or other matter.

#### Limitations on ENGINEER's Responsibilities

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- 9.13. Neither ENGINEER's authority to act under this Article 9 or elsewhere in the Contract Documents nor any decision made by ENGINEER in good faith either to exercise or not exercise such authority shall give rise to any duty or responsibility of ENGINEER to CONTRACTOR, any Subcontractor, any Supplier, or any other person or organization performing any of the Work, or to any surety for any of them.
- 9.14. Whenever in the Contract Documents the terms "as ordered", "as directed", "as required", "as allowed", "as approved" or terms of like effect or import are used, or the adjectives "reasonable", "suitable", "acceptable", "proper" or "satisfactory" or adjectives of like effect or import are used to describe a requirement, direction, review or judgment of ENGINEER as to the Work, it is intended that such requirement, direction, review or judgment will be solely to evaluate the Work for compliance with the Contract Documents (unless there is a specific statement indicating otherwise. The use of any such term or adjective shall not be effective to assign to ENGINEER any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 9.15 or 9.16.
- 9.15. ENGINEER will not be responsible for CONTRACTOR's means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, and ENGINEER will not be responsible for CONTRACTOR's failure to perform or furnish the Work in accordance with the Contract Documents.

- 9.16. ENGINEER will not be responsible for the acts or omissions of CONTRACTOR or of any Subcontractor, any Supplier, or of any other person or organization performing or furnishing any of the Work.

ARTICLE 10 - CHANGES IN THE WORK
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- 10.1. Without invalidating the Agreement and without notice to any surety, OWNER may, at any time or from time to time, order additions, deletions or revisions in the Work; these will be authorized by a Written Amendment, a Change Order, or a Work Directive Change. Upon receipt of any such document, CONTRACTOR shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).
- 10.2. If OWNER and CONTRACTOR are unable to agree as to the extent, if any, of an increase or decrease in the Contract Price or an extension or shortening of the Contract Time that should be allowed as a result of a Work Directive Change, a claim may be made therefor as provided in Article 11 or Article 12.
- 10.3. CONTRACTOR shall not be entitled to an increase in the Contract Price or an extension of the Contract Time with respect to any Work performed that is not required by the Contract Documents as amended, modified and supplemented as provided in paragraphs 3.4 and 3.5, except in the case of an emergency as provided in paragraph 6.22 and except in the case of uncovering Work as provided in paragraph 13.9.
- 10.4. OWNER and CONTRACTOR shall execute appropriate Change Orders (or Written Amendments) covering:
- 10.4.1. Changes in the Work which are ordered by OWNER pursuant to paragraph 10.1 are required because of acceptance of defective Work under paragraph 13.13 or correcting defective Work under paragraph 13.14, or are agreed to by the parties:
- 10.4.2. Changes in the contract Price or Contract Time which are agreed to by the parties; and
- 10.4.3. Changes in the Contract Price or Contract Time which embody the substance of any written decision rendered by ENGINEER pursuant to paragraph 9.11;
- Provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, CONTRACTOR shall carry on the Work and adhere to the progress schedule as provided in paragraph 6.29.
- 10.5. If notice 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 Time) is required by the provisions of any bond to be given to a surety, the giving of any such notice

will be CONTRACTORS responsibility, and the amount of each applicable bond will be adjusted accordingly.

ARTICLE 11 - CHANGE OF CONTRACT PRICE
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- 11.1. The Contract Price constitutes the total compensation (subject to authorized adjustments) payable to CONTRACTOR for performing the Work. All duties, responsibilities and obligations assigned to or undertaken by CONTRACTOR shall be at his expense without change in the Contract Price.
- 11.2. The Contract Price may only be changed by a Change Order or by a Written Amendment. Any claim for an increase or decrease in the Contract Price shall be based on written notice delivered by the party making the claim to the other party and to ENGINEER promptly (but in no event later than thirty days) after the occurrence of the event giving rise to the claim and stating the general nature of the claim. Notice of the amount of the claim with supporting data shall be delivered within sixty days after such occurrence (unless ENGINEER allows an additional period of time to ascertain more accurate data in support of the claim) and shall be accompanied by claimant's written statement that the amount claimed covers all known amounts (direct, indirect and consequential) to which the claimant is entitled as a result of the occurrence of said event. All claims for adjustment in the Contract Price shall be determined by ENGINEER in accordance with paragraph 9.11 if OWNER and CONTRACTOR cannot otherwise agree on the amount involved. No claim for an adjustment in the Contract Price will be valid if not submitted in accordance with this paragraph 11.2.
- 11.3. The value of any Work covered by a Change Order or of any claim for an increase or decrease in the Contract Price shall be determined in one of the following ways:
- 11.3.1. Where the Work involved is covered by unit prices contained in the Contract Documents, by application of unit prices to the quantities of the items involved (subject to the provisions of paragraphs 11.9.1 through 11.9.3 inclusive).
- 11.3.2. By mutual acceptance of a lump sum (which may include an allowance for overhead and profit and necessarily in accordance with paragraph 11.6.2.1).
- 11.3.3. On the basis of the Cost of the Work (determined as provided in paragraphs 11.4 and 11.5) plus a CONTRACTOR's Fee for overhead and profit (determined as provided in paragraphs 11.6 and 11.7).

#### Cost of the Work

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- 11.4. The term Cost of the Work means the sum of all costs necessarily incurred and paid by CONTRACTOR in the proper performance of the Work. Except as otherwise may be agreed in writing by OWNER, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items and shall not include any of the costs itemized in paragraph 11.5:

- 11.4.1. 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. 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' or workmen's compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. Such employees shall include superintendents and foremen at the site. The expenses of performing Work after regular working hours, on Saturday, Sunday or legal holidays, shall be included in the above to the extent authorized by OWNER.
- 11.4.2. 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 all returns from sale of surplus materials and equipment shall accrue to OWNER, and CONTRACTOR shall make provisions so that they may be obtained.
- 11.4.3. Payments made by CONTRACTOR to the Subcontractors for Work performed by Subcontractors. If required by OWNER, CONTRACTOR shall obtain competitive bids from Subcontractors acceptable to CONTRACTOR and shall deliver such bids to OWNER who will then determine, with the advice of ENGINEER, which bids will be accepted. If a 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 shall be determined in the same manner as CONTRACTOR's Cost of the Work. All subcontracts shall be subject to the other provisions of the Contract Documents insofar as applicable.
- 11.4.4. 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.
- 11.4.5. Supplemental costs including the following:
- 11.4.5.1. The proportion of necessary transportation, travel and subsistence expenses of CONTRACTOR's employees incurred in discharge of duties connected with the Work.
- 11.4.5.2. 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.

- 11.4.5.3. 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, installation, dismantling and removal thereof - all in accordance with 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.
- 11.4.5.4. Sales, consumer, use or similar taxes related to the Work, and for which CONTRACTOR is liable, imposed by Laws and Regulations.
- 11.4.5.5. Deposits lost for caused 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.
- 11.4.5.6. Losses and damages (and related expenses), not compensated by insurance or otherwise, to the Work or otherwise sustained by CONTRACTOR in connection with the performance and furnishing of the Work (except losses and damages within the deductible amounts of property insurance established by OWNER in accordance with paragraph 5.9), provided they 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. If, however, any such loss or damage requires reconstruction and CONTRACTOR is placed in charge thereof, CONTRACTOR shall be paid for services a fee proportionate to that stated in paragraph 11.6.2.
- 11.4.5.7. The cost of utilities, fuel and sanitary facilities at the site.
- 11.4.5.8. Minor expenses such as telegrams, long distance telephone calls, telephone service at the site, expressage and similar petty cash items in connection with the Work.
- 11.4.5.9. Cost of premiums for additional bonds and insurance required because of changes in the Work and premiums for property insurance coverage within the limits of the deductible amounts established by OWNER in accordance with paragraph 5.9.

11.5. The term Cost of the Work shall not include any of the following:

- 11.5.1. Payroll costs and other compensation of CONTRACTOR's officers, executives, principals (of partnership and sole proprietorships), general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks and other personnel employed by CONTRACTOR whether at the site or in CONTRACTOR's principal or a branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in paragraph 11.4.1 or specifically covered by paragraph 11.4.4 - all of which are to be considered administrative costs covered by the CONTRACTOR's Fee.
- 11.5.2. Expenses of CONTRACTOR's principal and branch offices other than CONTRACTOR's office at the site.
- 11.5.3. Any part of CONTRACTOR's capital expenses, including interest on CONTRACTOR's capital employed for the Work and charges against CONTRACTOR for delinquent payments.
- 11.5.4. Cost of premiums for all Bonds and for all insurance whether or not CONTRACTOR is required by the Contract Documents to purchase and maintain the same (except for the cost of premiums covered by subparagraph 11.4.5.9. above).
- 11.5.5. Costs due to the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective work, disposal of materials or equipment wrongly supplied and making good any damage to property.
- 11.5.6. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in paragraph 11.4.

#### CONTRACTOR's Fee

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- 11.6. The CONTRACTOR's Fee allowed to CONTRACTOR for overhead and profit shall be determined as follows:
  - 11.6.1. A mutually acceptable fixed fee, or if none can be agreed upon.
  - 11.6.2. A fee based on the following percentages of the various portions of the Cost of the Work.
    - 11.6.2.1. For costs incurred under paragraphs 11.4.1 and 11.4.2., the CONTRACTOR's Fee shall be fifteen percent:
    - 11.6.2.2. For costs incurred under Paragraph 11.4.3. the CONTRACTOR's Fee shall be five percent and if a subcontract is on the basis of Cost of the Work Plus a Fee, the maximum allowable to CONTRACTOR on account of overhead and profit of all Subcontractors shall be fifteen percent:

- 11.6.2.3. No fee shall be payable on the basis of costs itemized under paragraphs 11.4.4, 11.4.5 and 11.5.
- 11.6.2.4. The amount of credit to be allowed by CONTRACTOR to OWNER for any such change which results in a net decrease in cost will be the amount of the actual net decrease plus a deduction in CONTRACTOR's Fee by an amount equal to ten percent of the net decrease; and
- 11.6.2.5. 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 11.6.2.1 through 11.6.2.4, inclusive.
- 11.7. Whenever the cost of any Work is to be determined pursuant to paragraph 11.4 or 11.5. CONTRACTOR will submit in form acceptable to ENGINEER an itemized cost breakdown together with supporting data.

#### Cash Allowances

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- 11.8. 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 done by such Subcontractors or Suppliers and for such sums within the limit of the allowances as may be acceptable to ENGINEER, CONTRACTOR agrees that:
- 11.8.1. The 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
- 11.8.2. CONTRACTOR's costs for unloading and handling on the site, labor, installation costs, overhead, profit and other expenses contemplated for the allowances have been included in the Contract Price and not in the allowances. No demand for additional payment on account of any thereof will be valid.

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.

#### Unit Price Work

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- 11.9.1. 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 established unit prices for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of bids and determining an initial contract Price. Determinations of the actual quantities and

classifications of Unit Price Work performed by CONTRACTOR will be made by ENGINEER in accordance with Paragraph 9.10.

- 11.9.2. 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.
- 11.9.3. Where the quantity of any item of Unit Price Work performed by CONTRACTOR differs materially and significantly from the estimated quantity of such item indicated in the Agreement and there is no corresponding adjustment with respect to any other item of Work and if CONTRACTOR believes that CONTRACTOR has incurred additional expense as a result thereof. CONTRACTOR may make a claim for an increase in the Contract Price in accordance with Article 11 if the parties are unable to agree as to the amount of any such increase.

ARTICLE 12 - CHANGE OF CONTRACT TIME
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- 12.1. The Contract Time may only be changed by a Change Order or a Written Amendment. Any claim for an extension or shortening of the Contract Time shall be based on written notice delivered by the party making the claim to the other party and to ENGINEER promptly (but in no event later than thirty days) after the occurrence of the event giving rise to the claim and stating the general nature of the claim. Notice of the extent of the claim with supporting data shall be delivered within sixty days after such occurrence (unless ENGINEER allows an additional period of time to ascertain more accurate data in support of the claim) and shall be accompanied by the claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant has reason to believe it is entitled as a result of the occurrence of said event. All claims for adjustment in the Contract Time shall be determined by ENGINEER in accordance with paragraph 9.11 if OWNER and CONTRACTOR cannot otherwise agree. No claim for an adjustment in the Contract Time will be valid if not submitted in accordance with the requirements of this paragraph 12.1.
- 12.2. The Contract Time will be extended in an amount equal to time lost due to delays beyond the control of CONTRACTOR if a claim is made therefor as provided in paragraph 12.1. Such delays shall include, but not be limited to, acts or neglect by OWNER or others performing additional work as contemplated by Article 7, or to fires, floods. Labor disputes, epidemics, abnormal weather conditions or acts of God.
- 12.3. All time limits stated in the Contract Documents are of the essence of the Agreement. The provisions of this Article 12 shall not exclude recovery for damages (including but not limited to fees and charges of engineers, architects, attorneys and other professionals and court and arbitration costs) for delay by either party.



ARTICLE 13 - WARRANTY AND GUARANTEE: TESTS AND INSPECTIONS: CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK
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#### Warranty and Guarantee

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- 13.1. CONTRACTOR warrants and guarantees to OWNER and ENGINEER that all work will be in accordance with the Contract Documents and will not be defective. Prompt notice of all defects shall be given to CONTRACTOR. All defective Work, whether or not in place, may be rejected, corrected or accepted as provided in this Article 13.

#### Access to Work

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- 13.2. ENGINEER and ENGINEER's representatives, other representatives of OWNER, testing agencies and governmental agencies with jurisdictional interests will have access to the Work at reasonable times for their observation, inspecting and testing. CONTRACTOR shall provide proper and safe conditions for such access.

#### Tests and Inspections

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- 13.3. CONTRACTOR shall give ENGINEER timely notice of readiness of the Work for all required inspections, tests or approvals.
- 13.4. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) to specifically be inspected, tested or approved. CONTRACTOR shall assume full responsibility therefor, pay all costs in connection therewith and furnish ENGINEER the required certificates of inspection, testing or approval. CONTRACTOR shall also be responsible for and shall pay all costs in connection with any inspection or testing required in connection with OWNER's or ENGINEER's acceptance of a Supplier of materials or equipment proposed to be incorporated in the Work, or of materials or equipment submitted for approval prior to CONTRACTOR's purchase hereof for incorporation in the Work. The cost of all inspections, tests and approvals in addition to the above which are required by the Contract Documents shall be paid by OWNER (unless otherwise specified).
- 13.5 All inspections, tests or approvals other than those required by Laws or Regulations of any public body having jurisdiction shall be performed by organizations acceptable to OWNER and CONTRACTOR (or by ENGINEER if so specified).
- 13.6. If any Work (including the work of others) that is to be inspected, tested or approved is covered without written concurrence of ENGINEER, it must, if requested by ENGINEER, be uncovered for observation. Such uncovering shall be at CONTRACTOR's expense unless CONTRACTOR has given ENGINEER timely notice of CONTRACTOR's intention to cover the same and ENGINEER has not acted with reasonable promptness in response to such notice.

- 13.7. Neither observations by ENGINEER nor inspections, tests or approvals by others shall relieve CONTRACTOR from CONTRACTOR's obligations to perform the Work in accordance with the Contract Documents.

#### Uncovering Work:

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- 13.8. If any Work is covered contrary to the written request of ENGINEER, it must, if requested by ENGINEER, be uncovered for ENGINEER's observation and replaced at CONTRACTOR's expense.
- 13.9. If ENGINEER considers it necessary or advisable that covered Work be observed by ENGINEER or inspected or tested by others, CONTRACTOR, at ENGINEER's request, shall uncover, expose or otherwise make available for observation, inspection or testing as ENGINEER may require, that portion of the Work in question, furnishing all necessary labor, material and equipment. If it is found that such Work is defective, CONTRACTOR shall bear all direct, indirect and consequential costs of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction, (including but not limited to fees and charges of engineers, architects, attorneys and other professionals), and OWNER shall be entitled to an appropriate decrease in the Contract Price, and, if the parties are unable to agree as to the amount thereof, may make a claim therefor as provided in Article 11. If, however, such Work is not found to be defective, CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction; and, if the parties are unable to agree as to the amount or extent thereof, CONTRACTOR may make a claim therefor as provided in Articles 11 and 12.

#### Owner May Stop the Work

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- 13.10. If the Work is defective, or CONTRACTOR fails to supply sufficient skilled workers or suitable materials or equipment, or fails to furnish or perform the Work in such a way that the completed Work will conform to the Contract Documents, OWNER may order CONTRACTOR to stop the Work, or any portion thereof, until the cause for such order has been climated; 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 of any other party.

#### Correction or Removal of Defective Work

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- 13.11. If required by ENGINEER, CONTRACTOR shall promptly, as directed either correct all defective Work, whether or not fabricated, installed or completed, or, if the Work has been rejected by ENGINEER, removal it from the site and replace it with nondefective work CONTRACTOR shall bear all direct, indirect and consequential costs of such correction or removal (including but not limited to fees and charges of engineers, architects, attorneys and other professionals) made necessary thereby.

## One Year Correction Period

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\*13.12. If within one year after the date of Substantial Completion or such longer period of time as may be prescribed by Laws or Regulations any Work is found to be defective, CONTRACTOR shall promptly, without cost to OWNER and in accordance with OWNER's written instructions, either correct such defective Work, or, if it has been rejected by OWNER, remove it from the site and replace it with nondefective Work. If CONTRACTOR does not promptly comply with the terms of such instructions or in an emergency where delay would cause serious risk of loss or damage, OWNER may have the defective Work corrected or the rejected Work removed and replaced and all direct, indirect and consequential costs of such removal and replacement (including but not limited to fees and charges of engineers, architects, attorneys and other professionals) will be paid by CONTRACTOR. 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 or by Written Amendment.

## Acceptance of Defective Work

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13.13. If, instead of requiring correction or removal and replacement of defective Work, OWNER (and, prior to ENGINEER's recommendation of final payment, also ENGINEER) prefers to accept it, OWNER may do so. CONTRACTOR shall bear all direct, indirect and consequential costs attributable to OWNER's evaluation of and determination to accept such defective Work (such costs to be approved by ENGINEER as to reasonableness and to include but not be limited to fees and charges of engineers, architects, attorneys and other professionals). If any such acceptance occurs prior to ENGINEER's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work: and OWNER shall be entitled to an appropriate decrease in the Contract Price, and, if the Parties are unable to agree as to the amount thereof, OWNER may make a claim therefor as provided in Article 11. If the acceptance occurs after such recommendation, an appropriate amount will be paid by CONTRACTOR to OWNER.

\* See Supplementary General Conditions

## OWNER May Correct Defective Work

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13.14. If CONTRACTOR fails within a reasonable time after written notice of ENGINEER to proceed to correct and to correct defective Work or to remove and replace rejected Work as required by ENGINEER in accordance with paragraph 13.11, or if CONTRACTOR fails to perform the Work in accordance with the Contract Documents, or if CONTRACTOR fails to comply with any other provision of the Contract Documents, OWNER may, after seven days' written notice to CONTRACTOR, correct and remedy any such deficient. In exercising the rights and remedies under this paragraph OWNER shall proceed expeditiously. To the extent necessary to complete corrective and 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 tools, appliances, construction equipment and machinery at the site and incorporate in the Work all materials and equipment stored at the site or for which OWNER has paid CONTRACTOR but which are stored elsewhere. CONTRACTOR shall allow OWNER, OWNER's representatives, agents and employees such access to the site as may be necessary to enable OWNER to exercise the rights and remedies under this paragraph. All direct, indirect and consequential costs of OWNER in exercising such rights and remedies will be charged against CONTRACTOR in an amount approved as to reasonableness by ENGINEER, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work: and OWNER shall be entitled to an appropriate decrease in the Contract Price, and, if the parties are unable to agree as to the amount thereof, OWNER may make a claim therefor as provided in Article 11. Such direct, indirect and consequential costs will include but not be limited to fees and charges of engineers, architects, attorneys and other professional, all court and arbitration costs and all costs of repair and replacement of work of others destroyed or damaged by correction, removal or replacement of CONTRACTOR's defective Work. CONTRACTOR shall not be allowed an extension of the Contract Time because of any delay in performance of the Work attributable to the exercise by OWNER of OWNER's rights and remedies hereunder.

#### ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION

##### Schedule of Values

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- 14.1. The schedule of values established as provided in paragraph 2.9 will serve as the basis for progress payment 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.

##### Application for Progress Payment

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- 14.2. At least twenty days before each progress payment is scheduled (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, charges, security interests and encumbrances (which are hereinafter in these General Conditions referred to as "Liens") and evidence that the materials and equipment are covered by appropriate property insurance and other arrangements to protect OWNER's interest therein, all of which will be satisfactory to OWNER. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

## CONTRACTOR's Warranty of Title

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

## Review of Applications for Progress Payment

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- \*14.4. ENGINEER will, within ten days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to OWNER, or return the Application to CONTRACTOR indicating in writing ENGINEER's reasons for refusing to recommend payment. In the latter case, CONTRACTOR may make the necessary corrections and resubmit the Application. Ten days after presentation of the Application for Payment with ENGINEER's recommendation, the amount recommended will (subject to the provisions of the last sentence of paragraph 14.7) become due and when due will be paid by OWNER to CONTRACTOR.

\* See Supplementary General Conditions

- 14.5. ENGINEER's recommendation of any payment requested in an Application for Payment will continue a representation by ENGINEER to OWNER, based on ENGINEER's on-site observations of the Work in progress as an experienced and qualified design professional and on ENGINEER's review of the Application for Payment and the accompanying data and schedules that the Work has progressed to the point indicated; that, to the best of ENGINEER's knowledge, information and belief, the quality of the Work is in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, to the results of any subsequent tests called for in the Contract Documents, to a final determination of quantities and classifications for Unit Price Work under paragraph 9.10 and to any other qualifications stated in the recommendation); and that CONTRACTOR is entitled to payment of the amount recommended. However, by recommending any such payment ENGINEER will not thereby be deemed to have represented that exhaustive or continuous on-site inspections have been made to check the quality of the quantity of the Work beyond the responsibilities specifically assigned to ENGINEER in the Contract Documents or that there may not be other matters or issues between the parties that might entitle CONTRACTOR to be paid additionally by OWNER or OWNER to withhold payment to CONTRACTOR.
- 14.6. ENGINEER's recommendation of final payment will constitute an additional representation by ENGINEER to OWNER that the conditions precedent to CONTRACTOR's being entitled to final payment as set forth in paragraph 14.13 have been fulfilled.
- 14.7. ENGINEER may refuse to recommend the whole or any part of any payment if, in ENGINEER's opinion, it would be incorrect to make such representation by ENGINEER to

OWNER that the conditions precedent to CONTRACTOR's being entitled to final payment as set forth in paragraph 14.13 have been fulfilled.

- 14.7.1. The Work is defective, or completed work has been damaged requiring correction or replacement,
- 14.7.2. The Contract Price has been reduced by Written Amendment or Change Order,
- 14.7.3. OWNER has been required to correct defective Work or complete Work in accordance with paragraph 13.14. or
- 14.7.4. Of ENGINEER's actual knowledge of the occurrence of any of the events enumerated in paragraphs 15.2.1 through 15.2.9 inclusive.

OWNER may refuse to make payment of the full amount recommended by ENGINEER because claims have been made against OWNER on account of CONTRACTOR's performance or furnishing of the Work or Liens have been filed in connection with the Work as there are other items entitling OWNER to a set-off against the amount recommended, but OWNER must give CONTRACTOR immediate written notice (with a copy to ENGINEER) stating the reasons for such action.

#### Substantial Completion

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- 14.8. When CONTRACTOR considers the entire Work ready for its intended use CONTRACTOR shall notify OWNER and ENGINEER in writing that the entire Work is substantially complete (except for items specifically listed by CONTRACTOR as incomplete) and request that ENGINEER issue a certificate of Substantial Completion. Within a reasonable time thereafter, 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. If ENGINEER considers the Work substantially complete, ENGINEER will prepare and deliver to OWNER a tentative certificate of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. OWNER shall have seven days after receipt of the tentative list of items to be completed or corrected before final payment. OWNER shall have seven days after receipt of the tentative certificate during which to make written objection to ENGINEER as to any provisions of the certificate or attached list. If, after considering such objection, ENGINEER concludes that the Work is not substantially complete, ENGINEER will within fourteen days after submission of the tentative certificate to OWNER notify CONTRACTOR in writing, stating the reasons therefor. If, after consideration of OWNER's objections, ENGINEER considers the Work substantially complete, ENGINEER will within said fourteen days execute and deliver to OWNER and CONTRACTOR a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as ENGINEER believes justified after consideration of any objections from OWNER. At the time of delivery of the tentative certificate of Substantial Completion ENGINEER will deliver to OWNER and

CONTRACTOR a written recommendation as to the division of responsibilities pending final payment between OWNER and CONTRACTOR with respect to security, operation, safety, maintenance, heat, utilities, insurance and warranties. Unless OWNER and CONTRACTOR agree otherwise in writing and so inform ENGINEER prior to ENGINEER's issuing the definitive certificate of Substantial Completion. ENGINEER's aforesaid recommendation will be binding on OWNER and CONTRACTOR until final payment.

- 14.9. OWNER shall have the right to exclude CONTRACTOR from the Work after the date of Substantial Completion, but OWNER shall allow CONTRACTOR reasonable access to complete or correct items on the tentative list.

#### Partial Utilization

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- 14.10. Use by OWNER of any finished 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 without significant interference with CONTRACTOR's performance of the remainder of the Work, may be accomplished prior to Substantial Completion of all the Work subject to the following:

- 14.10.1. OWNER at any time may request CONTRACTOR in writing to permit OWNER to use any such part of the Work which OWNER believes to be ready for its intended use and substantially complete. If CONTRACTOR agrees, CONTRACTOR will certify to OWNER and ENGINEER that said part of the Work is substantially complete and request ENGINEER to issue a certificate of Substantial Completion for that part of the Work. Within a reasonable time after either such request, OWNER, CONTRACTOR and ENGINEER does not consider that part of the Work to be substantially complete, ENGINEER will notify OWNER and CONTRACTOR in writing giving the reasons therefor. If ENGINEER considers that part of the Work to be substantially complete, the provisions of paragraph 14.8 and 14.9 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.
- 14.10.2. OWNER may at any time request CONTRACTOR in writing to permit OWNER to take over operation of any such part of the Work although it is not substantially complete. A copy of such request will be sent to ENGINEER and within a reasonable time thereafter OWNER, CONTRACTOR and ENGINEER shall make an inspection of that part of the Work to determine its status of completion and will prepare a list of the items remaining to be completed or corrected thereon before final payment. If CONTRACTOR does not object in writing to OWNER and ENGINEER that such part of the Work is not ready for separate operation by OWNER, ENGINEER will finalize the list of items to be completed or corrected and will deliver such list to OWNER and CONTRACTOR together with a written recommendation as to the division of responsibilities pending final payment between OWNER and CONTRACTOR with respect to security, operation, safety, maintenance, utilities, insurance, warranties and guarantees for that part of the Work which will become binding upon OWNER and CONTRACTOR at the time

when OWNER takes over such operation (unless they shall have otherwise agreed in writing and so informed ENGINEER). During such operation and prior to Substantial Completion of such part of the Work, OWNER shall allow CONTRACTOR reasonable access to complete or correct items on said list and to complete other related Work.

- 14.10.3. No occupancy or separate operation of part of the Work will be accomplished prior to compliance with the requirements of paragraph 5.15 in respect of property insurance.

#### Final Inspection

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

#### Final Application for Payment

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- 14.12. After CONTRACTOR has completed all such corrections to the satisfaction of ENGINEER and delivered all maintenance and operating instructions, schedules, guarantees, Bonds, certificates of inspection, marked up record documents (as provided in paragraph 6.19) and other documents - all as required by the Contract Documents and after ENGINEER has indicated that the Work is acceptable (subject to the provisions of paragraph 14.16). CONTRACTOR may make application for final payment following the procedure for progress payments. The final Application for Payment shall be accompanied by all documentation called for in the Contract Documents, together with complete and legally effective releases or waivers (satisfactory to OWNER) of all Liens arising out of or filed in connection with the Work. In lieu thereof and as approved by OWNER, CONTRACTOR may furnish receipts or releases in full: an affidavit of CONTRACTOR that the releases and receipts include all labor, services, material and equipment for which a Lien could be filed, and that all payrolls, material and equipment bills, and other indebtedness connected with the Work for which OWNER or OWNER's property might in any way be responsible, have been paid or otherwise satisfied: and consent of the surety, if any, to final payment. If any Subcontractor or supplier fails to furnish a release or receipt in full. CONTRACTOR may furnish a Bond or other collateral satisfactory to OWNER to indemnify OWNER against any Lien.

#### Final Payment and Acceptance

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- \*14.13. 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 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, within ten days after



receipt of the final Application for Payment, indicate in writing ENGINEER's recommendation of payment and present the Application 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 14.16.

Otherwise, ENGINEER will return the Application 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. Thirty days after presentation to OWNER of the Application and accompanying documentation, in appropriate form and substance, and with ENGINEER's recommendation and notice of acceptability, the amount recommended by ENGINEER will become due and will be paid by OWNER to CONTRACTOR.

\*See Supplementary General Conditions

14.14. If through no fault of CONTRACTOR, final completion of the Work is significantly delayed and if ENGINEER's final Application for Payment and recommendation of ENGINEER, and without terminating the Agreement, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by OWNER for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if bonds have been furnished as required in paragraph 5.1, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by CONTRACTOR to ENGINEER with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

#### Contractor's Continuing Obligation

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14.15. CONTRACTOR's obligations to perform and complete the Work in accordance with the Contract Documents shall be absolute. Neither recommendation of any progress or final payment by ENGINEER, nor the issuance of a certificate of Substantial Completion, nor any payment by OWNER to CONTRACTOR under the Contract Documents, nor any use or occupancy of the Work or any part thereof by failure to do so, nor any review and approval of a Shop Drawing or sample submission, nor the issuance of a notice of acceptability by ENGINEER pursuant to paragraph 14.13, nor any correction of defective Work by OWNER will constitute an acceptance of Work not in accordance with the Contract Documents or a release of CONTRACTOR's obligation to perform the Work in accordance with the Contract Documents (except as provided in paragraph 14.16).

#### Waiver of claims

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14.16. The making and acceptance of final payment will constitute:

14.16.1. A waiver of all claims by OWNER against CONTRACTOR, except claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to paragraph 14.11 or from failure to comply with the Contract Documents or the

terms of any special guarantees specified therein; however, it will not constitute a waiver by OWNER of any rights in respect of CONTRACTOR's continuing obligations under the Contract Documents; and

- 14.16.2. A waiver of all claims by CONTRACTOR against OWNER other than those previously made in writing and still unsettled.

## ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION

### Owner May Suspend Work

- 15.1. OWNER may, at any time and without cause, suspend the Work or any portion thereof for a period of not more than ninety days by notice in writing to CONTRACTOR and ENGINEER which will fix the date on which Work will be resumed. CONTRACTOR shall resume the Work on the date so fixed. CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to any suspension if CONTRACTOR makes an approval claim therefor as provided in Articles 11 and 12.

### Owner May Terminate

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- 15.2. Upon the occurrence of any one or more of the following events:

- 15.2.1. If CONTRACTOR commences a voluntary case under any chapter of the Bankruptcy Code (Title 11, United States Code), as now or hereafter in effect, or if CONTRACTOR takes any equivalent or similar action by filing a petition or otherwise under any other federal or state law in effect at such time relating to the bankruptcy or insolvency:
- 15.2.2. If a petition is filed against CONTRACTOR under any chapter of the Bankruptcy Code as now or hereafter in effect at the time of filing, or if a petition is filed seeking any such equivalent or similar relief against CONTRACTOR under any other federal or state law in effect at the time relating to bankruptcy or insolvency:
- 15.2.3. If CONTRACTOR makes a general assignment for the benefit of creditors:
- 15.2.4. If a trustee, receiver, custodian or agent of CONTRACTOR is appointed under applicable law or under contract, whose appointment or authority to take charge of property of CONTRACTOR is for the purpose of enforcing a Lien against such property or for the purpose of general administration of such property for the benefit of CONTRACTOR's creditors:
- 15.2.5. If CONTRACTOR admits in writing an inability to pay its debts generally as they become due:

- 15.2.6. If CONTRACTOR persistently fails to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the progress schedule established under paragraph 2.9 as revised from time to time);
- 15.2.7. If CONTRACTOR disregards Laws or Regulations of any public body having jurisdiction;
- 15.2.8. If CONTRACTOR disregards the authority of ENGINEER; or
- 15.2.9. If CONTRACTOR otherwise violates in any substantial way any provisions of the Contract Documents;

OWNER may, after giving CONTRACTOR (and the surety, if there be one) seven days' written notice and to the extent permitted by Laws and Regulations, terminate the services of CONTRACTOR, exclude CONTRACTOR from the site and take possession of the Work and of all CONTRACTOR's tools, appliances, construction equipment and machinery at the site and use the same to the full extent they could be used by CONTRACTOR (without liability to CONTRACTOR for trespass or conversion), incorporate in the Work all materials and equipment stored at the site or for which OWNER has paid CONTRACTOR shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds the direct, indirect and consequential costs of completing the Work (including but not limited to fees and charges of engineers, architects, attorneys and other professionals and court and arbitration costs) such excess will be paid to CONTRACTOR. If such costs exceed such unpaid balance, CONTRACTOR shall pay the difference to OWNER. Such costs incurred by OWNER will be approved as to reasonableness by ENGINEER and incorporated in a Change Order, but when exercising any rights or remedies under this paragraph OWNER shall not be required to obtain the lowest price for the Work performed.

- 15.3. Where CONTRACTOR's services have been so terminated by OWNER, the termination will not affect any rights or remedies of OWNER against CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of moneys due CONTRACTOR by OWNER will not release CONTRACTOR from liability.
- 15.4. Upon seven days' written notice to CONTRACTOR and ENGINEER, OWNER may, without cause and without prejudice to any other rights or remedy, elect to abandon the Work and terminate the Agreement. In such case CONTRACTOR shall be paid for all Work executed and any expense sustained plus reasonable termination expenses, which will include, but not be limited to, direct, indirect and consequential costs (including, but not limited to, fees and charges of engineers, architects, attorneys and other professionals and court and arbitration costs).

## Contractor May Stop Work or Terminate

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- 15.5. If, through no act or fault of CONTRACTOR, the Work is suspended for a period of more than ninety days by OWNER or under an order of court or other public authority, or ENGINEER fails to act on any Application for Payment within thirty days after it is submitted, or OWNER fails for thirty days to pay CONTRACTOR any sum finally determined to be due, then CONTRACTOR may, upon seven days' written notice to OWNER and ENGINEER, terminate the Agreement, if ENGINEER has failed to act on an Application for Payment or OWNER has failed to make any payment as aforesaid, CONTRACTOR may upon seven days' written notice to OWNER and ENGINEER stop the Work until payment of all amounts then due. The provisions of this paragraph shall not relieve CONTRACTOR of the obligations under paragraph 6.29 to carry on the Work in accordance with the progress schedule and without delay during disputes and disagreements with OWNER.

ARTICLE 16 - ARBITRATION
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- 16.1. All claims, disputes and other matters in question between OWNER and CONTRACTOR arising out of, or relating to the Contract Documents or the breach thereof (except for claims which have been waived by the making or acceptance of final payment as provided by paragraph 14.16) may be decided by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association then obtaining subject to the limitations of this Article 16 at the Owners discretion. This agreement so to arbitrate and any other agreement or consent to arbitrate entered into in accordance herewith as provided in this Article 16 will be specifically enforceable under the prevailing law of any court having jurisdiction.
- 16.2. No demand for arbitration of any claim, dispute or other matter that is required to be referred to ENGINEER initially **for decision** in accordance with paragraph 9.11 will be made until the earlier of (a) the date on which ENGINEER has rendered a decision or (b) the tenth day after the parties have presented their evidence to ENGINEER if a written decision has not been rendered by ENGINEER before that date. No demand for arbitration of any such claim, dispute or other matter will be made later than thirty days after the date on which ENGINEER has rendered a written decision in respect thereof in accordance with paragraph 9.11; and the failure to demand arbitration within said thirty days' period shall result in ENGINEER's decision being final and binding upon OWNER and CONTRACTOR. If ENGINEER renders a decision after arbitration proceedings have been initiated, such decision may be entered as evidence but will not supersede the arbitration proceedings, except where the decision is acceptable to the parties concerned. No demand for arbitration of any written decision of ENGINEER rendered in accordance with paragraph 9.10 will be made later than ten days after the party making such demand has delivered written notice of intention to appear as provided in paragraph 9.10.
- 16.3. Notice of the demand for arbitration will be filed in writing with the other party to the Agreement and with the American Arbitration Association, and a copy will be sent to

ENGINEER for information. The demand for arbitration will be made within the thirty day or ten day period specified in paragraph 16.2 as applicable, and in all other cases within a reasonable time after the claim, dispute or other matter in question has arisen, and in no event shall any such demand be made after the date when institution of legal or equitable proceedings based on such claim, dispute or other matter in question would be barred by the applicable statute of limitations.

- 16.4. No arbitration arising out of or relating to the Contract Documents shall include by consolidation, joinder or in any other manner any other person or entity (including ENGINEER, ENGINEER's agents, employees or consultants) who is not a party to this contract unless:
- 16.4.1 The inclusion of such other person or entity is necessary if complete relief is to be afforded among those who are already parties to the arbitration.
  - 16.4.2. Such other person or entity is substantially involved in a question of law or fact which is common to those who are already parties to the arbitration and which will arise in such proceedings, and
  - 16.4.3. The written consent of the other person or entity sought to be included and of OWNER and CONTRACTOR has been obtained for such inclusion, which consent shall make specific reference to this paragraph, but no such consent shall constitute consent to arbitration of any dispute not specifically described in such consent or to arbitration with any party not specifically identified in such consent.
- 16.5. The award rendered by the arbitrators will be final, judgment may be entered upon it in any court having jurisdiction thereof, and will not be subject to modification or appeal except to the extent permitted by Sections 10 and 11 of the Federal Arbitration act (9 U.S.C. SS 10.11) .

END OF GENERAL CONDITIONS

SUPPLEMENTAL GENERAL CONDITIONS
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These Supplemental General Conditions amend or supplement the General Conditions 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.

SC-2.2. Amend the first sentence of paragraph 2.2 of the General Conditions to read as follows:

Owner shall furnish to Contractor up to four copies of the Contract Documents.

and as so amended paragraph 2.2 remains in effect.

SC-4.2.1 and 4.2.2 There are no reports of explorations and tests of subsurface conditions or drawings of physical conditions other than those included in these Contract Documents.

SC-5.3 The limits of liability for the insurance required by paragraph 5.3 of the General Conditions shall provide coverage for not less than the following amount or greater where required by Laws and Regulations:

SC-5.3.1 CONTRACTOR'S General Public Liability and Property Damage Insurance including vehicle coverage issued to the CONTRACTOR and protecting the CONTRACTOR from all claims for personal injury, including death, and all claims for destruction of or damage to property, arising out of or in connection with any operations under the CONTRACT DOCUMENTS, whether such operations be by the CONTRACTOR or by any SUBCONTRACTOR employed by the CONTRACTOR or anyone directly or indirectly employed by the CONTRACTOR or by a SUBCONTRACTOR employed by the CONTRACTOR. For General Liability coverage, Commercial General Liability in the amount of One Million (\$1,000,000) per occurrence and Two Million (\$2,000,000) aggregate is required. In addition, Excess Liability Umbrella is preferred. For Vehicle Liability, coverage that includes Scheduled Autos, Hired Autos, and Non-owned Autos is required, also in the amount of \$1,000,000 per occurrence and \$2,000,000 aggregate. Coverage for Any Auto is preferred. Worker's Compensation and Employer's Liability Insurance is required for the Contractor, and for any and all subcontractors, to meet Maine State requirements. Statutory Limits of coverage are acceptable.

SC-5.3.2 The CONTRACTOR shall acquire and maintain, if applicable, Fire and Extended Coverage insurance upon the PROJECT to the full insurable value thereof for the benefit of the OWNER, the CONTRACTOR, and SUBCONTRACTORS as their interest may appear. This provision shall in no way release the CONTRACTOR or CONTRACTOR'S surety from obligations under the CONTRACT DOCUMENTS to fully complete the PROJECT.

SC-5.3.3 The CONTRACTOR shall acquire and maintain, at the CONTRACTOR'S own expense, during the CONTRACT TIME, in accordance with the provisions of the laws of the state in which the WORK is performed, Workmen's Compensation insurance, including occupational disease provisions, for all of the CONTRACTOR'S employees at the site of the PROJECT and in case any WORK is sublet, the CONTRACTOR shall require such SUBCONTRACTOR similarly to provide

Workmen's Compensation Insurance, including occupational disease provisions for all of the latter's employees unless such employees are covered by the protection afforded by the CONTRACTOR. In case any class of employees engaged in hazardous work under this contract at the site of the PROJECT is not protected under Workmen's Compensation statute, the CONTRACTOR shall provide, and shall cause each SUBCONTRACTOR to provide, adequate and suitable insurance for the protection of its employees not otherwise protected.

SC-5.5 Delete 5.5 of the General Conditions in its entirety and insert the following in its place: Contractor shall provide endorsement to policy to name Owner and Engineer as Also Named Insured.

SC-5.6 Delete paragraph 5.6 of the General Conditions in its entirety.

SC-5.7 Delete paragraph 5.7 of the General Conditions in its entirety.

SC-5.8 Delete paragraph 5.8 of the General Conditions in its entirety.

SC-5.9 Delete paragraph 5.9 of the General Conditions in its entirety.

SC-5.10 Delete paragraph 5.10 of the General Conditions in its entirety.

SC-5.11 Delete paragraph 5.11 of the General Conditions in its entirety.

SC-5.12 Delete paragraph 5.12 of the General Conditions in its entirety.

SC-5.13 Delete paragraph 2.13 of the General Conditions in its entirety.

SC-9.8 Add the following paragraphs immediately after paragraph 9.8 which are to read as follows:

A Listing of the Duties, Responsibilities and Limitations of Authority of Resident Project Representative.

A. General. Resident Project Representative (RPR) will act as directed by and under the supervision of Engineer, and will confer with Engineer regarding his actions. Resident Project Representative's dealings in matters pertaining to the on-site Work shall in general be only with Engineer and contractor, and dealings with subcontractors shall only be through or with the full knowledge of contractor. Written communication with Owner will be only through or as directed by the Engineer.

B. Duties and Responsibilities.

Resident Project Representative will:

1. Schedules: Review the progress schedule, schedule of Shop Drawing submittals and schedule of values prepared by Contractor and consult with Engineer concerning acceptability.
2. Conferences and Meetings: Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences and other project-related meetings, and prepare and circulate copies of minutes thereof.
3. Liaison:
  - a. Serve as Engineer's liaison with Contractor, working principally through Contractor's superintendent and assist in understanding the intent of the Contract Documents; and assist Engineer in serving as Owner's liaison with Contractor when Contractor's operations affect Owner's on-site operations.
  - b. Assist in obtaining from Owner additional details or information, when required for proper execution of the Work.
4. Shop Drawings and Samples:
  - a. Record date of receipt of Shop Drawings and samples.
  - b. Receive samples which are furnished at the site by Contractor, and notify Engineer of availability of samples for examination.
  - c. Advise Engineer and Contractor of the Commencement of any Work requiring a Shop Drawing or sample if the submittal has not been approved by Engineer.
5. Review of Work, Rejection of Defective Work, Inspections and Tests:
  - a. Conduct on-site observations of the Work in progress to assist Engineer in determining if the Work is in general proceeding in accordance with the Contract Documents.
  - b. Report to Engineer whenever RPR believes that any Work is unsatisfactory, faulty or defective or does not conform to the Contract Documents, or has been damaged, or does not meet the requirements of any inspection, test or approval required to be made; and advise Engineer of Work **that RPR** believes should be corrected or rejected or should be uncovered for observation, or requires special testing inspection or approval.
  - c. Verify that tests, equipment and systems startups and operating and maintenance training are conducted in the presence of appropriate personnel, and that Contractor maintains adequate records thereof; and observe, record and report to Engineer appropriate details relative the test procedures and startups.



- d. Accompany visiting inspectors representing public or other agencies having jurisdiction over the Project, record the results of these inspections and report to Engineer.
- 6. Interpretation of Contract Documents: Report to Engineer when clarifications and interpretations of the Contract Documents are needed and transmit to Contractor clarifications and interpretations as issued by Engineer.
- 7. Modifications: Consider and evaluate Contractor's suggestions for modifications in Drawings or Specifications and report then with RPR's recommendations to Engineer. Transmit to Contractor decisions as issued by Engineer.
- 8. Records:
  - a. Maintain at the job site orderly files for correspondence, reports of job conferences, Shop Drawings and samples, reproductions of original Contract Documents including all Work Directive Changes, Addenda, Change orders, Field Orders, additional Drawings issued subsequent to the execution of the Contract, Engineer's clarifications and interpretations of the Contract Documents, progress reports, and other Project related documents.
  - b. Keep a diary or log book, recording Contractor hours on the job site, weather conditions, data relative to questions of Work Directive Changes, Change Orders or changed conditions, list of job site visitors, daily activities, decisions, observations in general and specific observations in more detail as in the case of observing test procedures; and send copies to Engineer.
  - c. Record names, addresses and telephone numbers of all Contractors, subcontractors and major suppliers of materials and equipment.
- 9. Reports:
  - a. Furnish Engineer periodic reports as required of progress of the work and of Contractor's compliance with the progress schedule and schedule of Shop Drawing and sample submittals.
  - b. Consult with Engineer in advance of scheduled major tests, inspections or start of important phases of Work.
  - c. Draft proposed Change Orders and Work Directive Changes, obtaining backup material from Contractor and recommend to Engineer Change Orders, Work Directive Changes, and Field Orders.
  - d. Report immediately to Engineer and Owner upon the occurrence of any accident.

10. Payment Requests: Review applications for payment with Contractor for compliance with the established procedure for their submission and forward with recommendations to Engineer, noting particularly the relationship of the payment requested to the schedule of values, work completed and materials and equipment delivered at the site but not incorporated in the Work.
11. Certificates, Maintenance and Operations Manuals: During the course of the Work, verify that certificates, maintenance and operation manuals and other data required to be assembled and furnished by Contractor are applicable to the items actually installed and in accordance with the Contract Documents, and have this material delivered to Engineer for review and forwarding to Owner prior to final payment for the Work.
12. Completion:
  - a. Before Engineer issues a Certificate of Substantial Completion, submit to Contractor a list of observed items requiring completion or correction.
  - b. Conduct final inspection in the company of Engineer, Owner and Contractor and prepare a final list of items to be completed or corrected.
  - c. Observe that all items on final list have been completed or corrected and make recommendations to Engineer concerning acceptance.

C. Limitations of Authority.

Resident Project Representative:

1. Shall not authorize any deviation from the Contract Documents or substitution of materials or equipment, unless authorized by Engineer.
2. Shall not exceed limitations on Engineer's authority as set forth in the contract Documents.
3. Shall not undertake any of the responsibilities of Contractor, subcontractors or Contractor's superintendent.
4. Shall not advise on, issue directions relative to or assume control over any aspect of the means, methods, techniques, sequences or procedures of construction unless such advice or directions are specifically required by the Contract Documents.
5. Shall not advise on, or issue directions regarding or assume control over safety precautions and programs in connection with the Work.
6. Shall not accept Shop Drawing or sample submittals from anyone other than Contractor.

7. Shall not authorize Owner to occupy the Project in whole or in part.

8. Shall not participate in specialized field or laboratory tests or inspections conducted by others except as specifically authorized by Engineer.

SC-14.2 Add the following statement with regard to Progress Payments:

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 (i.e. a lien waiver).

SC-14.4 Amend the third sentence of paragraph 14.4. of the General Conditions to read as follows:

Owner shall, within 30 days of presentation to him of an approved application for Payment, pay Contractor the amount approved by the Engineer.

and as so amended, paragraph 14.4 remains in effect.

SC-14.13. Amend the fourth sentence of paragraph 14.13 of the General Conditions to read as follows:

After presentation to Owner of the Application and accompanying documentation, in appropriate form and substance, and with Engineer's recommendation and notice of acceptability, the amount recommended by Engineer become due and will be paid by Owner to contractor in accordance with Article 5 of the Agreement.

and as so amended, paragraph 14.3 remains in effect.

END OF SUPPLEMENTAL GENERAL CONDITIONS

## Section 01010

### General Summary of Work

#### ***PART 1 - GENERAL***

##### 1.01 REQUIREMENTS INCLUDED

- A. The work to be performed under this Contract shall consist of furnishing all plant, tools, equipment, materials, supplies, and manufactured articles and for furnishing all transportation and services, including fuel, power, water, and essential communications, and for the performance of all labor, work, or other operations required for the fulfillment of the Contract in strict accordance with the specifications, drawings, and other Contract Documents as herein previously defined, all of which are made a part hereof, and including such detail sketches as may be furnished by the Engineer from time to time during the construction period in explanation of the Contract Documents. The work shall be complete, and all work, materials, and services not expressly shown or called for in the Contract Documents which may be necessary for the complete and proper construction of the work in good faith shall be performed, furnished, and installed by the Contractor as though originally so specified or shown, at no increase in cost to the Owner.

##### 1.02 WORK COVERED BY CONTRACT DOCUMENTS

- A. The project involves the full-depth reconstruction improvements to a 3,423 linear foot portion of Middle Road starting at a point 100 feet southerly of the Salty Dog Way (aka Dadileao Road) intersection and extending northerly to the Town of Cumberland municipal line, including approximately 1,200 linear feet of drainage pipe; 3 precast catch basin structures; 1,200 linear feet of concrete curb; 8,800 cubic yards of excavation including pavement removal; 6,200 cubic yards of aggregates; 2,600 tons of Hot Mix Asphalt; and other related items.
- B. This project is bid as a main bid (full 3,423 linear feet of the project area) as shown on the Drawings.

##### 1.03 CONTRACT METHOD

- A. The work herein described will be constructed under a combination of unit prices as indicated in the Bid Schedule.
- B. The Contractor shall include the General Conditions and Supplementary General Conditions of the Contract as a part of all its subcontractor agreements.

#### 1.04 WORK BY OTHERS

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- A. Interference with Work on Utilities: The Contractor shall cooperate fully with all utility forces of the Owner or forces of other public or private agencies engaged in the relocation, alteration, or otherwise rearranging of any facilities which interfere with the progress of the work, and shall schedule the work so as to minimize interference with said relocation, alteration, or other rearranging of facilities.

#### 1.05 WORK SEQUENCE

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- A. The Contractor shall construct the work in phases or stages to accommodate Owner's occupancy requirements. The Contractor shall coordinate the construction schedule and operations with the Engineer.

#### 1.06 CONTRACTOR USE OF PROJECT SITE

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- A. The Contractor's use of the project site shall be limited to its construction operations, including on-site storage of materials, on-site fabrication operations, and field offices. Right-of-way and easement limits shall be observed.

#### 1.07 PROJECT TIMING

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- A. This project can commence on or before June 19, 2017, but must commence by July 19, 2017 and is to be completed within 120 calendar days of the commencement of construction.

END OF SECTION 01010

## **SECTION 01026**

### **Measurement and Payment**

#### **PART 1 – GENERAL**

##### **1.01 SECTION INCLUDES**

- A. Unit price bid items.
- B. Other work.

##### **1.02 INCIDENTAL WORK**

Incidental work items for which separate payment will not be made includes, but is not limited to, the following items. Consult the Section 1.04 for specific Bid Items for this project as some elements of work may have separate pay items.

1. Pre-Construction photographs
2. Project record documents
3. Traffic control plan and traffic regulation
4. Signs
5. Clean-up and restoration of property
6. Restoration of fences and other structures
7. Cooperation and coordination with other Contractors and utility companies including related inspection costs and other costs.
8. Utility crossings and relocations, unless otherwise specified
9. Temporary utility services to buildings, as required to maintain service during construction
10. Minor Items--such as relocation of sign posts, guard rails, rock wall, mail boxes, curbs, traffic loop detectors, pavement markings, etc., damaged as a result of construction activities
11. Trench boxes, steel and/or wood sheeting as required, including that left in place
12. Maintenance of all existing sewer flows and repair of existing sewer pipes.
13. Dewatering as necessary
14. Dust control unless otherwise specified
15. Erosion control unless otherwise specified
16. Quality assurance testing unless an allowance is provided as a bid item
17. Final cleaning of new pipes and structures
18. Clearing, grubbing and stripping unless otherwise specified
19. Loam, seeding, grading, liming, fertilization, mulching, and watering
20. Routine flagman services unless otherwise specified.
21. Construction schedules, bonds, insurance, shop drawings, warranties, guarantees, certifications and other submittals required by the Contract Documents
22. Repair and replacement of culverts, underdrains, and rock lined drainage trenches and other utilities damaged by construction activities and corresponding proper disposal of removed materials

23. Temporary construction necessary for construction sequencing and other facilities not permanently incorporated into the work
24. Weather protection
25. Permits not otherwise paid for or provided by the Owner
26. Visits to the project site or elsewhere by personnel or agents of the Contractor, including manufacturer's representatives, as may be required.
27. Mobilization and demobilization, unless otherwise provided for as a Bid Item
28. Contract administration and insurance
29. Test pits to establish in place field soils density, groundwater conditions, or requirements for dewatering
30. Pipe markings
31. Sand, Gravel, Stone, Borrow, and Trench Pavement related to the drainage infrastructure pay items shall be incidental to their pertinent pay items

#### 1.03 RELATED DOCUMENTS AND SECTIONS

- A. Bid Form.
- B. General Conditions.
- C. Supplementary Conditions.
- D. Individual specification sections.
- E. Appendix A contains special provision requirements for the water main replacement work.

#### 1.04 SCHEDULE OF BID ITEMS

##### Bid Item No. 1 - Mobilization

1. Mobilization includes the delivery and organization of materials, equipment, laborers, bonds, insurances, and other incidentals to commence the work.
2. Method of Measurement: Mobilization will be measured by the lump sum.
3. Basis of Payment: Mobilization will be paid for at the contract lump sum. The amount of this lump sum shall not exceed 5% of the total contract amount, excluding Bid Item No. 1 and no payment shall be made in excess of this amount. Payment shall be made in two payments, one payment when the contractor is operation and the second payment what the project progression has reached a 50% completion level. Payment shall be full compensation for furnishing materials, equipment, labor, and other incidentals to commence the work.

##### Bid Item No. 2 – Trench Rock Excavation

1. Trench rock excavation for pipe and structure installations, including drilling or use of hydraulic and mechanical equipment with operator to break up rock and disposal of excavated rock off-site and pre-blast survey in accordance with the drawings and specifications.

2. Method of Measurement: The volume of trench rock excavation will be measured by the number of cubic yards measured in its original positions by cross-sectioning the area excavated. Limits of rock excavation will be determined by the vertical distance from the surface of ledge to the bottom of pipe bedding, measured along the centerline of pipe and the trench pay width as defined on the Drawings. For structures, the surface of the ledge will be sectioned to determine its average elevation. Depth will be measured from the average surface elevation to bottom of the bedding material. Horizontal dimensions shall be 6 inches clear of pipe and 1 foot outside maximum concrete line. Isolated rocks in excess of 2 cubic yards will be measured by the Engineer upon removal from the excavation.
3. Basis of Payment: The accepted quantity of trench rock excavation will be paid for at the contract unit price bid per cubic yard. Payment shall be full compensation for furnishing all materials, equipment, labor, and other incidentals to complete the work.

#### Bid Item No. 3 – Mass Rock Excavation

1. Mass rock excavation for pipe and structure installations, including drilling or use of hydraulic and mechanical equipment with operator to break up rock and disposal of excavated rock off-site and pre-blast survey in accordance with the drawings and specifications.
2. Method of Measurement: The volume of mass rock excavation will be measured by the number of cubic yards measured in its original positions by cross-sectioning the area excavated. Limits of rock excavation will be determined by the vertical distance from the surface of ledge to the design road subgrade within the design limit of the road as defined on the Drawings. There will be no payment for material removed beyond the design limits of the road gravel except where the Engineer determines that the displaced or loosened material beyond the design limits was unavoidable. Isolated rocks in excess of 2 cubic yards will be measured by the Engineer upon removal from the excavation.
3. Basis of Payment: The accepted quantity of mass rock excavation will be paid for at the contract unit price bid per cubic yard. Payment shall be full compensation for furnishing all materials, equipment, labor, and other incidentals to complete the work.

#### Bid Item No. 4 – Slope Alterations from Station 38+15 to 38+95 – Left Hand Side

1. Slope Alterations including rock excavation for final slope configuration, including drilling or use of hydraulic and mechanical equipment with operator to break up rock and disposal of excavated rock off-site and pre-blast survey in accordance with the drawings and specifications. Toe of the slope area must begin 6-feet from the back of curb and final slope grade will be 1:2 within a tolerance of 0 to 6-inches along the slope.
2. Method of Measurement: Slope Alterations from Station 38+15 to 38+95 – Left Hand Side will be paid for at the contract lump sum. The Town shall determine compliance with the configuration of the slope meeting the dimensional criteria.



3. Basis of Payment: Payment shall be full compensation for furnishing all materials, equipment, labor, and other incidentals to complete the work. Progress payments for this item will be on a percentage basis relative to the percentage of work complete for this item.

#### Bid Item No. 5 – Common Excavation

1. Work includes removing, hauling, disposing of all material not being removed under some other item, encountered for the construction of roads designated for full depth reconstruction, and grading and compaction of sub-grade in accordance with the drawings and specifications and in reasonably close conformity with the lines, grades, thickness, and typical cross-sections shown on the drawings or established.
2. Method of Measurement: Common excavation for road reconstruction will be measured by the number of cubic yards in its original position by cross-sectional elevations of the area excavated as accepted by the Engineer. Volumes will be computed by the average end area method or by other methods generally recognized as conforming to good engineering practice.
3. Basis of Payment: The accepted quantities of common excavation including removing, hauling, disposing of all material not being removed under some other item, encountered for the construction of roads designated for full depth reconstruction and grading and compaction of sub-grade, will be paid for at the contract price per cubic yard. Payment shall be full compensation for furnishing all materials, equipment, labor and other incidentals to complete the work.

#### Bid Item No. 6 – Aggregate Subbase Gravel (MDOT Type D)

1. Aggregate subbase gravel material for road reconstruction including placement, grading and compaction in accordance with the drawings and specifications.
2. Method of Measurement: Aggregate subbase gravel material for road reconstruction will be measured by the number of cubic yards measured in place and accepted by the Engineer. The width and thickness of aggregate base material as shown on the Drawings or as modified by the Engineer. The length will be along the centerline unless modified by other methods generally recognized as conforming to good engineering practice.
3. Basis of Payment: The accepted quantities of aggregate subbase gravel material for road reconstruction will be paid for at the contract price per cubic yard. Payment shall be full compensation for furnishing all materials, equipment, labor and other incidentals to complete the work.

#### Bid Item No. 7 – Aggregate Base Gravel (MDOT Type A)

1. Aggregate base gravel material for road reconstruction including placement, grading and compaction in accordance with the drawings and specifications.
2. Method of Measurement: Aggregate base gravel material for road reconstruction will be measured by the number of cubic yards measured in place and accepted by the Engineer. The

width and thickness of aggregate base material as shown on the Drawings or as modified by the Engineer. The length will be along the centerline unless modified by other methods generally recognized as conforming to good engineering practice.

3. Basis of Payment: The accepted quantities of aggregate base gravel material for road reconstruction will be paid for at the contract price per cubic yard. Payment shall be full compensation for furnishing all materials, equipment, labor and other incidentals to complete the work.

**Bid Item No. 8 – Hot Bituminous Driveway Reconstruction (MDOT 9.5 mm)**

1. Work includes removal of existing pavement, common excavation, aggregate course gravel and grading, tack coat, and placement of hot bituminous pavement in accordance with the drawings and specifications.
2. Method of Measurement: Hot bituminous pavement driveway reconstruction will be measured by the square yard and complete in place and accepted, based on an installed gravel depth as required to meet proposed grade and match existing undisturbed driveway elevation and an MDOT 9.5 mm fine mix, thickness of 2-inches placed in two 1-inch lifts.
3. Basis of Payment: The accepted quantity of hot bituminous pavement driveway reconstruction will be paid for at the contract unit price bid per square yard. Payment shall be full compensation for furnishing all materials, equipment, labor, and other incidentals to complete the work.

**Bid Item No. 9 – Shim and Hot Bituminous Driveway Repair (MDOT 9.5 mm)**

1. Work includes removal of existing pavement, aggregate shim course gravel and grading, tack coat, and placement of hot bituminous pavement in accordance with the drawings and specifications.
2. Method of Measurement: Shim and hot bituminous driveway repair will be measured by the square yard and complete in place and accepted, based on an installed shim gravel depth as required to meet proposed grade and match existing undisturbed driveway elevation with an MDOT 9.5 mm fine mix, thickness of 2-inches placed in two 1-inch lifts.
3. Basis of Payment: The accepted quantity of shim hot bituminous pavement driveway repair will be paid for at the contract unit price bid per square yard. Payment shall be full compensation for furnishing all materials, equipment, labor, and other incidentals to complete the work

**Bid Item No. 10 – Hot Bituminous Base Pavement (MDOT 19 mm)**

1. Work includes sawcutting of existing pavement to provide a neat vertical face, tack coat, placing and compacting hot bituminous pavement materials in roadway areas (excluding driveways) in accordance with the drawings and specifications.

2. Method of Measurement: Hot bituminous base pavement will be measured by the ton placed in roadway areas (excluding driveways) complete in place and accepted by the Engineer.
3. Basis of Payment: The accepted quantities of hot bituminous base pavement will be paid for at the contract unit price per ton. Payment shall be full compensation for furnishing all materials, equipment, labor, and other incidentals to complete the work.

**Bid Item No. 11 - Hot Bituminous Surface Pavement (MDOT 9.5 mm)**

1. Work includes sawcutting of existing pavement to provide a neat vertical face, placing and compacting hot bituminous pavement materials placed in roadway areas (excluding driveways) in accordance with the drawings and specifications. Also included in this bid item is tack coat, which is to be applied to the base course paving. The cost of the tack coat shall be included in the per ton price bid for Bid Item No. 9 and no separate payment will be made for the tack coat.
2. Method of Measurement: Hot bituminous surface pavement will be measured by the ton placed in roadway areas (excluding driveways) complete in place and accepted by the Engineer.
3. Basis of Payment: The accepted quantities of hot bituminous surface pavement will be paid for at the contract unit price per ton. Payment shall be full compensation for furnishing all materials, equipment, labor, and other incidentals to complete the work.

**Bid Item No. 12 – 6-inch HDPE Type B Perforated Underdrain**

1. Work includes HDPE perforated pipe, fittings, connections, core and boot at structures, excavation, bedding, backfill, sand backfill to subgrade, compaction, and disposal of surplus or unsuitable excavated material in accordance with the drawings and specifications.
2. Method of Measurement: 6-inch HDPE Type B perforated underdrain will be measured in linear feet along the centerline of the pipe to the inside face of structures, complete in place and accepted by the Engineer.
3. Basis of Payment: The accepted quantities of 6-inch HDPE Type B perforated underdrain will be paid for at the contract unit price per linear foot. Payment shall be full compensation for furnishing all materials, equipment, labor, and other incidentals to complete the work.

**Bid Item No. 13 –12-inch HDPE Storm Drain**

1. Includes installation of 12-inch HDPE storm drain piping, couplings, pipe bedding, excavation, dewatering, shoring, backfilling, compaction, connections to existing structures and removal and disposal of existing drainage pipe and surplus or unsuitable excavated material in accordance with the drawings and specifications.
2. Method of Measurement: 12-inch HDPE storm drain will be measured in linear feet along the centerline of the pipe to the inside face of structures, complete in place and accepted by the Engineer.

3. Basis of Payment: The accepted quantities of 12-inch HDPE storm drain will be paid for at the contract unit price per linear foot. Payment shall be full compensation for furnishing all materials, equipment, labor, and other incidentals to complete the work.

**Bid Item No. 14 – 12-inch HDPE Type C Perforated Pipe**

1. Work includes installation of 12-inch HDPE perforated piping, fittings, couplings, geotextile fabric, pipe bedding, excavation, dewatering, shoring, backfilling, sand backfill to road subgrade, compaction, and removal and disposal of existing drainage pipe and surplus or unsuitable excavated material in accordance with the drawings and specifications.
2. Method of Measurement: The accepted quantities of 12-inch HDPE perforated pipe will be measured in linear feet along the centerline of the pipe to the inside face of structures, complete in place and accepted by the Engineer.
3. Basis of Payment: The accepted quantities of 12-inch HDPE perforated pipe will be paid for at the contract unit price per linear foot. Payment shall be full compensation for furnishing all materials, equipment, labor, and other incidentals to complete the work.

**Bid Item No. 15 – 15-inch HDPE Storm Drain**

1. Includes installation of 15-inch HDPE storm drain piping, couplings, pipe bedding, excavation, dewatering, shoring, backfilling, compaction, connections to existing structures and the removal disposal of existing drainage pipe and of surplus or unsuitable excavated material in accordance with the drawings and specifications.
2. Method of Measurement: 15-inch HDPE storm drain will be measured in linear feet along the centerline of the pipe to the inside face of structures, complete in place and accepted by the Engineer.
3. Basis of Payment: The accepted quantities of 15-inch HDPE storm drain will be paid for at the contract unit price per linear foot. Payment shall be full compensation for furnishing all materials, equipment, labor, and other incidentals to complete the work.

**Bid Item No. 16 - 18-inch HDPE Storm Drain**

1. Includes installation of 18-inch HDPE storm drain piping, couplings, pipe bedding, excavation, dewatering, shoring, backfilling, compaction, connections to existing structures and disposal of surplus or unsuitable excavated material and television inspection of storm drains.
2. Method of Measurement: 18-inch HDPE storm drain will be measured in linear feet along the centerline of the pipe to the inside face of structures, complete in place and accepted by the Engineer.
3. Basis of Payment: The accepted quantities of 18-inch HDPE storm drain will be paid for at the contract unit price per linear foot. Payment shall be full compensation for furnishing all materials, equipment, labor, and other incidentals to complete the work.

#### Bid Item No. 17 – 24-inch HDPE Storm Drain

1. Includes installation of 24-inch HDPE storm drain piping, couplings, pipe bedding, excavation, dewatering, shoring, backfilling, compaction, connections to existing structures and the removal and disposal of existing drainage pipe and of surplus or unsuitable excavated material and television inspection of storm drains.
2. Method of Measurement: 24-inch HDPE storm drain will be measured in linear feet along the centerline of the pipe to the inside face of structures, complete in place and accepted by the Engineer.
3. Basis of Payment: The accepted quantities of 24-inch HDPE storm drain will be paid for at the contract unit price per linear foot. Payment shall be full compensation for furnishing all materials, equipment, labor, and other incidentals to complete the work.

#### Bid Item No. 18 – 4-foot Diameter Catch Basin

1. Includes excavation, shoring, dewatering, bedding material, installation of pipe connections, frames and grates, bricks, mortar, backfilling, and compaction in accordance with the drawings and specifications.
2. Method of Measurement: 4-foot diameter catch basin will be measured per each complete in place and accepted by the Engineer.
3. Basis of Payment: The accepted quantities of 4-foot diameter catch basin will be paid for at the contract unit price per each. Payment shall be full compensation for furnishing all materials, equipment, labor, and other incidentals to complete the work.

#### Bid Item No. 19 – Rip Rap Swale

1. Work includes the excavation, installation, and backfilling of a rip rap lined swale, including underlying geotextile fabric and/or aggregate base material, in accordance with the drawings and specifications.
2. Method of Measurement: Rip Rap Swale will be measured by the linear foot complete in place and accepted by the Engineer.
3. Basis of Payment: The accepted quantities of Rip Rap Swale will be paid for at the contract unit price per linear foot. Payment shall be full compensation for furnishing all materials, equipment, labor, and other incidentals to complete the work.

Bid Item No. 20 - Concrete Slip Form Curb – Type 2

1. Work includes cleaning, preparation, and epoxy preparation on bituminous pavement base course for concrete slip form curb in accordance with the drawings and specifications.
2. Method of Measurement: Concrete slip form curb will be measured by the linear foot complete in place and accepted by the Engineer.
3. Basis of Payment: The accepted quantities of concrete slip form curb will be paid for at the contract unit price per linear foot. Payment shall be full compensation for furnishing all materials, equipment, labor, and other incidentals to complete the work.

Bid Item No. 21 – Clearing including Tree and Stump Removal

1. Includes cutting, excavation, removal, backfilling, compaction, and proper removal and disposal of brush and roots, single trees and stumps in accordance with the drawings and specifications. Clearing shall include the trimming of branches and vegetation 25 feet from the roadway centerline to a height of 20 feet or directed by the Engineer.
2. Method of Measurement: Clearing, including tree and stump removal, will be measured by the lump sum.
3. Basis of Payment: The accepted quantities of tree and stump removal will be paid for by the contract lump sum. Clearing shall include the removal of trees, stumps, and vegetation within 25 feet from the roadway centerline to a height of 20 feet above grade as shown on the plan or directed by the Engineer. Payment shall be full compensation for furnishing all materials, equipment, labor, and other incidentals to complete the work.

Bid Item No. 22 – Plain Riprap

1. Work includes the excavation, installation, and backfilling of Plain Riprap, including underlying geotextile fabric and/or aggregate base material, in accordance with the drawings and specifications.
2. Method of Measurement: Plain Riprap will be measured by the lump sum for the material in place and accepted within the limits of work shown on the drawings.
3. Basis of Payment: The accepted quantity of plain riprap will be paid for at the contract lump sum. Payment shall be full compensation for furnishing materials, equipment, labor, and other incidentals to complete the work.

Bid Item No. 23 – Loam and Seed

1. Loam and seed, including fertilizer, lime, water, mulch, soil testing, in accordance with Section 02218 Landscape Grading and Section 02936 Seeding.
2. Method of Measurement: Loam and seed will be measured by the lump sum

3. Basis of Payment: Loam and seed will be paid for at the contract lump sum. Payment shall be full compensation for furnishing materials, equipment, labor, and other incidentals to complete the work. Satisfactory performance will be considered hauling and placement of loam and topsoil, fertilizing, seeding, liming, cutting/watering, providing stone lined, erosion control matting, and/or rip rap ditches, erosion control, and all operations as may be necessary to provide a healthy and flourishing growth of grass.

#### Bid Item No. 24 – Flaggers

1. Work includes providing MDOT certified flaggers for traffic control as required by the Town and Engineer.
2. Method of Measurement: Flaggers will be measured by the lump sum.
3. Basis of Payment: Flaggers will be paid for at the contract lump sum. Payment shall be full compensation for furnishing all materials, equipment, labor, and other incidentals to complete the work. Progress payments for this item will be on a percentage basis relative to the percentage of work complete for the entire project.

#### Bid Item No. 25 - Construction Signage and Traffic Control Devices

1. Construction signage and traffic control devices includes providing, installing and maintaining signs in accordance with the latest revision of MUTCD, Work Zone Safety, providing, installing construction signs, and maintaining traffic control devices in accordance with the drawings and specifications.
2. Method of Measurement: Construction signage and traffic control devices will be measured by the lump sum.
3. Basis of Payment: Construction signage and traffic control devices will be paid for at the contract lump sum. Payment shall be full compensation for furnishing all materials, equipment, labor, and other incidentals to complete the work. Progress payments for this item will be on a percentage basis relative to the percentage of work complete for the entire project.

#### Bid Item No. 26 - Erosion Control

1. Work includes providing, installing and maintaining erosion control facilities in accordance with the specifications and drawings, excavation, backfill, removal, disposal of accumulated silt.
2. Method of Measurement: Erosion control will be measured by the lump sum.
4. Basis of Payment: The accepted quantities of erosion control will be paid for at the contract lump sum. Payment shall be full compensation for furnishing all materials, equipment, labor, and other incidentals to complete the work. Progress payments for this item will be on a percentage basis relative to the percentage of work complete for the entire project.

Bid Item No. 27 - 4-inch Wide Double Yellow Centerline and 6-inch Wide White Fog Line (each side) Striping

1. Work includes cleaning, preparation, and applying 4-inch wide double yellow centerline and 6-inch wide white fog line (each side of roadway) striping in accordance with the drawings and specifications.
2. Method of Measurement: Striping will be measured by the linear foot complete in place and accepted by the Engineer.
3. Basis of Payment: Striping will be paid for at the contract lump sum. Payment shall be full compensation for furnishing all materials, equipment, labor, and other incidentals to complete the work.

Bid Item No. 28 – Mailbox

1. Method of Measurement: Mailboxes will be measured by each complete in place and accepted by the Engineer. Removal and disposal of the existing mailbox materials will be incidental to the installation of the new guardrail end treatments.
2. Basis of Payment: The accepted quantities of mailboxes will be paid for at the contract unit price per each. Payment shall be full compensation for furnishing all materials, equipment, labor, and other incidentals to complete the work. Removal and disposal of the existing mailbox materials will be incidental to the installation of the new mailboxes.
3. Basis of Payment: The accepted quantities mailboxes will be paid for at the contract unit price per each. Payment shall be full compensation for furnishing all materials, equipment, labor, and other incidentals to complete the work.

Bid Item No. 29 – Dust Control

1. Dust control including application of calcium chloride, watering, and other measures provided by the contractor in accordance with the drawings and specifications or as directed by the Engineer.
2. Method of Measurement: Dust control will be measured by the lump sum.
3. Basis of Payment: Dust control will be paid for at the contract lump sum. Payment shall be full compensation for furnishing all materials, equipment, labor, and other incidentals to complete the work. Progress payments for this item will be on a percentage basis relative to the percentage of work complete for the entire project.

Bid Item No. 30 – Laborer, Straight Time

1. Laborer, straight time, to perform work as directed by the Engineer in accordance with the drawings and specification.



2. Method of Measurement: Laborer, straight time, will be measured in the hours of work actually performed to the nearest ¼ hour.
3. Basis of Payment: Laborer, straight time, will be paid for at the contract unit price per hour. Payment shall be full compensation for hiring, transporting, supervising, payment of worker compensation, social security taxes, unemployment insurance, overtime, benefits, and for all hand tools, protective clothing and equipment, and all other incidentals to complete the work. Progress payments for this item will be on a percentage basis relative to the percentage of work complete the work. Company provided supervision of the Laborer is inclusive within the Laborer compensation rate.

Bid Item No. 31 – Excavator

1. Excavator as directed by the Engineer in accordance with the drawings and specification.
2. Method of Measurement: Excavator equipment rental will be measured in the hours of work actually performed to the nearest ¼ hour. Time spent moving to and from the site within the limits and from beyond the project limits, servicing, maintaining, and changing attachments will not be measured for payment.
3. Basis of Payment: The accepted quantities of Excavator equipment rental will be paid for at the contract unit price per hour. Payment shall include operators, fuel, grease, oil, and other incidentals necessary to operate the equipment. Company provided supervision of the Excavator equipment is inclusive within the Excavator contractor unit price.

Bid Item No. 32 – Front End Loader

1. Front End Loader as directed by the Engineer in accordance with the drawings and specification.
2. Method of Measurement: Front End Loader equipment rental will be measured in the hours of work actually performed to the nearest ¼ hour. Time spent moving to and from the site within the limits and from beyond the project limits, servicing, maintaining, and changing attachments will not be measured for payment.
3. Basis of Payment: The accepted quantities of Front End Loader equipment rental will be paid for at the contract unit price per hour. Payment shall include operators, fuel, grease, oil, and other incidentals necessary to operate the equipment. Company provided supervision of the Front End Loader equipment is inclusive within the Front End Loader contract unit price.

Bid Item No. 33 – Dump Truck

1. Dump Truck as directed by the Engineer in accordance with the drawings and specification.
2. Method of Measurement: Dump Truck equipment rental will be measured in the hours of work actually performed to the nearest ¼ hour. Time spent moving to and from the site within the limits and from beyond the project limits, servicing, maintaining, and changing attachments will not be measured for payment.

3. Basis of Payment: The accepted quantities of Dump Truck equipment rental will be paid for at the contract unit price per hour. Payment shall include operators, fuel, grease, oil, and other incidentals necessary to operate the equipment. Company provided supervision of the Dump Truck equipment is inclusive within the Dump Truck contract unit price.

Bid Item No. W-1 through W-18 – Water District Items.

1. Refer to Appendix A for information regarding Portland Water District items work description, Method of Measurement, and the Basis of Payment.

#### 1.05 OTHER WORK

- A. The cost of Division 1, General Requirements, and other work required by the Contract Documents not defined in the schedule of bid items above shall be included in the unit price and lump sum price bid items of the bid schedule and no separate payment will be made.
- B. See Appendix A for Special Provisions requirements for the Portland Water District work.

#### PART 2 – PRODUCTS

Not used.

#### PART 3 – EXECUTION

##### 3.01 FIELD QUALITY CONTROL

- A. Owner's representative will take measurements for determining quantities of unit price items incorporated into the work.
- B. Cooperate with Owner's representative for measurement of unit price items.
- C. Consult with Owner's representative prior to performing work associated with unit price bid items.

END OF SECTION 01026

## Section 01090

### Reference Standards and Definitions

#### **PART 1 - GENERAL**

##### 1.01 SECTION INCLUDES

- A. Quality assurance.
- B. Schedule of references.
- C. Definitions

##### 1.02 QUALITY ASSURANCE

- A. For Products or workmanship specified by association, trade, or Federal Standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard by date of issue current on date of Contract Documents.
- C. Obtain copies of standards when required by Contract Documents.
- D. Maintain copy at jobsite during submittals, planning, and progress of the specific work, until Substantial Completion.
- E. Should specified reference standards conflict with Contract Documents, request clarification from Engineer before proceeding.
- F. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

##### 1.03 SCHEDULE OF REFERENCES

###### AASHTO

American Association of State Highway and Transportation Officials  
444 North Capitol Street, N.W. Washington, DC 20001

###### ACI

American Concrete Institute  
Box 19150  
Reford Station  
Detroit, MI 48219

AI  
Asphalt Institute  
Asphalt Institute Building  
College Park, MD 20740

AIA  
American Institute of Architects  
1735 New York Avenue, N.W.  
Washington, DC 20006

AITC  
American Institute of Timber Construction  
333 W. Hampden Avenue  
Englewood, CO 80110

AISC  
American Institute of Steel Construction  
400 North Michigan Avenue  
Eighth Floor  
Chicago, IL 60611

AISI  
American Iron and Steel Institute  
1000 16th Street, N.W.  
Washington, DC 20036

ANSI  
American National Standards Institute  
1430 Broadway  
New York, NY 10018

APA  
American Plywood Association  
Box 11700  
Tacoma, WA 98411

ASHRAE  
American Society of Heating, Refrigerating and Air Conditioning Engineers  
1791 Tullie Circle, N.E.  
Atlanta, GA 30329

ASME  
American Society of Mechanical Engineers  
345 East 47th Street  
New York, NY 10017

ASTM  
American Society for Testing and Materials 1916 Race Street  
Philadelphia, PA 19103

AWWA  
American Water Works Association  
6666 West Quincy Avenue  
Denver, CO 80235

AWPA  
American Wood-Preservers' Association  
7735 Old Georgetown Road  
Bethesda, MD 20014

AWS  
American Welding Society  
550 Lejeune Road  
Miami, FL 33135

CLFMI  
Chain Link Fence Manufacturers Institute  
1101 Connecticut Avenue, N.W.  
Washington, DC 20036

CRSI  
Concrete Reinforcing Steel Institute  
933 Plum Grove Road  
Schaumburg, IL 60195

EJCDC  
Engineers' Joint Contract Documents  
Committee  
American Consulting Engineers Council  
1050 15th Street, N.W.  
Washington, DC 20005

FS  
Federal Specification  
General Services Administration  
Specifications and Consumer Information Distribution Section (WFSIS)  
Washington Navy Yard, Bldg. 197  
Washington, DC 20407

GA  
Gypsum Association  
1603 Orrington Avenue  
Evanston, IL 60201

MIL  
Military Specification  
Naval Publications and Forms Center  
5801 Tabor Avenue  
Philadelphia, PA 19120

NAAMM  
National Association of Architectural Metal Manufacturers  
221 North LaSalle Street  
Chicago, IL 60601

NEMA  
National Electrical Manufacturers' Association 2101 L Street, N.W.  
Washington, DC 20037

NFPA  
National Fire Protection Association  
1619 Massachusetts Avenue, N.W.  
Washington, DC 20036

NSWMA  
National Solid Wastes Management Association  
1120 Connecticut Avenue, N.W.  
Washington, DC 20036

PCA  
Portland Cement Association  
5420 Old Orchard Road  
Skokie, IL 60077

PCI  
Prestressed Concrete Institute  
201 North Wacker Drive  
Chicago, IL 60606

PS  
Product Standard  
U. S. Department of Commerce  
Washington, DC 20203

SDI  
Steel Deck Institute Box 3812  
St. Louis, MO 63122

SII  
Steel Joist Institute  
1703 Parham Road Suite 204  
Richmond, VA 23229

SSPC  
Steel Structures Painting Council  
4400 Fifth Avenue  
Pittsburgh, PA 15213

UL  
Underwriters' Laboratories, Inc.  
333 Pfingston Road  
Northbrook, IL 60062

### 1.03 DEFINITIONS

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- A. **General Explanation:** A substantial amount of specification language constitutes definitions for terms found in other contract documents, including drawings which must be recognized as diagrammatic in nature and not completely descriptive of requirements indicated thereon. Certain terms used in contract documents are defined generally in this article. Definitions and explanations of this section are not necessarily either complete or exclusive but are general for the work to extent not stated more explicitly in another provision of the contract documents.
- B. **General Requirements:** The provision and requirements of Division-I sections, and General Requirements apply to entire work of Contract and, where so indicated, to other elements which are included in project.
- C. **Indicated:** The term "Indicated" is a cross-reference to details, notes or schedules on drawings, to other paragraphs or schedules in the specifications, and to similar means of recording requirements in contract documents. Where terms such as "shown", "noted", "scheduled", and "specified" are used in lieu of "indicated", it is for purpose of helping reader locate cross-reference, and no limitation of location is intended except as specifically noted.
- D. **Directed, Requested, etc.:** Where not otherwise explained, terms such as "directed", "requested", "authorized", "selected", "approved", "required", "accepted" and "permitted" mean "directed by Engineer", "requested by Engineer", etc. However, no such implied meaning will be interpreted to extend Engineer's responsibility into Contractor's area of construction supervision.

- E. **Approve:** Where used in conjunction with Engineers' response to submittals, requests, applications, inquiries, reports and claims by Contractor, the meaning of term "approved" will be held to limitations of Engineer's responsibilities and duties as specified in General and Supplementary Conditions. In no case will "approval" by Engineer be interpreted as a release of Contractor from responsibilities to fulfill requirements of contract documents.
- F. **Project Site:** The space available by Contractor for performance of the work, either exclusively or in conjunction with others performing other work as part of the project. The extent of project site is shown on the drawings, and may or may not be identical with description of the land upon which project is to be built.
- G. **Furnish:** Except as otherwise defined in greater detail, term "furnish" is used to mean supply and deliver to project site, ready for unloading, unpacking, assembly, installation, etc., as applicable in each instance.
- H. **Install:** Except as otherwise defined in greater detail, term "install" is used to describe operations at project site, including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations, as applicable in each instance.
- 1. **Provide:** Except as otherwise defined in greater detail, term "provide" means furnish and install, complete and ready for intended use, as applicable in each instance.
- J. **Installer:** The entity (person or firm) engaged by Contractor or its subcontractor or sub-subcontractor for the performance of a particular unit of work at project site, including installation, erection, application and similar required operations. It is a general requirement that such entities (Installers) be expert in operations they are engaged to perform.
- K. **Testing Laboratory:** An independent entity engaged to perform specific inspections or tests of the work both at project site or elsewhere; and to report and (if required) interpret results of those inspections or tests.

#### 1.04 SPECIFICATION EXPLANATION

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##### A. Overlapping and Conflicting Requirements:

Where compliance with 2 or more industry standards or sets of requirements is specified, and overlapping of those different standards or requirements establishes different or conflicting minimums or levels of quality, most stringent requirement (which is generally recognized to be also most costly) is intended and will be enforced, unless specifically detailed language written into the contract documents (not by way of reference to an industry standard) clearly indicates that a less stringent requirement is to be fulfilled. Refer apparently-equal-but-different requirements, and uncertainties as to which level of quality is more stringent, to Engineer for a decision before proceeding.

##### B. Contractor's Options:



Except for overlapping or conflicting requirements, where more than one set of requirements are specified for a particular unit of work, option is intended to be Contractor's regardless of whether specifically indicated as such.

C. Minimum Quality/Quantity:

In every instance, quality level or quantity shown or specified is intended as minimum for the work to be performed or provided. Except as otherwise specifically indicated, actual work may either comply exactly with that minimum (within specified tolerances), or may exceed that minimum within reasonable limits. In complying with requirements, indicated numeric values are either minimums or maximums as noted or as appropriate for context of requirements. Refer instances of uncertainty to Engineer for decision before proceeding.

D. Specialist Assignments:

In certain instances, specification text requires (or at least implies) that specific work be assigned to specialists or expert entities, who must be engaged for performance of those units of work. These must be recognized as special requirements over which Contractor has no choice or option. These assignments must not be confused with (and are not intended to interfere with) normal conventions. One purpose of such assignments is to establish which party or entity involved in a specific unit of work is recognized as "expert" for indicated construction processes or operations. Nevertheless, final responsibility for fulfillment of entire set of requirements remains with Contractor.

END OF REFERENCE STANDARDS AND DEFINITIONS

## Section 01300

### Submittals

#### **PART 1 - GENERAL**

##### **1.01 SECTION INCLUDES**

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- A. Submittal procedures.
- B. Construction progress schedules.
- C. Proposed Products list.
- D. Shop drawings.
- E. Product data.
- F. Samples.
- G. Manufacturers' instructions.
- H. Manufacturers' certificates.
- I. Construction photographs.

##### **1.02 RELATED SECTIONS**

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- A. Section 01400 - Quality Control: Manufacturers' field services and reports.
- B. Section 01700 - Contract Closeout: Contract warranty and manufacturers' certificates.

##### **1.03 SUBMITTAL PROCEDURES**

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- A. Transmit each submittal with Engineer accepted form.
- B. Sequentially number the transmittal forms. Resubmittals to have original number with an alphabetic suffix.
- C. Identify Project, Contractor, Subcontractor or supplier; pertinent Drawing sheet and detail number(s), and specification Section number, as appropriate.
- D. 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 Contract Documents.

- E. Schedule submittals to expedite the Project, and deliver to Engineer at business address. Coordinate submission of related items.
- F. Identify variations from Contract Documents and Product or system limitations which may be detrimental to successful performance of the completed Work.
- G. Provide space for Contractor and Engineer review stamps.
- H. Revise and resubmit submittals as required, identify all changes made since previous submittal.
- I. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.

#### 1.04 CONSTRUCTION PROGRESS SCHEDULES

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- A. Submit initial progress schedule in duplicate within 15 days after date of Owner-Contractor Agreement.
- B. Revise and resubmit as required.
- C. Submit revised schedules with each Application for Payment, identifying changes since previous version.
- D. Submit a horizontal bar chart with separate line for each major section of Work or operation identifying first work day of each week.
- E. Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Indicate the early and late start, early and late finish, float dates, and duration.
- F. Indicate estimated percentage of completion for each item of Work at each submission.
- G. Indicate submittal dates required for shop drawings, product data, samples, and product delivery dates, including those furnished by Owner and under Allowances.

#### 1.05 PROPOSED PRODUCTS LIST

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- A. Within 15 days after date of Notice to Proceed, submit complete list of major products proposed for use, with name of manufacturer, trade name, and model number for each product.

- B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

#### 1.06 SHOP DRAWINGS

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- A. Submit in the form of one reproducible transparency and one opaque reproduction.
- B. After review, reproduce, and distribute in accordance with Article on Procedures above and for Record Documents described in Section 01700 Contract Closeout.

#### 1.07 PRODUCT DATA

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- A. Submit the number of copies which the Contractor requires, plus two copies which will be retained by the Engineer.
- B. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information unique to this Project.
- C. After review, distribute in accordance with Article on Procedures above and provide copies for Record Documents described in Section 01700 Contract Closeout.

#### 1.08 SAMPLES

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- A. Submit samples to illustrate functional and aesthetic characteristics of the Product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
- B. Submit samples of finishes from the full range of manufacturers' standard colors, textures, and patterns for Engineer's selection.
- C. Include identification on each sample, with full Project information.
- D. Submit the number of samples specified in individual specification Sections; one of which will be retained by Architect/Engineer.
- E. Reviewed samples which may be used in the Work are indicated in individual specification Sections.

#### 1.09 MANUFACTURERS' INSTRUCTIONS

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- A. When specified in individual specification sections, submit manufacturers' printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, in quantities specified for Product Data.

- B. Identify conflicts between manufacturers' instructions and Contract Documents.

#### 1.10 MANUFACTURERS' CERTIFICATES

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- A. When specified in individual specification Sections, submit manufacturers' certificate to Engineer for review, in quantities specified for Product Data.
- B. Indicate material or Product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or Product, but must be acceptable to Architect/Engineer.

#### 1.11 CONSTRUCTION PHOTOGRAPHS

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- A. The Contractor shall take pre- and post-construction photographs or videos of the project and furnish to the Engineer.

END OF SECTION 01300

<b>Section 01400</b>
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<b>Quality Control</b>
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***PART 1 - GENERAL***

**1.01 SECTION INCLUDES**

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- A. Quality assurance and control of installation.
- B. References.
- C. Testing laboratory services.
- D. Manufacturers' field services and reports.

**1.02 RELATED SECTIONS**

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- A. Section 01090 - Reference Standards.
- B. Section 01300 - Submittals: Submission of Manufacturers' Instructions and Certificates.
- C. Section 01600 - Material and Equipment: Requirements for material and product quality.

**1.03 QUALITY ASSURANCE/CONTROL OF INSTALLATION**

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- 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 each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
- D. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform work by persons qualified to produce workmanship of specified quality.
- F. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

#### 1.04 REFERENCES

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- A. Conform to reference standard by date of issue current on date of Contract Documents.

#### 1.05 FIELD SAMPLES

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- A. Install field samples at the site as required by individual specifications Sections for review.
- B. Acceptable samples represent a quality level for the Work.
- C. Where field sample is specified in individual Sections to be removed, clear area after field sample has been accepted by Engineer.

#### 1.06 TESTING LABORATORY SERVICES

---

- A. Owner shall employ the services of a qualified firm to perform quality control testing in the field or laboratory on concrete, moisture density relationships (Proctors) and relative density tests on embankment, fill and backfill materials, in-place field density tests on embankments and fills, and other materials and equipment, during and after their incorporation in the work. Field sampling and testing shall be performed by the testing firm with minimum interference with construction operations. Engineer shall determine the time and location of field sampling and testing as necessary to determine that materials and equipment conform to the Contract Documents.
- B. Contractor shall furnish all sample materials and cooperate in the sampling and field testing activities. Contractor will furnish personnel, equipment, and facilities to perform sampling and field-testing activities and to deliver samples and test specimens to the testing laboratory.
- C. If tests indicate work does not meet specified requirements, remove work, replace, and retest at no cost to Owner.
- D. Contractor shall be responsible for all sample gathering and testing laboratory services in connection with concrete and asphalt mix designs, field cores, pipe and appurtenances testing, manhole testing, and topsoil analysis testing.

#### 1.07 MANUFACTURERS' FIELD SERVICES AND REPORTS

---

- A. Submit qualifications of observer to Engineer 30 days in advance of required observations. Observer subject to approval of Engineer.
- B. When specified in individual specification Sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of

surfaces and installation, quality of workmanship, start-up of equipment, test, adjust, and balance of equipment applicable, and to initiate instructions when necessary.

- C. Individuals to report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

END OF SECTION 01400



## Section 01500

### Construction Facilities and Temporary Controls

#### ***PART I - GENERAL***

##### 1.01 SECTION INCLUDES

- A. Temporary Utilities: Electricity, lighting, telephone service, and sanitary facilities.
- B. Temporary Controls: Barriers, protection of the Work.
- C. Construction Facilities: Access roads, parking, progress cleaning.

##### 1.02 RELATED SECTIONS

- A. Section 01560 - Temporary Controls.
- B. Section 01700 - Contract Close-out: Final cleaning.

##### 1.03 TEMPORARY ELECTRICITY

- A. Provide and pay for power service required from Utility source.

##### 1.04 TEMPORARY LIGHTING

- A. Provide and maintain lighting for construction operations to achieve a minimum lighting level of 2 watt/sq. ft.

##### 1.05 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures.
- B. At end of construction, return facilities to same or better condition than originally found.

##### 1.06 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas and to protect existing facilities and adjacent properties from damage from construction operations.
- B. Provide protection for plant life designated to remain. Replace damaged plant life.
- C. Protect non-owned vehicular traffic, stored materials, site and structures from damage.

#### 1.07 PROTECTION OF INSTALLED WORK

---

- 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 minimize damage.
- C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- E. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- F. Prohibit traffic from landscaped areas.

#### 1.08 SECURITY

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- A. Provide security and facilities to protect work from unauthorized entry, vandalism, or theft.

#### 1.09 ACCESS ROADS

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- A. Construct and maintain temporary roads accessing public thoroughfares to serve construction area.
- B. Extend and relocate as Work progress requires. Provide detours necessary for unimpeded traffic flow.
- C. Provide and maintain access to fire hydrants, free of obstructions.
- D. Provide means of removing mud from vehicle wheels before entering streets.

#### 1.10 PARKING

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- A. Provide temporary parking areas to accommodate construction personnel.
- B. When site space is not adequate, provide additional off-site parking.

#### 1.11 PROGRESS CLEANING

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- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- B. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

- C. Remove waste materials, debris, and rubbish from site weekly and dispose off-site.

END OF SECTION 01500

## Section 01505

### Mobilization

#### ***PART 1 - GENERAL***

##### **1.01 GENERAL**

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- A. Mobilization shall include the obtaining of all permits, insurance, and bonds; moving onto the site of all plant and equipment; furnishing and erecting plants, temporary buildings, and other construction facilities; all as required for the proper performance and completion of the Work. Mobilization shall include but not be limited to the following principal items and shall not exceed five (5) percent of the total bid price excluding the mobilization line item:
1. Moving onto the site of all Contractor's plant and equipment required for first month operations.
  2. Installing temporary construction power, wiring, and lighting facilities as required.
  3. Developing construction water supply as deemed necessary by the contractor or the project.
  4. Providing field office trailers (if desired by Contractor for their own use), complete with a specified furnishings and utility services including telephones, telephone appurtenances, and copying machine
  5. Providing all on-site communication facilities, including telephones, for contractors use.
  6. Providing on-site sanitary facilities and potable water facilities as needed
  7. Arranging for an erection of Contractor's work and storage yard.
  8. Submittal of all required insurance certificates and bonds.
  9. Obtaining all required permits.
  10. Posting all OSHA required notices and establishment of safety programs.
  11. Having the Contractor's superintendent at the job site full time.
  12. Submittal of Preliminary Construction Schedule.
  13. Submittal of Schedule of Values.

## 1.02 PAYMENT FOR MOBILIZATION

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- A. The Contractor's attention is directed to the condition that no payment for mobilization, or any part thereof will be approved for payment under the contract until all mobilization items listed above have been completed as specified.

END OF SECTION 01505

## Section 01560

### Temporary Controls

#### **PART 1 GENERAL**

##### 1.01 SECTION INCLUDES

- A. Water Control.
- B. Dust Control.
- C. Erosion and Sediment Control.
- D. Pollution Control.

##### 1.02 RELATED SECTIONS

- A. Section 01010 - Summary of Work.
- B. Section 01039 - Coordination and Meetings Project coordination.

##### 1.03 WATER CONTROL

- A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
- B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.

##### 1.04 DUST CONTROL

- A. Execute Work by methods to minimize raising dust from construction operations.
- B. Provide positive means to prevent air-borne dust from dispersing into atmosphere.

##### 1.05 EROSION AND SEDIMENT CONTROL

- A. Plan and execute construction by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation. Adhere to the manual Stormwater Management for Maine: Best Management Practices as published by the Maine Department of Environmental Protection.
- B. Minimize amount of bare soil exposed at one time.
- C. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.
- D. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.

- E. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

1.06 POLLUTION CONTROL

- A. Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations.

END OF SECTION 01560

## Section 01570

### Traffic Control and Signage

#### **PART I - GENERAL**

##### **1.01 GENERAL REQUIREMENTS**

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- A. Regulate traffic when working within right-of way.
- B. Perform work in a manner to provide safe passage for the public at all times with a minimum of obstruction to traffic.
- C. The Town of Falmouth Public Works, Police Department, Fire Department, and the Engineer will determine if safe passage is being maintained. Perform additional work required by them to maintain safe passage.
- D. Provide all signs, barricades, flags, traffic guards, and warning devices.
- E. Provide access for residents and abutting land owners along the project to driveways and other normal outlets from their property.

#### **PART 2 - PRODUCTS**

##### **2.01 SIGNS, BARRICADES, AND WARNING DEVICES**

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- A. General: Comply with requirements in "Manual on Uniform Traffic Control Devices" published by Dept. of Transportation, Federal Highway Administration and requirements of Maine Dept. of Transportation.

#### **PART 3 - EXECUTION**

##### **3.01 MAINTENANCE OF TRAFFIC**

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- A. General: Roadway may be closed to thru traffic on a limited basis with approval of the Owner and 24-hours' notice to local police and fire departments. Detour signs are required. Generally one-way traffic will be maintained. Maintain two way traffic on nights, weekends, and holidays during non-closure periods.
- B. School buses shall be accommodated during the morning and afternoon pick-up times so that they are not detained. Emergency vehicles have the right-of-way at any time and shall be accommodated.



### 3.02      DETOURS:

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- A. At the discretion of the Owner and with 24-hour notice to the Police and Fire Departments. Alternative Route signs are recommended, though not required.

### 3.03      SCHEDULING OF WORK:

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- A. Schedule all work to minimize disruptions and to allow access to all buildings.
- B. Revise the plan of work if, in the opinion of the Engineer, Owner, or other regulatory agency, it will create traffic hazard or an unreasonably long delay.

### 3.04      SIGNS, BARRICADES, AND WARNING DEVICES

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- A. General: The contractor shall erect appropriate signs to warn traffic of construction zone and/or detours. Placement of necessary signs shall be at the discretion of the Engineer/Owner and shall be done so without added cost to the Owner.
- B. Provide adequate warning signs, barricades, signal lights, and take other necessary precautions for the safety of the public.
- C. Provide and illuminate suitable warning signs to show where construction, barricades, or detours exist.
- D. Signal lights: Illuminate at all barricades and obstructions from sunset to sunrise.
- E. Maintain necessary signs, and signs required by the Maine D.O.T., barricades, lights, and other safety precautions during authorized suspension of the work, weekends, holidays, or other times when construction work is not in progress.

### 3.05      EXISTING SIGNS

---

- A. Temporarily reset and maintain street directory and regulatory signs which must be moved during construction. Relocate signs so that no traffic hazards are created. This work is incidental to the contract.
- B. Permanently reset signs at designated locations prior to completion of work. This work is incidental to the contract.
- C. Temporarily reset and maintain mailboxes which must be moved during construction. Relocate boxes so that no traffic hazards are created. This work is incidental to the contract.

- D. Permanently reset mailboxes at locations specified by the Engineer and in accordance with U.S. Postal Service requirements prior to completion of work. This work is incidental to the contract.

END OF SECTION 01570

## Section 01600

### Material and Equipment

#### **PART 1 - GENERAL**

##### **1.01 SECTION INCLUDES**

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- A. Products.
- B. Transportation and handling.
- C. Storage and protection.
- D. Product options.
- E. Substitutions.

##### **1.02 RELATED SECTIONS**

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- A. Section 01400 - Quality Control: Product quality monitoring.

##### **1.03 PRODUCTS**

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- A. Products: Means new material, machinery, components, equipment, fixtures, and systems forming the Work. Does 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 reuse.

##### **1.04 TRANSPORTATION AND HANDLING**

---

- A. Transport and handle Products in accordance with manufacturers' instructions.
- B. Promptly inspect shipments to assure that Products comply with requirements, quantities are correct, and Products are undamaged.
- C. Provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.

#### 1.05 STORAGE AND PROTECTION

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- A. Store and protect Products in accordance with manufacturers' instructions, with seals and labels intact and legible. Store sensitive Products in weather tight, climate controlled enclosures.
- 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 onsite storage or protection.
- D. Cover Products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation.
- E. Store loose granular materials on solid flat surfaces in a well-drained area. Avoid mixing with foreign matter.
- F. Provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.
- G. Arrange storage of Products to permit access for inspection. Periodically inspect to assure Products are undamaged and are maintained under specified conditions.

#### 1.06 PRODUCT OPTIONS

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- A. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

#### 1.07 SUBSTITUTIONS

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- A. Engineer will consider requests for Substitutions only within 15 days after date established in Notice to Proceed.
- B. Substitutions may be considered when a Product becomes unavailable through no fault of the Contractor.
- C. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.

- D. A request constitutes a representation that the Contractor:
1. Has investigated proposed Product and determined that it meets or exceeds the quality level of the specified Product.
  2. Will provide the same warranty for the Substitution as for the specified Product.
  3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.
  4. Waives claims for additional costs or time extension which may subsequently become apparent.
- E. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.
- F. Substitution Submittal Procedure:
1. Submit three copies of request for Substitution for consideration. Limit each request to one proposed Substitution.
  2. Submit shop drawings, Product data, and certified test results attesting to the proposed Product equivalence.
  3. The Engineer will notify Contractor, in writing, of decision to accept or reject request.

END OF SECTION 01600

## Section 01700

### Contract Close-out

#### **PART 1 - GENERAL**

##### 1.01 SECTION INCLUDES

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- A. Close-out Procedures
- B. Final Cleaning
- C. Adjusting
- D. Project Record Documents
- E. operation and Maintenance Data
- F. Warranties
- G. Spare Parts and Maintenance Materials

##### 1.02 RELATED SECTIONS

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- A. Section 01500 - Construction Facilities and Temporary Controls: Progress cleaning.

##### 1.03 CLOSEOUT PROCEDURES

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- A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Engineer's inspection.
- B. Provide submittals to Engineer that are required by governing or other authorities.
- C. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.

##### 1.04 FINAL CLEANING

---

- A. Execute final cleaning prior to final inspection.
- B. Clean interior and exterior glass and surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.

- C. Clean equipment and fixtures to a sanitary condition.
- D. Clean or replace filters of operating equipment.
- E. Clean debris from roofs, gutters, downspouts, and drainage systems.
- F. Clean site; sweep paved areas, rake clean landscaped surfaces.
- G. Remove waste and surplus materials, rubbish, and construction facilities from the site.

#### 1.05 ADJUSTING

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- A. Adjust operating Products and equipment to ensure smooth and unhindered operation.

#### 1.06 PROJECT RECORD DOCUMENTS

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- A. Maintain on site, one set of the following record documents; record actual revisions to the Work:
  - 1. Contract Drawings.
  - 2. Specifications.
  - 3. Addenda.
  - 4. Change Orders and other Modifications to the Contract.
  - 5. Reviewed shop drawings, product data, and samples.
- B. Store Record Documents separate from documents used for construction.
- C. Record information concurrent with construction progress.
- D. Specifications: Legibly mark and record at each Product section description of actual Products installed, including the following:
  - 1. Manufacturers' name and product model and number.
  - 2. Product substitutions or alternates utilized.
  - 3. Changes made by Addenda and Modifications.
- E. Record Documents and Shop Drawings: Legibly mark each item to record actual construction including:
  - 1. Measured depths of foundations in relation to finish main floor datum.
  - 2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.

3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
  4. Field changes of dimension and detail.
  5. Details not on original Contract Drawings.
- F. Delete Engineer title block seal from all documents.
- G. Submit documents to Engineer with claim for final Application for Payment.

#### 1.07 OPERATION AND MAINTENANCE DATA

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- A. Submit two sets prior to final inspection, bound in 8-1/2-inch by 11-inch text pages, three D side ring binders with durable plastic covers.
- B. Prepare binder covers with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS", title of project, and subject matter of binder when multiple binders are required.
- C. Internally subdivide the binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.
- D. Contents: Prepare a Table of Contents for each volume, with each Product or system description identified, type on 24 pound white paper.
- E. Part 1: Directory, listing names, addresses, and telephone numbers of Engineer, Contractor, Subcontractors, and major equipment suppliers.
- F. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
  1. Significant design criteria.
  2. List of equipment.
  3. Parts list for each component.
  4. Operating instructions.
  5. Maintenance instructions for equipment and systems.
  6. Maintenance instructions for special finishes, including recommended cleaning methods and materials and special precautions identifying detrimental agents.
- G. Part 3: Project documents and certificates, including the following:
  1. Shop drawings and product data.
  2. Air and water balance reports.
  3. Certificates.



- 4. Photocopies of warranties and bonds.
- H. Submit one copy of completed volumes in final form 15 days prior to final inspection. This copy will be returned after final inspection, with Engineer comments. Revise content of documents as required prior to final submittal.
- I. Submit final volumes revised, within ten days after final inspection.

#### 1.08 WARRANTIES

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- A. Provide duplicate notarized copies.
- B. Execute and assemble documents from Subcontractors, suppliers, and manufacturers.
- C. Provide Table of Contents and assemble in three D side ring binder with durable plastic cover.
- D. Submit prior to final Application for Payment.
- E. For items of Work delayed beyond date of Substantial Completion, provide updated submittal within ten days after acceptance, listing date of acceptance as start of warranty period.

#### 1.09 SPARE PARTS AND MAINTENANCE MATERIALS

---

- A. Provide products, spare parts, maintenance and extra materials in quantities specified in individual specification Sections.
- B. Deliver to Project site and place in location as directed; obtain receipt prior to final payment.

END OF SECTION 01700

## Section 02110

### Site Clearing

#### **PART 1 - GENERAL**

##### **1.01 SECTION INCLUDES**

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- A. This work shall consist of clear cutting, selective clearing and thinning, tree trimming, removing single trees, including dead, blown down or uprooted trees, removing and disposing of all stumps and debris within the limits of the right-of-way and easement areas except such objects as are designated to remain or are to be removed in accordance with other sections of these specifications. This work shall also include the preservation from injury to or defacement of all vegetation and objects designated to remain and the treatment of stumps with herbicides.

##### **1.02 RELATED SECTIONS**

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- A. Section 02202 - Rock Removal.
- B. Section 02222 - Excavation.
- C. Section 02300 - Road and Street Construction

##### **1.03 REGULATORY REQUIREMENTS**

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- A. Conform to applicable code for disposal of debris.
- B. Coordinate clearing Work with utility companies.

#### **PART 2 - EXECUTION**

##### **2.01 DEFINITIONS**

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- A. Clearing shall consist of cutting and disposing of all trees, down timber, brush, bushes and debris within designated limits.
- B. Tree trimming shall consist of removing any designated branches and other tree portions for preservation purposes.
- C. Selective Clearing and Thinning shall consist of cutting and disposing of designated trees, down timber, stubs, brush, bushes and debris within designated limits. This work also includes application of approved herbicides on hardwood stumps.

- D. Removing trees shall consist of cutting and disposing of single trees, stumps and roots.

## 2.03 GENERAL

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- A. The Engineer will establish clearing and selective clearing limit lines and will designate all things that are to be preserved and to remain.
- B. Unsound or unsightly branches of trees and shrubs, designated to remain and not specified to be removed under another item, shall be removed as directed. Branches of trees extending over the roadbed shall be trimmed to provide a clear height of 6 m [20 feet] above the road and shoulder surface. Trimming shall be done by skilled workmen and in accordance with good tree surgery practices.
- C. Alignment stakes, grade stakes, witness stakes, boundary markers, bench marks and tie points shall be preserved until permission is given for their destruction.

## 2.04 CLEARING

---

- A. In areas indicated on the plans, all trees, down timber, brush, bushes, shrubs, plants and debris not designated to remain shall be removed and disposed of.
- B. In areas where the proposed embankment is not designated to be grubbed, all stumps shall be cut off as close to the ground as is practicable. When stumps are to remain in the backslope rounding of cut sections, they shall be cut flush with the final slope line.
- C. All wood in the clearing area, except trees designated to remain, shall become the property of the Contractor, unless otherwise provided.
- D. The Contractor shall take special care to completely dispose of all elm trees removed, by burning or by burying under soil in approved areas.
- E. All live hardwood stumps, 25 mm [1 inch] or more in diameter located between the lines of improvement and the outermost clearing or selective clearing lines shall be treated with herbicides, unless specifically exempted.
- F. In areas where stumps and shrubs are to remain, the surface of the ground shall not be unduly disturbed or compacted. Existing ground cover shall be preserved insofar as possible and the area shall be left neat and clean and in a condition which is reasonably consistent with the surroundings.

## 2.05 SELECTIVE CLEARING AND THINNING

---

- A. In order that trees may be properly marked, the Contractor shall give the Engineer at least 2 weeks notice prior to starting work. Only those trees or bushes designated to be removed shall be cut. In no event shall selective clearing and thinning operations begin until approval is given.
- B. All dead or diseased trees or shrubs, junk, trash, litter or foreign matter of any kind shall be removed from the areas to be enhanced. This shall include uprooted stumps and all branches, tops, trunks and dead wood, resulting from woodcutting operations or from any other causes.
- C. Trees and shrubs to be preserved shall be carefully pruned to remove all dead, diseased and injured wood. In addition, in certain areas, the Engineer may require the branches of designated trees to be removed to a height above ground as directed. Complete clearing may be required in certain areas. Such clearing shall be included under this Subsection. Storing logs and pulpwood in thinned areas shall be avoided.
- D. The Contractor shall avoid disturbing or compacting the existing ground surfaces as well as avoiding damage to plant growth. The use of heavy equipment, operating anywhere within the area to be selectively thinned, will not be allowed unless authorized.
- E. Any injury to trees and shrubs which are to be preserved shall be carefully repaired. Disturbed ground surface shall be restored as nearly as possible to natural conditions.
- F. Pruning and repairs to live trees and shrubs shall be done by skilled workmen or tree surgeons according to approved arboricultural practice. All stumps, new or old, shall be cut off as close to the ground as is practicable.
- G. Trees falling outside the specified limits of the thinning areas shall be removed and disposed of in a satisfactory manner. Undesirable trees leaning or falling over the highway right-of-way from outside shall be cut at the property line.

## 2.06 HERBICIDES

---

- A. All herbicides shall be approved by the Engineer. The herbicides shall be applied by Certified Pesticide Applicators in accordance with State Pesticides Control Board Regulations. With the exception of coniferous (softwood) trees, stumps over 25 mm [1 inch] in diameter resulting from cutting live hardwood trees and shrubs shall be treated with approved herbicide spray mixture. The spray mixture may be applied at any time until regrowth from the stumps has reached a height of approximately 600 mm [24 inches] except that it shall not be applied when the stumps are wet or frozen. The herbicide spray mixture shall be sprayed on all

exposed surfaces of stumps and the stems of regrowth, until there is complete saturation and run-off. Particular attention to coverage shall be given to the bark and all exposed roots.

- B. All stumps shall receive at least one treatment with the herbicide spray mixture. At the time of final acceptance, live regrowth of hardwood tree seedlings shall have been substantially eliminated. Any remaining regrowth will require another treatment prior to final acceptance.
- C. Particular care must be taken that the herbicide mix does not come in contact with or too near live trees and shrubs that are to be preserved. Unless otherwise directed the spray mixture shall not be applied closer than 600 mm [2 feet] from the trunk of a tree that is to remain.
- D. When directed, live stumps in specified areas shall be exempted from spraying with herbicides.
- E. The Contractor shall be responsible for maintaining the treated area until final acceptance of the work. All damage or die-back shall be repaired at the Contractor's expense as directed. At the time of final acceptance the area shall be free of all dead, dying or damaged trees and shrubs and litter of any kind as well as free from regrowth.

## 2.07 DISPOSAL

- A. All brush, timber, logs and other woody debris shall be disposed of by approved methods. The Contractor shall make every effort to provide useful disposition of woody material which may be marketable. If the Contractor can demonstrate that a reasonably suitable market for the material is not available, other disposal methods may be approved.
- B. Acceptable methods of disposal may include chipping and burying. Burning may be allowed when so provided by Special Provision.
  - (a) Chipping. Wood chippers shall reduce woody material to chips over not over 6 mm [1 inch] thick by not over 200 mm [8 inches] long, and the chips spread uniformly over the ground or as directed.
  - (b) Burying. Brush and logs may be disposed of by burying in approved waste dumps or by placing in the portion of the embankments outside a slope 1 ½ horizontal to 1 vertical extending from the edge of the shoulder to the existing ground and covering with a minimum of 600 mm [2 feet] of earth. Excavation or borrow used to cover the brush and logs in the slopes may be placed in layers at least 600 mm [2 feet] thick and compacted only to the extent that the stability of the slope is assured.
  - (c) Burning. A Special Provision will state when burning is allowed. Logs, brush and other refuse produced as a result of clearing, may be disposed of by burning, provided pollutant

type material is not used to start or maintain the fire. All fires shall be started with natural material and the fire maintained in such a manner that minimum of visible smoke is produced. The Contractor shall acquire a burning permit from the local fire authority and present it to the Engineer prior to burning.

- C. Special attention shall be given to wind direction to assure no nuisance results from smoke.
- D. Burning shall be done in accordance with applicable laws and ordinances and under the direction of competent watchmen. Extreme care shall be taken to control the fires. Fires will not be allowed where there is any possibility of burning, scorching, overheating or otherwise jeopardizing trees, shrubs, surrounding forest cover, adjacent property or buildings nor where there is a possibility of damaging overhead wires and cables. Fires will not be allowed where undisturbed ground is to remain exposed nor on areas which have been seeded to grass or other plants.
- E. The Contractor will be held responsible for any damage caused by fires built in the construction of the project. Such responsibilities shall include removing and disposing of burned material, replacing trees, shrubs, fences or any other material or object which has been designated to remain and seeding, fertilizing and mulching the burned areas. At the option of the Engineer, a cash settlement or a combination of replacement and cash settlement may be assessed in lieu of replacing all damaged trees and plants. When directed, the Contractor may be required to perform such work beyond the right-of-way lines.

## 2.08 REMOVING SINGLE TREES AND STUMPS

- A. When called for on the plans or otherwise designated, complete removal and disposal of single trees and stumps shall be required and shall include the backfilling of stump holes.
- B. Trees which have been uprooted shall be removed by cutting the tree and removing the stump from the ground or, where approved, the stumps may be placed back in the hole to present a natural appearance. The area shall be graded to conform to the surrounding terrain.

END OF SECTION 02110

## Section 02140

### Dewatering

#### **PART 1 – GENERAL**

##### 1.01 SUMMARY

- A. Furnish, operate and maintain dewatering equipment for control, collection and disposal of ground and surface water entering trenches and excavations.

##### 1.02 RELATED WORK

- A. Section 01500 - Construction Facilities and Temporary Controls.
- B. Section 02222 – Excavation.
- C. Section 02225 - Trenching.
- D. Section 02720 – Storm Sewerage Conveyance Systems.

#### **PART 2 – PRODUCTS**

##### 2.01 EQUIPMENT

- A. Provide pumps, drains, piping and other facilities necessary to keep excavations and trenches free of water, including spare units available for immediate use in the event of equipment failure.

#### **PART 3 – EXECUTION**

##### 3.01 PROTECTION

- A. Protect watercourses, storm drains, sewer systems and adjacent properties from siltation by use of sediment ponds, silt bags or other measures in accordance with the latest edition of the Maine Erosion and Sediment Control Best Management Practices.
- B. Keep excavations clear of groundwater, surface water, seepage, sewage and storm water.

##### 3.02 INSTALLATION

- A. Install, construct and maintain equipment and facilities required for work of this section.
- B. Dispose of water removed from work in a suitable manner which will not interfere with other work, cause erosion, damage pavements, other surfaces or property and is in accordance with the latest edition of the Maine Erosion and Sediment Control Best Management Practices.
- C. Remove dewatering equipment and facilities when no longer required.

- D. Backfill excavations in accordance with Sections 02222 and 02225.
- E. Repair damage resulting from dewatering operations.

END OF SECTION 02140



## Section 02150

### Shoring and Bracing

#### **PART I - GENERAL**

##### **1.01 DESCRIPTION OF WORK**

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A. Work included:

1. Shoring and bracing necessary to protect existing buildings, utilities, and other improvements and excavation against caving; and to meet OSHA safety requirements of shoring and bracing. Shoring and bracing to provide cofferdams.

2. Removal of bracing, as required.

B. Shoring and bracing, systems include, but are not limited to, the following:

1. Steel sheet piling
2. Movable box

C. Steel sheet piling: Provide steel sheet piling, to be removed following completion of Work, where shown on the drawings or where directed by the Engineer. Payment will be incidental to installation of piping, manholes and pump stations. Piling is to remain in place when directed by the Engineer. Payment for piling to remain in place will be made by change order.

Steel sheet piling may be left in place at the Contractor's option if approved by the Engineer. No additional payment will be made for this piling.

No payment will be made for steel sheet piling used for the Contractor's convenience.

D. Movable box: Provide where a shoring system is required but sheet piling is not called for. Cost of movable box system is incidental to other work items.

E. Earthwork: Section 02200

##### **1.02 QUALITY ASSURANCE**

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A. Design: Assign design of shoring and bracing to a registered Professional Engineer.

B. Regulations: Comply with local codes and OSHA requirements.

### 1.03 SUBMITTALS:

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- A. Design Documents: Submit design calculations and drawings for shoring and bracing system and other data prepared and sealed by a registered Professional Engineer, prior to commencing work on any built in place shoring and bracing system.

### 1.04 JOB CONDITIONS

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- A. Before starting work, check and verify governing dimensions and elevations. Survey condition of adjoining properties with Engineer. Take photographs, recording any prior settlement or cracking of structures, pavements and other improvements. Prepare a list of such damages, verified by dated photographs, and signed by Contractor, Engineer and others conducting the investigation.
- B. Survey adjacent structure and improvements, establishing exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations. Locate datum level used to establish benchmark elevations sufficiently distant so as not to be affected by excavation operations.
- C. During excavation, re-survey benchmarks weekly, employing licensed Land Surveyor or registered Professional Engineer. Maintain accurate log of surveyed elevations for comparison with original elevations. Notify Engineer if changes in elevations occur or if cracks, sags or other damage is evident.

## **PART 2 - PRODUCTS**

### 2.01 MATERIALS:

---

- A. General: Provide suitable shoring and bracing materials which will support loads imposed. Materials need not be new, but should be in serviceable condition.
- B. Steel sheet piling and shapes (comers, etc.): Continuous interlocking type; section modules and type of section as required by design.
- C. Bracing members: Wood timbers or A36 steel members.
- D. Bolts: ASTM A307.

### **PART 3 - EXECUTION**

#### **3.01 GENERAL**

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- A. Provide system to resist earth and hydrostatic pressures, including surcharges from surface loads.
- B. Locate shoring and bracing to clear permanent construction and to permit forming and finishing of concrete.
- C. Maintain shoring and bracing while excavation is open.
- D. Removal of systems: Remove systems in stages to prevent disturbance of soils and damage to structures and improvements. Fill voids as soon as sheeting is withdrawn.

#### **3.02 STEEL SHEET PILING AND BRACING**

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- A. Drive sheet piling prior to excavation where possible. Fill and compact voids outside sheeting to hold sides of excavation in place.
- B. Brace as required to prevent distortion of piling and other bracing members. If necessary to move a brace, install new bracing prior to removal of original brace.
- C. Cut off sheet piling to be left in place at least two feet below finish grade.

END OF SECTION 02150

## Section 02202

### Rock Excavation

#### **PART 1 - GENERAL**

##### 1.01 SECTION INCLUDES

- A. Removal of identified or discovered rock during excavation.
- B. Use of explosives to assist rock removal.

##### 1.02 RELATED SECTIONS

- A. Section 02211 - Rough Grading.
- B. Section 02222 - Excavation.
- C. Section 02223 - Backfilling

##### 1.03 UNIT PRICES

- A. Rock Quantity: Determined by quantity of rock indicated in the Contract Documents.
- B. Adjustments in Contract Price will be made due to changes in quantity of rock based on unit prices established in the Agreement for rock excavation.
- C. Determination of Unit Measurements: Identified by site measurements and verified by the Engineer.

##### 1.04 REFERENCES

- A. NFPA 495 - Code for Explosive Materials.

##### 1.05 DEFINITIONS

- A. Rock is defined as any stone, boulder, or pieces of concrete or masonry of two cubic yards or more in volume and any hard natural material or rock ledge that will withstand removal by the usual mechanical excavation methods such as, power shovels or toothed bulldozer blades, and such that normally requires blasting or continuous drilling, wedging, sledging, or barring for removal. No soft or disintegrated rock which can be removed with a hand pick or power operated excavator shovel; no loose, shaken, or previously blasted rock or broken stone in rock

fillings or elsewhere; and no rock exterior to the maximum limits of measurements allowed, which may fall into the excavation, will be measured or allowed. The Engineer shall be sole judge as to whether the material encountered shall be classified as rock in accordance with the above description.

#### 1.06 QUALIFICATIONS

- A. Seismic Survey Firm: Company specializing in seismic surveys with five years documented experience.
- B. Explosives Firm: Company specializing in explosives for disintegration of rock, with five years of documented experience.

#### 1.07 REGULATORY REQUIREMENTS

- A. Conform to applicable code for explosive disintegration of rock and to NFPA 495 for handling explosive materials.
- B. Obtain permits from authorities having jurisdiction before explosives are brought to site or drilling is started.

#### 1.08 SCHEDULING

- A. Schedule work under provisions of Section 01300.
- B. Schedule work to avoid disruption to occupied buildings nearby.

### **PART 2 - PRODUCTS**

#### 2.01 MATERIALS

- A. Explosives: Type recommended by explosive firm following seismic survey and required by authorities having jurisdiction.
- B. Delay Device: Type recommended by explosive firm.
- C. Blast Mat Materials: Type recommended by explosives firm.

### **PART 3 - EXECUTION**

#### 3.01 EXAMINATION

- A. Verify site conditions and note subsurface irregularities affecting work of this Section.

- B. Beginning of work of this Section means acceptance of existing conditions.

### 3.02 PREPARATION

---

- A. Identify required lines, levels, contours, and datum.
- B. Conduct survey and document conditions of buildings near locations of rock removal and prior to blasting, photograph existing conditions identifying existing irregularities.

### 3.03 ROCK REMOVAL - MECHANICAL METHOD

---

- A. Excavate and remove rock by the mechanical method. Drill holes and utilize expansive tools or wedges to fracture rock.
- B. Cut away rock at bottom of excavation to form level bearing.
- C. Remove shaled layers to provide sound and unshattered base.
- D. In utility trenches, excavate to 6-inches below invert elevation of pipe and 6-inches wider than pipe diameter.
- E. Remove excavated materials from site.
- F. Correct unauthorized rock removal in accordance with backfilling and compaction requirements of Section 02223.

### 3.04 ROCK REMOVAL - EXPLOSIVE METHOD

---

- A. If rock is uncovered requiring the explosives method for rock disintegration, notify the Engineer execute as follows.
- B. Advise owner of adjacent buildings or structures in writing, prior to executing seismographic survey. Explain planned blasting and seismic operations.
- C. Obtain a seismic survey prior to rock excavation to determine maximum charges that can be used at different locations in area of excavation without damaging adjacent properties or other work.
- D. Provide seismographic monitoring during progress of blasting operations.

- E. Disintegrate rock and remove from excavation.
- F. Remove rock at excavation bottom to form level bearing.
- G. Remove shaled layers to provide a sound and unshattered base.
- H. In utility trenches, excavate to 6 inches below invert elevation of pipe and 24 inches wider than pipe diameter.
- I. Remove excavated material from site.
- J. Correct unauthorized rock removal or overbreak in accordance with backfilling and compaction requirements of Section 02223.
- K. Perform no blasting without informing Engineer, governing authorities, and other concerned parties. Conform to all local, state, and federal regulations concerning blasting and pertinent provisions of the "Manual of Accident Prevention in Construction" issued by the Associated General Contractors of America, Inc., of the "Construction Safety Rules and Regulations, as adopted by the State Board of Construction Safety, Augusta, Maine, and Maine Department of Transportation Standard Specifications" Section 105.2.7, Use of Explosives.
- L. Blast only with such quantities and strength of explosives and in such manner as will break the rock approximately to the intended lines and grades and yet will leave the rock not be excavated in an unshattered condition. Avoid excessive cracking of the rock upon or against which any structure will be built and to prevent injury to existing pipes or other structures and properly above or below ground. Cover rock where necessary.
- M. Blast no closer than 20 feet from completed pipes, manholes, or other structure. Any damages to the work resulting from blasting shall be repaired at the Contractor's expense.
- N. The Contractor shall maintain and submit (if requested) to the Engineer accurate record of each blast. Show the general location of the blast, the depth and number of drill holes, the kind and quantity of explosive used, and other data required for a complete record.

### 3.05 FIELD QUALITY CONTROL

---

- A. Field inspection and testing will be performed under provisions of Section 01400.
- B. Provide for visual inspection of foundation bearing surfaces and cavities formed by removed rock.

END OF SECTION 02202





## Section 02211

### Rough Grading

#### **PART 1 - GENERAL**

##### 1.01 WORK INCLUDED

- A. Remove topsoil and stockpile for later reuse. Remove excess from site.
- B. Excavate subsoil and stockpile for later reuse.
- C. Grade and rough contour site.

##### 1.02 RELATED WORK

- A. Section 02202 – Rock Excavation.
- B. Section 02218 - Landscape Grading.
- C. Section 02222 - Excavation.
- D. Section 02223 - Backfilling.

##### 1.03 PROJECT RECORD DOCUMENTS

- A. Submit documents under provisions of Section 01700.
- B. Accurately record location of utilities remaining, rerouted utilities, new utilities by horizontal dimensions, elevations or inverts, and slope gradients.

##### 1.04 PROTECTION

- A. Protect trees, shrubs, lawns, and other features remaining as portion of final landscaping.
- B. Protect bench marks, existing structures, fences, roads, sidewalk, and paving, and curbs.
- C. Protect above or below grade utilities which are to remain.
- D. Repair damage.

## **PART 2 - PRODUCTS**

### **2.01 MATERIALS**

---

- A. Topsoil: Excavated material, graded free of roots, rocks larger than one inch, subsoil, debris, and large weeds.
- B. Subsoil: Excavated material, graded free of lumps larger than 6 inches, rocks larger than 3 inches, and debris.

## **PART 3 - EXECUTION**

### **3.01 PREPARATION**

---

- A. Identify required lines, levels, contours, and datum.
- B. Identify known below grade utilities. Stake and flag locations.
- C. Identify and flag above grade utilities.
- D. Maintain and protect existing utilities remaining which pass through work area.
- E. Notify utility company to remove and relocate utilities.
- F. Upon discovery of unknown utility or concealed conditions, discontinue affected work; notify Engineer.

### **3.02 TOPSOIL EXCAVATION**

---

- A. Excavate topsoil from areas to be further excavated, re-landscaped, or re-graded and stockpile in area designated on site. Remove excess topsoil not being reused from site.
- B. Do not excavate wet topsoil.
- C. Stockpile topsoil to depth not exceeding 8 feet. Cover to protect from erosion or install erosion control fencing, immediately from stockpile area.

### **3.03 SUBSOIL EXCAVATION**

---

- A. Excavate subsoil from areas to be re-landscaped or regraded marked areas and stockpile in area designated on site. Remove excess subsoil not being reused from site.
- B. Do not excavate wet subsoil.

END OF SECTION 02211

## Section 02218

### Landscape Grading

#### **PART 1 - GENERAL**

##### 1.01 WORK INCLUDED

- A. Finish grade subsoil and proof roll.
- B. Place, level, and compact topsoil.

##### 1.02 RELATED WORK

- A. Section 01400 - Quality Control
- B. Section 02211 - Rough Grading
- C. Section 02223 - Backfilling
- D. Section 02936 - Seeding: Finish ground cover

##### 1.03 SAMPLES

- A. Submit samples under provisions of Section 01400.
- B. Submit sample of topsoil material from onsite stockpile and all off site sources to be used for approval of Engineer.

##### 1.04 PROTECTION

- A. Protect landscaping and other features remaining as final work.
- B. Protect existing structures, fences, roads, sidewalks, paving, and curbs.

#### **PART 2 - PRODUCTS**

##### 2.01 MATERIALS

- A. Friable screened loam; free of subsoil, roots, grass, excessive amount of weeds, stone, and foreign matter; acidity range (pH) of 5.5 to 7.5; containing a minimum of 4 percent and a maximum of 25 percent organic matter, maximum soluble salt content of 500 ppm, maximum of 5% by volume of extraneous material exceeding 2 inches in diameter.

## **PART 3 - EXECUTION**

### **3.01 INSPECTION**

---

- A. Verify site conditions and note irregularities affecting work of this Section.
- B. Beginning work of this Section means acceptance of existing conditions.

### **3.02 SUBSOIL PREPARATION**

---

- A. Eliminate uneven areas and low spots. Remove debris, roots, branches, stones, in excess of 1/2 inch in size. Remove subsoil contaminated with petroleum products.
- B. Scarify subgrade to depth of 3 inches where topsoil is scheduled. Scarify in areas where equipment used for hauling and spreading topsoil has compacted subsoil.

### **3.03 PLACING TOPSOIL**

---

- A. Place topsoil in areas where seeding, sodding, and/or planting is scheduled at depths shown in details.
- B. Use topsoil in a relatively dry state. Place during dry weather. Do not place on frozen ground.
- C. Fine grade topsoil eliminating rough or low areas. Maintain levels, profiles, and contours of grade.
- D. Remove stone, roots, grass, weeds, debris, and foreign material while spreading to sizes specified in 3.02.A above.
- E. Manually spread topsoil around trees, plants, building, and structure to prevent damage.
- F. Roll placed topsoil.
- G. Remove surplus subsoil and topsoil from site.
- H. Leave stockpile area and site clean and raked, ready to receive landscaping.

### **3.04 SOIL CONDITIONERS**

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- A. Dolomitic Limestone: ASTM C 602-
- B. Aluminum Sulphate: Standard commercial grade.
- C. Peat: FS Q-P-166, Type 1, Class B.

- D. Perlite: Standard horticultural grade.
- E. Manure: Rotted a minimum of 6 months.
- F. Sawdust: Rotted a minimum of 24 months.
- G. Pesticides: As recommended by Department of Agriculture/Pesticide Control Board.
- H. Fertilizer:
  - 1. FS 0-F-241, Type 1, Grade B
  - 2. Available nutrients, % by weight.
    - a. 10 N
    - b. 6 P205
    - c. 4 K20
- I. Water: Harmless to plant growth.
- J. Soil conditioners to be used as an amendment to the topsoil to enhance grass growth, not solely as a topsoil material.

### 3.05 TOLERANCES

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- A. Top of Topsoil: Plus or minus ½ inch.

### 3.06 SCHEDULE OF LOCATIONS

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- A. The following paragraphs identify compacted topsoil thickness for various locations.
  - 1. Seeded grass in non-lawn area: minimum 4 inches.
  - 2. Seeded grass in lawn area: minimum 4 inches.

END OF SECTION 02218

## Section 02222

### Excavation

#### ***PART I - GENERAL***

##### **1.01 SECTION INCLUDES**

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- A. Excavation for building foundations.
- B. Excavation for slabs-on-grade, paving, and landscaping.
- C. Excavation for site structures.

##### **1.02 RELATED SECTIONS**

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- A. Section 01400 - Quality Control
- B. Section 02202 - Rock Excavation
- C. Section 02150 - Shoring and Bracing
- D. Section 02211 - Rough Grading
- E. Section 02223 - Backfilling

##### **1.03 FIELD MEASUREMENTS**

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- A. Verify that survey benchmark and intended elevations for the Work are as indicated.

##### **1.04 JOB CONDITIONS**

---

- A. Erect sheeting, shoring, and bracing as necessary for protection of persons, improvements, and excavations in accordance with OSHA safety requirements and Section 02150 of these specifications.
- B. Provide dewatering and drainage as required to accomplish work of this section.
- C. Protect new construction, existing structures, existing utilities, plants, trees, etc. at all times. Report any damages immediately to Engineer and proper authorities.
- D. Data on indicated subsurface conditions are not intended as representations or warranties of accuracy or continuity between soil borings. It is expressly understood that OWNER will not

be responsible for interpretations or conclusions drawn therefrom by the CONTRACTOR. Data is made available for the convenience of the CONTRACTOR.

Additional test borings and other exploratory operations may be made by the CONTRACTOR at no cost to the OWNER.

**PART 2 – NOT USED**

**PART 3 - EXECUTION**

**2.01 PREPARATION**

---

- A. Identify required lines, levels, contours, and datum.

**2.02 EXCAVATION**

---

- A. Underpin adjacent structures which may be damaged by excavation work, including utilities and pipe chases.
- B. Excavate subsoil required to accommodate building foundations, slabs on-grade, paving, and site structures to within a tolerance of 0.1'.
- C. Machine slope banks to angle of repose or less, until shored.
- D. Excavation cut not to interfere with normal 45 degree bearing splay of foundation.
- E. Excavate all materials regardless of nature to elevations and dimensions indicated plus sufficient space for forming, shoring, draining, inspecting, etc. Excavate using open cut method unless otherwise indicated or permitted.
- F. Grade top perimeter of excavation to prevent surface water from draining into excavation.
- G. Hand trim excavation. Remove loose matter. Take care not to disturb the bottom of excavation. Excavate by hand to final grade just before concrete reinforcement is placed. Trim bottoms to require lines and grades to leave a solid base to receive other Work.
- H. Allow Engineer to inspect bottom of excavation for suitability of base material.
- I. Remove unsuitable base material to a depth of at least 12 inches below any pipe or structure or to a depth directed by the Engineer and replace with compacted screened gravel or crushed stone or provide proper base as otherwise directed by Engineer. Place no footing, wall, structure, pipe, etc. on unsuitable material.



- J. Place no structure, pipe, etc. partially on earth and partially on rock. Remove rock and replace with compacted screened gravel or crushed stone.
- K. Protect excavation bottoms from frost and weathering. Place no structure, pipe, etc. on frozen or weathered ground.
- L. Remove lumped subsoil, boulders, and rock up to 2 cu yd measured by volume. Larger material will be removed under provisions of Section 02202.
- M. Notify Architect/Engineer of unexpected subsurface conditions and discontinue affected work in area until notified to resume work.
- O. Correct unauthorized excavation at no extra cost to Owner.
- P. Stockpile excavated material in area designated on site and remove excess material not being reused, from site. Remove excavated material from site.
- Q. Do not perform rock excavation or excavation of unsuitable materials until material to be excavated has been cross-sectioned and classified by Engineer.
- R. Excavation in paved areas. Cut pavement prior to excavation to provide a clean, uniform edge. Minimize disturbance of remaining paved surfaces. Cut and remove the minimum amount of pavement required to complete the Work. Utilize shoring and/or bracing where sides of excavation will not stand without undermining pavement.
- S. Unauthorized Excavation. Removal of materials beyond indicated in the Contract Documents is prohibited without consent of Engineer. Unauthorized excavation, as well as remedial Work directed by Engineer including refilling, is at Contractor's expense. Refilling unauthorized excavation shall be done with crushed stone or compacted screened gravel.

## 2.03 FIELD QUALITY CONTROL

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- A. Field inspection will be performed under provisions of Section 01400.
- B. Provide for visual inspection of bearing surfaces.

## 2.04 PROTECTION

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- A. Protect excavations by methods required to prevent cave-in or loose soil from falling into excavation.
- B. Protect bottom of excavations and soil adjacent to and beneath foundation, from freezing.

END OF SECTION 02222

## Section 02223

### Backfilling

#### ***PART 1 - GENERAL***

##### 1.01 SECTION INCLUDES

---

- A. Building perimeter and site structure backfilling to subgrade
- B. Site filling and backfilling
- C. Fill under slabs-on-grade and paving
- D. Consolidation and compaction
- E. Fill for over excavation

##### 1.02 RELATED SECTION

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- A. Section 01400 - Quality Control
- B. Section 02218 - Landscape Grading
- C. Section 02222 - Excavation
- D. Section 02225 - Trenching

##### 1.03 REFERENCES

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- A. ANSI/ASTM C136 - Method for Sieve Analysis of Fine and Coarse Aggregates.
- B. ANSI/ASTM D698 - Test Method for Moisture Density Relations of Soils and Soil Aggregate Mixtures, Using 5 lb. Hammer and 12 inch Drop.
- C. ANSI/ASTM D1556 - Test Method for Density of Soil in Place by the Sand-Cone Method.
- D. ASTM D2922 - Density of Soil and Soil Aggregate in Place by Nuclear Methods (Shallow Depth).
- E. ASTM D2487-69 - Classification of Soils for Engineering Purposes.

## **PART 2 - PRODUCTS**

### **2.01 SUITABLE FILL AND BACKFILL MATERIAL REQUIREMENT**

---

- A. General: Fill, backfill, and embankment materials shall be suitable selected or processed clean, fine earth, rock or sand, free from grass, roots, brush, or other vegetation.
- B. Fill and backfill to be placed within 6 inches of any structure or pipe shall be free of rocks or unbroken masses of earth materials having a maximum dimension no larger than 3 inches for structures and 1 inch for tape coated pipe or PVC pipe.
- C. Suitable Materials: Soils not classified as unsuitable as defined in paragraph entitled, "Unsuitable Material" herein, are defined as suitable material and may be used in fills, backfilling, and embankment construction subject to approval by Engineer.
- D. Suitable materials may be obtained from on-site excavations, may be processed on-site materials, or may be imported. If imported materials are required to meet the requirements of the section or to meet the quantity requirements of the project, the Contractor shall provide the imported materials at no additional expense to the Owner, unless a unit price item is included for imported materials in the bidding schedule.
- E. The following types of suitable materials are designated and defined as follows:

#### **1. COMMON BORROW**

Common borrow shall consist of earth suitable for fill or embankment construction. It shall meet the following criteria:

Sieve Size	Weight Passing
3"	100
No. 40	0-25
No. 200	0-5

#### **2. GRAVEL BORROW (*Bank Run Gravel*)**

Gravel borrow shall consist of granular material with uniform gradation and shall meet the following criteria:

Sieve Size	Weight Passing
6"	100
¼"	25-70
No.40	0-30
No. 200	0-5

### 3. **SCREENED GRAVEL**

Screened gravel shall consist of clean hard durable particles free from clay lumps, vegetated matter, and other deleterious substances and meeting the following criteria:

Sieve Size	Weight Passing
2"	100
½"	30-55
No.40	0-20
No. 200	0-5

### 4. **CRUSHED STONE**

Crushed stone shall be durable crushed rock consisting of the angular fragments obtained by breaking and crushing solid or smattered natural rock and reasonably free from thin, flat, elongated, or other objectionable pieces. The crushed stone shall be reasonably free from sand, clay, loam, chemical decay, or deleterious materials and not more than one percent of material passing a No. 200 sieve will be allowed to adhere to the crushed stone. The crushed stone shall be uniformly blended according to the grading requirements listed in the following tables:

*1 ½" Crushed Stone:*

Sieve Size	Weight Passing
2"	100
1½"	95-100
1"	35-70
¾"	0-25

*¾" inch crushed stone:*

Sieve Size	Weight Passing
1"	100
¾"	95-100
½"	35-70
3/8"	0-25

## 5. SAND

Sand shall be well graded coarse sand without excessive fines and free from loam, clay, and organic matter. Beach sand shall not be used. The grading requirements are as follows:

Sieve Size	Weight Passing
3/8"	100
No. 4	95-100
No. 16	50-85
No. 50	10-30
No. 100	2-10

## 6. AGGREGATE BASE

Aggregate Base shall be screened or crushed gravel consisting of hard durable particles which are free from vegetable matter, lumps or balls of clay, and other deleterious substances. The gradation of the part that passes a 3 inch sieve shall meet the grading requirements of the following table and in accordance with MDOT Type A material:

### Crushed Base (MDOT Type A)

Sieve Size	Weight Passing
1/2"	45-70
1/4"	30-55
No. 4	0-20
No. 200	0-6

### Screened Base (MDOT Type B)

Sieve Size	Weight Passing
1/2"	35-75
1/4"	25-60
No. 4	0-25
No. 200	0-6

Screened gravel base shall not contain particles of rock which will not pass the 2 inch square mesh sieve. Crushed gravel base shall not contain particles of rock which will not pass the 2 inch square mesh sieve.

Gradation tests shall conform to AASHTO method T-27 except that the material may be separated on the 1 inch sieve.

## **7. AGGREGATE SUBBASE**

MDOT Type D Aggregate Subbase shall be sand or gravel consisting of hard durable particles which are free from vegetable matter, lumps, or balls of clay, and other deleterious substances. The gradation of the portion which will pass a 3 inch sieve shall meet the grading requirements of the following table:

Sieve Size	Weight Passing
3"	100
½"	35-80
¼"	25-65
No. 40	0-30
No. 200	0-7

Granular subbase and gravel subbase shall not contain particles of rock which will not pass the 4 inch square mesh sieve.

Gradation tests shall conform to AASHTO Method T-27 except that the material may be separated on the 4 inch sieve.

## **8. REFILL MATERIAL**

Refill Material for replacement of unsuitable material or rock excavation below grade shall be clean screened gravel or crushed stone of ¾ inch maximum size, free from silt, loam, and clay.

## **9. GRANULAR FILL**

Granular Fill shall consist of mineral soil substantially free from clay, organic materials, loam, wood, trash, or other objectionable materials which may be compressible or which cannot be properly compacted. It shall not contain similar materials larger than 10 inches in largest dimension. It shall have physical properties such that it can be readily spread and compacted. It shall not contain any snow, ice, or frozen soil.

## **10. BEDDING MATERIAL**

Where any of the above material is to be used for bedding materials, it shall further meet the following additional criteria:

Bedding material shall be so graded that 100% will pass a one (1) inch screen and not more than 10% will pass a 200-mesh sieve. Gradation test results of the bedding material shall be submitted to the Engineer for approval. In the event abnormally unstable or wet conditions are encountered, bedding material shall be crushed stone, if directed by the Engineer.

#### **11. UNDERDRAIN BACKFILL MATERIAL**

Granular material for underdrain Type B shall be free from organic matter and shall conform to the following gradation:

Sieve Size	Weight Passing
1"	95-100
½"	75-100
No. 4	50-100
No. 20	15-80
No. 50	0-15
No. 200	0-5

Granular material for underdrain Type C shall be free from organic matter and shall conform to the following gradation:

Sieve Size	Weight Passing
1"	100
¾"	90-100
3/8"	0-75
No. 4	0-25
No. 10	0-5

#### **2.02 UNSUITABLE MATERIAL**

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- A. Unsuitable soils for fill and backfill material shall include soils which, when classified under the standard method for "Classification of Soils for Engineering Purposes", ASTM D2487, fall in the classifications of Pt, OH, CH, MH, or OL.
- B. In addition, any soil containing organic matter, having a plastic limit of less than 8 percent when tested in accordance with the requirements of ASTM D4313 and containing more than 25 percent of material, by weight, passing the No. 200 sieve when analyzed according to the requirements of ANSI/ASTM D1140, or any soil which cannot be compacted sufficiently to



achieve the percentage of maximum density specified for the intended use, shall be classed as unsuitable material.

### **PART 3 - EXCAVATION**

#### **3.01 EXAMINATION**

---

- A. Verify fill materials to be reused are acceptable.

#### **3.02 PREPARATION**

---

- A. Scarify and re-compact subgrade to density required for subsequent backfill materials.
- B. Cut out soft areas of subgrade not capable of insitu compaction as directed by Engineer. Backfill with an approved granular material and compact to a density equal to or greater than requirements for subsequent backfill material.
- C. Prior to placement of aggregate base course material at paved areas, compact subsoil to 95 percent of its maximum dry density in accordance with ANSI/ASTM D698.

#### **3.03 BACKFILLING**

---

- A. Use suitable materials from excavations which conform to the requirements herein or are approved by the Engineer for backfill up to rough grade lines except where these specifications have more stringent or special requirements for certain parts of the contract work. Supply extra fill if there is not enough fill to complete the project.  
  
Use no material from any excavation as backfill unless approved by the Engineer.
- B. Material within two feet of finished grade in any areas to be paved or within five feet horizontally of any structure shall contain no stone having any dimension exceeding six inches. Excess and unsuitable excavated materials shall be removed from the site and satisfactorily disposed of. In the event sufficient suitable excavated material is not available for backfill, supply a granular backfill.
- C. Place materials in layers of thickness specified herein but in no case greater than 12 inches before compaction. Wet backfill when necessary, uniformly to obtain required density. Compact each layer with vibratory or sheepsfoot compactors (as appropriate) before placing next layer.
- D. In cross-country runs, trenches shall be backfilled and mounded six inches above surrounding grade in addition to the normal compaction procedure.

- E. In street work, backfill above the pipe bedding to a depth of 18 inches below finish grade will be placed in maximum 12 inch layers and then compacted. Backfill in the remaining 18 inches will be placed in 6 inch layers of base or subbase as specified and then compacted.
- F. In backfilling around structures, place material in 8 inch layers and then compact. Allow no heavy machinery within 5 feet of structure during placement. Place no material until structure can withstand the load. Bring backfill up evenly on all sides of the structure.
- G. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces.
- H. Maintain moisture content within 2 percent, plus or minus, of optimum moisture content of backfill materials to attain required compaction density.

### 3.04 FIELD QUALITY CONTROL

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- A. Field inspection and testing will be performed under provisions of Section 01400.
- B. Tests and analysis of fill material will be performed in accordance with ANSI/ASTM D698 and with Section 01400.
- C. Compaction testing will be performed in accordance with ANSI/ASTM D698 and with Section 01400.
- D. If tests indicate Work does not meet specified requirements, remove Work, replace and retest all at no cost to Owner.
- E. Frequency of Tests: Compaction Tests:
  - Trench - 1 test every 300 feet, varying lifts
  - Manholes, Structures - 2 tests, varying lifts.
  - Roads - 1 test every 100 feet, varying lifts
- F. Proof roll compacted fill surfaces under paving.
- G. Minimum densities following compaction shall be as follows:

Fill and Backfill Location	Standard Proctor Density (%)
Top Two Feet Under Pavement	95
Under Pavements Below Top Two Feet	90
Trenches Through Unpaved Areas	90
Embankments	90
Pipe Bedding and Trenching	95
Under Structural Foundations and Slabs	95

- H. Compaction shall be accomplished by appropriate methods, i.e., vibratory compaction of granular materials, sheepsfoot compaction of cohesive materials, etc. In no case shall trench compaction be deemed adequate with the use of a non-compactive device such as a bulldozer. The Engineer may withhold 5 percent of the monthly requisition if in his opinion proper compaction was not met. Improper compacted materials shall be removed, replaced, or re-compacted at no additional cost to the Owner.

### 3.05 PROTECTION OF FINISHED WORK

- A. Protect finished Work under provisions of Section 01500.
- B. Where completed compacted areas are disturbed by subsequent construction activities or adverse weather, scarify the surface, re-shape, and compact to required density prior to further construction.

### 3.06 REMOVAL OF EXCESS MATERIALS

- A. Remove excess material, except surplus loam, and dispose of it off Owner's property unless otherwise directed by Engineer and required by Owner.

Grade material to the satisfaction of the Owner of the property on which the material is deposited. Keep roads free of debris by sweeping or other suitable methodology. Use suitable watertight vehicles for hauling wet materials over roads and streets. Clean up materials dropped from or spread by vehicles promptly or when directed by Engineer or Owner's representative.

END OF SECTION 02223

## **Section 02224**

### **Boring Information**

#### ***PART 1 – GENERAL***

##### **1.01 SECTION INCLUDES**

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- A. As provided in Appendix B, the Geotechnical Engineering data included within the February 11, 2016 report entitled "Middle Road Pavement Reconstruction" as prepared by S.W. Cole Engineering, Inc. is presented for the information to the contract with regards to the boring conducted during a subsurface investigation conducted on the project. The Engineer confirms the accuracy of the information for the locations drilled only in accordance with the report limitations. No liability is assumed for the locations of ledge or other materials at locations not investigated. The contractor is responsible for any additional borings or test pits needed to identify materials or area in question.
- B. Borings were done at intervals as shown on the plan and profile drawings to a depth shown on the profile view as reflected in the S.W. Cole Engineering, Inc. report.

**END OF SECTION 02224**

## Section 02225

### Trenching

#### **PART 1 - GENERAL**

##### **1.01 SECTION INCLUDES**

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- A. Furnish all labor, materials, equipment and incidentals necessary to perform all trenching for pipelines and appurtenances, including drainage, filling, backfilling, disposal of surplus material, and restoration of trench surfaces and easements.
- B. Excavation shall extend to the width and depth shown on the Drawings or as specified and shall provide suitable room for installing pipe, structures and appurtenances.
- C. Furnish and place all sheeting, bracing and supports and shall remove from the excavation all materials which the Engineer may deem unsuitable for backfilling. The bottom of the excavation shall be firm, dry and in all respects, acceptable. If conditions warrant, deposit gravel for pipe bedding, or gravel refill for excavation below grade, directly on the bottom of the trench immediately after excavation has reached the proper depth and before the bottom of the trench has become softened or disturbed by any cause whatever. The length of open trench shall be related closely to the rate of pipe laying. All excavation shall be made in open trenches.
- D. All excavation, trenching and related sheeting, bracing, etc. shall comply with the requirements of OSHA excavation safety standards (29 CFR Part 1926.650 Subpart P) and State requirements. Where conflict between OSHA and State regulations exists, the more stringent requirements shall apply.
- E. Whenever the requirement for 92 percent compaction is referred to herein it shall mean "at least 92 percent of maximum density as determined by ASTM D1557, Method C.
- F. Prior to the start of work submit the proposed method of backfilling and compaction to the Engineer for review.

##### **1.02 RELATED SECTIONS**

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- A. Section 01400- Quality Control
- B. Section 02202 - Rock Excavation
- C. Section 02211 - Rough Grading
- D. Section 02222 – Excavation

E. Section 02223 – Backfilling

**1.03 REFERENCES**

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- A. ANSI/ASTM C136 - Method for Sieve Analysis of Fine and Coarse Aggregates.
- B. ANSI/ASTM D698 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5 lb Hammer and 12-inch Drop.
- C. ANSI/ASTM D1556 - Test Method for Density of Soil in Place by the Sand-Cone Method.

**1.04 FIELD MEASUREMENTS**

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- A. Verify that survey benchmark and intended elevations for the Work are as shown on Drawings.

**PART 2 - PRODUCTS**

**2.01 FILL BEDDING MATERIALS**

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- A. Materials as specified in Section 02223.

**PART 3 - EXECUTION**

**3.01 EXAMINATION**

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- A. Verify bedding and backfill materials to be reused, are acceptable and obtain Engineers approval.
- B. Trench excavation shall include material of every description and whatever substance encountered, except rock and boulders. Pavement shall be cut with a saw, wheel or pneumatic chisel along straight lines prior to excavation. DO NOT USE REMOVED PAVEMENT AS FILL. The use of a wheel cutter attachment for a bucket loader in cold weather is not allowed.

**3.02 PREPARATION**

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- A. Identify required lines, levels, contours, and datum.
- B. Protect above and below grade utilities which are to remain.

- C. Strip and stockpile topsoil from grassed areas crossed by trenches. At the Contractor's option, topsoil may be otherwise disposed of and replaced, when required, with approved topsoil of equal quality. Surplus materials should be disposed of off site at Contractors expense.
- D. Cut out soft areas of subgrade not capable of insitu compaction as directed by Engineer. Backfill with refill material per Section 02223 and compact to density equal to or greater than requirements for subsequent backfill material.

### 3.03 EXCAVATION

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- A. Excavate subsoil required for utilities being installed.
- B. Cut trenches sufficiently wide to enable installation of utilities and allow inspection.
- C. Excavation shall not interfere with normal 45 degree bearing splay of foundations.
- D. Hand trim excavation. Hand trim for bell and spigot pipe joints. Remove loose matter.
- E. Remove lumped subsoil, boulders, and rock up to 2 cubic yards, measured by volume. Larger material will be removed under Section 02202.
- F. Correct unauthorized excavation at no cost to Owner.
- G. Correct areas over-excavated by error in accordance with Section 02223 at no additional cost to Owner.
- H. Stockpile excavated material in an area designated on site and remove excess material not being used, from site. Remove excavated material from site.
- I. While excavating and backfilling is in progress, traffic shall be maintained, and all utilities and other property protected as provided in the General Conditions and General Requirements.
- J. Trenches shall be excavated to the depth indicated on the Drawings and in widths sufficient for laying the pipe, bracing and for pumping and drainage facilities. The bottom of the excavations shall be firm and dry and in all respects acceptable to the Engineer. Trench width shall be practical minimum.
- K. Excavation and dewatering shall be accomplished by methods which preserve the undisturbed state of subgrade soils. The trench may be excavated by machinery to, or just below the designated subgrade, provided that material remaining in the bottom of the trench is no more than slightly disturbed. Subgrade soils which become soft, loose, "quick", or otherwise unsatisfactory as a result of inadequate excavation, dewatering, or other construction methods

shall be removed and replaced by screened gravel fill as required by the Engineer at the Contractor's expense.

- L. Clay and organic silt soils are particularly susceptible to disturbance due to construction operations. When excavation is to end in such soils, use a smooth-edge bucket to excavate the last one foot of depth.
- M. If the material at the level of trench bottom consists of fine sand, sand and silt or soft earth which may work into the screened gravel notwithstanding effective drainage, the subgrade material shall be removed to the extent directed and the excavation refilled with a 6-in layer of coarse sand, or a mixture graded from coarse sand to the fine peastone, as approved by the Engineer, to form a filter layer preserving the voids in the gravel bed of the pipe. The composition and gradation of gravel shall be approved by the Engineer prior to placement. Screened gravel shall then be placed in 6-inch layers thoroughly compacted up to the normal grade of the pipe.
- N. Geotextile filter fabric may be substituted for filter layer if approved by the Engineer. Filter fabric shall be Mirafi 140N or equal.
- O. Where pipe is to be laid in screened gravel bedding, the trench may be excavated by machinery to the normal depth of the pipe provided that the material remaining in the bottom of the trench is no more than slightly disturbed.

### 3.4 DISPOSAL OF MATERIALS

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- A. Excavated material shall be stacked without excessive surcharge on the trench bank or obstructing free access to fire hydrants and gate valves. Inconvenience to traffic and abutters shall be avoided as much as possible. Excavated material shall be segregated for use in backfilling as specified below.
- B. It is expressly understood that no excavated material shall be removed from the site of work or disposed of, except as directed by the Engineer. When removal of surplus materials has been approved by the Engineer, dispose of such surplus material in approved designated areas. Disposal of surplus materials will be at the Contractor's expense.
- C. Should conditions make it impracticable or unsafe to stack material adjacent to the trench, the material shall be hauled and stored at another location. When required, it shall be re-handled and used as backfill in the trench at no additional cost to the Owner.

### 3.5 EXCAVATION BELOW GRADE AND REFILL

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- A. Whatever the nature of unstable material encountered or the groundwater conditions, trench drainage shall be complete and effective.



- B. If the Contractor excavates below grade through error or for the Contractor's own convenience, or through failure to properly dewater the trench, or disturbs the subgrade before dewatering is sufficiently complete, he may be directed by the Engineer to excavate below grade as set forth in the following paragraph, in which case the work of excavating below grade and furnishing and placing the refill shall be performed at his own expense.
- C. If the material at the level of trench bottom consists of fine sand, sand and silt or soft earth which may work into the screened gravel notwithstanding effective drainage, the subgrade material shall be removed to the extent directed and the excavation refilled with a 6-inch layer of a mixture of coarse sand to fine peastone, as approved by the Engineer, to form a filter layer preserving the voids in the gravel bed of the pipe.

The composition and gradation of gravel shall be approved by the Engineer prior to placement. Screened gravel shall then be placed in 6-inch layers thoroughly compacted up to the normal grade of the pipe.

- D. Geotextile filter fabric may be substituted for filter layer if approved by the Engineer. Filter fabric shall be Mirafi 140N or equal.

### 3.6 BACKFILLING

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- A. As soon as practicable after the pipe has been laid and jointed, backfilling shall begin and thereafter be prosecuted expeditiously. Bedding gravel, as specified for the type of pipe installed, shall be placed up to 1-foot over the pipe
- B. An impervious dam or bulkhead cutoff of clay or other impervious material shall be constructed in the trench as directed, to interrupt the unnatural flow of groundwater after construction is completed. The dam shall be effectively keyed into the trench bottom and sidewalls. Provide at least one clay or other impervious material dam in the pipe bedding between each manhole where directed or every 300 feet, whichever is less.
- C. Where the pipes are laid cross country, the remainder of the trench shall be filled with common fill material in layers not to exceed 3-feet and mounded 6-inch above the existing grade or as directed. Where a loam or gravel surface exists prior to cross country excavations, it shall be removed, conserved and replaced to the full original depth as part of the work under the pipe items. In some areas it may be necessary to remove excess material during the clean-up process, so that the ground may be restored to its original level and condition.
- D. Where the pipes are laid in streets, the remainder of the trench up to a depth of 1.5-feet below the bottom of the specified permanent paving shall be backfilled with common fill material in layers not to exceed 1-foot and thoroughly compacted. The sub-base layer for paving shall be of aggregate subbase and aggregate base course thoroughly compacted in 6-

inch layers.

- E. To prevent longitudinal movement of the pipe, dumping backfill material into the trench and then spreading will not be permitted until selected material or screened gravel has been placed and compacted to a level 2-feet over the crown of the pipe.
- F. Backfill shall be brought up evenly on all sides. Each layer of backfill material shall be thoroughly compacted by rolling, tamping, or vibrating with mechanical compacting equipment or hand tamping, to 95 percent compaction. If rolling is employed, it shall be by use of a suitable roller or tractor, being careful to compact the fill throughout the full width of the trench.
- G. Water jetting may be used unless the refill contains too great a proportion of clay or loam to permit satisfactory drying. Water jetting shall consist of using a suitable length of pipe at least 1-1/4-inches in diameter fitted with quick acting valve and sufficient hose to connect to hydrant or pump having adequate pressure and capacity. The full depth of backfill shall be thoroughly inundated by thrusting the pipe into the fill at frequent intervals with the valve open until all slumping ceases. Water for jetting may be obtained from public hydrants wherever possible. Water may be furnished from these hydrants if reasonable care is exercised in its use and when approved by the Portland Water District. Puddling will not be allowed.
- H. If water restrictions are in force, obtain water elsewhere, or compact the backfill by other approved methods at no additional cost to this Contract
- I. Where other methods are not practicable, compaction shall be by use of hand or pneumatic ramming with tools weighing at least 20 pounds. The material being spread and compacted in layers not over 6-inch thick. If necessary, sprinkling shall be employed in conjunction with rolling or ramming.
- J. Bituminous paving shall not be placed in backfilling under any circumstances. Frozen material shall not be used under any circumstances.
- K. All road surfaces shall be broomed and hose-cleaned immediately after backfilling. Dust control measures shall be employed at all times.

### 3.7 RESTORING TRENCH SURFACE

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- A. Where the trench occurs adjacent to paved streets, in shoulders; sidewalks, or in cross-country areas, thoroughly consolidate the backfill and shall maintain the surface as the work progresses. If settlement takes place, immediately deposit additional fill to restore the level of the ground.
- B. In and adjacent to streets, the top 18-inch layer of trench backfill shall consist of compacted

aggregate subbase course and aggregate base course. Should the Contractor wish to use material excavated from the trench as gravel subbase for pavement replacement, the Contractor, at his/her own expense, have samples of the material tested by an independent testing laboratory at intervals not to exceed 500 feet, in order to establish its compliance with the specifications.

- C. Only material which has been tested and approved by the Engineer shall be allowed to be incorporated into the work. The surface of any driveway or any other area which is disturbed by the trench excavation and which is not a part of the paved road shall be restored to a condition at least equal to that existing before work began.
- D. In sections where the pipeline passes through grassed areas, and at the Contractor's own expense, remove and replace the sod, or loam and seed the surface to the satisfaction of the Engineer.

### 3.08 TOLERANCES

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- A. Top Surface of Backfilling: Under Paved Areas: Plus or minus 2 inches from required elevations.
- B. Top Surface of General Backfilling: Plus or minus one inch from required elevations.

### 3.09 FIELD QUALITY CONTROL

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- A. Field testing will be performed under provisions of Section 01400.
- B. Tests and analysis of fill material will be performed in accordance with ANSI/ASTM D698 and Section 01400.
- C. Compaction testing will be performed in accordance with ANSI/ASTM D698 and Section 01400.
- D. If tests indicate Work does not meet specified requirements, remove work, replace and retest at no cost to Owner.

### 3.10 PROTECTION OF FINISHED WORK

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- A. Protect finished Work under provisions of Section 01500.

END OF SECTION 02225

## SECTION 02260

### FILTER FABRIC

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

###### A. Work Included:

1. Furnish all materials and install filter fabric of the types, dimensions and in the location(s) shown on the Drawings and specified herein. B. Related Work Specified Elsewhere:
2. Temporary Erosion Control, Riprap and Stone Ditch Protection, and Gabions and Revet Mattresses are specified in the appropriate sections of this Division.

##### 1.2 QUALITY ASSURANCE

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

##### 1.3 SUBMITTALS

- A. Manufacturer shall furnish certified test reports with each shipment of material attesting that the fabric meets the requirements of this Specification.

#### PART 2 - PRODUCTS

##### 2.1 MATERIALS

- A. Filter fabric for use in stabilization, drainage, underdrains, erosion control, landscaping and beneath structures shall be formed in widths of not less than six (6) feet and shall meet the requirements of Table 1. Both woven and non-woven geotextiles are acceptable; however no "slit-tape" woven fabrics will be permitted for drainage, underdrain, and erosion control applications.

Table 1

<u>Geotextile Mechanical Property</u>	<u>Test Method</u>	<u>Minimum Permissible Value</u>
Grab Tensile Strength (both directions)	ASTM D4595-86	120 pounds
Grab Elongation	ASTM D4632-86	50 percent

Mullen Burst Strength	ASTM D3786-87	210 psi
Puncture Strength	ASTM D3787	60 pounds
Trapezoid Tear Strength	ASTM D4533-85	50 pounds
Water Flow Rate	ASTM D4491-85	120 gal/min/sf
Equivalent Opening Size (EOS)	ASTM D4751	80
Coefficient of Permeability	ASTM D4491-85	0.2 cm/sec

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

B. Filter fabric for use in reinforcement and under riprap shall meet the requirements of Table 2. Woven and non-woven geotextiles are acceptable.

Table 2

Geotextile Mechanical Property	Test Method	Minimum Permissible Value
Grab Tensile Strength (both directions)	ASTM 4595-86	195 pounds
Grab Elongation	ASTM D4632-86	20 percent
Mullen Burst Strength	ASTM D3786-87	340 psi
Puncture Strength	ASTM D3787	85 pounds
Trapezoid Tear Strength	ASTM D4533-85	85 pounds
Equivalent Opening Size (EOS)	ASTM D4751	U.S. Std. Sieve number(s) between #20 and #100

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

C. Filter Fabric for use in siltation fencing shall be the following:

1. Environfence 100X (Mirafi)
2. Supac 4NP (Phillip 66)
3. Exxon 180 Siltfence
4. Amoco 1380 Silt Stop
5. Harris Siltfence
6. Or equivalent

### PART 3 - EXECUTION

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

END OF SECTION 02260

## Section 02300

### Road and Street Reconstruction

#### PART I GENERAL

##### 1.01 WORK INCLUDED

- A. General procedure for road and street reconstruction.

##### 1.02 RELATED WORK

- A. Section 02211 - Rough Grading
- B. Section 02223 – Backfilling
- C. Section 02513 - Asphalt Concrete Paving

##### 1.03 REFERENCES

- A. Maine Department of Transportation Standard Specifications - Highways and Bridges, November 2014 or latest edition.

##### 1.04 QUALITY ASSURANCE

- A. Perform work in accordance with Maine Department of Transportation Standard Specification - Highways and Bridges.

##### 1.05 REGULATORY REQUIREMENTS

- A. Conform to applicable standards for excavation and backfilling work on public property.

##### 1.06 TESTS

- A. Testing and analysis of backfill and other materials will be performed under provisions of Section 01400.

##### 1.07 SUBMITTALS

- A. Reserved.

## **1.08 ENVIRONMENTAL REQUIREMENTS**

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- A. Work may proceed in various weather conditions. In the opinion of the Engineer, if the weather conditions shall result in a substandard work product, the project time shall be halted until conditions improve. Work undertaken against the Engineers decision to suspend work shall be done so at the contractor's risk. In the event work conducted during this period is substandard and requires replacement, it shall be done so at the contractor's expense.

## **PART 2 - PRODUCTS**

### **2.01 AGGREGATE SUBBASE AND BASE**

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- A. MDOT Specification, Section 703. (See Backfilling Section 02223 in these Specifications.)
- B. MDOT Specification, Section 304.02

### **2.02 COMMON BORROW**

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- A. MDOT Specification, Section 703.18
- B. Section 02223 these specifications.

### **2.03 RECLAIM MATERIAL FOR STABILIZED BASE**

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- A. MDOT Specification, Section 306.

### **2.04 STONE DITCH PROTECTION**

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Rock used for ditch protection shall consist of sound, durable rock which will not disintegrate by exposure to water or weather. Fieldstone, rough quarry stone, blasted ledge rock, or tailings may be used. The rock shall be graded within the following limits or as otherwise noted:

Sieve Size	Weight Passing
12"	90-100
4"	0-15

## **PART 3 - EXECUTION**

### **3.01 GENERAL REFERENCE**

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- A. MDOT Specification, Section 203 (execution portions only, not measurement and payment).



### 3.02 EXCAVATION - GENERAL

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- A. Reserved.
- B. Prior to beginning excavating, grading, and embankment operations in any area, all necessary clearing in that area shall have been performed in accordance with MDOT Section 201 -- Clearing Right-of-Way.
- C. Unsuitable material shall be disposed of as directed and no material shall be wasted without permission. Excavating operations shall be conducted so that material outside of the limits of slopes will not be disturbed.
- D. The Engineer may designate as unsuitable those soils which cannot be properly compacted in embankments and all such unsuitable material shall be disposed of in approved waste storage areas or waste areas as directed.
- E. Suitable material taken from excavation shall be used in the construction of embankment, subgrade, and for backfilling as indicated on the plans, or as directed, except that if the volume of suitable excavated material exceeds that required to Construct the embankments to the grades indicated, the excess shall be used to grade the areas of ultimate development or wasted as directed.
- F. The Contractor shall give the Engineer sufficient time before beginning excavation to take necessary cross section elevations and measurements. The Contractor shall not excavate beyond the dimensions, slopes and elevations established, and no material shall be removed prior to the staking out and cross sectioning the site. Unless otherwise authorized, borrow material shall not be placed until after all suitable excavation has been placed in the embankment unless the use of granular borrow is called for on the plans or required for use under embankments or in conjunction with the use of excavated material or for the maintenance of traffic. If the Contractor places more borrow than is required and thereby causes a waste of suitable excavation material, the amount of such waste will be measured by the method deemed most appropriate and 115 per cent of the amount deducted from the borrow volume.
- G. When different unit prices are bid for Common Excavation and Rock Excavation, the Contractor will be required to strip earth from the ledge to provide an opportunity for the Engineer to take the necessary measurements. When identical prices are bid for Common Excavation and Rock Excavation, the Contractor will not be required to strip the earth from the ledge.

- H. When it is necessary to temporarily remove fencing designated to remain, the fencing shall be replaced by the Contractor at his expense in as good a condition as it was originally. The Contractor shall be responsible for the confinement of livestock when a portion of the fence is removed. When new fencing for confinement of livestock is required, it shall be erected before existing fencing is disturbed. Where new fencing cannot be erected in its final location, temporary fencing shall be at the Contractor's expense.
- I. Excavating for obliterating old roadways or salvaging material from old roadways shall include all grading operations necessary to incorporate the old roadway into the new roadway and surroundings or placing salvaged material in a stockpile as directed.
- J. The degree of finish for grading ditches and slopes, both fill slopes and cut slopes, shall be that obtainable from machine operations. Ditches shall be constructed to within 6 inches above or below the grade called for on the cross sections or as otherwise modified but in no case shall the ditch be finished in a condition that will not allow the flow of water. Ditches shall be graded to the extent that puddles will not form. All provisions for measurement and payment limits shall remain in force and no payment will be made for unauthorized work done beyond authorized pay limits.
- K. Unstable slopes subject to sliding and slumping shall be excavated to the lines and grades shown or as directed. Immediately after each location is excavated approved stone or granular slope blanket backfill material shall be placed and shaped to match the adjacent slopes.
- L. Ledge slopes shall be scaled (cleaned of all loose material) immediately as the excavation proceeds. The ledge slope shall then be examined by the Contractor to determine if the slope is stable. If the slope is not deemed stable upon this examination, then immediate steps shall be taken by the Contractor to insure the stability of the slope during construction. There will be no additional pay for any temporary protection required for the construction of the project.

### 3.03 ROADWAY EXCAVATION

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- A. Roadway excavation shall be maintained in such condition that the excavation surface will be well drained. Temporary drains, drainage ditches and culverts shall be constructed to intercept and divert water which may adversely affect the condition of the excavation and the prosecution of the work.
- B. Excavation shall, in general, proceed in a direction upgrade. Subgrades shall be promptly graded and rolled to minimize absorption of water. Adjacent ditches shall be graded to the extent that puddles will not form. Grubbing areas which cannot be drained shall be promptly filled with approved excavation or borrow to such an elevation that surface drainage will be effective. If, due to unusual circumstances, drainage by gravity cannot be accomplished, the Engineer may require the Contractor to provide adequate means of pumping the area. Pump-

ing may be required on a 24 hour a day continuous basis and no direct compensation for cost of pumping will be made.

- C. Muck shall be removed in such a manner to insure its complete removal with no areas remaining or trapped below the embankment. Excavated muck shall be deposited in designated waste storage areas as shown on the plans or as otherwise directed. When muck is encountered that was not contemplated on the plans, it shall be disposed of as indicated above.
- D. Excavation adjacent to roots of trees or shrubs which are to remain shall be removed by hand.
- E. When excavating results in a subgrade of unsuitable soil, the Engineer may require the Contractor to remove the unsuitable material and backfill the area with approved material. The Contractor shall conduct his operations in such a way that the Engineer can take the necessary measurements before the backfill is placed.
- F. Material classified as rock, whether paid for as rock excavation, shall be excavated to the required depth. Care shall be taken that undrained pockets will not be left in the surface of the rock remaining.
- G. The space between the rock remaining and the normal subgrade shown on the plans shall be backfilled with the designated aggregate subbase or aggregate base, pulverized rock or other approved material. The Contractor shall conduct his excavating and hauling work in a manner that will cause as little contamination as possible. Fine grading at the normal subgrade line will be required unless aggregate subbase or aggregate base material is used.
- H. Ditches in rock cuts shall be constructed with no protrusions of rock above the designated rock cut pay lines. The space between the rock remaining and the finished surface of the ditch shall be backfilled with broken rock.
- I. For earth and rock backslopes designated to be constructed on a 1 vertical to 2 horizontal slope or flatter, the slope shall be uniformly finished to within 6 inches above or 6 inches below the lines designated, but in no case shall projections of rock extend over 6 inches above the actual finished surface of the slope as constructed. Rock backslopes designated to be constructed on a 1 vertical to ¼ horizontal slope shall be excavated at least to a vertical plane.
- J. Buried structures and obstructions, located within the designated limits of the work, shall be removed as part of the applicable excavation item for type of work being performed. Buried structures and obstructions located below or outside the required excavation, whose removal is ordered, shall be removed and such removal paid for as Common Excavation, Rock Excavation or Unclassified Excavation, whichever is applicable.

### 3.04 WASTE AREAS

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- A. It shall be the responsibility of the Contractor to obtain necessary permits and approvals from all pertinent State and Federal agencies and from the local municipality prior to the establishment of waste areas off the project. In addition, written permission of the property owners shall be obtained by the Contractor, including permission to dispose of waste in the area. Copies of all required permits shall be given to the Engineer.
- B. Provisions shall be made for temporary and permanent erosion controls at waste areas which shall include, but not necessarily be limited to, grading the surface to drain, covering the surface with loam or other earthy material that will support growth and seeding and mulching.

### 3.05 PREPARATION OF EMBANKMENT AREAS

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- A. When the depth of the embankment, measured vertically below subgrade, does not exceed 5 feet the area on which the embankment is to be placed shall be grubbed as defined in herein. When the embankment is more than 5 feet, as measured above, all vegetation in the embankment area shall be cut as specified in MDOT Specification Section 201 -- Clearing Right-of-Way.
- B. When embankment is to be placed and compacted on hillsides or where new embankment is to be compacted against existing embankment, slopes steeper than 1 vertical to 2 horizontal shall be continuously benched by excavating steps into the existing material of sufficient width to permit operations of placing and compacting the additional material. Material removed shall be placed and compacted along with the new embankment material. When such benching is required, it will be as indicated on the plans, called for in the special provisions or as directed.

### 3.06 EMBANKMENT CONSTRUCTION - GENERAL

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- A. Layers of material for embankments shall start at the deepest portion of the fill and as placement progresses, layers shall be constructed approximately horizontal. Except for the first layer over swampy ground and cleared areas, roadway embankment of earth shall be placed in layers not exceeding 8 inches loose measure, unless otherwise approved and the compacted as specified before the next layer is placed.
- B. When it is impractical to construct layers over the full width of the cross section, partial width layers may be authorized.
- C. Effective spreading equipment shall be used on each layer to obtain uniform thickness. Each layer shall be crowned and maintained free of ruts and ridges to provide direct drainage of water from the embankment. As the compaction of each layer progresses, - grading and

manipulating will be required to assure uniform density. Construction equipment shall be routed uniformly over the entire surface of each layer.

- D. Embankments within 50 feet of a bridge abutment, structural plate or box culvert type structure shall be compacted by the moisture and density control method as specified herein, except that rock embankments may be constructed over culverts as specified herein.
- E. Water shall be added or removed, if necessary, in order to obtain required compaction. Aeration of excavated roadway materials to reduce the moisture content to within specified limits shall be as specified under MDOT Subsection 631.04.
- F. When placing layers of specified thickness is not feasible, such as filling in water or over swampy ground, the initial layer of embankment may be constructed in one layer to an elevation where bridging will be accomplished. In embankment areas where no grubbing is required, the material placed in the first layer shall be of sufficient depth to cover all stumps.
- G. When the excavation or borrow consists predominantly of fragments of such size that the material cannot be placed in embankments in layers of specified thickness without breaking down the pieces, such material may be placed in layers in thicknesses not exceeding the approximate average size of the larger rocks but in no case shall layers exceed 600 mm [2 feet]. Rocks exceeding this thickness shall be separated and collectively placed in accordance with the requirements for rock embankments. Each layer shall be leveled and smoothed with suitable leveling equipment and by even distribution of rock spells and finer rock fragments or earth. The Engineer may test any or all layers by moisture and density control as specified in MDOT Subsection 203.12 which are constructed in depths exceeding 200 mm [8 inches]. The layers so constructed shall not be placed above an elevation 600 mm [2 feet] below the finish subgrade. The remainder of the embankment shall be composed of suitable material smoothed and placed in layers not exceeding 200 mm [8 inches], loose thickness, and compacted as specified for earth embankments.
- H. Where guardrail is to be installed, rock shall not be placed in the embankment under the location of the guardrail to an elevation 4 feet below the finished grade of the shoulder. Rocks, broken concrete and other solid materials shall not be placed in any portions of embankments where piling is to be placed or driven or where utility conduits are to be placed.
- I. Excess or unsuitable excavated material, including rock and boulders, which cannot be used in embankments shall be placed in the nearest available waste areas. When it is impossible to dispose of all material in the manner described, the remainder shall be disposed of in approved waste areas.
- J. When material obtained from roadway excavation is unsatisfactory for use in the formation of embankments due to excessive moisture content, can be rendered satisfactory for such use by

combining it with granular material, the unsatisfactory material shall be combined with granular borrow or granular excavation when and as directed by the Engineer.

- K. If the embankment is required to be deposited on only one side of abutments, wing walls piers or culvert headwalls, care shall be taken that the area immediately adjacent to the structure is not compacted excessively to the extent that it will cause overturning of or excessive pressure against the structure. When embankment is to be placed on both sides of a concrete wall, structural plate or box type structure, operations shall be so conducted that the embankment is always at approximately the same elevation on both sides of the structure.
- L. At the close of each day's work, the embankment surface shall be graded, crowned, smoothed, rolled, and sealed against infiltration of water.
- M. The portion of the embankment and subbase outside a 1 vertical to 1½ horizontal slope extending from the edge of the finished shoulder to the existing ground, as shown on the Standard Detail entitled "Disposal of Waste Materials", will be required to be compacted only to the extent that stability of the slope is assured. As construction of the embankment progresses, material placed in the portion of the embankment outside the 1 vertical to 1½ horizontal slope shall not be placed above the elevation of the surface of the main embankment unless provisions are made to allow drainage of surface water from the embankment. The surface of the slopes shall be finished to present a uniform neat appearance.
- N. The portion of the embankment inside the aforementioned 1 vertical to 1½ horizontal slope lines shall be compacted in accordance with the designated embankment compaction requirements specified for the project.

### **3.07 CONSTRUCTION OF EARTH EMBANKMENT - LAYER METHOD**

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- A. The layer method will be required unless otherwise specified. Unless otherwise approved the material shall be deposited and spread upon compacted material in full width layers not more than 8 inches in depth, loose measure. Clay or loam soils shall be compacted by use of sheepsfoot or tamping type roller having a minimum weight on each tamper, under working conditions, of 1725 kPa 250 pounds per square inch of cross sectional bearing area. Sand or gravel soils shall be compacted by vibratory type compaction equipment or by pneumatic tired equipment and, if necessary, by the addition of water. A combination of the above or other methods capable of producing equivalent results may be used. The compacting operations shall be continued until each layer is compacted to its full depth and width.
- B. With approval, the Contractor may place layers in excess of 8 inches and less than 24 inches, loose measure, providing the specified compaction requirements are obtained and the Contractor agrees to make necessary test excavation for the Engineer to determine density.

- C. The Contractor will be required to demonstrate that the compaction equipment and methods are obtaining satisfactory compaction.
- D. Satisfactory compaction for the purpose of the demonstration is defined as not less than 90 percent of the maximum density. The maximum density shall be determined in accordance with AASHTO T180, Method C or D, corrected by the Soils Laboratory Adjustment Chart, available at the MOOT Central Laboratory, Bangor, Maine. Field density tests will be made in accordance with AASHTO T191, adjusted to include only the material passing a 1 inch sieve or by an approved method using a calibrated nuclear device.

### 3.08 CONSTRUCTION OF EARTH EMBANKMENT WITH MOISTURE/DENSITY CONTROL

- A. The contract will designate the areas to be constructed with moisture and density control and the distance below subgrade to which such methods shall be applied. The moisture content at the time of compaction shall be suitable to obtain the required density. The maximum density shall be determined in accordance with AASHTO T180, Method C or D, corrected by the Soils Laboratory Adjustment Chart available at the MDOT Central Laboratory, Bangor, Maine. Field density tests will be made in accordance with AASHTO T191, adjusted to include only the material passing a 1 inch sieve or by an approved method using a calibrated nuclear device.
- B. All material in embankments above the elevation designated on the plans for moisture density control shall be placed at a moisture content suitable to obtain the required density. Each layer placed with controlled moisture shall be compacted to not less than 90 percent of the maximum density.
- C. Density requirements will not apply to the portions of embankments constructed of material which cannot be tested in accordance with AASHTO T191 or when the material contains more than 30 percent material retained on a 2 inch square mesh sieve.

### 3.09 CONSTRUCTION OF ROCK EMBANKMENTS

- A. The material for rock embankment shall be placed in compacted layers not exceeding 3 feet in depth. Depositing the rock directly over the end of the fill from the hauling equipment will not be permitted, it shall be deposited on the fill and pushed into place. The top of the rock embankment shall be so choked that there will be no infiltration of the earth embankment placed on the top of the rock embankment.
- B. This method shall be used only in fills in excess of 4 feet in depth. In no case shall the rock embankment be placed within 1 foot of subgrade unless authorized.
- C. When structures are located under rock embankment, they shall be covered with not less than 2 feet of earth excavation or borrow before the rock embankment is placed over the structures.

### 3.10 WINTER CONSTRUCTION OF EMBANKMENTS

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- A. Frozen material shall not be placed in the core embankment. The construction of embankments may continue during cold weather only when all frozen material in the top of the core embankment or the existing ground is moved to the waste area before placing additional material. When this procedure results in additional borrow quantity the additional borrow will not be paid for directly.
- B. Compaction shall be in accordance with the specified method of embankment construction. When the prevailing temperatures are below -1 °C [30 °F] all material used in embankment construction shall have a moisture content, at the time of compaction, equal to or less than the optimum moisture content.
- C. The embankment shall not be constructed upon frozen material except that such construction of embankments may be allowed providing the total depth of the added fill, including bases, plus the depth of the frozen material beneath does not exceed 5 feet. Frozen material may be left in the embankment only if it has been compacted as specified prior to freezing. The Contractor shall not resume construction of any embankments built in this manner until all frozen material has thawed. If test holes are required to make this determination they shall be dug and backfilled with satisfactory compaction at the Contractor's expense. Before additional material is added, un-compacted material on the surface of such embankments shall be either re-compacted in accordance with the specified method of embankment construction or removed.

### 3.11 PREPARATION AND PROTECTION OF THE SUBGRADE

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- A. Unless otherwise provided, the subgrade shall be brought to a condition of uniform stability and compacted for the full width of the roadway by grading and rolling operation and shall be maintained to no tolerance above or 3 inches below the required grade and cross section. The surface shall be compacted to uniform density and stability and graded to the extent that puddles of water will not form. Additional material required as a result of low subgrade shall be furnished and placed at the expense of the Contractor.
- B. The required compaction shall be the same as specified for embankments. When the subgrade occurs in cuts, the required compaction shall apply to a depth of 6 inches below subgrade unless otherwise specified.
- C. The Contractor shall protect the subgrade from damage. Ditches and drains along the roadway shall be maintained to effectively drain the subgrade. In no case shall vehicles be allowed to travel in a single track and form ruts. No material shall be deposited on a subgrade until the subgrade has been approved.



### 3.12 USE OF GEOTEXTILE FABRICS - GENERAL

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- A. Unless called for in the specifications or plans, the Engineer shall indicate to the Contractor which, if any, areas of the subgrade shall receive geotextile fabric once the subgrade is exposed.
- B. Prior to placement of the fabric, the site shall be prepared to provide a smooth surface, except as otherwise required, which is free from obstructions and depressions which could result in the fabric being torn or punctured during the cover operation. The fabric shall be unrolled loosely and positioned as smoothly as possible on the surface to minimize wrinkles and folds.
- C. When the fabric is to be placed in the roadway, the cover material shall be dumped on previously placed cover material or at the edges of the fabric and then pushed onto the fabric. The first layer of cover material shall be greater than 8 inches and first compacted by a track bulldozer. At no time shall construction equipment be allowed on the fabric when the fabric is covered with less than 8 inches of compacted cover material. Ruts shall be filled with additional cover material to maintain the minimum 8 inches cover over the fabric.
- D. When the fabric is to be placed as a reinforcement geotextile, care shall be taken to tension the fabric prior to completely covering with aggregate.
- E. When the fabric is to be placed in a ditch, shallow channel or downspout, the fabric shall be placed with the long direction parallel to the direction of water flow. All adjacent lengths of fabric shall be placed so that the upstream roll edge overlaps the downstream roll edge.
- F. When sloped riprap is to be placed on fabric, the Site shall be prepared to provide an undulating and uneven surface as much as is practical. The fabric shall be placed loosely to prevent any bridging of the uneven surface.
- G. Fabric to be placed on slopes shall have the long direction oriented up and down the slope as shown on the Standard Detail. All joints between adjacent fabric roll ends that may occur on the slope shall be overlapped shingle style.
- H. When riprap or stone ditch protection is placed on fabric, the stones shall be placed so that they do not puncture or otherwise damage the fabric.
- I. Except as hereinafter provided, fabric to be placed under riprap, where the stones weigh less than 250 pounds, shall be Class A Erosion Control Geotextile.
- J. Fabric to be placed under heavy riprap, or where the stone weights in plain riprap are greater than 250 pounds, shall be nonwoven Class A Erosion Control Geotextile with a 6 inch thick protective aggregate cushion placed on top of the fabric to protect the fabric from damage.

The aggregate cushion may be omitted if it can be demonstrated to the Engineer that no damage will occur to the fabric by the placement of the stone.

- K. Fabric to be placed under stone ditch protection may be Class A Erosion Control Geotextile.
- L. The height of drop of riprap stones less than 250 pounds shall be no greater than 3 feet when a 6 inch thick protective aggregate cushion is utilized nor any greater than 300 mm [1 foot] if stones are placed directly on the fabric. The 6 inch thick protective aggregate cushion shall be in addition to the specified riprap thickness and shall meet the requirements for granular borrow for underwater backfill.
- M. Riprap stones greater than 250 pounds shall not be placed by free-fall unless field trials are performed to the satisfaction of the Engineer, to determine the maximum height of drop that will not damage the fabric. In no case shall the maximum drop be greater than 3 feet.
- N. At no time shall riprap stones be rolled down the slope where fabric has been placed.

### 3.13 OVERLAPPING AND SEAMS

---

- A. Adjacent lengths of fabric shall be joined by overlapping a minimum of 18 inches at the ends and sides except when sewing is specified or fabric is placed on slopes. All overlaps on slopes shall be placed as follows:
  - (1) For slopes steeper than 1 vertical to 3 horizontal: Sewn seams or minimum 3 feet overlaps.
  - (2) For slopes flatter than 1 vertical to 3 horizontal: Sewn seams or minimum 18 inches overlaps and pins or stakes may be used to anchor the overlaps at the recommended spacings.
- B. When fabric is placed in the roadway, the fabric roll widths shall be chosen so that there will be a minimum number of overlaps of parallel rolls. The total width of surface Covered is shown on the Standard Detail.
- C. When sewn seams are to be used, field or factory seaming by machine will be allowed. All seams shall be sewn with polypropylene, polyester, or Kevlar thread which is a contrasting color to the fabric material. The "J-seam" shall be used with double-locked stitches (Class 401), except the "flat" seam may be used for repair of damaged in-place fabric. The length of a stitch shall be between 3.5 and 8 mm. [Seams shall contain between 3 and 7 stitches per inch]. All field seams shall be double stitched with two parallel passes and the 2 rows of stitching shall be approximately 1/2 inch apart and shall not cross at any point. All stitching shall be at least 1 inch from the fabric edge. All seams shall be exposed with the seam up so that repairs can easily be made if faulty seams are encountered during inspection, as shown on the Standard Detail.

### 3.14 PROTECTION OF FABRIC

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- A. To prevent damaging the fabric, the Contractor shall exercise necessary care while transporting, storing and installing the fabric.
- B. Prior to installation, the fabric shall be protected from rain, from sunlight or other ultra-violet exposure and from dust, mud debris or other elements that may affect its performance. Fabric which is torn, punctured or otherwise damaged shall not be placed. During installation, fabric shall not be left exposed for more than five days without being covered.
- C. When sewn seams are used, the Engineer may require damaged fabric be stitched together or the damage repaired by sewing a patch of the fabric over the damaged areas.

### 3.15 BASE CONSTRUCTION REQUIREMENTS

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- A. The maximum compacted thickness of any aggregate subbase or aggregate base course layer shall not exceed 12 inches unless the Contractor demonstrates by a test section that the required compaction can be obtained. If compacted layers more than 12 inches are allowed, the Contractor shall agree to make the necessary excavations and backfilling in the course for the Engineer to determine the density.
- B. When layers are constructed of differently graded aggregate, fine grading of the lower layer will not be required.
- C. Each layer of aggregate shall be placed over the full width of the section except, the Engineer may authorize the Contractor to place less than full width layers, when existing traffic or other conditions restrict operations over the full width of the section. When the Contractor places material to complete the full width, the exposed edge of the previously placed aggregate shall be cleaned of all contamination before additional base or subbase aggregate is placed adjacent to it.
- D. Aggregate base and subbase courses may be placed upon frozen surfaces when such surfaces have been properly constructed.
- E. The material as spread shall be well mixed with no pockets of either fine or coarse material. Segregation of large or fine particles will not be allowed.
- F. Compaction of each layer shall be in accordance with Section 02223.3.04.G. The maximum density shall be determined in accordance with AASHTO T180, Method C or D, corrected by the Soils Laboratory Adjustment Chart available at the MDOT Central Laboratory Bangor, Maine. Field density tests will be requested by the Owner. The surface, compaction and stability, shall be satisfactorily maintained until the pavement course has been placed. If required, additional water and fine material shall be applied to prevent checking, raveling or

rutting.

- G. Fine material added to the base shall be uniformly blended into the top 9 inches of the course being stabilized. The blended material shall meet the requirements of Section 02223.
- H. If the top of any layer becomes contaminated by degradation of the aggregate or addition of foreign material, the contaminated material shall be removed and replaced with the specified material.
- I. All layers of aggregate subbase course shall be compacted to the required density immediately after placing. As soon as the compaction of any layer has been completed, the next layer shall be placed unless otherwise authorized.
- J. The Contractor shall bear full responsibility for and make all necessary repairs to the subbase course and the subgrade until the full depth of the subbase course is placed and compacted. Repairs shall be considered incidental to other contract items.
- K. The top of any aggregate base or subbase course layer shall be scarified and loosened for a minimum depth of 1 inch immediately prior to the placing of the next layer of aggregate base or subbase. This scarifying shall be considered incidental to placing the course, and no separate payment will be made.
- L. The surface of each layer shall be maintained during compaction operations in such a manner that a uniform texture is produced and the aggregate firmly keyed. The moisture content of the material shall be maintained at the proper percent to attain the required compaction and stability.
- M. If voids remain on the surface after the subbase course has been constructed to grade, compacted, checked and approved, sand leveling material shall be dumped and spread as directed. The quantity of sand leveling material shall be limited to the amount necessary to fill the voids and the minor low areas on the subbase surface. After the sand leveling material has been spread, it shall be completely rolled by a rubber tired roller with water applied if necessary. The surface of this material shall be maintained in its compacted and graded condition until the bituminous pavement has been placed. The "furnishing, spreading, compacting and maintaining of sand leveling material will be considered included in the measurement and payment of the subbase Course and no separate payment will be made.
- N. The completed surface of the subbase or base course shall be shaped and maintained to a tolerance, above or below the required cross sectional shape, of 3/8-inch.

END OF SECTION 02300

## Section 02513

### Asphalt Concrete Paving

#### **PART I GENERAL**

##### **1.01 WORK INCLUDED**

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- A. Asphalt concrete paving.

##### **1.02 RELATED WORK**

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- A. Section 02211 - Rough Grading
- B. Section 02223 – Backfilling

##### **1.03 REFERENCES**

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- A. Maine Department of Transportation Standard Specifications - Highways and Bridges, November 2014 or latest edition.

##### **1.04 QUALITY ASSURANCE**

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- A. Perform work in accordance with Maine Department of Transportation Standard Specification - Highways and Bridges.
- B. Mixing Plant: Conform to State of Maine Department of Transportation Standards.
- C. Obtain materials from same source throughout.

##### **1.05 REGULATORY REQUIREMENTS**

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- A. Conform to applicable standards for paving work on public property.

##### **1.06 TESTS**

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- A. Testing and analysis of asphalt mix will be performed under provisions of Section 01400.

##### **1.07 SUBMITTALS**

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- A. Submit proposed mix design of each class of mix to Engineer for review prior to commencement of work.

- B. Certified weight slips for each truck load of hot bituminous material.

#### 1.08 ENVIRONMENTAL REQUIREMENTS

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- A. Apply bituminous prime and tack coats only when the ambient temperature in the shade is at least 50°F for 12 hours immediately prior to application.
- B. Do not apply when the base surface is wet or contains an excess of moisture which would prevent uniform distribution and the required penetration.
- C. Construct asphalt concrete surface course only when atmospheric temperature is above 50°F, when the underlying base is dry, and when weather is not rainy.
- D. Base course may be placed when air temperature is above 40°F and rising. The underlying base gravel is firm and dry, in the Engineer's opinion.

### **PART 2 - PRODUCTS**

#### 2.01 AGGREGATE SUBBASE AND BASE

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- A. MDOT Specification, Section 703. (See Backfilling Section 02223 in these Specifications.)

#### 2.02 BITUMINOUS CONCRETE BASE COURSE

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- A. MDOT Specification, Sections 401, 702 and 703.
- B. 19.5mm

#### 2.03 BITUMINOUS TACK COAT

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- A. MDOT Specifications, Section 401, 702, and 409.
- B. Type AE-90, Emulsified Asphalt, Mixing.

#### 2.04 BITUMINOUS CONCRETE SURFACE COURSE

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- A. MDOT Specification, Sections 401, 702 and 703.
- B. 9.5mm.

## 2.05 SIDEWALKS, DRIVES, AND SHIM

- A. MDOT Specification, Sections 401, 702 and 703.
- B. 9.5mm
- C. Type E, Shim.

## 2.06 TEMPORARY PATCHING

- A. Hot or cold, at Contractor's option.

## **PART 3 - EXECUTION**

### 3.01 AGGREGATE SUBBASE AND BASE

- A. MDOT Specification, Section 304; Section 02300 of these specifications if applicable.

### 3.02 BITUMINOUS CONCRETE BASE COURSE

- A. MDOT Specification, Section 401.

### 3.03 BITUMINOUS TACK COAT

- A. Apply emulsified asphalt tack coat to curbing, gutters, manholes, pavement, etc. if required by Engineer to promote adequate bond. Generally a tack coat will not be required for pavement placed immediately following the rolling of the underlying course.
- B. Apply at a rate of 0.05 to 0.15 gallons/square yard; excess coating and/or fat spots will not be permitted.

### 3.04 BITUMINOUS CONCRETE SURFACE COURSE

- A. MDOT Specification, Section 403.

### 3.05 SIDEWALKS, DRIVES, AND SHIM

- A. MDOT Specification, Section 403, 608.

### 3.06 TEMPORARY PATCHING

- A. Place and compact per manufacturers' recommendation.

- B. Trench patching: leave no more than 1,000 linear feet (total for job, not in just one location) unpatched at any time.

### 3.07 EQUIPMENT

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- A. All main line trench shall be paved with a properly operating self-propelled paver. Under no circumstances shall main line trench be paved by handwork. Cross trenches may be paved by hand.
- B. A roller(s) sufficient to meet the density requirements and to provide a smooth, durable surface shall be used.

### 3.08 COMPACTION

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- A. Bituminous compaction shall take place at as high a temperature as possible without the mix bulging excessively in front of the rolls. For most dense graded mixes, this range is between 260\* F and 285°F. At no time shall the pavement be allowed to fall below 175°F without compaction. Table 1 illustrates recommended laydown temperatures for various mix thickness giving 15 minutes + till 175°F mat temperature is reached.

### 3.09 TOLERANCES

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

### 3.10 FIELD QUALITY CONTROL

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- A. Field testing will be performed under provisions of Section 01400.

### 3.11 PROTECTION

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- A. Immediately after placement, protect pavement from mechanical injury for 3 days.

### 3.12 PERMANENT TRENCH REPAIR

---

- A. Saw edges of existing pavement to provide a vertical binding face.
- B. Remove temporary paving and sawn out existing paving.



- C. Reset manhole frames and covers as necessary. For sewer work, it is advised to place a layer of base pavement over the existing manhole prior to mortaring the frame in place. Cut out a square around the manhole frame, set the frame to FINAL GRADE ABOVE SURROUNDING BINDER, patch in with binder, and place the final wearing surface as indicated on the details.
- D. Apply tack coat to sawn edges.
- E. Apply binder and surface pavement as indicated on the Contract Drawings.

Table 1

CESSATION REQUIREMENTS

Recommended Minimum Laydown Temperature

Base Temp.	½"	¾"	1"	1 ½"	2"	3" and greater
20-32						285 <sup>1</sup>
32-40				305	295	280
40-50			310	300	285	275
50-60		310	300	295	280	270
60-70	310	300	290	285	275	265
70-80	300	290	285	280	270	265
80-90	290	280	275	270	265	260
+90	280	275	270	265	260	255
Rolling Time in Minutes	4	6	8	12	15	15

<sup>1</sup> Increase by 15° when placement is on base or subbase containing frozen moisture.

From National Asphalt Pavement Association, Training Aid Series A12.

- B. Pavement compacted below 175° may be removed if specified by the Engineer.

END OF SECTION 02513

## Section 02525

### Slipform Concrete Curb

#### **PART 1 - GENERAL**

##### 1.01 WORK INCLUDED

- A. This work shall consist of furnishing and placing Slipform Concrete Curb in close conformity with the plans, or as authorized by the Resident.

##### 1.02 RELATED WORK

- A. Section 01400 - Quality Control
- B. Section 02222 – Excavation
- C. Section 02223 - Backfilling
- D. Section 02300 – Road and Street Reconstruction
- E. Section 02513 – Asphalt Concrete Paving

#### **PART 2 - PRODUCTS**

##### 2.01 MATERIALS

- A. Concrete for slipform shall be Class A meeting the requirements of 502.05 of the MaineDOT Specifications and have a minimum compressive strength of 4,000 psi. A mix design for the Portland Cement Concrete shall be submitted to the Resident.

Except as provided below, the materials used shall meet the requirements specified in MaineDOT Section 700 – Materials:

Portland Cement and Portland Pozzolan Cement	701.01
Water	701.02
Fine Aggregate for Concrete	703.01
Coarse Aggregate for Concrete	703.02

The aggregate shall conform to the requirements of Subsections 703.01 and 703.02, with the exception that the aggregate gradation of the Portland Cement Concrete may be sized, graded, and combined in a composite blend that will produce a stable durable curb with an acceptable texture with a minimum designed compressive strength of 4,000 psi for the concrete used for the Slipform curb.

- B. Apply salt guard penetrating sealant to all concrete curb.
- C. Concrete shall include polyester fibers shall be uniformly incorporated into the dry mix at a rate of 0.25 percent of the total batch weight. Certification shall be provided from the supplier with each shipment meeting the following requirements:

Average Length 0.25 inches  $\pm$  0.005  
Average Diameter 0.0008 inches  $\pm$  0.0001  
Specific Gravity 1.32-1.40  
Melting Temperature 480 °F Minimum

### **PART 3 - EXECUTION**

#### **3.01 PLACEMENT OF CURBING**

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##### **A. Installation of Slipform Curb:**

1. Set curb on a compacted HMA base paving. The curb shall be placed on a firm, uniform bearing surface, shall conform to the section profile specified in the plans, and shall match the appropriate grade.
2. Before placing the curb, the foundation course shall be thoroughly cleaned of all foreign and objectionable material. The Contractor shall not place Slipform Concrete Curb on a wet or frozen base. String or chalk lines shall be positioned on the prepared base to provide guide lines.
3. Apply epoxy bonding agent. The foundation shall be uniformly painted with an epoxy resin adhesive that meets AASHTO 235, Type II
4. Deposit, consolidate, and slip form the concrete to the required section. Concrete shall be placed with an approved slipform machine that will produce a finished product according to the design specified in the contract documents and will meet the same standards set for cast-in-place curbing. For cold weather slipforming, the outside temperature must be at least 36°F (2.2°C) and rising.
5. Expansion joints will be provided at ends of curve radii, or wherever the curb meets rigid structures such as building foundations or fire hydrants. Contraction joints will be placed at 10 foot (3 m) intervals using sawing methods, which shall cut 1-3" into the concrete. Joints shall be constructed perpendicular to the subgrade and match other joints in roadways, sidewalks or other structures when applicable.

6. Proper curing shall be insured through the use of either a combination curing/sealing compound spray that meets ASTM 1315 Type 1-Class A, or a curing compound spray that meets ASTM 309 Type 1-D – Class A.
7. Backfilling:
  - a. Fill all remaining spaces under the curb with approved material and thoroughly hand tamped so the stones will have a firm uniform bearing on the foundation for the entire length and width.
  - b. Fill any remaining excavated areas surrounding the curb to the required grade with approved materials. Place this material in layers not exceeding 8 inches in depth, loose measure and thoroughly tamped.
8. Protection:
  - a. Protect the curb and keep in new condition.
  - b. Slipform curbing must be adequately protected after placement. The concrete shall be allowed to cure for at least 72 hours. During cold weather conditions, when temperatures drop below the required temperature of 36°F (2.2°C) after placement, curbing shall be protected by concrete blankets or a combination of plastic sheeting and straw. After any placement of slipform curbing, regardless of weather conditions, the placed curbing shall be adequately protected by traffic control devices and flagging as necessary.
9. Acceptance:
  - a. Curb shall be accepted or rejected based on appearance concerning texture, alignment, or both. All damaged curb shall be removed and replaced at the Contractor's expense.

END OF SECTION 02525

**Section 02660**

**Water Distribution**

SEE APPENDIX A FOR PORTLAND WATER DISTRICT'S REQUIREMENTS

## Section 02720

### Storm Sewage Conveyance Systems

#### **PART 1 - GENERAL**

##### 1.01 SECTION INCLUDES

- A. Storm drainage piping, fittings, and accessories
- B. Catch basins and site surface drainage

##### 1.02 RELATED WORK

- A. Section 02222 - Excavation
- B. Section 02223 – Backfilling
- C. Section 02225 – Trenching
- D. Section 02735 – Manholes, Structures, Covers, and Frames

##### 1.03 QUALITY ASSURANCE

- A. Reference Standards
  - 1. American Society for Testing and Materials (ASTM)
    - a. C76-78, Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.
    - b. D3034, Type PSM Ply (Vinyl Chloride) (PVC) Sewer, Pipe and Fittings.
    - c. D3212, Joints for Drain and Sewer Pipes Using Flexible Elastomeric Seals.
    - d. F-810 Specification for Smoothwall Polyethylene (PE) Pipe for Use in Drainage and Waste Disposal Systems
  - 2. American Association of State Highway and Transportation Officials (AASHTO).
    - a. M36-74 Zinc Coated (Galvanized) Corrugated Iron or Steel Culverts and Underdrains.
    - b. M252 Corrugated Polyethylene Drainage Tubing
    - c. M294 Corrugated Polyethylene Pipe, 12-36 Inch Diameter
  - 3. American Society for Testing and Materials (ASTM):

- a. C478-78, Precast Reinforced Concrete Manhole Sections.
- b. C443-78, Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets.

#### 1.04 SUBMITTALS

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- A. Manufacturer's Literature: Supply copies of descriptive literature and recommendations for installation.
- B. Certificates: Supply copies of manufacturer's certification that supplied products comply with specification requirements.

#### 1.05 PRODUCT DELIVERY, STORAGE, AND HANDLING

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- A. Deliver products on manufacturer's original skids, or in original unopened protective packaging.
- B. Store materials to prevent physical damage.
- C. Protect material during transportation and installation to avoid physical damage.

#### 1.06 PROJECT RECORD DOCUMENTS

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- A. Submit documents under provisions of Section 01700.
- B. Accurately record location of pipe runs, connections, catch basins, and invert elevations.

### **PART 2 - PRODUCTS**

#### 2.01 MANUFACTURERS STORM SEWER PIPE MATERIALS

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- A. HPDE: Hancor, Advanced Drainage Systems (ADS)
- B. Substitutions: Under provisions of Section 01600.

#### 2.02 STORM SEWER PIPE MATERIALS

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- A. Corrugated High Density Polyethylene Pipe (HDPE), AASHTO M-294
  - 1. ADS N-12, Hancor HI-Q or equivalent.
- B. MDOT Type C Underdrain (where referenced specifically on plans):
  - 1. Corrugated high density polyethylene (HDPE-SI)

C. MDOT Type B Underdrain (where referenced specifically on plans):

1. Corrugated high density polyethylene
2. Connections for drainage tubing shall be made with external wrap-around split couplings, screw-on type couplings, or external snap-on couplings. External wrap-around split couplings shall be secured with heavy duty splicing tape or plastic or wire ties on each side of the coupling. External snap-on couplings shall comply with the appropriate section of AASHTO specifications.

## 2.03 PIPE ACCESSORIES

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- A. Fittings: Same material as pipe, molded or formed to suit pipe size and end design, in required 'T' bends, elbows, cleanouts, reducers, traps, and other configurations required.

## **PART 3 – EXECUTION**

### 3.01 EXAMINATION

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- A. Verify that trench cut is ready to receive work, and excavations, dimensions, and elevations are as indicated on Drawings.
- B. Beginning of installation means acceptance of existing conditions.

### 3.02 PREPARATION (Reference Section 02225 - Trenching)

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- A. Hand trim excavations to required elevations.
- B. Remove large stones or other hard matter which could damage drainage pipe or impede consistent backfilling or compaction.
- C. Consult Engineer regarding over excavation of areas that will not support intended pipe and bedding.
- D. Bedding: Culverts less than 42 inches in diameter shall be bedded on a firm foundation of uniform density. After placing the culvert pipe, backfill material shall be placed along the bottom of the trench, thoroughly tamped against the lower portion of the pipe with special care taken not to move the bedded pipe.
- E. For culverts 42 inches in diameter and larger, the bottom of the trench shall be compacted to uniform density and shaped to fit a template with reasonable closeness for at least 10 percent of the culvert's total height.



- F. On all bedding, when bell and spigot pipe is used, the portion of trench at the joints shall be shaped to fit the bell.

### 3.03 LAYING CULVERTS

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- A. The contractor shall not install nor backfill culverts between December 15th and April 1st without written permission. Installing shall begin at the downstream end of the culvert line. Bell or groove ends of rigid culverts shall be placed facing upstream.

### 3.04 INSTALLATION - DRAINAGE PIPE

---

- A. Install pipe, fittings, and accessories in accordance with ANSI-ASTM D2321 and manufacturer's instructions. Seal joints watertight.
- B. The method of joining rigid culvert sections shall be such that the ends are fully entered and the inner surfaces are reasonably flush and even. Joints shall be made with Portland cement mortar, Portland cement grout, rubber ring gaskets or flexible plastic gaskets.
- C. The pipe ends shall be thoroughly cleaned before the joint is made. Mortared joints shall be made with an excess of mortar to form a bead around the outside of the culvert and finished smooth inside. For grouted joints, molds or runners shall be used to retain the poured grout.
- D. Joints with rubber ring gasket or flexible plastic gasket shall be made in accordance with the manufacturer's recommended procedures. When Portland cement mixtures are used, the completed joints shall be covered to protect against drying.
- E. Flexible culvert section and metal end sections shall be firmly jointed by coupling bands. These bands shall meet the same applicable requirements as the flexible culvert being joined.
- F. After the pipe is installed, it will be inspected before any backfill material is placed. All pipe found to be out of alignment, unduly settled or damaged to the extent that full performance is impaired, shall be taken up and re-laid or replaced.
- G. Place pipe on minimum 6-inch deep bed of crushed stone (or other suitable bedding per details) of the size indicated in the details.
- H. Lay pipe to slope gradients noted on drawings, with maximum variation from true slope of 1/8 inch in 10 feet. Completed lines will be free of offsets and deviations.
- I. Install crushed stone at sides and over top of pipe for 1-2 inches. Do not mechanically compact crushed stone over flexible pipe. If sand is allowed, utilize a vibrating plate or other suitable device to compact the bedding material around the pipe. The backfill material shall be thoroughly rammed under the haunches of the pipe with power or pneumatic operated hand

tampers. The remainder of the backfill shall be thoroughly compacted with power tampers or vibratory compactors or other approved equipment or combination of equipment.

- J. When the top of the pipe is exposed above the top of the trench, the embankment material around the pipe shall be placed and compacted on each side of the pipe in the aforementioned manner described for backfilling trenches, for a width of 5 feet measured from the outside diameter of the pipe. Only that portion of the embankment on each side and top of the pipe, for a minimum distance of 15 inches measured from the outside diameter of the pipe, must be of material conforming to the requirements described for backfilling in subsection 206.03. Backfill material beyond these limits may contain stones larger than 3 inches, but no greater than the thickness of the layer being placed. The embankment construction around the pipe shall continue up to an elevation 15 inches above the top of the pipe. Above and beyond these limits, the embankment shall be placed and compacted in accordance with the embankment construction requirements specified for the work except where the induced trench method is called for on the plans.
- K. Place excavated material or select granular backfill as permitted by Engineer over the pipe. Materials shall be placed in maximum 12 inch lifts and compacted per Section 02223.
- L. Increase compaction of each successive lift. Refer to Section 02223 for compaction requirements.
- M. Do not displace or damage pipe when compacting. Install no length of pipe until the previous length has been backfilled and secured.
- N. Continue placing fill material till aggregate subbase level is reached.
- O. When construction equipment is used or traffic is maintained the contractor shall provide a minimum cover of 3 feet over all pipes, if possible. Whenever this cover extends above the subgrade the contractor shall temporarily place earth which shall be removed when necessary to complete the work in accordance with the plans or as directed. Any deviation from this practice shall have prior approval.

### 3.06 INSTALLATION OF UNDERDRAIN

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- A. Type B: The trench shall be excavated to the required width and depth and a bed of the specified granular material, 3 inches in depth, prepared in the trench. Six inch perforated pipe shall be laid on this bed with the perforations as shown on the Standard Detail plans.
- B. After the pipe has been firmly bedded and joints securely connected, it will be inspected before any backfill is placed. The remaining backfill shall be granular material meeting the same requirements as that used for bedding the pipe. For underdrain placed under areas of except that the initial layer of backfill around the pipe may be placed in a layer not exceeding 12

inches.

- C. For underdrains placed under areas not proposed to be paved, the proposed pavement, the material shall be placed in 8 inch layers, loose measure and thoroughly compacted initial layer of backfill shall not exceed 12 inches and the remaining material may be placed in one lift to the elevation of the subgrade and compacted with heavy rubber tired or vibratory compaction equipment to the satisfaction of the Engineer.
- D. The upstream end of all completed underdrain pipe shall be sealed with cement mortar or other acceptable material. Care shall be taken that soil does not enter the pipe. Pipe so contaminated before backfilling shall be removed, cleaned and re-laid.
- E. Type C: The trench shall be excavated to the width and depth as determined by the size and depth of the pipe to be installed.
- F. The perforated pipe shall be laid to line and grade centered on the bottom of the trench with the perforations as shown on the Standard Detail plans.
- G. After the pipe has been firmly bedded and all joints securely connected it will be inspected before any backfill is placed.
- H. When Underdrain Type B or Underdrain Type C is constructed, backfill material beyond the underdrain trench lateral limits designated on the plans shall be material conforming to the requirements of Granular Borrow, Underwater Backfill. Material within the underdrain trench limits shall conform to the requirements of the type underdrain being constructed. The Contractor shall take precautions to prevent the underdrain backfill material from becoming contaminated with clay, silts, organic matter or other foreign matter. Methods of placing backfill material shall be limited to the use of equipment which will place material directly into the trench. Pushing material into the trench will not be allowed.
- I. When underdrain is to be constructed in embankment fill, the excavation for the trench shall be done after the embankment has been completed to subgrade elevation.

### 3.07 FIELD QUALITY CONTROL

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- A. Field inspection will be performed under provisions of Section 01400.

### 3.08 PROTECTION

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- A. Protect finished installation as directed by Engineer and in accordance with pertinent sections of these specification.

END OF SECTION 02720

## Section 02735

### Manholes, Structures, Covers, and Frames

#### **PART 1 GENERAL**

##### **1.01 SECTION INCLUDES**

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- A. Manholes
- B. Catch Basins
- C. Precast Structures
- D. Frames and Covers
- E. Testing

##### **1.02 RELATED SECTIONS**

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- A. Section 02222 - Excavation.
- B. Section 02223 - Backfilling.
- C. Section 02225 - Trenching.
- D. Section 02720 - Storm Sewerage Conveyance Systems.

##### **1.03 REFERENCE STANDARDS**

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- A. American Society for Testing and Materials
  - 1. C478-84 - Precast Reinforced Concrete Manhole Section.
  - 2. C923-84 - Resilient Connectors between Reinforced Concrete Manhole Structures and Pipes.

##### **1.04 SUBMITTALS**

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- A. Manufacturer: Literature. Supply copies of descriptive literature and recommendations for installation.
- B. Certificates: Supply copies of manufacturers' certification that supplied products comply with specification requirements.

- C. Structure Stack Sheets: Submit for review

#### 1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

---

- A. Deliver products on manufacturers' original skids or in original unopened protective packaging.
- B. Store materials to prevent physical damage.
- C. Protect material during transportation and installation to avoid physical damage.

#### 1.05 PROJECT RECORD DRAWINGS

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- A. Submit documents under provisions of Section 01700.
- B. Accurately record location of manholes and catch basins and elevations of rim and inverts.

### **PART 2 - PRODUCTS**

#### 2.01 MANHOLES AND STRUCTURES

---

- A. Cone sections shall be eccentric for sewer manholes. Cones for catch basins shall be concentric. Other components shall be in one foot (1'), two-foot (2'), three-foot (3'), or four-foot (4') lengths.
- B. Steps or rungs shall be of copolymer polypropylene plastic coated steel and meet all applicable safety requirements; steel to be ½ inch diameter, grade 60 minimum, or forged aluminum. (Reference MDOT Section 712.09)
- C. All horizontal manhole-joints shall be watertight within the requirements specified under testing; comply with ASTM C443 or butyl rubber joint sealant as approved.
- D. All pipe-to-manhole joints shall be of molded neoprene compound, conforming to ASTM C923 with a 3/8 inch wall thickness throughout, integrally formed into the manhole structure.
- E. Concrete shall have a minimum 28 day compressive strength of 4,000 psi for 4 foot diameter structure and 5,000 psi for larger diameters. Structure will support an H20 loading.
- F. Precast concrete shall comply with requirements of MDOT Section 712.06.
- G. Manhole frame and cover to be 24 inch diameter (22" clear opening) gray cast iron conforming to MDOT Section 712.07. Manhole cover to be labeled "Sewer" or "Drain" as

appropriate, and manufactured in the United States. Catch basin frame/grate shall be 24" square, Type "B" frame and Type "C" grate.

- H. Precast concrete products shall be as manufactured by Gagne Precast, Veazie, Maine, or approved equal.
- I. All precast structures shall have the dated of manufacturing and the manufacturer indelibly marked or impressed inside the structure.
- J. All sewer manholes shall factory coated with two layers of bituminous waterproofing.
- K. All mortar used in the construction of inverts and frame support shall be Type II Portland cement (1 part), sand (2 parts), and hydrated lime (not to exceed 10 lbs. per bag of cement). Bricks shall be solid red clay. Precast concrete grade rings are recommended for frame support.

### **PART 3 - EXECUTION**

#### **3.01 MANHOLE INSTALLATION**

---

- A. EXCAVATION, BEDDING, and BACKFILL for manholes shall conform to the appropriate items of these technical specifications.
- B. Manholes shall be placed on a foundation of  $\frac{3}{4}$ " crushed stone of not less than 12' inches depth. The bedding shall be brought to accurate level and grade such that when the manhole base section is placed, the sewer pipe inverts shall be at the elevation specified. The base section shall be reset, if necessary.
- C. Manhole sections shall be accurately placed with joints tightly sealed with Kent Seal No. 2. Grout all lift holes and joints with non-shrinking mortar. Place manhole frost barrier (poly wrap) as required by specifications prior to backfilling.
- D. Precast barrel sections shall be installed to minimize the use of precast rings for shimming frames and covers to finish grade and in no case shall precast ring shimming exceed one foot in height.
- E. After the precast components and sewer pipe have been installed, manhole inverts where called for shall be constructed. Inverts shall be constructed to conform to the sizes of flow-through sewer. At changes in directions, the inverts shall be laid out in curves of the longest possible radii tangent to the sewer pipe centerlines. Shelves shall be constructed to the elevation of the highest pipe crown and sloped one on twelve to drain toward the channel.

Brick shall conform to ASTM standard specification for sewer brick, C32, Grade SS, Hard Brick. Only clean brick will be used.

- F. Concrete for construction and forming inverts in manholes shall have a 28-day compressive strength of 2,500 psi.
- G. Forms, dimensions, concrete, and construction methods shall be approved by the Engineer prior to construction.
- H. Drop manhole appurtenances shall be installed as shown on the detail sheets of the contract drawings. The support straps shall be securely fastened to the manhole wall with masonry fasteners set at least 12" on center. The bottom of the drop leg pipe shall be set into the manhole invert during forming.
- I. Amount of precast concrete rings required to reach final grade with cover shall not exceed 12 inches.
- J. The Contractor shall, at all times during construction, provide and maintain ample means and devices, including standby units, with which to promptly remove and properly dispose of water or seepage entering trenches and excavations. Trenches and excavations shall remain sufficiently dry for the proper construction of the sewer and pipe appurtenances until backfill material is placed and compacted. The Engineer shall determine if the trench is sufficiently dry for sewer construction to progress.
- K. All water pumped and drained from the work shall be disposed of in a suitable manner without undue interference with other work or damage to adjacent property. Suitable temporary channels shall be provided for water that may flow along or across the site of the work. IN NO CASE SHALL DRAINAGE BE THROUGH THE PIPES BEING INSTALLED.
- L. The Contractor may choose any method he wishes to handle any groundwater or seepage flow subject to the provisions herein, but he shall assume all responsibility for the adequacy of the methods, and all the materials and equipment employed. He shall furnish all materials and equipment and shall do all incidental work and excavation required for proper installation of drainage devices used.
- M. No construction shall be undertaken until, in the opinion of the Engineer, adequate drainage for the work at hand is assured. Drainage methods or materials which allow appreciable amounts of fine material to be pumped from the soil supporting the structure or pipe, shall be deemed as unsatisfactory and shall be corrected immediately.
- N. No temporary connection to a sewer will be made without first receiving approval and supervision of the Engineer.

### 3.02 CATCH BASIN INSTALLATION

---

- A. Form bottom of excavation to a smooth and clean surface. Install 6 inches of crushed stone under catch basin base unit.
- B. Establish elevations and pipe inverts for inlets and outlets from basin.
- C. Mount lid and frame level in grout, secured to top cone section to elevation indicated. Amount of bricking or concrete riser rings required to reach final grade with the cover shall not exceed 12 inches. Securing of the frame shall be performed after the binder pavement is installed and prior to surface pavement. In this manner, the basin can be accurately set to final grade based on field conditions.

### 3.03 MANHOLE TESTING

---

- A. General:
  - 1. Perform tests on all manholes.
  - 2. All testing must be performed in presence of Engineer Representative.
- B. Vacuum Test:
  - 1. Install the testing equipment according to the manufacturers' instructions.
  - 2. A vacuum of 10 inches of Hg shall be drawn on the manhole and the loss of 1 inch of Hg vacuum timed. The manhole shall be considered to have passed the test if the time for the loss of 1 inch of Hg vacuum is two (2) minutes or longer.
  - 3. If the manhole fails the initial test, the Contractor shall locate the leak(s) and make repairs. The manhole shall be re-tested until a satisfactory test result is obtained.
- C. Manhole Repairs:

Correct leakage by reconstruction, replacement of gaskets and/or other methods as approved by the Engineer.

END OF SECTION 02735



## Section 02800

### Hand Labor and Equipment Rental

#### **PART 1 - GENERAL**

##### **1.01 SECTION INCLUDES**

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- A. This work shall consist of furnishing and supervising laborers, equipment operators, and operating construction equipment when authorized or directed by the Engineer in accordance with these specifications.
- B. General Laborer: Work under this section shall require no special skill but shall be accomplished in a competent manner. The personnel shall be physically and mentally capable of efficiently performing the assigned duties.

Nothing in this section shall be construed to relieve the Contractor of their responsibility for furnishing personnel and equipment under other contract items. The intent is that this item shall be used to perform necessary work not covered or provided for under existing contract items or other sections of the specifications.

- C. Equipment operators shall be skilled in the operation of the equipment required for the equipment specified.

##### **1.02 RELATED WORK**

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- A. Section 01026 – Measurement and Payment.

##### **1.03 UNIT PRICES**

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- A. Measurement and payment under provisions of Section 01026.

#### **PART 2 – PRODUCTS**

##### **2.01 EQUIPMENT**

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- A. Provide trucks with drivers and equipment with operators conforming to MDOT Specifications Section 631, as directed by the Engineer.
- B. Provide hand laborers directed by the Engineer conforming to MDOT Specifications Section 629.

#### **PART 3 – EXECUTION**

- 3.01 Perform work as directed by the Engineer to accomplish necessary work not covered or provided for under contract bid items or other sections of these specifications.

END OF SECTION 02800

## Section 02901

### Miscellaneous Work Items and Cleanup

#### **PART 1 - GENERAL**

##### 1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required to do the miscellaneous work not specified in other sections but obviously necessary for the proper completion of the work as shown on the Drawings.
- B. When applicable, perform the work in accordance with other sections of this Specification. When no applicable specification exists, perform the work in accordance with Maine Department of Transportation Standard Specifications, latest edition.
- C. The Work of this section includes but is not limited to the following:
  - 1. Crossing and relocating utilities
  - 2. Restoring of driveways and sidewalks
  - 3. Cleaning up.
  - 4. Incidental work.
  - 5. Videotapes of Project.
  - 6. Protection and/or removal and reinstallation of signs, lampposts, and mailboxes.
  - 7. Restoration of and replacement of curbing.
  - 8. Protection and bracing of utility poles.
  - 9. Restoring easement and rights of way.
- D. Submit to the Engineer a breakdown of the lump sum for miscellaneous work and cleanup including the above items as a minimum. This breakdown shall be subject to the approval of the Engineer and when so approved shall become the basis for determining progress payments and for negotiation of change orders.

#### **PART 2 - PRODUCTS**

##### 2.01 MATERIAL

- A. Materials required for this section shall be the same quality of materials that are to be restored. Where possible, re-use existing materials that are removed.

#### **PART 3 - EXECUTION**

##### 3.01 CROSSING AND RELOCATING EXISTING UTILITIES

- A. This item includes any extra work required in crossing culverts, water courses, including brooks and drainage ditches, storm drains, gas mains, water mains, electric, telephone, gas and water services and other utilities. This work shall include but is not limited to the following: bracing, hand excavation and backfill, and any other work required for crossing the utility or obstruction not included for payment in other items of this specification. Notification of Utility companies shall be as specified by law.
- B. In locations where existing utilities cannot be crossed without interfering with the construction of the work as shown on the Drawings, remove and relocate the utility as directed by the Engineer or cooperate with the Utility Companies concerned if they relate the utility.
- C. At pipe crossings and where designated by the Engineer, furnish and place either compacted crushed stone, screened gravel bedding, or flowable fill so that the existing utility or pipe is firmly supported for its entire exposed length. The bedding shall extend to the mid-diameter (springline) of the pipe crossed. Payment for support is incidental to the new utility being installed.

### 3.02 RESTORATION OF DRIVEWAYS AND SIDEWALKS AND CURBING

- A. Existing public and private driveways disturbed by the construction shall be replaced. Paved drives shall be repaved to the limits disturbed and to a thickness equal to that prior to construction unless otherwise directed by the Engineer. Gravel drives shall be repaved and regarded.
- B. Existing public and private sidewalks disturbed by the construction shall be replaced with sidewalks of equal quality and dimension and are considered incidental to the project unless otherwise accounted for as a bid item.
- C. Curbing shall be replaced with similar material (i.e. bituminous of like style, granite, etc.) and such work is considered incidental to the project unless otherwise accounted for as a bid item.

### 3.03 CLEANING UP

- A. Remove all construction material, excess excavation, buildings, equipment, and other debris remaining in the job as a result of construction operations and restore the project area to a neat and orderly condition as approved by the Engineer and Owner.

### 3.04 INCIDENTAL WORK

- A. Do all incidental work not otherwise specified, but obviously necessary to the proper completion of the Contract as specified and as shown on the Drawings. Incidental work shall include erosion and sedimentation control measure as detailed in the Contract Documents.

### 3.05 VIDEOS OF PROJECT

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- A. Reserved.

### 3.06 RESTORATION AND REPLACEMENT OF SIGNS, LAMPOPSTS, MAILBOXES

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- A. Existing signs, lampposts, and mailboxes which may be damaged or removed during the course of the project shall be reinstalled in a vertical position at the same location from which they were removed (unless such location no longer exists and in which case a new location must be found). Damaged items shall be replaced with an item equal to or better than the damaged item. A concrete anchor shall be provided as necessary, at no additional cost, to ensure a rigid alignment. Care shall be exercised in the reinstallation of all items to prevent damage to the newly installed project.

### 3.07 PROTECTION AND BRACING OF UTILITY POLES

---

- A. Be responsible for making all arrangements with the utility companies for the bracing and protection of all utility poles that may be damaged or endangered by the project. Work under this section shall include the related removal and reinstallation of guy wires, or support poles, whether shown on the Drawings or not.

### 3.08 RESTORATION OF EASEMENTS AND RIGHT-OF-WAYS

---

- A. Be responsible for all damage to private property due to the operations. Protect from injury all walls, fences, cultivated shrubbery and vegetables, fruit trees, flower gardens, underground facilities such as water or sewer pipe, or other utilities which may be encountered along the project route. If removal and replacement is required, it shall be done in a workmanlike manner so that replacement is equivalent to that which existed prior to construction.
- B. Existing lawn and sod surfaces damaged by construction shall be replaced. Cut and replace the lawn and sod, or restore the areas with an equivalent depth and quality of loam, seed, and fertilizer as necessary to produce a stand of grass at least equal to that existing prior to construction. These areas shall be maintained and reseeded, if necessary, until all work under this Contract has been completed and accepted. Any additional work required to restore property to the original condition shall be performed.
- C. Existing trees, shrubs, plants, and bushes outside of easements shall be fully protected. The work shall also include removing and replacing those trees, shrubs, and bushes as indicated on the Drawings. It shall include the careful excavation of the root ball which shall be wrapped with burlap while to of the ground. Replant them after backfilling the trench, stake them in an upright position and periodically water replanted trees, bushes, and shrubs. Be fully responsible for ensuring that any and all trees, bushes, and shrubs removed and replanted “take” and return to a viable state. Any replanted item that fails to “take” or that is so damaged as to be unsuitable for replanting shall be replaced, at no additional cost to the Owner, with an item of equal size and caliper.

- D. All plants shall be guaranteed for not less than one full year from the time of acceptance of work completed. At the end of the one year period, any plant that is missing, dead, or not in satisfactory growth, as determined by the Owner or the Owner's representative, shall be replaced at no additional cost to the Owner. After all necessary corrective work has been completed, the Owner will certify in writing of final acceptance.

END OF SECTION 02901

## Section 02936

### Seeding

#### **PART 1 - GENERAL**

##### 1.01 SECTION INCLUDES

- A. Fertilizing.
- B. Seeding.
- C. Hydroseeding.
- D. Mulching.
- E. Maintenance.
- F. Sodding.

##### 1.02 RELATED WORK

- A. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections of these Specifications including:
  - 1. Section 02218 - Landscape Grading

##### 1.03 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for performance of the work of this Section.
- B. Comply with all local, state, and federal regulations concerning seeding.
- C. Reference Standards:
  - 1. American Association of State Highway and Transportation Officials (AASHTO)
    - a. M 145-74, Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes.

2. American Society for Testing and Materials (ASTM):
  - a. C 602-69 (1975), Agricultural Liming Materials.
  - b. D 2487-69 (1975), Classification of Soils for Engineering Purposes.
  - c. D 977-73, Emulsified Asphalt.
3. Association of Official Analytical Chemists (AOAC)
  - a. Official Method of Analysis.
4. Federal Specifications
  - a. O-F-241D, Fertilizer, Mixed, Commercial.
  - b. O-P-166E, Peat Moss, Peat Humus, Peat, Reed-Sedge.

#### 1.04 SUBMITTALS

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##### A. Test Reports

1. Provide analysis of topsoil fill under provisions of Section 01400.
  - a. Analyze to ascertain percentage of nitrogen, phosphorus, potash, soluble salt content, organic matter content, and pH value.
2. Results of seed purity and germination tests.
3. Results of fertilizer analysis.
4. Results of peat moss analysis.

##### B. Certificates

1. Soil conditions and fertilizers.
2. Grass seed.
3. Quarantine restrictions.

#### 1.05 PRODUCT DELIVERY, STORAGE, AND HANDLING

---

- A. Tag seed, with botanical and common names.
- B. Store and protect seed from excessive heat, cold, sun, rain, wind, and other deleterious environmental conditions.
- C. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

#### 1.06 JOB CONDITIONS

---

- A. Place no frozen soils or extremely wet or dry soils.
- B. The seeding process shall meet the following conditions.
  - 1. Not on or in frozen or extremely wet or dry soils.
  - 2. Not between October 31<sup>st</sup> and April 30<sup>th</sup>.
  - 3. Do no seeding when wind exceeds 15 mph.

#### 1.07 DEFINITIONS

---

- A. Weeds: Includes Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lamsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel, and Brome Grass.

#### 1.08 GUARANTEE

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- A. Guarantee seed through one full growing season after planting. Replace if necessary.

#### 1.09 MAINTENANCE DATA

---

- A. Submit maintenance data for continuing Owner maintenance under provisions of Section 01700.
- B. Include maintenance instructions, cutting method and maximum grass height; types, application frequency, and recommended coverage of fertilizer.

### **PART 2 - PRODUCTS**

#### 2.01 SUBSOIL

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- A. See Section 02218 - Landscape Grading: Products.

#### 2.02 TOPSOIL

---

- A. See Section 02218 - Landscape Grading: Products.



### 2.03 SOIL CONDITIONERS

---

- A. See Section 02218 - Landscape Grading: Soil Conditioners.

### 2.04 SEED

---

- A. Mix:

Name	% Weight	% Purity	% Germination
Kentucky Blue	50	95	85
Red Top	25	95	90
Canada Blue Grass	10	95	85
Dwarf White Clover	10	95	85
English Rye Grass	5		

### 2.05 MULCH

---

- A. Clean hay, wood fiber, jute netting, cheese cloth, burlap, or asphalt emulsion (ASTM D977, Grade SS-1) as appropriate.

### 2.06 ACCESSORIES

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- A. Herbicide: Approved chemical registered in State of Maine for stump or basal bark treatment.  
B. Stakes: Softwood lumber, chisel pointed.  
C. String: Inorganic fiber.  
D. Edging: Galvanized steel.

## **PART 3 - EXECUTION**

### 3.01 INSPECTION

---

- A. Verify that prepared soil base is ready to receive the work of this Section.  
B. Beginning of installation means acceptance of existing site conditions.

### 3.02 PREPARATION OF SUBSOIL

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- A. Prepare subsoil to eliminate uneven areas and low spots. Maintain lines, levels, 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. Remove rocks over 1 inch in diameter in lawn areas and 2" in diameter in non-lawn areas.
- C. Scarify subsoil to a depth of 4 inches where topsoil is to be placed. Repeat cultivation in areas where equipment, used for hauling and spreading topsoil, has compacted subsoil.

### 3.03 PLACING TOPSOIL

---

- A. Place or replace with soil meeting AASHTO M 145 A4.
  - 1. Lawn areas: 4 inches
  - 2. Non-lawn areas: 4 inch
- B. Place topsoil during dry weather and on dry unfrozen subgrade.
- C. Remove vegetable matter and foreign non-organic material while spreading. Remove rocks and other objects over 2 inches in diameter.
- D. Grade to eliminate rough, low, or soft areas, and to ensure positive drainage.
- E. Do not compact topsoil.

### 3.04 FERTILIZING

---

- A. Apply fertilizer at a rate of 25 pounds per 1000 square feet or as recommended by manufacturer.
- B. Apply after smooth raking of topsoil and prior to roller compaction.
- C. Do not apply fertilizer at same time or with same machine as will be used to apply seed.
- D. Mix thoroughly into upper 2 inches with an appropriate method.
- E. Lightly water to aid the dissipation of fertilizer.
- F. Water dry topsoil to a depth of 4 inches, 48 hours prior to seeding to obtain a loose, and friable seed bed.

### 3.05 SEEDING

---

- A. Apply seed at a rate of 3 lbs. per 1,000 sq. ft. evenly in two intersecting directions. Rake in lightly to a depth of 3/8 inch. Do not seed area in excess of that which can be mulched on same day.
- B. Do not sow immediately following rain, when ground is too dry, or during windy periods.
- C. Roll seeded area with roller weighing a maximum of 150 lbs. per foot of width.
- D. Immediately following seeding and rolling, apply mulch to a thickness of 1/8 inches. Maintain clear of shrubs and trees.
- E. Apply water with a fine spray immediately after each area has been mulched. Saturate to 4 inches of soil.

### 3.06 HYDROSEEDING

---

- A. Apply seeded slurry at a rate of 3 lbs. per 1,000 sq. ft. evenly in two intersecting directions, with a hydraulic seeder. Do not hydroseed area in excess of that which can be mulched on same day.
- B. Immediately following seeding, apply mulch to a thickness of 1/8 inches. Maintain clear of shrubs and trees.
- C. Apply water with a fine spray immediately after each area has been mulched. Saturate to 4 inches of soil.

### 3.07 SEED PROTECTION

---

- A. Cover seeded slopes where grade is 4 inches per foot or greater with erosion fabric. Roll fabric onto slopes without stretching or pulling.
- B. Lay fabric smoothly on surface, bury top end of each section in 6 inch deep excavated topsoil trench. Provide 12 inch overlap of adjacent rolls. Backfill trench and rake smooth, level with adjacent soil.
- C. Secure outside edges and overlaps at 36 inch intervals with stakes.
- D. Lightly dress slopes with topsoil to ensure close contact between fabric and soil.
- E. At sides of ditches, lay fabric laps in direction of water flow. Lap ends and edges minimum 6 inches.

- F. Erect warning signs and barriers to protect seeded areas.

### 3.08 MAINTENANCE

---

- A. Mow grass at regular intervals to maintain at a maximum height of 2 inches. Do not cut more than 1/3 of grass blade at any one mowing.
- B. Neatly trim edges and hand clip where necessary.
- C. Immediately remove clippings after mowing and trimming.
- D. Water to prevent grass and soil from drying out.
- E. Roll surface to remove minor depressions or irregularities.
- F. Control growth of weeds. Apply herbicides in accordance with manufacturers' instructions. Remedy damage resulting from improper use of herbicides.
- G. Immediately re-seed areas which show bare spots.
- H. Protect seeded areas with warning signs during maintenance period.

END OF SECTION 02936

## Section 02950

### Sedimentation and Erosion Control Measures

#### **PART 1 GENERAL**

##### **1.1 SECTION INCLUDES**

---

- A. Establishment and maintenance of temporary and permanent drainage areas.
- B. Construction, stabilization and maintenance of temporary construction entrances.
- C. Construction and maintenance of temporary and permanent outfalls, swales, waterways, embankments.
- D. Temporary and permanent vegetative stabilization.
- E. Establishment and maintenance of designated stockpile areas.
- F. Construction and maintenance of silt fences and hay bale barriers.
- G. All erosion and sediment control work required for the safe conduct of the work, whether or not specifically mentioned in these Specifications or indicated on the Drawings.

##### **1.2 REFERENCES**

---

- A. Quality, grades of materials and installation procedure: In conformance with applicable code and standards including:
  - 1. Environmental Quality Handbook, Maine Soil and Water Conservation Commission (Handbook).
  - 2. American Society for Testing and Materials (ASTM).
  - 3. State of Maine, Department of Transportation, Standard Specifications Highway and Bridges (MDOT), November 2014 or most recent edition.
  - 4. Maine Department of Environmental Protection - Bureau of Land and Water Quality, Maine Erosion and Sedimentation Control Best Management Practices, March 2003 or most recent edition.
- B. Land, Air and Water Pollution: Comply with Pollution Control Standards for the State of Maine applicable to the work to ensure that no pollution is caused by work of this Contract.

- C. Soil Erosion and Sediment Control: Implement soil erosion and sediment control in strict accordance with provisions of the Environmental Quality Handbook.

### 1.3 DEFINITIONS

---

#### 1.3.1 Sediment

Soil and other debris that have eroded and have been transported by runoff water or wind.

#### 1.3.2 Dust

Earthy material and any substance reduced to fine powder.

#### 1.3.3 Solid Waste

Rubbish, debris, garbage, and other discarded solid materials, except hazardous waste as defined in paragraph entitled "Hazardous Waste," resulting from industrial, commercial, and agricultural operations and from community activities.

#### 1.3.4 Rubbish

Combustible and noncombustible wastes such as paper, boxes, glass, crockery, metal, lumber, cans, and bones.

#### 1.3.5 Debris

Combustible and noncombustible wastes such as ashes and waste materials resulting from construction or maintenance and repair work, leaves, and tree trimmings.

#### 1.3.6 Oily Waste

Petroleum products and bituminous materials.

### 1.4 SUBMITTALS (In Accordance With Section 01300)

---

#### 1.4.1 Samples

- A. Geotextile Fabric.

#### 1.4.2 Record of Existing Conditions

- A. Pre-construction video or photographs.

#### 1.4.3 Factory Test Reports

- A. Geotextile Fabric.

#### 1.4.4 Certificate of Compliance

- A. Seed Mix

### 1.5 ENVIRONMENTAL PROTECTION REQUIREMENTS

---

Provide and maintain, during the life of the contract, environmental protection as defined. Plan for and provide environmental protective measures to control pollution that develops during normal construction practice. Plan for and provide environmental protective measures required to correct conditions that develop during the construction of permanent or temporary environmental features associated with the project. Comply with Federal, State, and local regulations pertaining to the environment, including but not limited to water, air, and noise pollution.

#### 1.5.1 Pre-construction Survey

Perform a pre-construction survey of the project site and take photographs or videos showing existing environmental conditions in and adjacent to the site. Provide a copy of photographs to the Engineer.

## **PART 2 PRODUCTS**

### 2.1 MATERIALS

---

- A. All Products: As specified by Environmental Quality Handbook
- B. All Fill Materials: In accordance with requirements of Section 02223.
- C. Temporary Vegetative Stabilization: Temporary Seeding for graded or cleared areas which are subject to erosion for a period of 14 days or more. Vegetation in accordance with Handbook.
- D. Permanent Vegetative Stabilization: Seeding for graded or cleared areas subject to erosion where a permanent, long-lived vegetation cover is needed. Vegetation in accordance with Handbook.
- E. Riprap Waterways, Trapezoidal Outlets and Outfalls:
  - 1. Riprap: Sizes indicated.
  - 2. Drainage Fabric:
    - a. Outlets, Outfalls: Mirafi 600X.

F. Grass Waterways:

1. Vegetation: In accordance with Handbook; Section 02936, Seed Mix A.
2. Erosion Control Mesh: North American Green DS150.
3. Pins: U or T type as recommended by fabric manufacturer.

G. Hay Bale Barriers, Dams:

1. Barriers: Wire or nylon bound straw or hay bales.
2. Stakes: Steel rebar or 2-inch by 2-inch wood stakes.

H. Silt Fence:

1. Posts:
  - a. Wood: Minimum 2 inch hardwood stakes.
  - b. Steel: Type T or Type U.
2. Woven Wire: 14 gauge; maximum 6 inch mesh.
3. Fabric: High strength polypropylene netting treated to ensure protection against sunlight degradation:
  - a. Mirafi Silt Fence.
  - b. Amoco Propex Silt Stop.
  - c. Poly Filter X.
  - d. Stabilina T140N.

I. Pre-fabricated Silt Fence: Mirafi Envirofence or equal approved by Engineer.

J. Approved Filter Cloths:

1. Filter: Mirafi 140N.
2. Embankment: Mirafi 600X.
3. Slope Protection: North American Green or equal approved by Engineer.
4. Channel Protection: North American Green.
5. Substitutions: Under provisions of Section 01600.

K. Stone Check Dams:

1. Stone: Sizes indicated.
2. Fabric: Mirafi 600X.



## **PART 3 EXECUTION**

### **3.1 PROTECTION OF NATURAL RESOURCES**

---

Preserve the natural resources within the project boundaries and outside the limits of permanent work. Restore to an equivalent or improved condition upon completion of work. Confine construction activities to within the limits of the work indicated or specified.

#### **3.1.1 Land Resources**

##### **3.1.1.1 Protection of Vegetation**

---

Except in areas to be cleared, do not remove, cut, deface, injure, or destroy trees or shrubs without the Engineer permission. Do not fasten or attach ropes, cables, or guys to existing nearby trees for anchorages unless authorized by the Engineer. Where such use of attach ropes, cables, or guys is authorized, the Contractor shall be responsible for any resultant damage.

Protect existing trees which are to remain and which may be injured, bruised, defaced, or otherwise damaged by construction operations. Remove displaced rocks from un-cleared areas. By approved excavation, remove trees with 30 percent or more of their root systems destroyed.

##### **3.1.1.2 Grading**

---

- A. Limit initial grading to that required to install required sediment and erosion controls.
- B. Extent: Remain just ahead of planned new construction.
- C. Plan to control runoff and contain erosion.
- D. Do not place fill before existing vegetation has been removed.
- E. Do not impair existing surface drainage, create potential hazards, cause hazardous erosion, or cause sediment to collect in drainage systems on adjacent properties, alleys, streets or highways by grading operations.
- F. Riprap Outfalls, Outlets, 'Waterways: Construct in accordance with details. Embed riprap in approved fabric.
- G. Grass Waterways: Construct in accordance with details for specific profile. Pin fabric mesh to subgrade with U or T pins in accordance with fabric manufacturer's recommendations.

#### H. Hay Bales:

1. Place at areas indicated in rows with ends tightly butted.
2. Embed each bale a minimum of 4 inches into soil.
3. Securely anchor in place with two stakes driven 1-1/2 to 2 feet into ground.

#### I. Silt Fence:

1. Establish silt fence at areas indicated and as required for control prior to starting work. Repair as needed.
2. Space posts as required to adequately support wire and cloth against flow and at a maximum of 6 feet on center. Embed posts into ground a minimum of 18 inches.
3. Fasten woven wire fence securely to posts with wire ties or staples.
4. Fasten filter cloth to wire mesh at top and mid-section with ties spaced every 24 inches; overlap edges minimum 6 inches and fold. Embed filter cloth minimum 8 inches into ground.

#### 3.1.1.3 Borrow Pit Areas

---

Manage and control borrow pit areas to prevent sediment from entering nearby streams or lakes. Restore areas, including those outside the borrow pit, disturbed by borrow and haul operations. Restoration includes grading, replacement of topsoil, and establishment of a permanent vegetative cover. Uniformly grade side slopes of borrow pit to note more than a slope of 1 part vertical to 2 parts horizontal. Uniformly grade the bottom of the borrow pits to provide a flat bottom and drain by outfall ditches or other suitable means. Stockpile topsoil remove during the borrow pit operation, and use as part of restoring the borrow pit area.

#### 3.1.1.4 Protection of Erodible Soils

---

Immediately finish the earthwork brought to a final grade, as indicated or specified. Immediately protect the side slopes and back slopes upon completion of rough grading. Plan and conduct earthwork to minimize the duration of exposure of unprotected soils.

#### 3.1.1.5 Temporary Protection of Erodible Soils

---

Use the following methods to prevent erosion and control sedimentation:

#### 3.1.1.6 Mechanical Retardation and Control to Runoff

---

Mechanically retard and control the rate of runoff from the construction site. This includes construction of diversion ditches, benches, and berms to retard and divert runoff to protected drainage courses. Operate track-driven equipment perpendicular to steel slopes.

#### 3.1.1.7 Vegetation and Mulch

---

Provide temporary protection on sides and back slopes as soon as rough grading is completed or sufficient soil is exposed to require erosion protection. Protect slopes by accelerated growth of permanent vegetation, temporary vegetation, mulching, or netting. Stabilize slopes by hydroseeding, anchoring mulch in place, covering with anchored netting, sodding, or such combination of these and other methods necessary for effective erosion control.

- a. Seeding: Provide new seeding where ground is disturbed. Include topsoil or nutriment during the seeding operation necessary to establish or reestablish a suitable stand of grass. The seeding operation shall be as specified in Section 02936, "Seeding".

#### 3.1.1.8 Stabilization

---

- A. Stabilize all cleared or graded areas. Stabilize with temporary or permanent vegetation, mulch, or paving as indicated on Drawings within 15 days of obtaining final grade or 30 days after obtaining temporary grade.
- B. For vegetating critical areas where erosion is imminent, place and repeatedly replace adequate mulch, fertilizer, and seed until a vigorous and adequate growth of turf has been established over greater than 80 percent of the area.

#### 3.1.1.9 Replacement

---

Remove trees and other landscape features scarred or damaged by equipment operations, and replace with equivalent, undamaged trees and landscape features. Obtain Engineer's approval before replacement.

#### 3.1.1.10 Temporary Construction

---

Remove traces of temporary construction facilities such as haul roads, work areas, structures, foundations of temporary structures, stockpiles of excess or waste materials, and other signs of construction. Grade temporary roads, parking areas, and similar temporarily used areas to conform to surrounding contours.

#### 3.1.1.11 Burn-off

---

Burn-off of the ground cover is not permitted.

#### 3.1.1.12 Dust Control

---

Keep dust down at all times, including during non-working periods. Sprinkle or treat, with dust suppressants, the soil at the site, haul roads, and other areas disturbed by operations. Dry power

brooming will not be permitted. Instead, use vacuuming, wet mopping, wet sweeping, or wet power brooming. Air blowing will be permitted only for cleaning non-particulate debris such as steel reinforcing bars. Only wet cutting will be permitted for cutting concrete blocks, concrete, and bituminous concrete. Do not unnecessarily shaking bags of cement, concrete mortar, or plaster.

### **3.1.2 Water Resources**

#### **3.1.2.1 Erosion Control**

---

Provide measures specified in Part 3.1 of this section to prevent sedimentation of all wetlands, streams, rivers, ponds and other water resources.

#### **3.1.2.2 Resource Protection Zone**

---

Provide a 25-foot resource protection zone on both sides of a stream or river or adjacent to a wetland or pond. Entry into a crossing the zone except in areas specified by vehicular or pedestrian traffic shall be prohibited. Boundaries shall be clearly marked prior to start of construction.

#### **3.1.2.3 Utility Crossings and Crossings**

---

Where utilities or temporary access roads are indicated to cross streams or wetlands, all appropriate rules, laws, ordinances and regulations by governing and permitting authorities having jurisdiction shall be followed.

#### **3.1.2.4 Sedimentation**

---

In addition to measures specified in this section and shown on the drawings, additional steps shall be taken where necessary, in order to prevent sedimentation of water. Evidence of sedimentation includes visible gully erosion, discoloration of water by suspended particles and slumping of banks.

#### **3.1.2.5 Oily Wastes**

---

Prevent oily or other hazardous substances from entering the ground, drainage areas, or local bodies of water. Surround all temporary fuel oil or petroleum storage tanks with a temporary earth berm of sufficient size and strength to contain the contents of the tanks in the event of leakage or spillage.

#### **3.1.2.6 Fish and Wildlife Resources**

---

Do not disturb fish and wildlife. Do not alter water flows or otherwise significantly disturb the native habitat adjacent to the project and critical to the survival of fish and wildlife, except as indicated or specified.

### 3.2 MAINTENANCE

---

- A. Vegetative Stabilization: Irrigate to prevent loss of stand of protective vegetation. Regularly inspect and overseed as necessary. Immediately reestablish damaged stands.
- B. Hay Bales: Inspect weekly and after every rain; adjust as needed, removing material when bulges develop.
- C. Silt Fence: Inspect weekly and after every rain; adjust as needed, removing material when bulges develop or when silt build up exceeds 1/3 of the fence height.
- D. Construction Entrances: Inspect and repair after every rain. Maintain in a condition to prevent tracking or flowing of sediment onto public right-of-ways. Dress with stone as required.
- E. Swales, Outlets, outfalls: Inspect regularly and after every rain;
- F. See notes on Plan sheet for other related maintenance.

END OF SECTION 02950

APPENDIX A

PORTLAND WATER DISTRICT  
SPECIAL PROVISION DOCUMENTS  
FOR  
WATER SYSTEM ALTERATIONS

The documents included in Appendix A were prepared by the Portland Water District for the water system alterations work shown on the drawings and specified in Appendix A. They are only applicable to the water work specified in this Appendix A. The documents in Appendix A, however, are part of the Town of Falmouth Middle Road Reconstruction - 2016 Project Contract Documents.

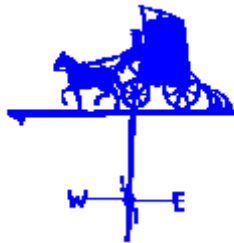
The Portland Water District will provide on site inspection and administration for the water system alterations work. However, the Town of Falmouth will provide on-site monitoring and construction administration for the Town of Falmouth Middle Road Reconstruction - 2016 Project overall.

Please refer to Portland Water District website ([www.pwd.org/document-library](http://www.pwd.org/document-library)) for Construction Specifications and Standard Details related to water work.

**CONTRACT DOCUMENTS**  
**FOR**  
**Middle Rd.**  
**WATER MAIN REPLACEMENT**  
**Falmouth, Maine**



**April 2017**  
**PORTLAND WATER DISTRICT**  
**225 Douglass Street**  
**Portland, Maine 04104-3553**



## TABLE OF CONTENTS

<u>Document #</u>	<u>Title</u>	<u>Page</u>
<u>DIVISION 0 - BIDDING &amp; CONTRACT REQUIREMENTS</u>		
00510	Notice of Award	3
00520	Agreement Between Owner and Contractor for Construction Contract (Stipulated Price)	4
00610	Performance Bond	10
00615	Payment Bond	14
00620	Contractor's Application for Payment	16
00700	Standard General Conditions of the Construction Contract	18
00810	Supplementary Conditions	74
00941	Change Order	86
<u>DIVISION 1 - GENERAL REQUIREMENTS</u>		
01001	Description of Work	87
01035	Control of Work	89
01151	Measurement and Payment	91
01310	Submittals	94
01710	Cleanup	95
<u>DIVISION 2 - SITE WORK</u>		
02217	Excavation and Backfill for Water Mains	97
02219	Bedding and Backfill Material	104
02536	Temporary Water Systems	106
02537	Ductile Iron Water Pipe and Fittings	110
02594	Pressure and Leakage Testing of D.I. Water Mains	114
02595	Disinfection of Water Mains	116
02999	Water Main Materials Specifications:	
	Bolts and Nuts	119
	Corporation Stops	120
	Curb Stops	121
	Cut-In Sleeve	122
	Ductile Iron Fittings	123
	Ductile Iron Pipe	124
	Fire Hydrant	125
	Pipe Joint Restrainer	127
	Polyethylene Encasement	128
	PVC Water Main	129
	Resilient Seat Gate Valve	131
	Insertion Gate Valve	133
	Restrained Joint Gaskets	134
	Service Box and Rod	135
	Service Saddles	137
	Stainless Steel Repair Clamps	138
	Tapping Sleeves	139
	Valve Boxes	141



## Section 00510 - Notice of Award

Dated \_\_\_\_\_

Project:	Owner:	Owner's Contract No.:
Contract:		Engineer's Project No.:
Bidder:		
Bidder's Address: (send Certified Mail, Return Receipt Requested)		

You are notified that your Bid dated \_\_\_\_\_ for the above Contract has been considered. You are the Successful Bidder and are awarded a Contract for Water Main Replacements – Middle Rd., Falmouth.

The Contract Price of your Contract is \_\_\_\_\_.

*(Insert appropriate data if Unit Prices are used.)*

You must comply with the following conditions precedent within [15] days of the date you receive this Notice of Award.

1. Deliver to the Owner three (3) fully executed counterparts of the Contract Documents.
2. Deliver with the executed Contract Documents the Contract security [Bonds] as specified in the Instructions to Bidders (Article 20), [and] General Conditions (Paragraph 5.01) [and Supplementary Conditions (Paragraph SC-5.01).]
3. Other conditions precedent:

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

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

Within ten days after you comply with the above conditions, Owner will return to you one fully executed counterpart of the Contract Documents.

PORTLAND WATER DISTRICT

By: \_\_\_\_\_  
Carrie Lewis, General Manager

**SECTION 00520 -AGREEMENT  
BETWEEN OWNER AND CONTRACTOR  
FOR CONSTRUCTION CONTRACT (STIPULATED PRICE)**

THIS AGREEMENT is by and between PORTLAND WATER DISTRICT (“Owner”) and  
 (“Contractor”).

Owner and Contractor, in consideration of the mutual covenants hereinafter set forth, agree as follows:

## ARTICLE 1 – WORK

- 1.3 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

### Water Main Replacements – Middle Rd., Falmouth

## ARTICLE 2 – THE PROJECT

- 2.3 The Project for which the Work under the Contract Documents may be the whole or only a part is generally described as follows:

### Water Main Replacements – Middle Rd., Falmouth

## ARTICLE 3 – ENGINEER

- 3.3 The Project has been designed by Portland Water District, who is to act as Owner's representative, assume all duties and responsibilities, and have the rights and authority assigned to Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

## ARTICLE 4 – CONTRACT TIMES

- ### 4.3 Time of the Essence

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

- #### 4.4 Days to Achieve Substantial Completion and Final Payment

- A. The Work must progress so as not to delay the completion of work under a separate contract between the Contractor and the Town of Falmouth in the same area.

- #### 4.5 Liquidated Damages

- A. There are no liquidated damages specified in this contract.

## **ARTICLE 5 – CONTRACT PRICE**

5.3 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents an amount in current funds equal to the sum of the amounts determined pursuant to Paragraphs 5.01.A. below:

A. For all Work, at the prices stated in Contractor's Bid, attached hereto as an exhibit

## **ARTICLE 6 – PAYMENT PROCEDURES**

### **6.3 *Submittal and Processing of Payments***

A. Contractor shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.

### **6.4 *Progress Payments; Retainage***

A. Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment on or about the 30th day of each month during performance of the Work as provided in Paragraphs 6.4.A.1 and 6.4.A.2 below. All such payments will be measured by the schedule of values established as provided in Paragraph 2.07.A of the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no schedule of values, as provided in the General Requirements:

1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Engineer may determine or Owner may withhold, including but not limited to liquidated damages, in accordance with Paragraph 14.02 of the General Conditions:

a. 90 percent of Work completed (with the balance being retainage). If the work has been 50 percent completed as determined by Engineer, and if the character and progress of the work has been satisfactory to Owner and Engineer, Owner, on recommendation of Engineer, may determine that as long as the character and progress of the Work remain satisfactory to them, there will be no additional retainage;

b. No payment will be made for materials not incorporated in the work.

2. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to 98 percent of the Work completed, less such amounts as Engineer shall determine in accordance with Paragraph 14.02.B.5 of the General Conditions.

### **6.5 *Final Payment***

A. Upon receipt of the final Application for Payment accompanied by Engineer's recommendation of payment in accordance with Paragraph 14.07 of the General Conditions, Owner shall pay Contractor as provided in Paragraph 14.07 of the General Conditions the remainder of the Contract Price as recommended by Engineer as provided in said Paragraph 14.07, less any sum Owner is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages.

## **ARTICLE 7 – INTEREST**

- 7.3 All moneys not paid when due as provided in Article 14 of the General Conditions shall bear interest at the maximum legal rate.

## **ARTICLE 8 – CONTRACTOR’S REPRESENTATIONS**

- 8.3 In order to induce Owner to enter into this Agreement Contractor makes the following representations:
- A. Contractor has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents.
  - B. Contractor has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
  - C. Contractor is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.
  - D. Contractor has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) which have been identified in the Supplementary Conditions as provided in Paragraph 4.02 of the General Conditions and (2) reports and drawings of a Hazardous Environmental Condition, if any, at the Site which has been identified in the Supplementary Conditions as provided in Paragraph 4.06 of the General Conditions.
  - E. Contractor has obtained and carefully studied (or assumes responsibility for doing so) all additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and Underground Facilities) at or contiguous to the Site which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, including any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents, and safety precautions and programs incident thereto.
  - F. Contractor does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract Documents.
  - G. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.
  - H. Contractor has correlated the information known to Contractor, information and observations obtained from visits to the Site, reports and drawings identified in the Contract Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Contract Documents.
  - I. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.

- J. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

## **ARTICLE 9 – CONTRACT DOCUMENTS**

### **9.3 Contents**

A. The Contract Documents consist of the following:

1. This Agreement (pages 1 to 6, inclusive).
2. Performance bond (pages 1 to 2, inclusive).
3. Payment bond (pages 1 to 3, inclusive).
4. General Conditions (pages 1 to 51, inclusive).
5. Supplementary Conditions (pages 1 to 9, inclusive).
6. Specifications as listed in the table of contents of the Project Manual.
7. Water main drawings and details contained within the project drawings titled: Middle Rd Reconstruction, Falmouth, Me. 2017.
8. Addenda (numbers \_\_\_\_ to \_\_\_\_, inclusive).
9. Exhibits to this Agreement (enumerated as follows):
  - a. Contractor's Bid (pages 1 to 6, inclusive).
  - b. Documentation submitted by Contractor prior to Notice of Award (pages \_\_\_\_ to \_\_\_\_, inclusive).
10. The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:
  - a. Work Change Directives.
  - b. Change Order(s).

B. The documents listed in Paragraph 9.01.A are attached to this Agreement (except as expressly noted otherwise above).

C. There are no Contract Documents other than those listed above in this Article 9.

D. The Contract Documents may only be amended, modified, or supplemented as provided in Paragraph 3.04 of the General Conditions.

## **ARTICLE 10 – MISCELLANEOUS**

### **10.3 Terms**

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

#### 10.4 *Assignment of Contract*

- A. No assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

#### 10.5 *Successors and Assigns*

- A. Owner and Contractor each binds itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

#### 10.6 *Severability*

- A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement in triplicate. One counterpart each has been delivered to Owner and Contractor. All portions of the Contract Documents have been signed, initialed, or identified by Owner and Contractor or on their behalf.

This Agreement will be effective on \_\_\_\_\_, 2017 (*which is the Effective Date of the Agreement*).

OWNER:

CONTRACTOR

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

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

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

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

[CORPORATE SEAL]

[CORPORATE SEAL]

Attest  
\_\_\_\_\_  
.

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

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

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

Address for giving notices:

Address for giving notices:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Agent for service of process:

\_\_\_\_\_

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

END OF SECTION

## Section 00610 - PERFORMANCE BOND

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

CONTRACTOR (Name and Address):

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

OWNER (Name and Address): PORTLAND WATER DISTRICT  
225 Douglass Street  
Portland, Maine 04104-3553

### CONTRACT

Date:

Amount:

Description (Name and Location):

### BOND

Bond Number:

Date (Not earlier than Contract Date):

Amount:

Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Performance Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

#### CONTRACTOR AS PRINCIPAL

Company:

Signature: \_\_\_\_\_ (Seal)

Name and Title:

(Space is provided below for signatures of additional parties, if required.)

#### CONTRACTOR AS PRINCIPAL

Company:

Signature: \_\_\_\_\_ (Seal)

Name and Title:

#### SURETY

\_\_\_\_\_  
(Seal)

Surety's Name and Corporate Seal

By:

Signature and Title

(Attach Power of Attorney)

Attest:

Signature and Title

#### SURETY

\_\_\_\_\_  
(Seal)

Surety's Name and Corporate Seal

By:

Signature and Title

(Attach Power of Attorney)

Attest:



Signature and Title:

1. Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner for the performance of the Contract, which is incorporated herein by reference.
2. If Contractor performs the Contract, Surety and Contractor have no obligation under this Bond, except to participate in conferences as provided in Paragraph 3.1.
3. If there is no Owner Default, Surety's obligation under this Bond shall arise after:
  - 3.1. Owner has notified Contractor and Surety, at the addresses described in Paragraph 10 below, that Owner is considering declaring a Contractor Default and has requested and attempted to arrange a conference with Contractor and Surety to be held not later than 15 days after receipt of such notice to discuss methods of performing the Contract. If Owner, Contractor and Surety agree, Contractor shall be allowed a reasonable time to perform the Contract, but such an agreement shall not waive Owner's right, if any, subsequently to declare a Contractor Default; and
  - 3.2. Owner has declared a Contractor Default and formally terminated Contractor's right to complete the Contract. Such Contractor Default shall not be declared earlier than 20 days after Contractor and Surety have received notice as provided in Paragraph 3.1; and
  - 3.3. Owner has agreed to pay the Balance of the Contract Price to:
    1. Surety in accordance with the terms of the Contract;
    2. Another contractor selected pursuant to Paragraph 4.3 to perform the Contract.
4. When Owner has satisfied the conditions of Paragraph 3, Surety shall promptly and at Surety's expense take one of the following actions:
  - 4.1. Arrange for Contractor, with consent of Owner, to perform and complete the Contract; or
  - 4.2. Undertake to perform and complete the Contract itself, through its agents or through independent contractors; or
  - 4.3. Obtain bids or negotiated proposals from qualified contractors acceptable to Owner for a contract for performance and completion of the Contract, arrange for a contract to be prepared for execution by Owner and Contractor selected with Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Contract, and pay to Owner the amount of damages as described in Paragraph 6 in excess of the Balance of the Contract Price incurred by Owner resulting from Contractor Default; or
  - 4.4. Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:
    1. After investigation, determine the amount for which it may be liable to Owner and, as soon as practicable after the amount is determined, tender payment therefore to Owner; or
    2. Deny liability in whole or in part and notify Owner citing reasons therefore.
5. If Surety does not proceed as provided in Paragraph 4 with reasonable promptness, Surety shall be deemed to be in default on this Bond 15 days after receipt of an additional written notice from Owner to Surety demanding that Surety perform its obligations under this Bond, and Owner shall be entitled to enforce any remedy available to Owner. If Surety proceeds as provided in Paragraph 4.4, and Owner refuses the payment tendered or Surety has denied liability, in whole or in part, without further notice Owner shall be entitled to enforce any remedy available to Owner.
6. After Owner has terminated Contractor's right to complete the Contract, and if Surety elects to act under Paragraph 4.1, 4.2, or 4.3 above, then the responsibilities of Surety to Owner shall not be greater than those of Contractor under the Contract, and the responsibilities of Owner to Surety shall not be greater than those of Owner under the Contract. To a limit of the amount of this Bond, but subject to commitment by Owner of the Balance of the Contract Price to mitigation of costs and damages on the Contract, Surety is obligated without duplication for:
  - 6.1. The responsibilities of Contractor for correction of defective Work and completion of the Contract;
  - 6.2. Additional legal, design professional, and delay costs resulting from Contractor's Default, and resulting from the actions or failure to act of Surety under Paragraph 4; and
  - 6.3. Liquidated damages, or if no liquidated damages are specified in the Contract, actual damages caused by delayed performance or non-performance of Contractor.
7. Surety shall not be liable to Owner or others for obligations of Contractor that are unrelated to the Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than Owner or its heirs, executors, administrators, or successors.
8. Surety hereby waives notice of any change, including changes of time, to Contract or to related subcontracts, purchase orders, and other obligations.
9. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the Work or part of the Work is located and shall be instituted within two years after Contractor Default or within two years after Contractor ceased working or within two years after Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.
10. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the address shown on the signature page.
11. 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.
12. Definitions.

12.1 Balance of the Contract Price: The total amount payable by Owner to Contractor under the Contract after all proper adjustments have been made, including allowance to Contractor of any amounts received or to be received by Owner in settlement of insurance or other Claims for damages to which Contractor is entitled, reduced by all valid and proper payments made to or on behalf of Contractor under the Contract.

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

12.3. Contractor Default: Failure of Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Contract.

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

<p>INFORMATION ONLY – Name, Address and Telephone Surety Agency or Broker Owner’s Representative (engineer or other party)</p>
--

## Section 00615 - 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): PORTLAND WATER DISTRICT  
225 Douglass Street  
Portland, Maine 04104-3553

### CONTRACT

Date:  
Amount:  
Description (Name and Location):

### BOND

Bond Number:  
Date (Not earlier than Contract Date):  
Amount:  
Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Payment Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

### CONTRACTOR AS PRINCIPAL

Company:

Signature: \_\_\_\_\_ (Seal)  
Name and Title:

(Space is provided below for signatures of additional parties, if required.)

### CONTRACTOR AS PRINCIPAL

Company:

Signature: \_\_\_\_\_ (Seal)  
Name and Title:

### SURETY

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

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

Attest: \_\_\_\_\_  
Signature and Title

### SURETY

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

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

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

## Signature and Title:

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

Contract are dedicated to satisfy obligations of Contractor and Surety under this Bond, subject to Owner's priority to use the funds for the completion of the Work.

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

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

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

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

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

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

## 15. DEFINITIONS

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

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

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

## Section 00620 -Contractor's Application For Payment No. \_\_\_\_\_

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

### APPLICATION FOR PAYMENT

#### Change Order Summary

Approved Change Orders					
Number	Additions	Deductions			
			1. ORIGINAL CONTRACT PRICE .....	\$	_____
			2. Net change by Change Orders .....	\$	_____
			3. CURRENT CONTRACT PRICE (Line 1 ± 2) .....	\$	_____
			4. TOTAL COMPLETED TO DATE		
			(Column G on Progress Estimate) .....	\$	_____
			5. RETAINAGE:		
			a. _____ % x \$ _____ Work Completed .....	\$	_____
			6. AMOUNT ELIGIBLE TO DATE (Line 4 - Line 5) .....	\$	_____
			7. LESS PREVIOUS PAYMENTS (Line 6 from prior Application) .....	\$	_____
			8. AMOUNT DUE THIS APPLICATION .....	\$	_____
TOTALS					
NET CHANGE BY CHANGE ORDERS					

### CONTRACTOR'S CERTIFICATION

The undersigned Contractor certifies that: (1) all previous progress payments received from Owner on account of Work done under the Contract have been applied on account to discharge Contractor's legitimate obligations incurred in connection with Work covered by prior Applications for Payment; (2) title of all Work, materials and equipment incorporated in said Work or otherwise listed in or covered by this Application for Payment will pass to Owner at time of payment free and clear of all Liens, security interests and encumbrances (except such as are covered by a Bond acceptable to Owner indemnifying Owner against any such Liens, security interest or encumbrances); and (3) all Work covered by this Application for Payment is in accordance with the Contract Documents and is not defective.

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

Payment of:	\$ _____	(Line 8 or other - attach explanation of other amount)
is recommended by:	_____	_____ (Date)
	(Engineer)	
Payment of:	\$ _____	(Line 8 or other - attach explanation of other amount)
is approved by:	_____	_____ (Date)
	(Owner)	
Approved by:	_____	_____ (Date)
	Funding Agency (if applicable)	

## Progress Estimate

## Contractor's Application

For (contract):	Application Number:
Application Period:	Application Date:

A		B Bid Quantity	C	D	E	F	G	H
Bid Item No.	Description		Unit Price	Contract Amount	Quantity From Previous Applications	Quantity This Period	Total Value Completed to Date	% Complete
	Totals							

## SECTION 00700

# STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

*Prepared by*

**ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE**

and

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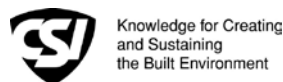
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1420 King Street, Alexandria, VA 22314-2794  
(703) 684-2882

American Council of Engineering Companies  
1015 15th Street N.W., Washington, DC 20005  
(202) 347-7474

American Society of Civil Engineers  
1801 Alexander Bell Drive, Reston, VA 20191-4400  
(800) 548-2723

## TABLE OF CONTENTS

	<b>Page</b>
Article 1 – Definitions and Terminology.....	46
1.01 Defined Terms.....	46
1.02 Terminology.....	49
Article 2 – Preliminary Matters .....	50
2.01 Delivery of Bonds and Evidence of Insurance.....	50
2.02 Copies of Documents.....	50
2.03 Commencement of Contract Times; Notice to Proceed.....	51
2.04 Starting the Work.....	51
2.05 Before Starting Construction.....	51
2.06 Preconstruction Conference.....	51
2.07 Initial Acceptance of Schedules.....	51
Article 3 – Contract Documents: Intent, Amending, Reuse.....	52
3.01 Intent.....	52
3.02 Reference Standards.....	52
3.03 Reporting and Resolving Discrepancies.....	52
3.04 Amending and Supplementing Contract Documents.....	53
3.05 Reuse of Documents.....	53
3.06 Electronic Data.....	53
Article 4 – Availability of Lands; Subsurface and Physical Conditions; Hazardous Environmental Conditions; Reference Points.....	54
4.01 Availability of Lands.....	54
4.02 Subsurface and Physical Conditions.....	54
4.03 Differing Subsurface or Physical Conditions.....	55
4.04 Underground Facilities.....	56
4.05 Reference Points.....	56
4.06 Hazardous Environmental Condition at Site.....	57
Article 5 – Bonds and Insurance.....	59
5.01 Performance, Payment, and Other Bonds.....	58
5.02 Licensed Sureties and Insurers.....	58
5.03 Certificates of Insurance.....	59
5.04 Contractor’s Liability Insurance.....	59
5.05 Owner’s Liability Insurance.....	60
5.06 Property Insurance.....	60
5.07 Waiver of Rights.....	61
5.08 Receipt and Application of Insurance Proceeds.....	62
5.09 Acceptance of Bonds and Insurance; Option to Replace.....	62
5.10 Partial Utilization, Acknowledgment of Property Insurer.....	62
Article 6 – Contractor’s Responsibilities.....	63
6.01 Supervision and Superintendence.....	63
6.02 Labor; Working Hours.....	63
6.03 Services, Materials, and Equipment.....	63
6.04 Progress Schedule.....	63
6.05 Substitutes and “Or-Equals”.....	64
6.06 Concerning Subcontractors, Suppliers, and Others.....	66
6.07 Patent Fees and Royalties.....	67
6.08 Permits.....	67
6.09 Laws and Regulations.....	67
6.10 Taxes.....	68

6.11	Use of Site and Other Areas.....	68
6.12	Record Documents.....	68
6.13	Safety and Protection.....	69
6.14	Safety Representative.....	69
6.15	Hazard Communication Programs.....	69
6.16	Emergencies.....	69
6.17	Shop Drawings and Samples.....	70
6.18	Continuing the Work.....	71
6.19	Contractor's General Warranty and Guarantee.....	71
6.20	Indemnification.....	72
6.21	Delegation of Professional Design Services.....	72
	Article 7 – Other Work at the Site.....	73
7.01	Related Work at Site.....	73
7.02	Coordination.....	74
7.03	Legal Relationships.....	74
	Article 8 – Owner's Responsibilities.....	74
8.01	Communications to Contractor.....	74
8.02	Replacement of Engineer.....	74
8.03	Furnish Data.....	74
8.04	Pay When Due.....	74
8.05	Lands and Easements; Reports and Tests.....	74
8.06	Insurance.....	75
8.07	Change Orders.....	75
8.08	Inspections, Tests, and Approvals.....	75
8.09	Limitations on Owner's Responsibilities.....	75
8.10	Undisclosed Hazardous Environmental Condition.....	75
8.11	Evidence of Financial Arrangements.....	75
	Article 9 – Engineer's Status During Construction.....	75
9.01	Owner's Representative.....	75
9.02	Visits to Site.....	75
9.03	Project Representative.....	76
9.04	Authorized Variations in Work.....	76
9.05	Rejecting Defective Work.....	76
9.06	Shop Drawings, Change Orders and Payments.....	76
9.07	Determinations for Unit Price Work.....	76
9.08	Decisions on Requirements of Contract Documents and Acceptability of Work.....	77
9.09	Limitations on Engineer's Authority and Responsibilities.....	77
	Article 10 – Changes in the Work; Claims.....	77
10.01	Authorized Changes in the Work.....	77
10.02	Unauthorized Changes in the Work.....	78
10.03	Execution of Change Orders.....	78
10.04	Notification to Surety.....	78
10.05	Claims.....	78
	Article 11 – Cost of the Work; Allowances; Unit Price Work.....	79
11.01	Cost of the Work.....	79
11.02	Allowances.....	81
11.03	Unit Price Work.....	82
	Article 12 – Change of Contract Price; Change of Contract Times.....	82
12.01	Change of Contract Price.....	82

12.02 Change of Contract Times.....	83
12.03 Delays.....	83
Article 13 – Tests and Inspections; Correction, Removal or Acceptance of Defective Work.....	84
13.01 Notice of Defects .....	84
13.02 Access to Work.....	84
13.03 Tests and Inspections.....	84
13.04 Uncovering Work.....	85
13.05 Owner May Stop the Work.....	85
13.06 Correction or Removal of Defective Work.....	85
13.07 Correction Period .....	86
13.08 Acceptance of Defective Work.....	86
13.09 Owner May Correct Defective Work.....	87
Article 14 – Payments to Contractor and Completion.....	87
14.01 Schedule of Values.....	87
14.02 Progress Payments.....	87
14.03 Contractor’s Warranty of Title.....	90
14.04 Substantial Completion.....	90
14.05 Partial Utilization .....	90
14.06 Final Inspection.....	91
14.07 Final Payment.....	91
14.08 Final Completion Delayed.....	92
14.09 Waiver of Claims .....	92
Article 15 – Suspension of Work and Termination.....	93
15.01 Owner May Suspend Work.....	93
15.02 Owner May Terminate for Cause.....	93
15.03 Owner May Terminate For Convenience.....	94
15.04 Contractor May Stop Work or Terminate.....	94
Article 16 – Dispute Resolution.....	94
16.01 Methods and Procedures.....	94
Article 17 – Miscellaneous.....;	95
17.01 Giving Notice.....	95
17.02 Computation of Times.....	95
17.03 Cumulative Remedies.....	95
17.04 Survival of Obligations.....	95
17.05 Controlling Law.....	95
17.06 Headings.....	96

# GENERAL CONDITIONS

## ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

### 1.1 *Defined Terms*

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

14. *Contract Price* – The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.03 in the case of Unit Price Work).
15. *Contract Times* – The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any, (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Engineer's written recommendation of final payment.
16. *Contractor* – The individual or entity with whom Owner has entered into the Agreement.
17. *Cost of the Work* – See Paragraph 11.01.A for definition.
18. *Drawings* – That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.
19. *Effective Date of the Agreement* – The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.
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 which does not involve a change in the Contract Price or the Contract Times.
22. *General Requirements* – Sections of Division 1 of the Specifications. The General Requirements pertain to all sections of the Specifications.
23. *Hazardous Environmental Condition* – The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto in connection with the Work.
24. *Hazardous Waste* – The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.
25. *Laws and Regulations; Laws or Regulations* – Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
26. *Liens* – Charges, security interests, or encumbrances upon Project funds, real property, or personal property.
27. *Milestone* – A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.
28. *Notice of Award* – The written notice by Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Owner will sign and deliver the Agreement.
29. *Notice to Proceed* – A written notice given by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents.
30. *Owner* – The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed.

31. *PCBs* – Polychlorinated biphenyls.
32. *Petroleum* – Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.
33. *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.
34. *Project* – The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.
35. *Project Manual* – The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.
36. *Radioactive Material* – Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.
37. *Related Entity* – An officer, director, partner, employee, agent, consultant, or subcontractor.
38. *Resident Project Representative* – The authorized representative of Engineer who may be assigned to the Site or any part thereof.
39. *Samples* – Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.
40. *Schedule of Submittals* – A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.
41. *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.
42. *Shop Drawings* – All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.
43. *Site* – Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.
44. *Specifications* – That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto.
45. *Subcontractor* – An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.
46. *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.

- 47. *Successful Bidder* – The Bidder submitting a responsive Bid to whom Owner makes an award.
- 48. *Supplementary Conditions* – That part of the Contract Documents which amends or supplements these General Conditions.
- 49. *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 any Subcontractor.
- 50. *Underground Facilities* – All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
- 51. *Unit Price Work* – Work to be paid for on the basis of unit prices.
- 52. *Work* – The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.
- 53. *Work Change Directive* – A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Owner and Agency upon recommendation of the Engineer ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

## 1.2 Terminology

- A. The following words or terms are not defined but, when used in the Bidding Requirements or Contract Documents, have the following 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 requirements of and information in the Contract Documents and conformance with the design concept of the completed Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.09 or any other provision of the Contract Documents.



C. *Day*

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

D. *Defective*

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

E. *Furnish, Install, Perform, Provide*

1. The word “furnish,” when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
  2. The word “install,” when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.
  3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.
  4. When “furnish,” “install,” “perform,” or “provide” is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, “provide” is implied.
- F. Unless stated otherwise in the Contract Documents, words or phrases which 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. When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.
- B. *Evidence of Insurance:* Before any Work at the Site is started, Contractor and Owner shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Contractor and Owner respectively are required to purchase and maintain in accordance with Article 5.

### **2.2 *Copies of Documents***

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

2.3 *Commencement of Contract Times; Notice to Proceed*

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

2.4 *Starting the Work*

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

2.5 *Before Starting Construction*

- A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), Contractor shall submit to Engineer for timely review:
  - 1. a preliminary Progress Schedule;
  - 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.

2.6 *Preconstruction Conference*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, Agency, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.05.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.

2.7 *Initial Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference attended by Contractor, Engineer, and others as appropriate will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.05.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.
  - 1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work nor interfere with or relieve Contractor from Contractor's full responsibility therefore.
  - 2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
  - 3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

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

### 3.1 *Intent*

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

### 3.2 *Reference Standards*

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

### 3.3 *Reporting and Resolving Discrepancies*

#### F. Reporting Discrepancies

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

#### G. Resolving Discrepancies

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

#### *3.4 Amending and Supplementing Contract Documents*

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

#### *3.5 Reuse of Documents*

- J. Contractor and any Subcontractor or Supplier shall not:
  1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or Engineer's consultants, including electronic media editions; or
  2. reuse any of 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 adaption by Engineer.
- K. The prohibition of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

#### *3.6 Electronic Data*

- L. Copies of data furnished by Owner or Engineer to Contractor or Contractor to Owner or Engineer that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.
- M. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party.

- N. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

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

**4.1**      *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. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in Owner's furnishing the Site or a part thereof, Contractor may make a Claim therefore as provided in Paragraph 10.05.
- B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

**4.2**      *Subsurface and Physical Conditions*

- A. *Reports and Drawings:* The Supplementary Conditions identify:
1. those reports of explorations and tests of subsurface conditions at or contiguous to the Site that Engineer has used in preparing the Contract Documents; and
  2. those drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) that Engineer has used in preparing the Contract Documents.
- B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their Related Entities with respect to:
1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or
  2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
  3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information.

#### 4.3 *Differing Subsurface or Physical Conditions*

A. *Notice:* If Contractor believes that any subsurface or physical condition at or contiguous to the Site that is uncovered or revealed either:

1. is of such a nature as to establish that any “technical data” on which Contractor is entitled to rely as provided in Paragraph 4.02 is materially inaccurate; or
2. is of such a nature as to require a change in the Contract Documents; or
3. differs materially from that shown or indicated in the Contract Documents; or
4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

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

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

C. *Possible Price and Times Adjustments*

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor’s cost of, or time required for, performance of the Work; subject, however, to the following:
  - a. such condition must meet any one or more of the categories described in Paragraph 4.03.A; and
  - b. with respect to Work that is paid for on a Unit Price Basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.07 and 11.03.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:
  - a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or
  - b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor’s making such final commitment; or
  - c. Contractor failed to give the written notice as required by Paragraph 4.03.A.
3. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefore as provided in Paragraph 10.05. However, Owner and Engineer, and any of their Related Entities shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of

engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

#### 4.4 *Underground Facilities*

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

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

B. *Not Shown or Indicated*

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

#### 4.5 *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.

4.6 *Hazardous Environmental Condition at Site*

- A. *Reports and Drawings:* Reference is made to the Supplementary Conditions for the identification of those reports and drawings relating to a Hazardous Environmental Condition identified at the Site, if any, that have been utilized by the Engineer in the preparation of the Contract Documents.
- B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the general accuracy of the “technical data” contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such “technical data” is identified in the Supplementary Conditions. Except for such reliance on such “technical data,” Contractor may not rely upon or make any claim against Owner or Engineer, or any of their Related Entities with respect to:
  - 1. the completeness of such reports and drawings for Contractor’s purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or
  - 2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
  - 3. any Contractor interpretation of or conclusion drawn from any “technical data” or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.
- D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any.
- E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered to Contractor written notice: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, either party may make a Claim therefore as provided in Paragraph 10.05.
- F. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim



therefore as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 7.

- G. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- H. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06. H shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- I. The provisions of Paragraphs 4.02, 4.03, and 4.04 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

## **ARTICLE 5 – BONDS AND INSURANCE**

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

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

### **5.2      *Licensed Sureties and Insurers***

- A. All bonds and insurance required by the Contract Documents to be purchased and maintained by Owner or Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized in the

jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

### 5.3 *Certificates of Insurance*

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

### 5.4 *Contractor's Liability Insurance*

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

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

#### 5.5 *Owner's Liability Insurance*

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

#### 5.6 *Property Insurance*

- A. Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (Contractor shall be responsible for any deductible or self-insured retention.). This insurance shall:
  1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, partners, employees, agents, consultants and subcontractors of any of them, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured;
  2. be written on a Builder's Risk "all-risk" or open peril or special causes of loss policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage (other than caused by flood), and such other perils or causes of loss as may be specifically required by the Supplementary Conditions;
  3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);

4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;
  5. allow for partial utilization of the Work by Owner;
  6. include testing and startup; and
  7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other additional insured to whom a certificate of insurance has been issued.
- B. Contractor shall purchase and maintain such boiler and machinery insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured.
- C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with Paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 5.07.
- D. Owner shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.06 to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.

#### 5.7 *Waiver of Rights*

- A. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or additional insureds thereunder. Owner and Contractor waive all rights against each other and their respective officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insured or additional insured (and the officers, directors, 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 Contractor as trustee or otherwise payable under any policy so issued.
- B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them for:

1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and
  2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.
- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them.

#### 5.8 *Receipt and Application of Insurance Proceeds*

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

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

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

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

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

## ARTICLE 6 – CONTRACTOR’S RESPONSIBILITIES

### 6.1 *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. Contractor shall not be responsible for the negligence of Owner or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances. The superintendent will be Contractor’s representative at the Site and shall have authority to act on behalf of Contractor. All communications given to or received from the superintendent shall be binding on Contractor.

### 6.2 *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. Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without Owner’s written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.

### 6.3 *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.
- B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.
- C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

### 6.4 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.07 as it may be adjusted from time to time as provided below.
  - 1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.07) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

#### 6.5 *Substitutes and “Or-Equals”*

A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or “or-equal” item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.

1. *“Or-Equal” Items:* If in Engineer’s sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an “or-equal” item, in which case review and approval of the proposed item may, in Engineer’s sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:

a. in the exercise of reasonable judgment Engineer determines that:

- 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
- 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;
- 3) it has a proven record of performance and availability of responsive service; and

b. Contractor certifies that, if approved and incorporated into the Work:

- 1) there will be no increase in cost to the Owner or increase in Contract Times, and
- 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

#### 2. Substitute Items

a. If in Engineer’s sole discretion an item of material or equipment proposed by Contractor does not qualify as an “or-equal” item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.

b. Contractor shall submit sufficient information as provided below to allow Engineer to determine that the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefore. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.

c. The procedure requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented in the General Requirements and as Engineer may decide is appropriate under the circumstances.

- d. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:
- 1) shall certify that the proposed substitute item will:
    - will perform adequately the functions and achieve the results called for by the general design,
    - be similar in substance to that specified, and
    - be suited to the same use as that specified;
  - 2) will state:
    - the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time;
    - whether or not 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
    - whether or not incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;
  - 3) will identify:
    - all variations of the proposed substitute item from that specified, and
    - available engineering, sales, maintenance, repair, and replacement services;
  - 4) and shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change.
- B. *Substitute Construction Methods or Procedures:* If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.
- C. *Engineer's Evaluation:* Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by either a Change Order for a substitute or an approved Shop Drawing for an "or equal." Engineer will advise Contractor in writing of any negative determination.
- D. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- E. *Engineer's Cost Reimbursement:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B. Whether or not Engineer approves a substitute item so proposed or submitted by Contractor, Contractor shall reimburse Owner for the charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the charges



of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

- F. *Contractor's Expense:* Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.

6.6 *Concerning Subcontractors, Suppliers, and Others*

- A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Owner as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.
- B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Engineer to reject defective Work.
- C. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:
1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity, nor
  2. shall anything in the Contract Documents create any obligation on the part of Owner or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.
- D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.
- E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.
- F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer. Whenever any such agreement is with a Subcontractor or Supplier who is listed as an additional insured on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the

Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner, Contractor, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

#### 6.7 *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, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

#### 6.8 *Permits*

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

#### 6.9 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work. However, it shall not be Contractor's primary responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.
- C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

6.10 *Taxes*

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

6.11 *Use of Site and Other Areas*

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

1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.
  2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.
  3. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.
- B. *Removal of Debris During Performance of the Work:* During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.
- C. *Cleaning:* Prior to Substantial Completion of the Work, Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.
- D. *Loading Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

6.12 *Record Documents*

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

#### 6.13 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:
  - 1. all persons on the Site or who may be affected by the Work;
  - 2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
  - 3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.
- C. All damage, injury, or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or , 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).
- D. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

#### 6.14 *Safety Representative*

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

#### 6.15 *Hazard Communication Programs*

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

#### 6.16 *Emergencies*

- A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer

determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

6.17 *Shop Drawings and Samples*

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

1. *Shop Drawings*

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

2. *Samples*

- a. Submit number of Samples specified in the Specifications.
- b. Clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 6.17.D.

- B. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. *Submittal Procedures*

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

specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.

*D. Engineer's Review*

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1.

*E. Resubmittal Procedures*

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

6.18 *Continuing the Work*

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

6.19 *Contractor's General Warranty and Guarantee*

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

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

#### 6.20 *Indemnification*

- A. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, 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 respective consultants, agents, officers, directors, partners, or employees by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- C. The indemnification obligations of Contractor under Paragraph 6.20.A shall not extend to the liability of Engineer and Engineer's officers, directors, partners, employees, agents, consultants and subcontractors arising out of:
  1. the preparation or approval of, or the failure to prepare or approve, maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
  2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

#### 6.21 *Delegation of Professional Design Services*

- A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable law.

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

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

### **7.1 *Related Work at Site***

- A. Owner may perform other work related to the Project at the Site with Owner's employees, or via other direct contracts therefore, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:
  - 1. written notice thereof will be given to Contractor prior to starting any such other work; and
  - 2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefore as provided in Paragraph 10.05.
- B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and shall properly coordinate the Work with theirs. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering their work and will only cut or alter their work with the written consent of Engineer and the others whose work will be affected. The duties and responsibilities of Contractor under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Owner and such utility owners and other contractors.
- C. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 7, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.



## 7.2 *Coordination*

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

## 7.3 *Legal Relationships*

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

# **ARTICLE 8 – OWNER'S RESPONSIBILITIES**

## 8.1 *Communications to Contractor*

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

## 8.2 *Replacement of Engineer*

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

## 8.3 *Furnish Data*

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

## 8.4 *Pay When Due*

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

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

- A. Owner's duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. Paragraph 4.02 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of subsurface conditions and drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site that have been utilized by Engineer in preparing the Contract Documents.

8.6 *Insurance*

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

8.7 *Change Orders*

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

8.8 *Inspections, Tests, and Approvals*

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

8.9 *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.

8.10 *Undisclosed Hazardous Environmental Condition*

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

8.11 *Evidence of Financial Arrangements*

- A. If and to the extent Owner has agreed to furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents, Owner's responsibility in respect thereof will be as set forth in the Supplementary Conditions.

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

9.1 *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 Documents and will not be changed without written consent of Owner and Engineer.

9.2 *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 9.09. Particularly, but without limitation, during or as a result of Engineer's visits or

observations of Contractor's Work Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

9.3 *Project Representative*

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

9.4 *Authorized Variations in Work*

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

9.5 *Rejecting Defective Work*

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

9.6 *Shop Drawings, Change Orders and Payments*

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

9.7 *Determinations for Unit Price Work*

- A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of Paragraph 10.05.

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

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

9.9 *Limitations on Engineer's Authority and Responsibilities*

- A. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.
- B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 14.07.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with the Contract Documents.
- E. The limitations upon authority and responsibility set forth in this Paragraph 9.09 shall also apply to the Resident Project Representative, if any, and assistants, if any.

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

10.1 *Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Owner may, subject to written approval by Agency at any time or from time to time, order additions, deletions, or revisions in the Work by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed

with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

- B. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefore as provided in Paragraph 10.05.

#### 10.2 *Unauthorized Changes in the Work*

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

#### 10.3 *Execution of Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders recommended by Engineer covering:
  - 1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.01.A, (ii) required because of acceptance of defective Work under Paragraph 13.08.A or Owner's correction of defective Work under Paragraph 13.09, or (iii) agreed to by the parties;
  - 2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and
  - 3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Engineer pursuant to Paragraph 10.05; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the Progress Schedule as provided in Paragraph 6.18.A.

#### 10.4 *Notification to Surety*

- A. If notice 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) is required by the provisions of any bond to be given to a surety, the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

#### 10.5 *Claims*

- A. *Engineer's Decision Required:* All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.
- B. *Notice:* Written notice stating the general nature of each Claim shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data shall be delivered to the Engineer and the other party to the Contract within 60 days after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract Time shall be prepared in accordance with the provisions of Paragraph 12.02.B. Each Claim shall be

accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to Engineer and the claimant within 30 days after receipt of the claimant's last submittal (unless Engineer allows additional time).

- C. *Engineer's Action:* Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:
  - 1. deny the Claim in whole or in part,
  - 2. approve the Claim, or
  - 3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer's sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.
- D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.
- E. Engineer's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial.
- F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.05.

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

### **11.1 *Cost of the Work***

- A. *Costs Included:* The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items, and shall not include any of the costs itemized in Paragraph 11.01.B.
  - 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 at the Site. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.
  - 2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates and refunds

and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.

3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.01.
4. Costs of special consultants (including but not limited to Engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
5. Supplemental costs including the following:
  - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
  - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
  - c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.
  - d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, imposed by Laws and Regulations.
  - e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
  - f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 5.06.D), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.
  - g. The cost of utilities, fuel, and sanitary facilities at the Site.
  - h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, expressages, and similar petty cash items in connection with the Work.
  - i. The cost of premiums for all bonds and insurance Contractor is required by the Contract Documents to purchase and maintain.

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

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

## 11.2 *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*
1. Contractor agrees that:
    - a. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
    - b. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.



C. *Contingency Allowance*

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

11.3 *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. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of Paragraph 9.07.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- D. Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 if:
  1. the Bid price of a particular item of Unit Price Work amounts to more than 5 percent of the Contract Price and the variation in the quantity of that particular item of Unit Price Work performed by Contractor differs by more than 25 percent from the estimated quantity of such item indicated in the Agreement; and
  2. there is no corresponding adjustment with respect to any other item of Work; and
  3. Contractor believes that Contractor is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

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

12.1 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.
- B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:
  1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or
  2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or

3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).

C. Contractor's Fee: The Contractor's fee for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or
2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
  - a. for costs incurred under Paragraphs 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be 15 percent;
  - b. for costs incurred under Paragraph 11.01.A.3, the Contractor's fee shall be five percent;
  - c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraph 12.01.C.2.a is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under Paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;
  - d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;
  - e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and
  - f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

## 12.2 *Change of Contract Times*

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

## 12.3 *Delays*

- A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefore as provided in Paragraph 12.02.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.

- B. If Owner, Engineer, or other contractors or utility owners performing other work for Owner as contemplated by Article 7, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- C. If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of God, acts or failures to act of utility owners not under the control of Owner, or other causes not the fault of and beyond control of Owner and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays described in this Paragraph 12.03.C.
- D. Owner, Engineer and the Related Entities of each of them shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of Engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.
- E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

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

#### **13.1     *Notice of Defects***

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

#### **13.2     *Access to Work***

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

#### **13.3     *Tests and Inspections***

- A. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.
- B. Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:
  - 1. for inspections, tests, or approvals covered by Paragraphs 13.03.C and 13.03.D below;
  - 2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in said Paragraph 13.04.C; and
  - 3. as otherwise specifically provided in the Contract Documents.

- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.
- D. Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.
- E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, it must, if requested by Engineer, be uncovered for observation.
- F. Uncovering Work as provided in Paragraph 13.03.E shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.

#### 13.4 *Uncovering Work*

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

#### 13.5 *Owner May Stop the Work*

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

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

- A. Promptly after receipt of notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it

with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).

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

### 13.7 *Correction Period*

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

### 13.8 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner (and, prior to Engineer's recommendation of final payment, Engineer) prefers to accept it, Owner may do so. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers,

architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness) and the diminished value of the Work to the extent not otherwise paid by Contractor pursuant to this sentence. If any such acceptance occurs prior to Engineer's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefore as provided in Paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner.

#### 13.9 *Owner May Correct Defective Work*

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

### **ARTICLE 14 – PAYMENTS TO CONTRACTOR AND COMPLETION**

#### 14.1 *Schedule of Values*

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

#### 14.2 *Progress Payments*

##### *A. Applications for Payments*

- 1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled

out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

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

*B. Review of Applications*

1. Engineer will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Owner or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations on the Site of the executed Work as an experienced and qualified design professional and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:
  - a. the Work has progressed to the point indicated;
  - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, to the results of any subsequent tests called for in the Contract Documents, to a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, and to any other qualifications stated in the recommendation); and
  - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
  - a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract Documents; or
  - b. that there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.
4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:

- a. to supervise, direct, or control the Work, or
  - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or
  - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or
  - d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or
  - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:
- a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;
  - b. the Contract Price has been reduced by Change Orders;
  - c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or
  - d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

*C. Payment Becomes Due*

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

*D. Reduction in Payment*

1. Owner may refuse to make payment of the full amount recommended by Engineer because:
- a. claims have been made against Owner on account of Contractor's performance or furnishing of the Work;
  - b. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;
  - c. the Contractor's performance or furnishing of the Work is inconsistent with funding Agency requirements;
  - d. there are other items entitling Owner to a set-off against the amount recommended; or



- e. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.c or Paragraph 15.02.A.
- 2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, when Contractor corrects to Owner's satisfaction the reasons for such action.
- 3. If it is subsequently determined that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.02.C.1.

#### 14.3 *Contractor's Warranty of Title*

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

#### 14.4 *Substantial Completion*

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

#### 14.5 *Partial Utilization*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions.
  - 1. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor will certify to Owner and Engineer that such part of the Work is substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
  - 2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready for its intended use and substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
  - 3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefore. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
  - 4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 5.10 regarding property insurance.

#### 14.6 *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, Agency, and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

#### 14.7 *Final Payment*

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

- 1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance certificates of inspection, marked-up record documents (as provided in Paragraph 6.12), and other documents, Contractor may make application for final payment following the procedure for progress payments.
- 2. The final Application for Payment shall be accompanied (except as previously delivered) by:
  - a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.04.B.7;
  - b. consent of the surety, if any, to final payment;
  - c. a list of all Claims against Owner that Contractor believes are unsettled; and

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

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

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

*C. Payment Becomes Due*

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

14.8 *Final Completion Delayed*

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

14.9 *Waiver of Claims*

- A. The making and acceptance of final payment will constitute:
  - 1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and

2. a waiver of all Claims by Contractor against Owner other than those previously made in accordance with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.

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

### **15.1     *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 notice in writing to Contractor and Engineer which will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be granted an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if Contractor makes a Claim therefore as provided in Paragraph 10.05.

### **15.2     *Owner May Terminate for Cause***

- A. The occurrence of any one or more of the following events will justify termination for cause:
  1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);
  2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;
  3. Contractor's disregard of the authority of Engineer; or
  4. Contractor's violation in any substantial way of any provisions of the Contract Documents.
- B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:
  1. exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion),
  2. incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and
  3. complete the Work as Owner may deem expedient.
- C. If Owner proceeds as provided in Paragraph 15.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this Paragraph Owner shall not be required to obtain the lowest price for the Work performed.
- D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.

- E. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.
- F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.02.B, and 15.02.C.

#### 15.3 *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;
  - 3. all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and
  - 4. reasonable expenses directly attributable to termination.
- B. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

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

- A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (iii) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Paragraph 15.03.
- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this Paragraph 15.04 are not intended to preclude Contractor from making a Claim under Paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this Paragraph.

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

#### 16.1 *Methods and Procedures*

- A. Owner and Contractor may mutually request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.05 before such decision becomes final and binding. The mediation will be governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective

Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association. Timely submission of the request shall stay the effect of Paragraph 10.05.E.

- B. Owner and Contractor shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.
- C. If the claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:
  - 1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions, or
  - 2. agrees with the other party to submit the Claim to another dispute resolution process, or
  - 3. gives written notice to the other party of their intent to submit the Claim to a court of competent jurisdiction.

## **ARTICLE 17 – MISCELLANEOUS**

### **17.1     *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 to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or
  - 2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

### **17.2     *Computation of Times***

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

### **17.3     *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 Documents. The provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

### **17.4     *Survival of Obligations***

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

17.5 *Controlling Law*

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

17.6 *Headings*

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

## Section 00810 - Supplementary Conditions

### Table of Contents

SC-1.01.A.4	Application for Payment.	99
SC-1.01.A.10	Change Order .....	<b>99</b>
SC-1.01.A.43	Site .....	99
SC-2.01.B	Delivery of Bonds and Evidence of Insurance .....	99
SC-2.02	Copies of Documents.....	99
SC-2.05.A.3	Preliminary Schedules .....	99
SC-4.01	Availability of Lands .....	99
SC-4.02	Subsurface and Physical Conditions.....	99
SC-4.03.A	Differing Subsurface or Physical Conditions .....	100
SC-4.04.B.1	Underground Facilities – Not Shown or Indicated .....	100
SC-4.04.B.2	Underground Facilities – Not Shown or Indicated .....	100
SC-4.05	Reference Points .....	100
SC-4.06	Hazardous Environmental Conditions .....	100
SC-5.02	Licensed Sureties and Insurers.....	100
SC-5.03	Certificates of Insurance .....	100
SC-5.04	Contractor's Liability Insurance .....	101
SC-5.05	Owner's Liability Insurance .....	101
SC-5.06	Property Insurance .....	101
SC-5.07	Waiver of Rights .....	101
SC-5.09	Acceptance of Bonds and Insurance; Option to Replace .....	102
SC-6.02	Labor; Working Hours.....	102
SC-6.03	Services Materials and Equipment.....	102
SC-6.06	Concerning Subcontractors, Suppliers, and Others .....	102
SC-6.08	Permits .....	102
SC-6.10	Taxes.....	102
SC-6.13	Safety and Protection.....	103
SC-6.17	Shop Drawings and Samples .....	103
SC-7.01.A.2	Related Work at Site.....	103
SC-8	Owner's Responsibilities .....	103
SC-9	Engineer's Status During Construction .....	103
SC-10.05.B	Notice of Claim .....	105
SC-11.02	Allowances.....	105
SC-11.03	Unit Price Work.....	105
SC-13.03	Tests and Inspections .....	105
SC-14	Payment to Contractor and Completion .....	105
SC-15.04	Contractor May Stop Work or Terminate .....	106
SC-16	Dispute Resolution.....	106
SC-17.01	Giving Notice .....	106
SC-17.07	Fill on Private Land .....	106
SC-17.08	Operation of Existing Facilities.....	106
SC-17.09	Noise Control .....	106
SC-17.10	Vehicle Idling Policy .....	106



## **SUPPLEMENTARY CONDITIONS**

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract (No. C-710, 2002 Edition) and other provisions of the Contract Documents as indicated below. All provisions which are not so amended or supplemented remain in full force and effect.

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

### **SC-1.01.A.4 Application for Payment**

Add the following language to the end of Paragraph 1.01.A.4:

The Application for Payment form to be used on this project is EJCDC No. C-620. The Agency must approve all Applications for Payment before payment is made.

### **SC-1.01.A.10 Change Order**

Add the following language to the end of Paragraph 1.01.A.10:

The Change Order form to be used on this project is EJCDC No. C-941. The Agency must approve all Change Orders before they become effective.

### **SC-1.01.A.43 Site**

Add the following language after the first sentence of Paragraph 1.01.A.43:

The term "Site" may include locations within public streets wherein the OWNER'S utility plant is to be constructed and/or replaced.

### **SC-2.01.B Delivery of Bonds and Evidence of Insurance**

Delete Paragraph 2.01.B in its entirety and insert the following in its place:

B. Evidence of Insurance: Before any Work at the Site is started, Contractor shall deliver to the Owner, with copies for each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which any additional insured may reasonably request) which Contractor is required to purchase and maintain in accordance with Article 5.

### **SC-2.02 Copies of Documents**

Delete Paragraph 2.02.A in its entirety and insert the following in its place:

A. Owner shall furnish to Contractor One printed or hard copy of the Drawings and Project Manual and one set in electronic format. Additional copies will be furnished upon request at the cost of reproduction.

### **SC-2.05.A.3 Preliminary Schedules**

Delete Paragraph 2.05.A.3 in its entirety and substitute the following:

3. A preliminary Schedule of Values is required for each lump sum item of the Work for which partial payment may be requested. Each required Schedule of Values shall include quantities and prices of items which when added together equal the Lump Sum Price for that item 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.

#### **SC-4.01      Availability of Lands**

Delete Paragraphs GC-4.01.C in its entirety and insert the following:

C. The CONTRACTOR shall provide at his own expense and without liability to the OWNER any land and access thereto that the CONTRACTOR may desire for temporary construction facilities, or for storage of materials and equipment.

#### **SC-4.02      Subsurface and Physical Conditions,**

Delete Paragraphs 4.02.A and 4.02.B in their entirety and insert the following:

A. No reports of explorations or tests of subsurface conditions at or contiguous to the Site are known to the Owner or Engineer.

#### **SC-4.03.A    Differing Subsurface or Physical Conditions**

Delete Paragraphs 4.03.A in its entirety and insert the following:

A Notice: If Contractor believes that any subsurface or physical condition at or contiguous to the Site that is uncovered or revealed is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

#### **SC-4.04.B.1   Underground Facilities – Not Shown or Indicated**

Amend the first sentence of Paragraph 4.04.B.1 to read as follows:

If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated in the Contract Documents, Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer.

#### **SC-4.04.B.2   Underground Facilities - Not Shown or Indicated**

Amend the second sentence of Paragraph 4.04.B.2 to read as follows:

An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated.

#### **SC-4.05      Reference Points**

Delete the first sentence of paragraph A in its entirety. Modify the second sentence to read as follows:

Contractor shall be responsible for laying out the Work, shall protect and preserve any established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner.

#### **SC-4.06      Hazardous Environmental Condition**

Delete Paragraphs 4.06.A and 4.06.B in their entirety and insert the following:

A. No reports or drawings related to Hazardous Environmental Conditions are known to Owner or Engineer.

B. Not Used.

## **SC-5.02 Licensed Sureties and Insurers**

Modify the first sentence of paragraph A by deleting the words: “Owner or”.

## **SC-5.03 Certificates of Insurance**

SC-5.03.A: Delete paragraph 5.03.A in its entirety and substitute the following:

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

SC-5.03.B: Delete paragraph 5.03.B in its entirety and substitute the following:

B. Failure of Owner to demand such certificates or other evidence of full compliance with these insurance requirements or failure of Owner to identify a deficiency from evidence provided shall not be construed as a waiver of Contractor’s obligation to maintain such insurance.

SC-5.03.C: Add the following new paragraph immediately after Paragraph 5.03.B:

C. By requiring such insurance and insurance limits herein, Owner does not represent that coverage and limits will necessarily be adequate to protect Contractor, and such coverage and limits shall not be deemed as a limitation on Contractor’s liability under the indemnities granted to Owner in the Contract Documents.

## **SC-5.04 Contractor’s Liability Insurance**

SC-5.04.A: Delete paragraph 5.04.A in its entirety and substitute the following:

A. Contractor shall purchase and maintain such liability and other insurance as is appropriate for the Work being performed and as required by the Supplemental Conditions, and as will provide protection from claims set forth below which may arise out of or result from Contractor’s performance of the Work and Contractor’s other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:

SC-5.04.B.7: Amend the duration of coverage in this paragraph SC-5.04.B.7 to be at least three years.

SC-5.04.C: Add the following new paragraph immediately after Paragraph 5.04.B:

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

1. Workers’ Compensation, and related coverages under Paragraphs 5.04.A.1 and A.2 of the General Conditions:
  - a. State of Maine Statutory
  - b. Applicable Federal: Statutory
  - c. Employers Liability: \$2,000,000
2. Contractor’s General Liability under Paragraphs 5.04.A.3 through A.6 of the General Conditions which shall include completed operations and product liability coverages and eliminate the exclusion with respect to property under the care, custody and control of Contractor:
  - a. General Aggregate: \$2,000,000
  - b. Products – Completed Operations Aggregate: 2,000,000

- c. Personal and Advertising Injury: \$2,000,000
  - d. Each Occurrence (Bodily Injury and Property Damage): \$1,000,000
  - e. Property Damage liability insurance will provide Explosion, Collapse, and Under-ground coverages where applicable.
  - f. Excess or Umbrella Liability
    - 1) General Aggregate \$1,000,000
    - 2) Each Occurrence \$1,000,000
3. Automobile Liability under Paragraph 5.04.A.6 of the General Conditions:
- a. Bodily Injury:
    - Each person \$1,000,000
    - Each Accident \$1,000,000
  - b. Property Damage:
    - Each Accident \$1,000,000
  - c. Combined Single Limit of \$2,000,000
4. The Contractual Liability coverage required by Paragraph 5.04.B.4 of the General Conditions shall provide coverage for not less than the following amounts:
- a. Bodily Injury:
    - Each Accident \$1,000,000
    - Annual Aggregate \$2,000,000
  - b. Property Damage:
    - Each Accident \$1,000,000
    - Annual Aggregate \$2,000,000
5. Additional insureds shall include: The Portland Water District.

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

Delete Paragraph 5.05 in its entirety.

#### **SC-5.06 Property Insurance**

Delete Paragraph 5.06 in its entirety.

#### **SC-5.07 Waiver of Rights**

Delete paragraphs GC-5.07.B and GC-5.07.C in their entirety. (The terms of the District's insurance policies require that it transfer its rights of recovery against another party to the District's insurer.)

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

Delete paragraph GC-5.09 in its entirety.

#### **SC6.02 Labor; Working Hours**

Insert the following Paragraph in their entirety directly after 6.02.B

C. If the Contractor must Work beyond the regular Work week at anytime, all expenses, including labor costs, of the Engineer and personnel required for inspection or observation shall be deducted monthly from any sums due or which

shall become due to the Contractor. A regular work week is defined as 40 hours commencing 7:00 AM and ending at 4:00 PM, Monday through Friday.

### **SC-6.03 Services Materials and Equipment**

Insert the following Paragraphs in their entirety directly after 6.02.C

D. Materials and equipment shall be so stored as to insure the preservation of their quality and fitness for the Work. Stored materials and equipment to be incorporated in the Work shall be located so as to facilitate prompt inspection.

E. No Chattel Mortgages: Materials, supplies, or equipment to be incorporated into the Work shall not be purchased by the Contractor or the Subcontractor subject to a chattel mortgage or under a conditional sale Contract or other agreement by which an interest is retained by the seller.

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

SC-6.06.B: Delete paragraph 6.06.B in its entirety and substitute the following:

B. Within 5 days of the Bid opening and before the Notice of Award, the apparent Successful Bidder is required to identify all Subcontractors, Suppliers, or other individuals or entities that will supply a work value equal to or greater than 10% of the total contract value, for acceptance by Owner.

1. Owner's acceptance will be indicated by issuance of a Notice of Award to the Contractor. Owner's objections if any, to any listed Subcontractors, Suppliers, or other individuals or entities will be communicated in writing to the apparent Successful Bidder.

2. Owner's acceptance of any Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. In the event that the Owner rejects a Subcontractor, Supplier, or other individual or entity, either before the Notice of Award, or after execution of the Agreement, the Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Engineer to reject defective Work.

SC-6.06.H. Add a new paragraph immediately after Paragraph 6.06.G:

H. Owner or Engineer 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 a particular Subcontractor or Supplier.

SC-6.06.I. Add a new paragraph immediately after Paragraph 6.06.H:

I. The Contractor shall not award Work to Subcontractor(s) in excess of fifty (50) percent of the Contract Price without prior written approval of the Owner.

### **SC-6.10 Taxes**

Add a new paragraph immediately after Paragraph 6.10.A:

B. Owner is exempt from payment of sales and compensating use taxes of the State of Maine and of cities and counties thereof on all materials to be incorporated into the Work.

1. Owner will furnish the required certificates of tax exemption to Contractor for use in the purchase of equipment, supplies and materials to be physically incorporated into the Work such that they become a part of the real estate.

2. Owner's exemption does not apply to construction tools, machinery, equipment, or other property purchased by or leased by Contractor, or to supplies or materials consumed in, but not incorporated into, the Work.

### **SC-6.13 Safety and Protection**

Add a new paragraph immediately after Paragraph 6.13.D:

E. Confined Space and Lock-out/Tag-out programs: The Contractor is advised that the Owner has clearly established on-going Confined Space and Lock-out/Tag-out programs. Where the Contractor's Work requires confined space entry into existing facilities and/or lock-out/tag-out of existing equipment and electrical controls, the Contractor shall strictly abide by the Owner's programs if they are more stringent than the Contractor's own procedures.

### **SC-6.17 Shop Drawings and Samples**

SC 6.17.B Delete paragraph GC-6.17.B in its entirety and insert the following in its place:

B. Portions of the Work requiring a Shop Drawing or sample submission shall not begin until the Shop Drawing or submission has been approved by the Engineer. 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 all pertinent submittals will be at the sole risk, expense and responsibility of Contractor.

SC-6.17.C.4 Add the following paragraph after paragraph SC-6.17.C.3:

4. Each submittal shall be cataloged and identified individually according to the specification section, paragraph, sub paragraph, etc. to which it pertains. Submittals from various specifications shall not be grouped into one submittal pertaining to a larger piece of the Work or the work of a single supplier. For example, submittals for pumps, pipe of various types and fittings that are specified in separate sections of the Contract Documents may not be cataloged and identified as a single submittal pertaining to a pump station or other facility, or as a submittal from a single supplier.

SC-6.17.F: Add the following new paragraphs immediately after Paragraph 6.17.E:

F. Contractor shall furnish required submittals with sufficient information and accuracy in order to obtain required approval of an item with no more than three submittals. Engineer will record Engineer's time for reviewing subsequent submittals of Shop Drawings, samples or other items requiring approval and Contractor shall reimburse Owner for Engineer's charges for such time.

SC-6.17.G: Add the following new paragraphs immediately after new Paragraph 6.17.F:

G. In the event that Contractor requests a substitution for a previously approved item, Contractor shall reimburse Owner for Engineer's charges for such time unless the need for such substitution is beyond the control of Contractor.

SC-6.19.B: Contractor's General Warranty and Guarantee

Delete Paragraphs B, B.1 and B.2 in their entirety and substitute the following:

B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, modification, or improper maintenance or operation by persons or entities for whom the Contractor is not responsible; or
2. normal wear and tear under normal usage that occurs after Substantial Completion.

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### **SC-7.01.A.2 Related Work at Site**

Delete GC-7.01.A.2 in its entirety.

### **SC-8 Owner's Responsibilities**

Delete Paragraphs 8.04, 8.05, 8.06, 8.07, 8.08, 8.10 and 8.11 in their entirety and substitute the following:

8.04 Several of the Owner's responsibilities described in various Articles of the General Conditions have been modified by various Supplemental Conditions that will not be specifically enumerated here. Full review of the Supplemental Conditions is necessary to a full understanding of the Owner's Responsibilities under this contract.

## **SC-9 Engineer's Status during Construction**

### **SC-9.01 Owner's Representative**

Delete Paragraph 9.01.A in its entirety and substitute the following:

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

### **SC-9.03 Project Representative**

Delete Paragraph 9.03.A in its entirety and substitute the following:

A. Owner will furnish a Resident Project Representative to assist Engineer in providing more extensive observation of the Work. The authority and responsibilities of any such Resident Project Representative and assistants will be as provided in the following paragraph SC-9.03.B, and limitations on the responsibilities thereof will be as provided in General Condition Paragraph 9.09.

B. Duties, Responsibilities and Limitations of Authority of Resident Project Representative.

#### **1. General**

- a. Resident Project Representative is Owner's agent, will act as directed by and under the supervision of ENGINEER, and will confer with ENGINEER regarding his actions. Resident Project Representative's dealings in matters pertaining to the on-site work shall in general be only with ENGINEER and Contractor(s), and dealings with subcontractor(s) shall only be through or with the full knowledge of Contractor(s).
- b. Resident Project Representative services shall be provided as the progress of construction necessitates.

#### **2. Duties and Responsibilities - Resident Project Representative will:**

- a. Schedules: Review the progress schedule, schedule of Shop Drawing submissions and schedule of values prepared by Contractor(s) and consult with ENGINEER concerning their acceptability.
- b. Conference: Attend preconstruction conferences. Arrange a schedule of progress meetings and other job conferences, as required, in consultation with ENGINEER and notify those expected to attend in advance. Attend meetings and maintain and circulate copies of minutes thereof.
- c. Liaison: Serve as ENGINEER's liaison with Contractor(s), working principally through Contractor(s)' superintendent.
- d. Shop Drawings and Samples:
  - 1) Receive samples which are furnished at the site by Contractor(s), and notify ENGINEER of their availability for examination.
  - 2) Advise ENGINEER and Contractor(s) or its superintendent immediately of the commencement of any work requiring a Shop Drawing or sample submission, if the submission has not been approved by ENGINEER.
- e. Review of Work, Rejection of Defective Work, Inspections and Tests:
  - 1) Conduct on-site observations of the work in progress to assist ENGINEER in determining if the work is proceeding in accordance with the Contract Documents and that completed work will conform to the Contract Documents.
  - 2) Report to ENGINEER whenever he/she believes that any work is unsatisfactory, faulty or defective or does not conform to the Contract Documents, or does not meet the requirements of any inspections, tests or approval required to be made or has been damaged prior to final payment; and advise ENGINEER when he believes work should be corrected or rejected or should be uncovered for observation, or requires special testing, inspection or approval.
  - 3) Verify that tests, equipment and system(s) startup(s) and operating and maintenance inspections are conducted as required by the Contract Documents and in presence of the required personnel, and that Contractor(s) maintains adequate records thereof; observe, record and report to ENGINEER appropriate details relative to the test procedures and startup(s).
  - 4) Accompany visiting inspectors representing public or other agencies having jurisdiction over the Project, record the outcome of these inspections and report to ENGINEER.

- f. Interpretation of Contract Documents: Transmit to Contractor(s) ENGINEER's clarifications and interpretations of the Contract Documents.
- g. Modifications: Consider and evaluate Contractor(s)' suggestions for modifications in Drawings or Specifications and report them with recommendations to ENGINEER.
- h. Records:
- 1) Maintain at the job site orderly files for correspondence, reports of job conferences, Shop Drawings and samples submissions, reproductions of original Contract Documents including all Addenda, change orders, field orders, additional Drawings issued subsequent to the execution of the contract(s), ENGINEER's clarifications and interpretations of the Contract Documents, progress reports, and other Project related documents.
  - 2) Keep a diary or log book, recording hours on the job site, weather conditions, data relative to questions of extras or deductions, list of visiting officials and representatives of manufacturers, fabricators, suppliers and distributors, daily activities, decisions, observations in general and specific observations in more detail as in the case of observing test procedures. Send copies to ENGINEER.
  - 3) Record names, addresses and telephone numbers of all Contractors, subcontractors and major suppliers of materials and equipment.
- i. Reports:
- 1) Furnish ENGINEER periodic reports as required of progress of the work and Contractor(s)' compliance with the approved progress schedule and schedule of Shop Drawing submissions.
  - 2) Consult with ENGINEER in advance of scheduled major tests, inspections or start of important phases of the work.
  - 3) Report immediately to ENGINEER upon the occurrence of any accident.
- j. Payment Requisitions: Review applications for payment with Contractor(s) for compliance with the established procedure for their submission and forward them with recommendations to ENGINEER, noting particularly their relation to the schedule of values, work completed and materials and equipment delivered at the site but not incorporated in the work.
- k. Certificates, Maintenance and Operation Manuals: During the course of the work, verify that certificates, maintenance and operation manuals and other data required to be assembled and furnished by Contractor(s) are applicable to the items actually installed; and deliver this material to ENGINEER for its review and forwarding to OWNER prior to final acceptance of the work.
- l. Completion:
- 1) Before ENGINEER issues a Certificate of Substantial Completion, submit to Contractor(s) a list of observed items requiring completion or correction.
  - 2) Conduct final inspection in the company of ENGINEER, OWNER and Contractor(s) and prepare a final list of items to be completed or corrected.
  - 3) Verify that all items on final list have been completed or corrected and make recommendations to ENGINEER concerning acceptance.
3. Limitations of Authority: Resident Project Representative:
- a. Shall not authorize any deviation from the Contract Documents or approve any substitute materials or equipment.
  - b. Shall not exceed limitations on ENGINEER's authority as set forth in the Contract Documents.
  - c. Shall not undertake any of the responsibilities of Contractor(s), subcontractor(s) or Contractor(s)' superintendent, or expedite the work.
  - d. Shall not advise on or issue directions relative to any aspect of the means, methods, techniques, sequences or procedures of construction unless such is specifically called for in the Contract Documents.
  - e. Shall not advise on or issue directions as to safety precautions and programs in connection with the work.
  - f. Shall not participate in specialized field or laboratory tests.

### **SC-10.05.B. Notice of Claim**

Add the following two sentences to the end of Paragraph GC-10.05.B:

The parties recognize that the Engineer is an employee of the Owner and as such may also prepare the Owner's notice of Claim envisioned in this paragraph. This fact shall not otherwise affect the process, responsibilities of the Engineer or the remedies available to the parties as set forth elsewhere in GC-10.05.



## **SC-11.02 Allowances**

“Delete GC-11.02 in its entirety. There are no Allowances included in the Work of this Project.”

## **SC-11.03. Unit Price Work**

Delete Paragraph GC-11.03.D.1 in its entirety and insert the following in its place:

1. the Bid price of a particular item of Unit Price Work amounts to 10 percent or more of the Contract Price and the variation in the quantity of that particular item of Unit Price Work performed by Contractor differs by more than 25 percent from the estimated quantity of such item indicated in the Agreement; and

## **SC-13.03 Tests and Inspections**

SC-13.03.F. Add the following sentence to the end of GC-13.03.F: “For the purpose of this paragraph, the words ‘timely notice’ shall be construed as to mean not less than 48 hours prior to the event of the work being covered.”

SC-13.04.E. Add the following paragraph after GC-13.04.D.:

E. Paragraphs B, C, and D, above shall apply only to the situation where work that has been covered by mutual agreement is subsequently determined to require uncovering for further observation.

## **SC-14 Payment to Contractor and Completion**

SC-14.02.A.1: Modify the beginning of the first sentence of GC-14.02.A.1 to read as follows: “At least 10 days before the date established in the Agreement....” Delete the second sentence of GC-14.02.A.1.

SC-14.02.A.2: Delete Paragraph GC-14.A.2 in its entirety and substitute the following:

2. Beginning with the second Application for Payment, each Application shall include a lien release or other waiver acceptable to the Owner signed by the appropriate officer of each Subcontractor or Supplier that has provided labor, equipment or material to the Project during the period applicable to the previous Application for Payment.

SC-14.02.C.1 Modify the beginning of the first sentence of GC-14.02.C.1 to read as follows: “Twenty days after presentation of the Application for Payment....”

SC-14.07.A.3 Delete paragraph GC-14.07.A.3 in its entirety.

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

Add the following paragraph after GC-15.04.B:

C. The parties recognize that the Engineer is an employee of the Owner and as such will be reviewing and recommending Applications for Payment by the Owner. Therefore, the Owner shall have no less than 60 days after the receipt of an Application for Payment by the Engineer to pay any amount finally determined to be due before the Contractor may invoke the actions contemplated in GC-15.04.

## **SC-16 Dispute Resolution**

SC-16.01.C Delete GC-16.01.C in its entirety and insert the following in its place:

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

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

SC-16.01.D Add the following new paragraph immediately after Paragraph SC-16.01.C.

D. Notwithstanding any applicable statute of limitations, a party giving notice under Paragraph SC-16.01.C.1 shall commence an action on the Claim within one year of giving such notice. Failure to do so shall result in the Claim being time-barred and Engineer’s action or denial shall become final and binding.

### **SC-17.01 Giving Notice**

Delete GC-17.01.A.1 in its entirety and insert the following in its place:

1. intended for Owner: delivered in person to the individual named in the Agreement as Engineer; if intended for Contractor: given in person to the individual named in the Agreement as Agent for Service or Process.

Delete GC-17.01.A.2 in its entirety and insert the following in its place:

2. delivered at or sent by registered or certified mail, postage prepaid, to the “Address for Giving Notices” listed in the Agreement.

### **SC-17.07 Fill on Private Land**

Insert GC-17.07 after GC-17.06 as follows:

17.07 Fill on Private Land

A. The Contractor shall not deposit any matter on private land for the purpose of fill without written permission of the land owner.

### **SC-17.08 Operation of Existing Facilities**

Insert GC-17.08 after GC-17.07 as follows:

17.08 Operation of Existing Facilities

A. No valve, hydrant or other facility of the Portland Water District may be operated by the CONTRACTOR or his agents. The OWNER will, upon reasonable request of the CONTRACTOR, furnish men and equipment for such activity at no additional cost to the CONTRACTOR.

### **SC-17.09 Noise Control**

Insert GC-17.09 after GC-17.08 as follows:

17.09 Noise Control

A. The project area is residential in nature. The CONTRACTOR shall provide adequate exhaust silencers on all equipment and shall generally endeavor to minimize noise throughout the term of construction. This shall be in addition to any applicable ordinance or regulation pertaining to noise.

### **SC-17.10 Vehicle Idling Policy**

Insert GC-17.10 after GC-17.09 as follows:

17.09 Vehicle Idling Policy

A. Purpose: Air pollution is a major public health concern in Portland Water District’s Service Area. Air pollution can cause or aggravate lung illnesses as well as impose significant economic costs and negative impacts on our quality of life. Exhaust from both on- and off-road vehicles is a source of carbon monoxide, particulate matter, toxic air contaminants, and greenhouse gases. The Portland Water District can play an important role in improving air quality by limiting the amount of time the District vehicles are allowed to idle. As an environmental leader in the water and wastewater fields the District has the responsibility to be a leader by the adoption of effective policies to improve air quality. Under this policy, limitations and guidelines on engine idling are established by the District to reduce the idling of District and Contractor vehicles.

B. Definitions:

1. “Driver” means any person who drives, operates, or is in actual physical control of a vehicle.
2. “Emergency” means a sudden, urgent, usually unforeseen, occurrence.
3. “Equipment Operator” means any person who is in actual physical control of a piece of off-road equipment.
4. “Idling” means the engine is running while the vehicle is stationary or the piece of off-road equipment is not performing work.
5. “Traffic Control Device” means any sign, signal, marking or device placed or erected for the purpose of regulating, warning, or guiding traffic.
6. “Off-road Equipment” means all non-road equipment such as bulldozers, loaders, backhoes, compressors, etc.

7. "Vehicle" means any on-road, self-propelled vehicle that is required to be registered and have a license plate by the Department of Motor Vehicles.

C. Scope: This policy applies to all District and Contractor vehicles regardless of gross vehicle weight rating, all heavy-duty vehicles regardless of the fuel being used, all off-road diesel equipment regardless of horsepower rating, and all off-road equipment regardless of fuel being used, except as provided as specific exceptions stated in the policy.

D. Policy:

1. The driver of a vehicle shall turn off the engine upon stopping at a destination and shall not cause or allow an engine to idle at any location for:

a. More than ten consecutive minutes or

b. A period or periods totaling more than ten minutes in any one hour period.

2. An equipment operator of an off-road piece of equipment shall not cause or allow an engine to idle at any location for:

a. More than ten consecutive minutes or

b. A period or periods totaling more than ten minutes in any one hour period

3. This idling policy does not apply to a vehicle or a piece of equipment for the period or periods during which:

a. idling is necessary while stopped:

1) and the vehicle is being used for a traffic control device (Using strobe lights, light-bars, etc.) to protect employees while working in the street from traffic.

2) for traffic conditions over which the driver has no control, included but not limited to: stopped in a line of traffic, at a railroad crossing, etc.

3) at the direction of a law enforcement officer

b. idling is necessary to determine that the vehicle and / or the off-road equipment is in safe operating condition and equipped as required by all provisions of the law, and that all equipment is in good working order, either as part of the daily vehicle inspection, or as otherwise needed.

c. idling is necessary for the testing, servicing, repairing, and diagnostic purposes.

d. idling is necessary, for a period of 3 minutes or as recommended by the manufacturer, to cool down a turbo-charged vehicle before turning off the vehicle.

e. idling is necessary to accomplish work for which the vehicle / equipment was designed, other than transporting goods, for example: operating a lift, crane, pump, drill, hoist, or other auxiliary equipment other than a heater or air conditioner.

f. idling is necessary to operate defrosters, heaters, air conditioners, or other equipment to prevent a safety hazard such as melting ice on the windshield, but not solely for the comfort of the driver or passengers for a period not to exceed twenty minutes.

g. idling is necessary solely to recharge a battery or other energy storage unit of a hybrid electric vehicle / equipment.

h. idling is permitted when vehicles are occupied by personnel and being actively used as a work station, i.e. TV truck, using computers, etc.

i. idling is permitted to provide a habitable environment during breaks during extreme weather conditions, hot or cold (above 80 degrees F or below 32 degrees F)

## Section 00941 - Change Order No. \_\_\_\_\_

Date of Issuance: \_\_\_\_\_ Effective Date: \_\_\_\_\_

Project:	Owner:	Owner's Contract No.:
Contract:	Date of Contract:	
Contractor:	Engineer's Project No.:	

**The Contract Documents are modified as follows upon execution of this Change Order:**

Description:

\_\_\_\_\_

\_\_\_\_\_

Attachments: (List documents supporting change):

\_\_\_\_\_

\_\_\_\_\_

CHANGE IN CONTRACT PRICE:	CHANGE IN CONTRACT TIMES:
Original Contract Price:	Original Contract Times: <input type="checkbox"/> Working days <input type="checkbox"/> Calendar days
\$ _____	Substantial completion (days or date): _____
	Ready for final payment (days or date): _____
[Increase] [Decrease] from previously approved Change Orders No. _____ to No. _____:	[Increase] [Decrease] from previously approved Change Orders No. _____ to No. _____:
\$ _____	Substantial completion (days): _____
	Ready for final payment (days): _____
Contract Price prior to this Change Order:	Contract Times prior to this Change Order:
\$ _____	Substantial completion (days or date): _____
	Ready for final payment (days or date): _____
[Increase] [Decrease] of this Change Order:	[Increase] [Decrease] of this Change Order:
\$ _____	Substantial completion (days or date): _____
	Ready for final payment (days or date): _____
Contract Price incorporating this Change Order:	Contract Times with all approved Change Orders:
\$ _____	Substantial completion (days or date): _____
	Ready for final payment (days or date): _____

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

## **SECTION 01001 - DESCRIPTION OF WORK**

### **PART 1: GENERAL**

#### **1.1 SCOPE:**

- A. The CONTRACTOR shall furnish and install water main and appurtenances in Middle Rd., Falmouth as shown on the drawings and specified herein.
- B. The CONTRACTOR shall perform leakage and pressure tests and disinfect the installed water main as specified herein.

#### **1.2 DUTIES OF THE OWNER:**

- A. The OWNER will locate the terminal points of the work and will also locate any of its facilities lying in close proximity which would in any way be a hazard to the CONTRACTOR's operations.
- B. The OWNER will operate any valves or hydrants which may be found desirable or necessary to be used for any purpose. The OWNER will perform work in coordination with the CONTRACTOR at the locations specified on the plans.
- C. The OWNER will notify customers of all work involving temporary shutdown of service.

#### **1.3 DUTIES OF THE CONTRACTOR:**

- A. The CONTRACTOR will familiarize himself with all obstructions which he can foresee, such as existing pipes, services, conduits, ducts, sewers or any other such obstructions which might interfere with the construction, and he agrees to make arrangements with the owners of such facilities so as to save the OWNER harmless from any damages thereto caused by his operations and to make whatever arrangements might be necessary to move or remove and replace these facilities so as to permit the construction, all at his own expense. The CONTRACTOR agrees that there will be no extras charged for this type of work, except by special agreement with the ENGINEER and upon written order from him.
- B. The CONTRACTOR will make any changes which may be required, such as the removing or restoring of the property of others in the land through which this line will cross in right-of-way or otherwise. The CONTRACTOR will place all pipe, fittings and all attendant facilities to proper line and grade, as called for in the plans and specifications and to the satisfaction of the ENGINEER.

- C. The CONTRACTOR must give the District at least 4 days notice prior to a shutdown in order to properly notify customers.
- D. The CONTRACTOR will furnish all fuel, gasoline, oil, etc. for the operation of his equipment, all tools and equipment, and all labor and supervision necessary for the handling of material, for excavation, installation, backfilling and cleaning the site as required. He will dispose of excess spoil and restore the land surface to the original contour over the entire length of the project. Restoration shall be made to the satisfaction of the ENGINEER.
- E. The CONTRACTOR will perform the pressure and leakage test and disinfection of the main as described herein in the presence of the ENGINEER or OWNER.
- F. The CONTRACTOR shall install the water mains to supply the OWNER with a satisfactory, watertight pipeline, laid to proper line and grade in accordance with these contract documents, to the satisfaction of the OWNER. The CONTRACTOR shall leave the site in a condition, which is suitable to the OWNER, abutting landowners and any municipal or state authorities having jurisdiction over the areas involved.
- G. The CONTRACTOR shall install and maintain a temporary water system sufficient to maintain service to all customers during the water main replacement.

END OF SECTION

## **SECTION 01035 - CONTROL OF WORK**

### **PART 1: GENERAL**

#### **1.01 PLANT**

- A. The Contractor shall furnish plant and equipment which will be efficient, appropriate and large enough to secure a satisfactory quality of work and a rate of progress which will insure the completion of the work within the time stipulated in the Proposal. If at any time such plant appears to the Portland to be inefficient, inappropriate or insufficient for securing the quality of work required or for producing the rate of progress aforesaid, he may order the Contractor to increase the efficiency, change the character or increase the plant equipment, and the Contractor shall conform to such order. Failure of the Owner to give such order shall in no way relieve the Contractor of his obligations to secure the quality of the work and rate of progress required.

#### **1.02 PIPE LOCATIONS**

- A. Pipelines shall be located substantially as indicated on the Drawings, but the Owner reserves the right to make such modifications in locations as may be found desirable to avoid interference with existing structures or for other reasons. Where fittings are noted on the Drawings, such notation is for the Contractor's convenience and does not relieve him from laying and jointing different or additional items where required.

#### **1.03 CARE AND PROTECTION OF PROPERTY**

- A. The Contractor shall be responsible for the preservation of all public and private property, and shall use every precaution necessary to prevent damage thereto. If any direct or indirect damage is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the work on the part of the Contractor, such property shall be restored by the Contractor, at his expense, to a condition similar or equal to that existing before the damage was done, or he shall make good the damage in other manner acceptable to the Owner.

#### **1.04 PROTECTION AND RELOCATION OF EXISTING STRUCTURES, TREES AND UTILITIES**

- A. The Contractor shall assume full responsibility for the protection of all trees, buildings, structures, and utilities, public or private, including poles, signs, services to buildings, buried utilities, gas pipes, water pipes, hydrants, sewers, drains, and electric and telephone cables, whether or not they are shown on the Drawings. The Contractor shall carefully support and protect all such

structures and utilities from injury of any kind. Any damage resulting from the Contractor's operations shall be repaired by him at his expense.

- B. Protection and temporary removal and replacement of existing utilities and structures as described in this Section shall be a part of the work under the Contract and all costs in connection therewith shall be included in the Prices in the Proposal.

#### 1.05 CLEANUP

- A. During the course of the work, the Contractor shall keep the site of his operations in as clean and neat a condition as is possible. He shall dispose of all residue resulting from the construction work and, at the conclusion of the work, he shall remove and haul away any surplus excavation, lumber, equipment, temporary structures, and any other refuse remaining from the construction operations, and shall leave the entire site of the work in a neat and orderly condition.

END OF SECTION



## **SECTION 01151 - MEASUREMENT AND PAYMENT**

### **PART 1: GENERAL**

#### **1.1 METHOD OF MEASUREMENT AND BASIS OF PAYMENT:**

All measurements for payments will be based on completed work performed in strict accordance with the drawings and specifications, and on the contract bidding and payment item schedules. All work completed under the contract will be measured by the PORTLAND WATER DISTRICT ("DISTRICT") according to the methods outlined below. In cases where the payment clause in the specifications relating to any unit or lump sum price stated in the contract requires that the said unit or lump sum price cover and be considered compensation for certain work or material essential to the item, this same item will not be measured or paid for under any other pay item which may appear elsewhere in the specifications.

### **PART 2: PAYMENT ITEMS:**

#### **2.1 ITEM NO. 1 - Temporary Water System**

- A. Method of Measurement: Lump Sum
- B. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for flagging, excavation, installation and removal of temporary valves, fittings, piping and connections, laying and jointing, maintenance, testing and associated work as specified and shown on the Drawings.

#### **2.2 ITEM NO. W-2 & W-3 Water Main**

- A. Method of Measurement: Linear feet as measured along the centerline of the pipe for the actual number of linear feet of pipe and fittings installed.
- B. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for flagging, excavating, shoring and bracing, dewatering, pipe, laying and jointing, connections to existing piping, removal and disposal of existing piping, services and appurtenances, capping existing pipes that are not removed, thrust restraint, select backfill, base and subbase gravels,

backfilling, testing, restoration, and associated work as specified and shown on the Drawings.

2.2 ITEM NO. W-4, W-5, W-6 & W-7 – Gate Valves

- A. Method of Measurement: Each
- B. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for flagging, excavation, installation, shoring and bracing, dewatering, valve, valve box, abandoning/removing existing valves, backfill, testing and associated work as specified and shown on Drawings.

2.3 ITEM NO. W-8 & W-9 – Copper Service

- A. Method of Measurement: Each.
- B. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for flagging, excavation, shoring and bracing, dewatering, pipe, corporation, saddle, fittings, connection to existing service, service box, rod, curb stop, backfilling and associated work as specified and shown on Drawings.

2.4 ITEM NO. W-10 – Air Release Valve – 1”

- A. Method of Measurement: Each
- B. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for flagging, excavation, shoring and bracing, dewatering, corporation, angle valve, fittings, operating rod, service box, valve box, installation, backfill, testing and associated work as specified and shown on the Drawings.

2.5 ITEM NO. W-11 – Hydrant Assembly

- A. Method of Measurement: Each
- B. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for flagging, excavation, removal of existing hydrant, shoring and bracing, dewatering, hydrant, 6” gate valve, tee, pipe, thrust blocks, backfill, testing and associated work as specified and shown on Drawings.

2.6 ITEM NO. W-12 – Gravel Borrow

- A. Method of Measurement: Cubic yards as measured in place for the actual number of yards of gravel borrow installed.

- B. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for excavation, installation and compaction of gravel borrow as directed by the ENGINEER to replace unsuitable excavated material.

2.6 ITEM NO. W-13 – Rock Removal

- A. Method of Measurement: Cubic yard measured in place for the actual number of cubic yards of rock removed within the pay limits shown on the drawings. Boulders less than two cubic yards in volume will not be measured for payment.
- B. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for excavation, shoring and bracing, dewatering, excavation, bedding replacement, erosion control, cleanup and associated work as specified and shown on the Drawings.

2.7 ITEM NO. W-14 & W-15 – Foreman & Laborer

- A. Method of Measurement: Total man-hours.
- B. Basis of Payment: Unit price per man-hour as stated in the Bid. Payment shall include wages, benefits and overhead and profit for personnel for the purpose of performing extra work at the request of P.W.D.

2.8 ITEM NO. W-16, W-17 & W-18 – Excavator, Loader and Dump Truck

- A. Method of Measurement: Total hours.
- B. Basis of Payment: Unit price per hour as stated in the Bid. Payment shall include equipment and operator/driver, wages, benefits, fuel and overhead and profit for the purpose of performing extra work at the request of P.W.D.

END OF SECTION

## **SECTION 01310 - SUBMITTALS**

### **PART 1 - GENERAL**

#### **1.01 SUBMITTALS FOR OWNER'S APPROVAL**

- A. For all products to be incorporated into the Work submit to the OWNER for approval sufficient information in the form of shop drawings, product data and/or samples such that the OWNER can determine that the product is in compliance with the Technical Specifications and Drawings.
- B. Submit two (2) copies of each submittal. One (1) copy will be returned to the CONTRACTOR. Each copy shall include a cover sheet which clearly identifies the product and corresponding specification section. Each cover sheet shall bear the CONTRACTOR's stamp and signature certifying that the submittal is in full compliance with the Contract Documents or that any deviations from the Contract Documents are clearly identified on a separate sheet(s) labeled "Deviations From Contract Documents" and attached to the cover sheet.
- C. OWNER's Review: The OWNER shall review the submittals and indicate their status as:
  - 1. APPROVED SUBJECT TO REQUIREMENTS OF THE CONTRACT DOCUMENTS
  - 2. APPROVED AS NOTED, SUBJECT TO REQUIREMENTS OF THE CONTRACT DOCUMENTS
  - 3. REVISE AS NOTED, RESUBMITAL REQUIRED.
  - 4. NOT APPROVED

OWNER's review is only for general conformance with the design concept and general conformance with the information given in the Contract Documents. Corrections or comments made during the review do not relieve the CONTRACTOR from compliance with the requirements of the Contract Documents.

- D. Re-submittals: Make re-submittals under procedures specified for submittals; identify changes made since previous submittal.
- E. CONTRACTOR shall be responsible for the delays and or additional expenses that result from the CONTRACTOR's failure to submit a complete submittal and/or to identify portions of the submittal that does not conform to the specifications.

## **SECTION 01710 - CLEANUP**

### **PART 1: GENERAL**

#### **1.1 SCOPE:**

- A. The work covered by this section is to provide all cleanup over the entire project.

### **PART 2: PRODUCTS**

#### **2.1 METHOD:**

- A. The Contractor may choose any method he wishes for cleanup and shall assume all responsibility for the adequacy of the method and equipment employed.

### **PART 3: EXECUTION**

#### **3.1 CLEANING UP:**

- A. During the progress of the work, the construction areas shall be kept clean and all rubbish, surplus materials, and unneeded construction equipment shall be removed and all damages repaired so that the public and property owners will be inconvenienced as little as possible.
- B. Contractor shall fill in all depressions and water pockets on public and private property caused by his operations; clean all drains, ditches and culverts which have been obstructed by his work; and, shall leave the site in a neat condition wherever his operations have disturbed existing conditions.
- C. Contractor shall make restitution for any damage to trees, shrubbery or other structures or facilities owned by adjacent property owners.
- D. Cleanup shall follow directly behind the progress of the project.
- E. All excess material, rubbish or other type of mess shall be cleaned up and the site shall be left to the satisfaction of the right-of-way grantor, or any abutters, as well as to the satisfaction of any municipal or state authority which may be involved if in public right-of-way.

- F. Any damage to or displacement of street or highway surfaces due to blasting or otherwise shall be either replaced satisfactorily by the Contractor or shall be paid for by him to the authority responsible for the street or highway

END OF SECTION

## **SECTION 02217 - EXCAVATION AND BACKFILLING FOR WATER MAINS**

### **PART 1: GENERAL**

#### **1.1 SCOPE:**

- A. This section includes all excavation for water mains, hydrants and appurtenances, including drainage, sheeting and bracing, backfilling, disposal of surplus material, and miscellaneous grading. All work shall be done as indicated on the drawings and as herein specified.
- B. Excavation for water mains shall be the width and depth as indicated on the standard details. Excavation for hydrants and appurtenances shall provide suitable room for their construction.
- C. The CONTRACTOR shall furnish and place all sheeting, bracing and supports, and necessary dewatering, and shall carry out the excavation in such a manner as to eliminate all possibilities of undermining or disturbing existing pipelines, utilities, roadways, shoulders and/or structures.

#### **1.2 RELATED WORK SPECIFIED ELSEWHERE:**

Bedding and Backfill Material - Section 02219

### **PART 2: PRODUCTS**

#### **2.1 EQUIPMENT:**

Equipment shall be at CONTRACTOR'S option.

### **PART 3: EXECUTION**

#### **3.1 EXCAVATION:**

- A. When any pavement, regardless of type, must be cut, it shall be done in a neat and symmetrical manner by use of a saw or other approved method. In no case shall pavement be torn up with a backhoe bucket except between and inside of cuts previously made as above. Should any further pavement be broken, outside of the cuts, as by blasting, such damaged pavement shall be cut out in a neat and orderly fashion.

- B. The CONTRACTOR shall perform all excavation of every description and of whatever substances encountered to the depths shown on the drawings or directed by the ENGINEER.
- C. No extras will be allowed for quicksand excavation, muck excavation, or any other type unless specifically provided for in the bidding schedule.
- D. Surplus excavated material may be used at other parts of the construction project as required for fill, etc. Excess material shall be disposed of by the CONTRACTOR.
- E. The sidewalls of all trench excavation shall be kept as nearly vertical as possible in all roadways, lawns, near homes, etc. by sheeting, bracing, or other means. The width of the trench at a point six (6) inches above the top of the water pipe shall not be greater than the width detailed. If the type of excavated material will not allow the width detailed, then the trench shall be properly sheeted and braced. The cost of sheeting, bracing, or other means is included in the cost of the pipelines and no extras will be allowed.
- F. The excavation shall be made to secure a flat bottom trench (undisturbed earth bottom) for the full length of the pipe so as to give a uniform support to the pipe and shall be in accordance with ANSI A21.50 (AWWA C150), Type 2 Laying Condition.
- G. The bottom of the trench shall be accurately graded to provide support to the full length of the pipe barrel. Excavate at each bell to prevent bell from bearing on trench bottom.

### 3.2 EXCAVATION BELOW TRENCH GRADE:

- A. By mistake of CONTRACTOR: Where the bottom of the trench shall, by mistake of the Contractor, have been taken out to a greater depth than required, it shall be refilled to the proper grade with bedding material, and all to be placed and compacted as specified. The CONTRACTOR shall receive no additional compensation.
- B. By instruction from ENGINEER: If, in the opinion of the ENGINEER, existing material below trench grade is unsuitable for properly laying the pipe, the CONTRACTOR will excavate and remove the unsuitable material and replace the same with bedding material as authorized by the ENGINEER and properly compacted to his satisfaction. The CONTRACTOR will be paid under the item titled "Unsuitable Material Excavated Below Trench Grade."

### 3.3 EXCAVATION NEAR EXISTING UTILITIES, ETC.

- A. It will be necessary to excavate near existing pipes, drains and other utilities in certain locations. Some of these have been indicated on the drawings, but no attempt has been made to show all of the services and the completeness and



accuracy of the information given is not guaranteed. The CONTRACTOR shall call "Dig-Safe" at least three business days in advance of any excavation to allow utilities to locate underground facilities.

- B. As the excavation approaches pipes, conduits, or other underground structures and utilities, digging by machinery shall be discontinued and the excavation shall be done by means of hand tools.
- C. If the utility is of the opinion that at any point sufficient or proper support has not been provided, they may order additional supports placed at the expense of the CONTRACTOR. Compliance with such order shall not relieve the CONTRACTOR from his responsibility for the sufficiency of such supports. It shall be the responsibility of the CONTRACTOR to prevent damage to or displacement of utilities and to consult with and request the concurrence of the utility company's representative in this matter at all locations. The cost of protecting such utilities shall be considered incidental to the cost of laying the pipe.

#### 3.4 TRENCH SURCHARGES:

The excavated material shall be placed adjacent to the excavation in a manner to cause no excessive surcharge on the trench bank nor to obstruct free access to hydrants and valves. Should traffic or other conditions make it impractical or unsafe to stack material adjacent to trench, it shall be hauled and stored at a location provided by the CONTRACTOR and at the expense of the CONTRACTOR. When required, it shall be re-handled and used in backfilling the trench by the CONTRACTOR and at his expense.

#### 3.5 SHEETING AND BRACING:

- A. The CONTRACTOR shall be responsible for the design, construction, maintenance and safety of all sheeting and bracing required to support the sides of the excavation and to prevent the movement of earth which could in any way damage or endanger adjacent structures, utilities, roadways, increase the width of the excavation to more than that specified, or delay the work.
- B. All sheeting, bracing and shoring is to be included in prices bid for several items of work in bidding schedule and will not be paid for as separate items.
- C. No shoring shall be left in place unless so directed by the ENGINEER.

#### 3.6 DRAINAGE AND DEWATERING OF EXCAVATIONS:

- A. The CONTRACTOR shall conduct his operations so as to prevent at all times the accumulation of water, ice and snow in excavations or in the vicinity of excavated areas so as to prevent water from interfering with the progress or quality of the

work. Under no conditions shall water be allowed to rise in unbackfilled trenches after pipe has been placed.

- B. Accumulated water, ice and snow shall be promptly removed and disposed of by dewatering. Disposal shall be carried out in a manner which will not create a hazard to public health; nor cause injury to public or private property, work completed or in progress, or public streets; nor cause any interference in the use of streets and roads by the public. Pipes under construction shall not be used for drainage of excavations.
- C. During construction, when an unstable condition in the pipe sub-grade has been created due to the CONTRACTOR'S excavation, the sub-grade shall be stabilized by dewatering or other means accepted by the ENGINEER.

### 3.7 BACKFILLING - GENERAL:

- A. In general and unless other material is indicated on the drawings or is specified, material used for backfilling trenches and excavations around structures shall be suitable material which was removed in the course of making the construction excavations or as specified.
- B. Frozen materials shall not be placed in the backfill, nor shall material be placed upon frozen material. Previous frozen material shall be removed or shall be otherwise treated as required before new backfill is placed.
- C. Backfilling shall be done as soon as practical after the pipe has been laid and jointed.

### 3.8 SUITABLE BACKFILL MATERIAL

Suitable backfill material shall be the following or a combination of the following:

- (1) Excavated material that will compact to the compaction requirements.
- (2) Excavated material that does not contain rocks larger than 8" in any dimension or granular borrow.
- (3) Dry clay backfill free from lumps.
- (4) Wet clay that alone would pump but when mixed with sand and/or gravel will be stable and will compact.

### 3.9 BACKFILLING PIPE TRENCHES:

- A. As soon as practicable after the pipes have been laid and jointed, backfilling shall begin and shall proceed until it is completed or has sufficient backfill to allow pipe testing.

- (1) The first layer of suitable backfill material shall be brought half-way up the pipe and compacted to 80% maximum density and then the normal backfilling shall begin and shall be compacted as specified.
  - (2) All backfill shall be thoroughly compacted by hand tamping as placed, by use of mechanical or vibratory compactors, or by other acceptable methods.
  - (3) Remainder of the trench shall be backfilled as follows:
    - a) In paved areas, road shoulders and seeded areas, the entire depth of trenches above the center line of the pipe shall be backfilled in eight (8) inch layers with suitable backfill material and each layer thoroughly and carefully compacted as specified. Bring backfill up to bottom of gravel base and/or loam.
    - b) In other areas, the trench above the center- line of the pipe shall have suitable backfill material placed and compacted in eighteen (18) inch maximum layers as specified.
- B. The nature of the excavated materials will govern both their acceptability for backfill and the method best suited for their placement and compaction in the backfill.
- (1) Both the materials and the methods shall be subject to the acceptance of the ENGINEER.
  - (2) No stones or rock larger than 8" in the greatest dimension shall be placed in the backfill.
- C. Backfilling in public right-of-way, along the streets or highways in or along shoulder, berm or backslope shall be done in accordance with the specifications and requirements of the state or municipality, whichever is responsible for the street or highway involved. Responsibility for the fulfillment of permit conditions or any other applicable requirements of the street or highway authority shall be the obligation of the CONTRACTOR. Surface restoration shall be carried out to the satisfaction of the street or highway authority or as shown on the plans.
- D. Backfilling shall follow pipe laying as closely as reasonable, so that a minimum of trench shall be open at any time. Observe all Maine Department of Transportation specifications regarding open trenches. Any caved-in trench, especially after heavy rain and flooding, shall be cleaned out and the bottom consolidated before any additional pipe shall be laid.

### 3.10 TOP OF BACKFILL:

- A. In paved and shoulder areas, backfill shall be carried up to pavement or shoulder sub-grade ready to receive the gravel base. In other areas, backfill shall be

brought up to adjacent finished grade minus the depth of any required topsoil and so as to provide a finished surface slightly mounded over the trench. Any trenches improperly backfilled, or where settlement occurs, shall be reopened to the depth required for proper compaction, and shall then be refilled and compacted with the surface restored to required grade and degree of compaction, mounded over, and smoothed off, at no additional expense.

- B. In unpaved areas, the gravel topping shall be left in a smooth and even condition, with no large stone on or in the surface. In cases where a paved surface has been broken, a temporary bituminous patch and/or a permanent paving restoration shall be made as required by the appropriate local or state road authority.

### 3.11 COMPACTION:

- A. Compaction densities specified herein shall be the percentage of the maximum density obtainable at optimum moisture content as determined and controlled in accordance with AASHTO Standard T-180, Method A or D depending on the material size. Field density tests shall be made in accordance with AASHTO Standard T-147.

Each layer of backfill shall be moistened or dried as required and shall be compacted to the following densities, unless otherwise specified in the project specifications.

(1) Bedding material	80%
(2) Suitable backfill material under paved or shoulder areas	90%
(3) Gravel base:	
(a) Under paved areas	95%
(b) In shoulder areas	90%
(c) As replacement for unsuitable material excavated below grade	90%
(4) Loam areas	90%
(5) All other areas	85%

- B. Methods and equipment proposed for compaction shall be subject to prior acceptance by the ENGINEER. Compaction generally shall be done with vibrating equipment. Displacement of, or injury to, the pipe and structure shall be avoided. Movement of in-place pipe or structures shall be at the CONTRACTOR'S risk. Any pipe or structure damaged thereby shall be replaced or repaired as directed by the ENGINEER and at the expense of the CONTRACTOR.

- C. Testing:

- (1) Field density tests may be ordered by the ENGINEER for each foot of depth of backfill at an average interval of 200 feet along the trench.
- (2) The CONTRACTOR shall furnish all necessary samples for laboratory tests and shall provide assistance and cooperation during field tests. The CONTRACTOR shall plan his operations to allow adequate time for laboratory tests and to permit taking of field density tests during compaction.
- (3) Any costs of retesting required as a result of failure to meet compaction requirements shall be borne by the CONTRACTOR.

### 3.12 FILL AND GRADING:

- A. Excavated material not required for backfilling around pipes or structures may be used for fill in areas which require material for re-grading.
- B. The re-grading shall be carried out as directed by the ENGINEER, so that all surface water will drain towards brooks or drainage pipes.
- C. All material shall be of such nature that after it has been placed and properly compacted, it will make a dense and stable fill.

### 3.13 PROTECTION OF EXISTING STRUCTURES:

- . All existing pipes, wires, poles, fences, property line markers and other items, which must be preserved in place without being temporarily or permanently relocated, shall be carefully supported and protected from injury by the CONTRACTOR, at no additional cost to the OWNER. Should such items be injured, they shall be restored by the CONTRACTOR, without compensation therefore, to at least as good condition as that in which they were found immediately before the work was begun.

### 3.14 ACCOMMODATION OF TRAFFIC:

- A. The CONTRACTOR shall construct and maintain, without extra compensation, such adequate and proper bridges over excavations as may be necessary or as directed for the safe accommodation of pedestrians and vehicles. The CONTRACTOR shall furnish and erect, without cost to the OWNER, substantial barricades at crossing of trenches, or along the trench, to protect the traveling public.
- B. The CONTRACTOR shall not obstruct fire hydrants.

END OF SECTION

## **SECTION 02219 - BEDDING AND BACKFILL MATERIAL**

### **PART 1: GENERAL**

#### **1.1 SCOPE:**

- A. The CONTRACTOR shall furnish, place and compact various types of bedding material and trench sand as called for in the specifications or as directed.
- B. The types and quality of bedding and backfill material are specified in this section, but its use for pipe bedding, backfill, replacement of unsuitable material excavated below trench grade, and other uses are as specified elsewhere.

#### **1.2 RELATED WORK SPECIFIED ELSEWHERE:**

Excavation and Backfilling for Water Mains - Section 02217

### **PART 2: PRODUCTS**

#### **2.1 MATERIALS:**

##### **A. Bedding Material:**

- 1. Screened or crushed gravel bedding material shall be hard durable particles free from organic matter, lumps of clay and other deleterious substances. The gradation shall meet the requirements of the following table and MDOT specifications Section 703.06 Type B aggregate

<u>Sieve Size Designation</u>	<u>% By Weight</u>
1/2 inch	35 - 75
1/4 inch	25 - 60
No. 40	0 - 25
No. 200	0 - 5.0

##### **B. Select Backfill:**

- 1. Shall be sand backfill, hard, durable particles of granular material with 100% passing the 1/2" sieve and between 0-15% passing the #200 mesh. All percentages are by weight. Sand shall be graded so as to secure the required compaction.

##### **C. Backfill:**

1. Suitable native material that does not contain stone or rock particles with any dimensions greater than 8".
2. Bank Run gravel borrow consisting of uniformly graded granular material having no rocks with a maximum dimension greater than 8" and that portion passing a 3-inch square mesh sieve shall contain no more than 70% passing 1/4 inch mesh sieve and not more than 10% passing a No. 200 mesh sieve.

### PART 3: EXECUTION

#### 3.1 METHODS:

The materials will be used in accordance with the requirements of the various sections of the specifications, drawings and standard details.

END OF SECTION

## SECTION 02536 – TEMPORARY WATER SYSTEMS

In order to maintain uninterrupted water service to District customers, the Contractor shall provide temporary above ground water systems. The temporary water systems consist of mains, services and fire department outlets. The above ground systems shall be installed only for the duration of deep water main replacement and removed promptly after main replacement is complete. Currently the District has approved 2 manufacturers for the temporary mains and 100-psi poly tube for individual services. Only authorized District personnel shall operate control valves attached to these systems.

### Temporary Water Systems Approved Pipe

Certaiteed Certa-Lok Yellowmine	Restrained Joint PVC pressure pipe and fittings
AquaMine (Victaulic Co)	Restrained Joint PVC pressure pipe and fittings

Temporary above ground water mains shall be installed in a manner to both protect the public water supply and to minimize customer service interruption. To allow the District to notify its affected customers, the Contractor shall provide the District a minimum of 5 working days notice prior to installing any temporary lines.

The size and approximate location of the temporary systems are shown on the drawings. The Contractor must obtain the approval of the District for any changes prior to installation of the system.

Temporary mains shall typically be installed behind sidewalks or along the edge, and within the public right of way. The mains shall follow a uniform straight course and shall not bow to accommodate long sections of pipe. Temporary mains shall not be installed on private property. The route of services lines installed from the mains to houses shall be acceptable to the property owner.

The Contractor shall follow the pipe manufactures installation guidelines when installing temporary systems. Additionally, an approved joint lubrication for the installation of potable water pipe shall be used on all joints prior to connecting pipe.



**Hydrant Connections:** Provide temporary main connection to hydrant using LL brass or 304ss adaptor, 304ss adaptor, 304ss NPT to HDPE transition, and flanged HDPE piping to bring piping elevation from hydrant port to grade. Provide piping supports/blocking adaptors and D.I. backup rings, dimensions per AWWA C207. All piping and fittings shall be NSF 61.

Provide flanged LL double check valve backflow device, same nominal size as temporary main, at each hydrant connected to a temporary main. Provide flanged resilient seated gate valve for isolation, and provide upstream and downstream taps. Remove backflow only upon Owner's request and provide flanged HDPE replacement spool piece. HDPE shall be AWWA C906, SDR 11 with IPS flange adaptors and D.I. backup rings. Flange dimensions per AWWA C207. All piping and fittings shall be NSF 61. Provide documentation of annual inspection by a person certified by the New England Water Works Assoc. or American Backflow Prevention Assoc.

**Source:** See drawings for source location(s) and associated notes.

**Disinfections:** All 2" diameter and larger temporary mains shall be chlorinated, sampled, and tested for bacteria prior to activating any portion of the temporary mains. (See disinfection specification for deep mains).

**Leakage test:** All systems shall be watertight. A static pressure test shall be performed on all systems prior to disinfecting any portion of the system.

### **Test Procedure**

1. Install a pressure gauge at furthest end of the system.
2. Open main feed valve to fully charge the system with water and bleed all air.
3. Record the static pressure reading.
4. Close main feed valve.
5. The system must hold static pressure for a minimum of 30 minutes.

**Driveway crossings:** Temporary mains 4" or larger shall be buried below existing grade. A gravel or cold patch raised berm shall be placed over 2" temporary mains to prevent vehicles from dragging along the ridge.

**Sidewalk crossings:** Temporary mains crossing sidewalks must be buried below grade or temporary pavement ramps constructed over the pipe in compliance with Americans with Disabilities Act standards.

**Roadway crossings:** Temporary mains shall be buried just below the surface of the roadway. The pipe shall be protected with clean sand or material free from rocks, as the rocks tend to punch through the pipe when exposed to heavy traffic. The use of cold patch or QPR as fill material is acceptable.

**Curbing or esplanade rise:** To accommodate curb rise, pre-fabricated certa-lock bends and/or elbows shall be used. Sweeping or bending the actual pipe is not an acceptable method unless the sweep lies flat on the ground and is not obstructing walkways. A traffic barrel shall be placed near the curb at offset connections to protect the offsets from being damaged by vehicles.

**Cutting pipe:** Follow manufacturer's installation instructions. All joints, including those on cut lengths of pipe, shall be grooved to provide a restrained joint. Pre-fabricated bends, elbows, and tees shall be used when changing direction.

**Blow off:** A 1" blow off shall be installed at the ends of all temporary mains. The blow off shall be constructed using a 1" brass female curb stop.

**Isolation valves:** Shall be 2" brass female curb stops for 2" mains and 4" resilient wedge valves for 4" mains (grip rings shall be used for 4" valves). Valves shall be located as shown on the plan. The valves are attached to the mains using pre-fabricated adapters.

**Service line connections:** All temporary individual service lines shall be  $\frac{3}{4}$ " poly tube rated at a minimum working pressure of 100 psi. The service lines shall be connected to a 2"x  $\frac{3}{4}$ " factory tapped restrained joint coupling, then a  $\frac{3}{4}$ " close brass nipple, a  $\frac{3}{4}$ " female curb stop and a brass poly tube adapter  $\frac{3}{4}$ " insert x male. The tube shall be extended to a sill cock (outside faucet) and connected using the same poly tube adapter. Prior to connecting the service, a garden hose connection, including a brass boiler drain or sill cock valve shall be installed in the line. All service lines shall be flushed prior to activating mains.

**Anti-siphon sill cocks:** Only District authorized personnel shall disassemble anti-siphon sill cocks.

Excavating and connecting into existing deep service lines may be required where properties have malfunctioning sill cocks or no exterior plumbing.

### ***Shutting off meters***

After activating the temporary lines, all meters shall be shut off. Only District authorized personnel may de-activate meters.

**Maintenance of temporary water systems:** The contractor shall be responsible for maintaining the temporary systems during the regular workday including making repairs to the systems. The District's Inspector must be on site prior to any work, or repairs being performed on the temporary water systems. District crews

will respond to all after hour's emergencies. All affected customers shall be notified as soon as possible prior to any service interruption.

It is expected that contractors will keep an inventory of readily available repair parts on hand enabling them to quickly respond to any type of problem. Restrained joints shall be maintained. The use of non-restrained joint couplings is prohibited. Joint leaks shall be cut out. The use of stainless steel wrap around repair clamps over pinholes is acceptable.

END OF SECTION

## **SECTION 02537 - DUCTILE IRON WATER PIPE & FITTINGS**

### **PART 1: GENERAL**

#### **1.1 SCOPE:**

- A. This section includes the furnishing and installing of ductile iron water pipe and ductile iron or cast iron fittings as specified.

#### **1.2 RELATED WORK SPECIFIED ELSEWHERE:**

- A. Excavation and Backfill for Water Mains - Section 02217
- B. Bedding and Backfill Material - Section 02219

#### **1.3 SUBMITTALS:**

- A. Submit shop drawings for all material in accordance with the provisions of Section 01310.

### **PART 2: PRODUCTS**

#### **2.1 MATERIALS:**

- A. See SEC02999 – Water Main Material Specifications

### **PART 3: EXECUTION**

#### **3.1 PIPE LAYING CONDITIONS:**

- A. The interior of each pipe shall be inspected while being joined to see that the alignment is preserved and to assure that no dirt or debris has entered the pipe after laying and partial backfilling.
- B. Pipe fittings and accessories shall be carefully lowered into the trench, piece by piece, by means of derrick, crane, slings and other suitable tools and equipment, in a manner such as to prevent damage to the material or to its protective coating and linings. No chain or slings shall be passed through the inside bore of any pipe or valve or fitting. Under no circumstances shall piping materials be dropped or dumped into the trench.

#### **3.2 LAYING DUCTILE IRON PIPE:**

- A. As soon as the excavation is completed and the existing trench bottom has been brought to the proper grade, the pipe shall be laid.
- B. All pipe, before being lowered into the trench, shall be inspected inside and out. Both ends shall be cleaned and any visible dirt or debris removed from inside the pipe. Care shall be taken to lay the pipe to true lines and grades as shown on the drawings.
- C. Coupling holes shall be excavated so that the barrel of the pipe shall bear upon the trench bottom.
- D. Blocking under the pipe will not be permitted.
- E. Each section shall rest upon the pipe bed for the full length of its barrel.
- F. The circular rubber gasket shall be inserted in the gasket seat provided. A thin film of gasket lubricant shall be applied to the inside surface of the gasket. Gasket lubricant shall be a solution of vegetable soap or other solution supplied by the pipe manufacturer.
- G. The spigot end of the pipe shall be cleaned and entered into the rubber gasket in the bell, using care to keep the joint from contacting the ground. The joint shall then be completed by forcing the plain end to the seat of the bell. Pipe which is not furnished with a depth mark shall be marked before assembly to assure that the spigot end is inserted to the full depth of the joint.
- H. Pipe shall be aligned with the preceding unit and laid so as to form a close joint with the adjoining pipe and bring the inverts continuously to the required line and grade.
- I. No length of pipe shall be laid until the previous length has had sufficient material tamped about it to firmly secure it in place so as to prevent any movement or disturbance.
- J. Under no circumstances shall pipe be laid in water, and no pipe shall be laid when trench conditions or weather are unsuitable for such work, except by permission of the ENGINEER.
- K. The pipe shall be laid with the bell ends facing the direction of the laying, unless otherwise permitted by the ENGINEER.
- L. Joints, when made, shall be done in the manner prescribed by the manufacturer of the pipe. In the case of rubber gasket joints, these joints shall be made up in accordance with the American National Standards for the jointing of cast iron pressure pipe and fittings. (ANSI/AWWA C111/A21.11).

- M. Thrust blocks shall be used behind tees, bends, or other fittings where shown. Size shall be appropriate for soil conditions and thrust forces acting on the specific fitting.
- N. Water mains shall be laid at least 10 feet horizontally from any sanitary sewer, or sewer manhole, whenever possible; the distance shall be measured edge-to-edge (pipe wall to pipe wall).
- O. When local conditions (such as ledge, bridges, utility congestion, etc.) prevent a horizontal separation of 10 feet, a water main may be laid closer to a sanitary sewer provided that:
  - a. The bottom of the water main is at least 18 inches above the top of the sewer in a separate trench or undisturbed earth shelf and a minimum of 5 feet edge-to-edge (pipe wall to pipe wall) horizontally is provided.
  - b. Where this vertical separation cannot be obtained, the sewer shall be constructed of materials and with joints that are equivalent to water main standards-of-construction and shall be pressure tested to assure water tightness prior to backfilling.

### 3.3 TRENCH BOTTOM:

- A. Should the trench bottom contain unsuitable material, as indicated in Section 02217, Article 3.2-b, the CONTRACTOR shall over-excavate and replace with bedding material as required and authorized by the ENGINEER. The quantity of unsuitable material will be measured from the bottom outside of the pipe.
- B. Should ledge be encountered, it shall be removed to a depth of 6" below the bottom of the pipe, and replaced with bedding material.

### 3.4 CUTTING PIPE:

- A. All ductile iron pipe shall be cut using abrasive wheel cutter, rotary wheel hand cutter (with carbide cutter) or a guillotine pipe saw. All cuts shall be square and even with no ragged rough ends.
- B. Field cut pipe lengths shall be beveled and filed to avoid damage to the gasket and facilitate making the joint.
- C. When the cut end of pipe is to be used as a joint, the outside of the cut end shall be tapered back about 1/8-inch at an angle of about 30 degrees with the center line of the pipe. This shall be done with a coarse file or a portable grinder.

### 3.5 TEMPORARY PLUGS:

When pipelaying is not actually in progress, the openings of pipes shall be closed by temporary watertight plugs or other accepted means.

### 3.6 RETAINER GLANDS:

Install retainer glands on all mechanical joints of fittings, valves and hydrants.

### 3.7 POLYETHYLENE ENCASEMENT:

- A. Tube type polyethylene encasement shall be installed on all ductile iron pipe and fittings in accordance with AWWA Standard C105 - latest revision, Method A. Circumferential wraps of tape or plastic tie straps shall be placed at 2-ft. intervals along the barrel of the pipe.
- B. The polyethylene encasement shall prevent contact between the pipe and the surrounding backfill and bedding material but is not intended to be a completely airtight or watertight enclosure. All lumps of clay, mud, cinders, and so forth, on the pipe surface shall be removed prior to installation of the polyethylene encasement. During installation, care shall be exercised to prevent soil or embankment material from becoming trapped between the pipe and the polyethylene.
- C. The polyethylene film shall be fitted to the contour of the pipe to effect a snug, but not tight, encasement with minimum space between the polyethylene and the pipe. Sufficient slack shall be provided in contouring to prevent stretching the polyethylene where it bridges irregular surfaces, such as bell-spigot interfaces, bolted joints, or fittings, and to prevent damage to the polyethylene due to backfilling operations. Overlaps and ends shall be secured with adhesive tape, string, plastic tie straps, or any other material capable of holding the polyethylene encasement in place until backfilling operations are complete.

END OF SECTION

## **SECTION 02594 - PRESSURE AND LEAKAGE TESTS OF DI WATER MAINS**

### **PART 1: GENERAL**

#### **1.1 SCOPE:**

Furnish all labor, materials, equipment, gages and related items necessary to complete all pressure and leakage tests of all ductile iron (DI) water mains.

### **PART 2: PRODUCTS**

#### **2.1 MATERIALS:**

Materials shall be at CONTRACTOR's option.

### **PART 3: EXECUTION**

#### **3.1 PRESSURE AND LEAKAGE TESTS:**

- A After the pipe has been laid and backfilled, it shall be pressure tested and tested for leakage in the presence of the ENGINEER and/or the OWNER.
- B. All tests shall be conducted at a time and in a manner to minimize as much as possible any interference with the operation of the existing water system. The OWNER will supply all water necessary for testing and placing the lines in service. The CONTRACTOR shall supply all labor, materials and equipment necessary to make any necessary connections to the water system and to carry out the tests.
- C. The CONTRACTOR shall excavate and provide a corporation tap for pressure and leak testing as directed by the ENGINEER. The CONTRACTOR is responsible for all work associated with the excavation, including proper trench protection, barricades, traffic control and proper backfilling and compaction upon successful completion of the test.
- D. The pipe shall be slowly filled with water and all air expelled from the pipe. If permanent air vents are not located at all high points, CONTRACTOR shall install corporation stops at such high points to bleed off air as the line is filled with water.
- E. A pressure test pump will be connected to the new main at the testing point. The pressure will be slowly increased to 150 psi and allowed to stabilize (+/-2.5 psi) for a minimum of 15 minutes.
- F. A reservoir of potable water shall be connected to the test pump and the initial level of water recorded.



- G. The pump pressure shall be maintained at 150 psi for one hour with all make up water withdrawn from the reservoir.
- H. After one hour, the water level in the reservoir will be measured and the volume of water drawn from the reservoir calculated and compared with the following allowable leakage:

$$\text{Allowable Leakage (gph)} = \frac{\text{Pipe Length (feet)} \times \text{Nominal Diameter (inches)}}{10,876^*}$$

\*Correct only for 150 psi test pressure

- I. If any test discloses leakage greater than that specified above, the CONTRACTOR shall, at his own expense, locate and make repairs as necessary until the leakage is within the specified allowance.
- J. Final acceptance of the lines will not occur until satisfactory tests have been passed.

END OF SECTION

## **SECTION 02595 - DISINFECTION OF WATER MAINS**

### **PART 1: GENERAL**

#### **1.1 SCOPE**

- A. Furnish all labor, materials, equipment, and incidentals necessary to disinfect the distribution system.
- B. Do not disinfect water mains until all testing required by Section 02593 and/or Section 02594 has been satisfactorily completed.

### **PART 2: PRODUCTS**

#### **MATERIALS:**

- A. The CONTRACTOR shall chlorinate the new main in accordance with the continuous feed method specified in Section 5.2 of AWWA Standard C651-latest revision, using 5% to 15% sodium hypochlorite solution.
- B. The CONTRACTOR may use calcium hypochlorite granules or tablets placed in the new mains during installation in accordance with Section 5.1 of AWWA Standard C651-latest revision, as a supplement to the continuous feed method.

### **PART 3: EXECUTION**

#### **3.1 DISINFECTION:**

Upon satisfactory completion of the pressure and leak test, all new water mains shall be disinfected before they are placed into service in accordance with Section 5.2 of AWWA Standard C651-latest revision and the procedures specified herein.

#### **3.2 FLUSHING:**

- A. Section of pipe to be disinfected shall first be flushed to remove any solids or contaminated material that may have become lodged in the pipe. If no hydrant is installed at the end of the main, then a suitably sized tap should be provided.
- B. All taps required by the CONTRACTOR for chlorination or flushing purposes, or for temporary release of air, shall be provided by him as part of the construction of the water main.
- C. Flushing shall proceed for 4 hours at a flow velocity of 2.5 feet per second.

3.3 REQUIREMENTS OF CHLORINE:

Before being placed into service, the main shall be chlorinated so that a chlorine residual of not less than 10 parts per million remains in the water after standing 24 hours in the pipe. Chlorine residual at start of test shall be at least 50 parts per million.

3.4 POINT OF APPLICATION:

The preferred point of application of the chlorinating agent is at the beginning of the pipeline or any valved section of it and through a corporation stop inserted in the pipe. The water injector for delivering the chlorine solution water into the pipe should be supplied from a tap made on the pressure side of the gate valve controlling the flow into the pipeline extension. Alternate points of application may be used when accepted or directed by the ENGINEER.

3.5 RATE OF APPLICATION:

Water from the distribution system, or other source of supply as accepted by the ENGINEER, shall be controlled to flow very slowly into the newly laid pipeline during application of the chlorine. The rate of chlorine mixture flow shall be in such proportion to the rate of water entering the newly laid pipe that the dosage applied to the water will be sufficient to achieve at least 50 parts per million unless otherwise directed by the ENGINEER.

3.6 PREVENTING REVERSE FLOW:

Valves shall be operated by the OWNER so that the strong chlorine solution in the line being treated will not flow back into the line supplying the water. Check valves may be used, if desired.

3.7 RETENTION PERIOD:

Treated water shall be retained in the pipe at least 24 hours. After this period, the chlorine residual at pipe extremities and at other representative points shall be at least 10 parts per million.

3.8 CHLORINATING VALVES AND HYDRANTS:

In the process of chlorinating newly laid pipe, all valves or other appurtenances shall be operated while the pipeline is filled with the chlorinating agent and under normal operating pressure.

3.9 FINAL FLUSHING AND TESTING:

- A. Following chlorination, all treated water shall be thoroughly flushed from the newly laid pipe at its extremity until the replacement water throughout its length shows, upon tests, that the residual chlorine is not in excess of that to be carried in the system.
- B. After flushing, water samples collected from the treated piping system as directed by the ENGINEER, shall show satisfactory bacteriological results. Bacteriological analyses shall be performed by the OWNER.
- C. Chlorine residual of water being flushed from the newly laid pipe following chlorination must be neutralized by treating with one of the chemicals listed in the table below.

AMOUNTS OF CHEMICALS REQUIRED TO NEUTRALIZE VARIOUS  
RESIDUAL CHLORINE CONCENTRATIONS IN 100,000 GALLONS OF  
WATER\*

<u>Residual Chlorine Concentration (mg/l)</u>	<u>Sulphur Dioxide</u>	<u>Sodium Bisulfate</u>	<u>Sodium Sulfite</u>	<u>Sodium Thiosulfate</u>
1	0.8	1.2	1.4	1.2
2	1.7	2.5	2.9	2.4
10	8.3	12.5	14.6	12.0
50	41.7	62.6	73.0	60.0

\*Except for residual chlorine concentration, all amounts are in pounds.

3.10 REPETITION OF FLUSHING AND RESULTS:

Should the initial disinfection process result in an unsatisfactory bacterial test, the original chlorination procedure shall be repeated by the CONTRACTOR until satisfactory results are obtained.

## **SECTION 02999 – Water Main Materials Specifications**

Note: All materials, products, and coatings that contact drinking water must be certified to meet NSF/ANSI Standard 61.

### **BOLTS AND NUTS**

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#### **GENERAL SPECIFICATIONS**

General Description of Properties Required:

- 1.0 Stainless Steel: Type 304 – contains the addition of Molybdenum to the nickel-chromium steels.
- 2.0 High Strength/Low Alloy Steel: Trade name for cold formed T-head bolts containing alloying elements such as copper, nickel, and chrome (Cor-Ten).

## **CORPORATION STOPS**

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### **GENERAL SPECIFICATIONS**

- 1.0 Conforming to AWWA C-800.
- 2.0 ¾" to 2" curb stops shall be ball valve design with brass ball that is teflon coated or brass ball with teflon seats.
- 3.0 The ball shall be supported by seats which are water tight in either direction.
- 4.0 The valve shall have a full port opening.
- 5.0 The body of the corporation stop shall be of heavy duty design.
- 6.0 The valve working pressure shall be 300 p.s.i.

### **APPROVED MANUFACTURERS**

- A. A.Y. McDonald
- B. Cambridge Brass
- C. Ford Meter Box Co.
- D. Mueller Co.

## **CURB STOPS**

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### **GENERAL SPECIFICATIONS**

- 1.0 Conforming to AWWA C-800
- 2.0 ¾" to 2" curb stops shall be ball valve design with brass ball that is teflon coated or brass ball with teflon seats.
- 3.0 The ball shall be supported by seats which are water tight in either direction.
- 4.0 The valve shall have a full-port opening.
- 5.0 The valve shall open with ¼ turn (90°) with a check or stop.
- 6.0 The valve shall not have a drain.
- 7.0 The valve stem shall have 2 "O" rings and a bronze ring lock which holds the stem solidly in the valve body.
- 8.0 The valve body shall be of heavy duty design.
- 9.0 The valve working pressure shall be 300 p.s.i.

### **APPROVED MANUFACTURERS**

- A. A.Y. McDonald
- B. Cambridge Brass
- C. Ford Meter Box Co.
- D. Mueller Co.

## **CUT-IN SLEEVE**

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### **GENERAL SPECIFICATIONS**

- 1.0 The sleeve shall be mechanical joint to plain-end type.
- 2.0 The sleeve shall fit over either AB or CD pattern pipe.
- 3.0 Coatings:
  - a) Interior – Seal-coated – AWWA C104-74, min. 4 mils D.F.T.
  - b) Exterior – Bituminous coated, min. 4 mils D.F.T.
- 4.0 Mechanical joint accessories shall be furnished:
  - a) Glands: Duck-tipped for AB pipe, Plain Gaskets for CD pipe
  - b) Cor-Ten tee bolts and nuts
- 5.0 Cut-in sleeves shall have at least one stop-screw in sizes up through 10” and at least 2 stop-screws in 12” size.
- 6.0 The stop-screw “O” ring shall be recessed into the body of the sleeve between stop-screw and body.

### **APPROVED MANUFACTURERS**

- A. Mueller Co.



# DUCTILE IRON FITTINGS

## INCLUDING BENDS, REDUCERS, OFF-SETS, TEES AND SLEEVES

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### GENERAL SPECIFICATIONS

- 7.0 Material shall be ASTM A536 latest, grade 70-50-05, in accordance with AWWA C110 (latest revision) for fittings larger than 24" and C153 (latest revision) for fittings 3" thru 24".
- 8.0 Fittings shall be cement lined AWWA C104 (latest revision) or fusion bonded epoxy coated with a 5 mil nominal thickness per AWWA C550 and C116.
- 9.0 Interior seal coated AWWA C104 with minimum of 4 mils dry film thickness.
- 10.0 Exterior bituminous coated, 4 mils minimum dry film thickness or fusion bonded epoxy coated with a 5 mil nominal thickness per AWWA C550 and C116.
- 11.0 Sleeves shall not be cement lined, but shall be bituminous coated inside to 4 mils dry film thickness. All sleeves shall be long body type.
- 12.0 Mechanical joint with accessories furnished: D.I. glands, gaskets, Cor-Ten T-bolts and nuts.
- 13.0 Pressure Ratings:
  - a) Class 350 pressure rating in accordance with AWWA C153 - 3"-24" sizes.
  - b) Class 250 pressure rating in accordance with AWWA C110 - 30"-48" sizes.
- 14.0 The "compact design" fittings must provide adequate space for the MJ joint and accessories to be installed without special tools (i.e. Lowell wrench can be used).

### APPROVED MANUFACTURERS

- A. All Manufacturers

## DUCTILE IRON PIPE

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### GENERAL SPECIFICATIONS

- 1.0 Ductile iron pipe shall meet requirements of AWWA Standard C-151 (latest revision) and be cement lined and seal coated to meet AWWA Standard C-104 (latest revision).
- 2.0 Joints shall meet requirements of AWWA C-111 (latest revision).
- 3.0 Interior seal coated, bituminous paint oil cut, emulsion not acceptable, thickness minimum of 2 mils dry film thickness.
- 4.0 Exterior bituminous coated with minimum of 2 mils dry film thickness.
- 5.0 Class 52 wall thickness, 4-inch diameter through 12-inch diameter inclusive.
- 6.0 Ductile Iron Pipe with diameters 16-inches and larger shall be Class 51.
- 7.0 State nominal laying length and mark shorter lengths near bell.
- 8.0 Mechanical joint pipe to be furnished with gland, gaskets and Cor-Ten bolts and nuts.
- 9.0 Welded-on thrust collars, for wall pipe and pipe thrust restraint, shall be welded steel collars designed for the thrust generated by 250 psi working pressure with a safety factor of at least two (2.0) against failure. The manufacturer shall qualify all welding procedures and welders per the requirements of a documented quality assurance system based on ANSI/AWS D11.2.

### APPROVED MANUFACTURERS

- A. American Cast Iron Pipe
- B. Griffin Pipe
- C. U.S. Pipe

# **FIRE HYDRANT**

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## **GENERAL SPECIFICATIONS**

- 1.0 The hydrant shall open right.
- 2.0 The operating nut shall:
  - a) be D.I. or bronze
  - b) be pentagon in shape with dimensions: Top 1-13/16" tapering to 1-7/8" on bottom.
- 3.0 Nozzles shall be:
  - a) 2 each – 2-1/2" National Standard Thread
  - b) 1 each – 4-1/2" National Standard Thread.
- 4.0 Port covers shall be supplied without chains and shall have the same size pentagon operator as specified in 3.0(b) above.
- 5.0 Traffic model hydrant with breakaway feature
- 6.0 Barrel length(s) shall be:
  - a) 6 ft. cover, 6-1/2 ft. bury; or
  - b) 5-1/2 ft. cover, 6 ft. bury, or
  - c) 5 ft. cover, 5'-6" bury
- 7.0 Hydrant shoe or base shall have the following:
  - a) 6" MJ inlet;
  - b) 5-1/4" valve opening with non-draining bronze seat that is permanently plugged;
  - c) valve seat and sub-seat arrangement shall be bronze to bronze;
  - d) Horizontal and vertical blocking planes manufactured into hydrant base
- 8.0 Bolts:
  - a) all buried mechanical joint bolts and nuts (T-head, etc.) shall be Cor-Ten or equal;
  - b) all buried flange joint bolts shall be stainless steel (Type 304) or silicone bronze.
- 9.0 Protective Coatings shall consist of the following:
  - a) all paintings and coatings shall be a minimum of 3 mils total dry film thickness, unless noted

- b) the internal area of the hydrant base, which is normally exposed to water and which includes the internal body of hydrant shoes, including lower valve plate, shall be epoxy coated
- c) all internal and external cast iron or ductile iron components shall be coated with an approved bituminous coating, 3 mils minimum
- d) Coatings for upper barrel - exterior:
  - 1. Surface preparation blast clean SSPC-SP-6
  - 2. Primer Sherwin Williams Red Oxide E61RC21, 1.5 mils, dry
  - 3. Finish coat Sherwin Williams – Regal Yellow, F78Y30, 1.5 mils, dry or sufficient paint to hide the second coat
  - 4. Total dry film thickness - 3 mils minimum.
- e) Coatings for bonnet, operating nut, port cap:
  - 1. Surface preparation: Blast clean, SSPC-SP-6
  - 2. Exterior primer
  - 3. Exterior aluminum
  - 4. Total dry film thickness: 3 mils minimum.

10.0 Flow Indicator Collars: PWD personnel shall install flow indicator collars on all new hydrants.

#### FIELD TEST OF INSTALLED HYDRANT

- 1.0 Hydrant flow shall completely stop with no more than 200 ft. lb. of torque applied to the operating nut.
- 2.0 Failure to shut completely at no more than 200 ft. lb. of torque will be cause for rejection of that hydrant.

#### APPROVED HYDRANTS

- A. Clow Eddy – with lower stem machined from bar stock
- B. American Darling Models: B62B-1, B62B-5

# PIPE JOINT RESTRAINER

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## GENERAL SPECIFICATIONS

### 1.0 Pipe Restraints:

- 1.1 Use in conjunction with mechanical joint fittings.
- 1.2 The joint restraint ring and its wedging components shall be made of ductile iron conforming to ASTM A536-80.
- 1.3 Dimensions of the restrainer must allow use with standard M.J. bell conforming to AWWA C111 and AWWA C153.
- 1.4 Restrainer must restrain up to 350 psi of working pressure in 3" to 16" sizes and 250 psi of working pressure in 18" to 48" sizes with a 2:1 safety factor.
- 1.5 Torque limiting twist off nuts shall be used to ensure proper actuation of the restraining wedges (used on a,b,c below).

## APPROVED MANUFACTURERS

- A. Sigma Super Lug
- B. Ford Uni-Flange Series 1400
- C. Ebba Mega Lug
- D. Romac Grip Ring
- E. Star Grip Series 300
- F. Romac Romagrip
- G. MJ FIELD LOK Gasket

# **POLYETHYLENE ENCASEMENT**

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## **GENERAL SPECIFICATIONS**

- 1.0 Tube type polyethylene encasement shall be installed on all ductile iron pipe and fittings in accordance with AWWA Standard C105 - latest revision, Method A.
- 2.0 Polyethylene encasement shall be either linear low-density polyethylene (LLDPE) film with a minimum thickness of 8-mil or high-density, cross-laminated polyethylene (HDCLPE) film with a minimum thickness of 4-mil.
- 3.0 Circumferential wraps of tape or plastic tie straps shall be placed at 2-ft. intervals along the barrel of the pipe.
- 4.0 The polyethylene encasement shall prevent contact between the pipe and the surrounding backfill and bedding material but is not intended to be a completely airtight or watertight enclosure. All lumps of clay, mud, cinders, and so forth, on the pipe surface shall be removed prior to installation of the polyethylene encasement. During installation, care shall be exercised to prevent soil or embankment material from becoming trapped between the pipe and the polyethylene.
- 5.0 The polyethylene film shall be fitted to the contour of the pipe to effect a snug, but not tight, encasement with minimum space between the polyethylene and the pipe. Sufficient slack shall be provided in contouring to prevent stretching the polyethylene where it bridges irregular surfaces, such as bell-spigot interfaces, bolted joints, or fittings, and to prevent damage to the polyethylene due to backfilling operations. Overlaps and ends shall be secured with adhesive tape, string, plastic tie straps, or any other material capable of holding the polyethylene encasement in place until backfilling operations are complete.
- 6.0 Three layers of polyethylene adhesive tape shall be wrapped around any polywrapped pipe where a tapping machine will be placed. All copper services connected to a pipe wrapped in polyethylene encasement shall be wrapped within three feet of the pipe.

# PVC WATER PIPE

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## GENERAL SPECIFICATIONS

1.0 For all water main installations that are less than 4" I.D. (4" and larger use ductile iron), the District will require use of 2" I.D. PVC plastic water pipe meeting the following: Under special site conditions the District does require the use of C-900 PVC in sizes larger than 4".

2.0 Pipe Specifications (2"):

2.1 Diameter:

A. The I.D. shall be a minimum of 2"

B. The O.D. shall be a maximum of 2.38"

5.2 Pressure Rating

A. The minimum working pressure rating shall be 250 PSI (SDR-17).

B. The pipe shall conform to standard ASTM 2241.

Pipe Length

A. The pipe shall be provided in 20' lengths.

\* Shorter lengths may be allowed and/or field cut following manufacturer's recommended procedures.

5.2 Gaskets

A. The gasket or O-Ring material shall be rubber meeting ASTM F 477 and of the "permanent use" type.

3.0 Fittings:

3.1 Standard AWWA C900 fittings are not available in the 2" I.D. and therefore "steel pipe" class fittings, or Certa-Lok Yelomine couplings and fittings meeting ASTM D 3139 shall be used.

5.2 The normal nomenclature for "steel fittings" is Schedule 40 or Schedule 80, with the respective pressure ratings of 280 PSI and 400 PSI. Both of these fitting classes are acceptable for use.

4.0 Service Connections:

- 4.1 All service connections shall be made with tapping saddles\* per Portland Water District specifications or by use of tees meeting the above noted fitting specifications.
- 5.0 Installation:
  - 5.1 Follow manufacturer's instructions.
  - 5.2 A 10 gauge insulated (for direct buried use) solid copper wire shall be fastened to the buried PVC pipe to facilitate electronic pipe locating. The wire shall be fastened at two locations per length and not at any joint.
    - a. Wire shall be polyethylene coated per ASTM D-1248
    - b. Insulation thickness shall be a minimum of .030"
- 6.0 The District requires 305 PSI (SDR-14) PVC pipe for sizes such as 4", 6", 8", and 12". Pipe shall conform to AWWA C-900.

APPROVED MANUFACTURER / TYPE

- A. J-M Manufacturing - Blue Brute
- B. Certainteed - Yelomine
- C. Victaulic - Aquamine
- D. IPEX – Blue Brute



## **RESILIENT SEATED GATE VALVE**

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### **GENERAL SPECIFICATIONS**

- 1.0 Valve shall meet the latest revision of the AWWA C-509 or C-515 Standard.
- 2.0 Valve shall have a smooth unobstructed water way which shall be a minimum diameter of the valve.
- 3.0 Valve ends to be specified and shall be furnished with Cor-ten (or equal) bolts and nuts.
- 4.0 Valve shall be rated for zero leak rate at 200 psi differential working pressure and have a 400 psi hydrostatic test for structural integrity.
- 5.0 Sealing - Valve shall have a minimum of 2 "O" rings situated such that the "O" rings above the thrust collar can be replaced with the valve under pressure and in the open position.
- 6.0 Stem - Valve stem shall:
  - a) open right with a stem nut made of grade D,E manganese bronze;
  - b) be non-rising;
  - c) be designed with a thrust collar integrally cast to the stem;
  - d) be designed with two (2) thrust washers, placed one above and one below the stem thrust collar;
  - e) be constructed of grade D,E manganese bronze;
  - f) be such that the thrust washers are made of a synthetic polymer with physical properties required.
- 7.0 Valve Body - The body, including the stuffing box and the bonnet, shall be constructed of cast iron or ductile iron, meeting the latest revision of AWWA C-153.
- 8.0 Valve Wedge:
  - a) shall be constructed of ductile iron (less guiding mechanism);
  - b) shall be fully encapsulated and permanently bonded with a resilient elastomer;
  - c) shall be constructed such to allow the flushing of any interior exposed surface during operations.
- 9.0 Coatings:

- a) the internal and external valve body, including the stuffing box, bonnet, and interior of the wedge shall be fusion bonded epoxy coated with 8 mils D.F.T.
- b) interior shall meet latest version of AWWA C-550.
- c) shall be holiday free, interior and exterior, per testing method described in AWWA C-550, Sec. 5.1.

10.0 Operating Nut:

- a) shall be two (2) inch square ductile iron:
  - 2. with a countersunk hold down nut (made of 316 stainless steel or silicone bronze). This applies to stems that are tapered; or
  - 3. with a stainless steel pin inserted thru the stem. This applies to stems of full diameter.

11.0 Bolts – The seal plate and bonnet bolts shall be stainless steel (Type 316 or Type 304).

12.0 Valves 12" nominal diameter and smaller shall be directly operated by the nut on the valve stem and mounted vertically. Number of turns to open or close shall closely match the formula:  $(3 \times D) + 2$ . For example, a 12" valve should open or close with approximately  $(3 \times 12) + 2 = 38$  turns of the operating nut.

13.0 Horizontal valves larger than 12" nominal diameter shall have bevel gear operators driven by the operating nut. Vertical valves larger than 12" nominal diameter shall have spur gear operators driven by the operating nut. Valves 14" – 24" nominal diameter shall have 4:1 bevel gear operators. Valves with 30" – 36" nominal diameters shall have 6:1 bevel gear operators and valves with 42" – 48" nominal diameters shall have 8:1 bevel gear operators. Number of turns to open or close shall closely match the formula:  $((3 \times D) + 2)$  times the bevel gear ratio. For example, a 24" valve should open or close with approximately  $((3 \times 24) + 2) \times 4 = 296$  turns of the operating nut.

## GENERAL PROVISIONS

- 1.0 Vendor shall identify any and all exceptions to the specifications.
- 2.0 Vendor shall provide standard brochures for item quoted.
- 3.0 Vendor may be required to supply a valve for inspection and determination of coating process.

## APPROVED RESILIENT SEATED GATE VALVES

- A. U.S.P.
- B. AFC Series 2500
- C. Mueller A-2360/61
- D. Clow Series F6100

# INSERTION GATE VALVE

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## GENERAL SPECIFICATIONS

- 1.0 Valve shall meet the latest revision of the AWWA C-509 Standard.
- 2.0 Valve shall have a smooth unobstructed water way which shall be a minimum diameter of the valve.
- 3.0 Valve ends to be specified and shall be furnished with Cor-ten (or equal) bolts and nuts.
- 4.0 Valve shall be rated for 250 psi differential working pressure.
- 5.0 Valve Body - The body, including the stuffing box and the bonnet, shall be constructed ductile iron, meeting the latest revision of AWWA C-153.
- 6.0 The milled slot in the pipe wall shall be less than 2" wide.
- 7.0 Coatings:
  - a) the internal and external valve body, including the stuffing box, bonnet, and interior of the wedge shall be fusion bonded epoxy coated with 8 mils D.F.T.
  - b) interior shall meet latest version of AWWA C-550.
- 8.0 Bolts – The seal plate and bonnet bolts shall be stainless steel (Type 316 or Type 304).

## APPROVED INSERTION VALVE:

- A. Inserta Valve (Romac) or approved American Manufacturer

# **RESTRAINED JOINT GASKETS**

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## **GENERAL SPECIFICATIONS**

- 1.0 All accepted restrained joint gaskets in the Portland Water District distribution system shall be rated in accordance with the performance requirements of ANSI/AWWA C111/A21.11.
- 2.0 Required Applications
  - 2.1 Any hydrant branch or service with a distance greater than 18' shall have an approved restrained joint gasket in the bell ends.
  - 2.2 Where a casing is required, all joints within the casing shall have an approved restrained joint gasket unless restrained joint pipe is used.
  - 2.3 At any time as required by a PWD Engineer.
  - 2.4 Any live service tap where there is a joint between the connection and the end of the service.

## **APPROVED MANUFACTURERS**

- A. American Fast-Grip Gasket – American Pipe
- B. Field Lok 350 Gasket – US Pipe

## SERVICE BOX AND ROD

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### GENERAL SPECIFICATIONS

#### **Reference Standard Details**

##### 1.0 Service Box - Approved Manufacturers: American Manufacture

- 1.1 Shall be 1.0" Schedule 40 steel pipe with top having 1.0" N.P.T. pipe threads for screw-on cover or coupling.
- 1.2 Shall be Erie style with 6' slide-type riser.
- 1.3 Any extension of a service box requires a threaded merchant coupling with no set screw.

##### 2.0 Service Box Cover – Approved Manufacturers: American Manufacture

- 2.1 Shall be Quincy type (heavy duty) cover that screws on Service Box (1.1 above).
- 2.2 Shall be tapped with a 1" rope thread with a solid brass plug with pentagon operating head.

##### 3.0 Service Box Foot Piece – Approved Manufacturer: American Manufacture

- 3.1 The standard foot piece shall be heavy duty (Ford style or equal) cast iron design.
- 3.2 The large, heavy-duty foot piece shall have an arch that will fit over 2" ball-valve curb stops.

##### 4.0 Service Rod – Approved Manufacturer: American Manufacture

- 4.1 Shall have a self aligning design.
  - a) 36" length for all services.
  - b) 24" length for air valves.
- 4.2 Shall be round and constructed of stainless steel (304) with an epoxy coating (minimum 4 mil D.F.T.).

4.3 Shall have a yoke design that is an integral part of the rod.

4.4 The curb-stop attachment pin shall be a brass cotter pin.

4.5 The rod "wrench-flat" shall have a minimum thickness of  $\frac{1}{4}$ " tapered to  $\frac{1}{16}$ " and width of  $\frac{5}{8}$ " or  $\frac{1}{2}$ ".

4.6 Diameter

a)  $\frac{1}{2}$ ",  $\frac{3}{4}$ " and 1" services use  $\frac{1}{2}$ " diameter.

b) 1  $\frac{1}{2}$ " and 2" services use  $\frac{5}{8}$ " diameter.

## SERVICE SADDLES

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### GENERAL SPECIFICATIONS FOR DUCTILE IRON PIPE

- 1.0 The service saddle shall have the “larger sized” body, the same as associated with the “service repair” saddle, which shall have a minimum diameter of 6 in. and multiple “O” ring type sealing.
- 2.0 The saddle body shall be constructed of epoxy coated ductile iron.
- 3.0 The sealing gasket(s) shall be either Buna-N rubber or SBR rubber (ASTM D2000).
- 4.0 Service saddles shall be installed with all 1 1/2” and 2” corporation stops (cc only).

#### Approved Manufacturers

<u>Size</u>	<u>Tap</u>	<u>Saddle</u>
2” – 2-1/4”	3/4”, 1” cc	Smith-Blair 315, Ford FC 202
4” - 12” D.I.	3/4” - 1 1/2” cc	Smith Blair 331
4” - 12” D.I.	2” cc	Smith-Blair 313
16”	3/4”-2” cc	Smith-Blair 313
20” – 36”	3/4”-2”cc	Smith-Blair 366

### GENERAL SPECIFICATIONS FOR PVC PIPE

- 1.0 Stainless steel straps will be used on saddles on C-900 PVC Pipe

#### Approved Manufacturers

<u>Size</u>		<u>Saddle</u>
4”-12”		Smith-Blair 265

# STAINLESS STEEL REPAIR CLAMPS

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## GENERAL SPECIFICATIONS

- 1.0 The sleeve shall be of full circle design, either one piece or two piece, for pipe sizes 2" thru 12".
- 2.0 Body: Shall be 18-8 stainless steel shell.
- 3.0 Gasket:
  - a) Shall be full length and diameter of the body size;
  - b) This gasket shall form a multiple O-ring, or grid, sealing barrier for the entire length and circumference;
  - c) Shall be virgin SBR rubber (ASTM D2000 AA 415).
- 4.0 Lugs, sidebar, and lifting bar shall be heavy gauge 18-8 stainless steel with TIG/MIG welding and chemical passivation of all welds.
- 5.0 Bolts and Nuts shall be Teflon coated 18-8 heavy gauge stainless steel.
- 6.0 Armor: The armor, or bridging plate between the side bars shall be heavy gauge 18-8 stainless steel bonded to the gasket to bridge the lug area.

## APPROVED MANUFACTURERS

- A. All Manufacturers



## **TAPPING SLEEVES (on Ductile Iron Pipe)**

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### **GENERAL SPECIFICATIONS**

- 1.0 For sizes 12" and smaller tapping sleeve shall be ductile iron or approved fabricated steel:
  - 1.1 Tapping sleeve shall be mechanical joint with recessed outlet flange for tapping valve.
  - 1.2 Tapping sleeve shall conform to AWWA C-207, Class D, with rated maximum working pressure of 200 psi.
  - 1.3 The side rubber gaskets shall be rectangular in cross-section and fit into grooved channels in the casting. These gaskets shall extend the entire length of the sleeve and shall not require cutting or trimming to match MJ end gaskets.
  - 1.4 Tapping sleeve shall be AB-CD pattern to permit use of plain rubber and duck-tipped gaskets for various O.D. piping sizes.
  - 1.5 Mechanical joint with accessories furnished; glands, gaskets, and Cor-Ten T-bolts and nuts or equal.
  - 1.6 All flange outlet bolts shall be stainless steel (Type 304).
  - 1.7 Interior and exterior to be bituminous coated with a minimum of 4 mils dry film thickness or fusion bonded epoxy coated.
  - 1.8 The sleeve shall be provided with a ¾" F.I.P.T. test port and brass lug.
- 2.0 For sizes 16" and larger tapping sleeve shall be fabricated steel:
  - 2.1 Body and Flange - A-36
  - 2.2 Coating - Fusion-bonded epoxy coating with minimum D.F.T. of 15 mils, inside and out.
  - 2.3 Bolts, Nuts - Stainless Steel (Type 304).
  - 2.4 Gaskets - Nitrile

- 2.5 Flange - AWWA Class D plate flange with ANSI 150# drilling, proper recessing for tapping valves.
- 2.6 Sleeves shall be provided with 3/4" F.I.P.T. test port and plug.
- 2.7 Taps larger than 20" require an experience submittal. The tapping contractor shall have a minimum of seven continuous years of experience tapping pipes larger than 20" in diameter. Furmanite Corp. – Paulsboro, NJ or equal.

APPROVED MANUFACTURERS (4"-12")

- A. AFC
- B. Mueller Co.
- C. U.S. Pipe
- D. Tyler / Union
- E. Powerseal Model 3490 and 3490MJ (Fabricated Steel)

APPROVED MANUFACTURERS (16" and larger)

- A. Romac FTS 420
- B. Ford FTSC
- C. Smith Blair 622
- D. JCM 412
- E. Powerseal Model 3490 and 3490 MJ (up to 24")
- F. JCM 415 or approved equal (for RCCP pipe only)

## **VALVE BOXES**

---

### **GENERAL SPECIFICATIONS**

#### **Reference Standard Details**

- 1.0 The valve box bottom section shall be slide-type with bell-type base with bottom lip.  
Manufacturer: North American Manufacture
- 2.0 The valve box top section shall be slide-type, 36 inches long (minimum). No top flange and no "bead" or bottom flange.  
Manufacturer: North American Manufacture
- 3.0 The valve box cover shall be a 2" drop-type cover to fit the 7-1/4" opening of the top section.  
Manufacturer: Bibby St-Croix (no substitute)
- 4.0 The valve box intermediate (mid) section shall be slide-type with a minimum 3" belled bottom. Base section No. 645 may be used as an alternate.  
Manufacturer: North American Manufacture
- 5.0 Material shall be cast iron or ductile iron free from defects.
- 6.0 Interior and exterior of all components shall be bituminous coated with a minimum of 4 mils dry film thickness.

**END OF SECTION**

# REPORT

February 11, 2016

15-1089 S

## Geotechnical Engineering Services

Proposed Pavement Reconstruction

Middle Road

Falmouth, Maine

### PREPARED FOR:

Sebago Technics, Inc.

Attention: Steve Harding, P.E.

75 John Roberts Road, Suite 1A

South Portland, Maine 04106

### PREPARED BY:

S. W. Cole Engineering, Inc.

286 Portland Road

Gray, Maine 04039

207-657-2866



**S.W.COLE**  
ENGINEERING, INC.

- *Geotechnical Engineering*
- *Construction Materials Testing*
- *GeoEnvironmental Services*
- *Ecological Services*

[www.swcole.com](http://www.swcole.com)

## TABLE OF CONTENTS

1.0 INTRODUCTION .....	1
1.1 Scope and Purpose .....	1
1.2 Proposed Construction .....	1
2.0 EXPLORATION AND TESTING .....	2
2.1 Explorations .....	2
2.2 Testing .....	2
3.0 SUBSURFACE CONDITIONS .....	2
3.1 Soil and Bedrock .....	2
3.2 Groundwater .....	3
4.0 EVALUATION AND RECOMMENDATIONS .....	3
4.1 Pavement Analysis and Section .....	3
4.1.1 Full Depth Reconstruction .....	4
4.1.2 Full Depth Recycling with Cement .....	4
4.2 Excavation, Dewatering and Subgrade Preparation .....	5
4.3 Placement and Compaction .....	5
4.4 Design Review and Construction Testing .....	6
5.0 CLOSURE .....	6

Attachment A	Limitations
Sheets 1A – 1D	Exploration Location Plans
Sheets 2 - 28	Exploration Logs
Sheet 29	Key to the Notes and Symbols
Sheets 30 - 33	Gradation Test Results
Appendix A	Summary of HMA, Base Gravel and Roadbed Soils
Appendix B	Pavement Section Analysis

15-1089 S

February 11, 2016

Sebago Technics, Inc.  
Attention: Steve Harding, P.E.  
75 John Roberts Road, Suite 1A  
South Portland, Maine 04106

Subject: Geotechnical Engineering Services  
Proposed Pavement Reconstruction  
Middle Road  
Scarborough and South Portland, Maine

Dear Steve:

In accordance with our Agreement, dated October 29, 2015, we have performed subsurface explorations for the subject project. This report summarizes our findings and geotechnical recommendations and its contents are subject to the limitations set forth in Attachment A.

## **1.0 INTRODUCTION**

### **1.1 Scope and Purpose**

The purpose of our services was to obtain subsurface information at the site in order to develop recommendations for pavement reconstruction. Our scope of services included twenty seven test boring explorations, soils laboratory testing, a geotechnical analysis of the subsurface findings and preparation of this report.

### **1.2 Proposed Construction**

Based on the information provided, we understand the pavement along the segment of Middle Road between Woods Road to the Cumberland Town Line is planned to be reconstructed. We understand full depth reclamation is being considered as a means to reconstruct the pavement structure. We understand the roadway is generally conceived to remain at the current profile with potential for localized widening and storm drain improvements.

## **2.0 EXPLORATION AND TESTING**

### **2.1 Explorations**

Twenty seven test borings (B-1 through B-27) were made along the roadway on November 9 and 10, 2015 by S.W.Cole Explorations, LLC, a subsidiary of S. W. Cole Engineering, Inc. (S.W.COLE). Boring location offsets were selected and established in the roadway shoulder by Sebago Technics. The as-drilled boring locations were located in the field by measurements from the offsets by S.W.COLE.

The approximate exploration locations are shown on the “Exploration Location Plans” attached as Sheets 1A through 1D. Logs of the explorations are attached as Sheets 2 through 28. A key to the notes and symbols used on the logs is attached as Sheet 29.

### **2.2 Testing**

The borings were performed using solid stem auger drilling techniques. The soils were sampled at approximately 2 to 5 foot intervals using a split spoon sampler and Standard Penetration Testing (SPT) techniques. SPT blow counts are shown on the logs.

Soil samples obtained from the explorations were returned to our laboratory for further classification and testing. The results of four gradation analyses are attached as Sheets 30 through 33.

## **3.0 SUBSURFACE CONDITIONS**

### **3.1 Soil and Bedrock**

The test borings made at the site generally encountered a layer of hot-mix asphalt (HMA) pavement overlying gravelly base material (base gravel) overlying sandy fill overlying native soils and bedrock. The sandy fill was discontinuous and not present at all boring locations. The principal strata encountered are summarized below; see the attached logs for more detailed subsurface information.

Hot Mix Asphalt (HMA) Pavement: The existing HMA pavement varied in thickness from approximately 4 to 6 inches at the boring locations.

Base Gravel: Below the HMA pavement, the borings encountered base material generally extending to depths varying from 0.8 to 3 feet. The base gravel was variable in composition and generally consists of brown, gray, and black sand with varying portions of silt and gravel. Borings B-3 through B-7, B-10 through B-12, B-14, B-21, B-26 and B-27 encountered up to 6 inches of an apparent relic reclaimed asphalt material above or within the base layer. Several borings encountered an apparent black relic oiled surface at the top of the base gravel.

Fill and Native Soils: Below the base gravel, the borings generally encountered sandy fill or native soils varying from silty sand to stiff brown silty clay to silty glacial till.

Bedrock: Bedrock was encountered at the majority of the borings at depths varying from approximately 1.8 to 6.1 feet. A weathered bedrock surface was penetrated by the drilling equipment up to 2.5 feet before encountering refusal on sound, intact bedrock.

### **3.2 Groundwater**

Wet to saturated soils were encountered at some borings at depths varying from approximately 2 to 5 feet. Groundwater likely becomes perched on the relatively impervious silty clay and bedrock encountered at some explorations. Long term groundwater information is not available. It should be anticipated that groundwater levels will fluctuate, especially in response to periods of snowmelt and precipitation, as well as changes in site use.

## **4.0 EVALUATION AND RECOMMENDATIONS**

### **4.1 Pavement Analysis and Section**

We were provided the 2013 Annual Average Daily Traffic (AADT) from Sebago Technics Inc. (STI) and estimated truck traffic volume. Pavement analysis was made using recommendations in the *AASHTO Guide for Design of Pavement Structures* (AASHTO, 1993) and Chapter 13 (Flexible Pavement Design) of the Maine Department of Transportation (MaineDOT) *Highway Design Guide* (2007). We calculated the layer thicknesses based on the AASHTO layered analysis approach using the required structural number (SN) for each layer based on Figure 3.1 (AASHTO, 1993). Based on our analysis, we offer the following alternatives for pavement reconstruction:



#### 4.1.1 Full Depth Reconstruction

Full depth reconstruction involves box cutting the roadway for installation of a new pavement section. This method is generally favorable where the existing profile and alignment require alteration and/or the existing HMA and gravel are insufficient depth for reclaiming. For this method, we offer the following typical pavement sections:

<b>PAVEMENT SECTION FOR FULL DEPTH RECONSTRUCTION – 10 Year</b>	
<b>Pavement Layer</b>	<b>Thickness</b>
MaineDOT 12.5mm Hot Mix Asphalt (75 Gyratation Design)	1 ¾ inches
MaineDOT 19.0mm Hot Mix Asphalt (75 Gyratation Design)	2 ¼ inches
MaineDOT 703.06 Aggregate Base Type A Crushed Gravel	6 inches
MaineDOT 703.06 Aggregate Subbase Type D Gravel	12 inches

<b>PAVEMENT SECTION FOR FULL DEPTH RECONSTRUCTION – 20 Year</b>	
<b>Pavement Layer</b>	<b>Thickness</b>
MaineDOT 12.5mm Hot Mix Asphalt (75 Gyratation Design)	2 inches
MaineDOT 19.0mm Hot Mix Asphalt (75 Gyratation Design)	3 inches
MaineDOT 703.06 Aggregate Base Type A Crushed Gravel	3 inches
MaineDOT 703.06 Aggregate Subbase Type D Gravel	15 inches

Full depth reconstruction is generally completing in accordance with 2014 MaineDOT Standard Specification 304.

#### 4.1.2 Full Depth Recycling with Cement

Full depth recycling with cement stabilization of the base gravel involves pulverizing the existing asphalt and base gravel, spreading cement and tilling it into the pulverized materials, micro-fracturing the stabilized base and then paving with new HMA layers. This method is generally favorable where there is sufficient HMA and gravel to reclaim and the roadway profile is raised by several inches. For this method, we recommend a typical pavement section consisting of:

<b>PAVEMENT SECTION FOR FULL DEPTH RECYCLING WITH CEMENT – 20 Year</b>	
<b>Pavement Layer</b>	<b>Thickness</b>
MaineDOT 12.5mm Hot Mix Asphalt (75 Gyratation Design)	4 inches
MaineDOT Section 308 Full Depth Recycled with Cement	6 inches

After the pulverized material is shaped, we recommend mixing 5% cement by weight to a depth of 6 inches in accordance with 2014 MaineDOT Standard Specification 308.

#### **4.2 Excavation, Dewatering and Subgrade Preparation**

Excavation of the asphalt surface and soils overlaying bedrock may be accomplished with conventional excavating equipment. Excavation of bedrock will require hoe-ramming and/or blasting. Blasting should be performed by a qualified, licensed contractor. Pre-blast surveys should be performed on adjacent structures, utilities, and groundwater wells prior to blasting. Overblasted bedrock subgrades should be compacted with at least 3 passes of a vibratory roller having a static weight of at least 10 tons prior to placing fills. Blasted bedrock subgrades should be thoroughly choked with blasting fines or Crushed Stone to prevent migration of fill into the subgrade.

Blasting may open groundwater seeps in the road subgrade. We recommend that contract documents contain provisions to install Crushed Stone cross drains to intercept groundwater seeps encountered during construction.

Saturated soils were encountered at several explorations at depths varying from 2 to 5 feet. Dewatering may be required for deeper excavations such as for utilities. Dewatering by sumping and pumping should be adequate.

The pavement surface over the existing waterline appeared more distressed and cracked than the surrounding pavement. We recommend construction documents require removing the base and subbase over this trench line for densification of the trench backfill soils with a hoe-pack or similarly narrow compactor that is less than the width of the trench line. Areas of trench backfill that become soft or yielding after densification should be removed and replaced with compacted Granular Borrow.

#### **4.3 Placement and Compaction**

Fill should be placed in horizontal lifts and compacted such that the desired density is achieved throughout the lift thickness with 3 to 5 passes of the compaction equipment. Loose lift thicknesses for grading, fill and backfill activities should not exceed 12 inches. We recommend that fill and backfill be compacted to at least 95 percent of its maximum dry density as determined by AASTHO T180. Base, subbase and asphalt layers should be compacted according to the requirements of 2014 MaineDOT Standard Specifications.

**4.4 Design Review and Construction Testing**

S.W.COLE should be retained to review the bid documents to determine that our earthwork and pavement recommendations have been properly interpreted and implemented. A soils and HMA asphalt testing program should also be implemented during construction to observe compliance with the design concepts, plans, and specifications. S.W.COLE is available to provide roadway subgrade observations as well as testing services for soils, full depth recycled and asphalt construction materials.

**5.0 CLOSURE**

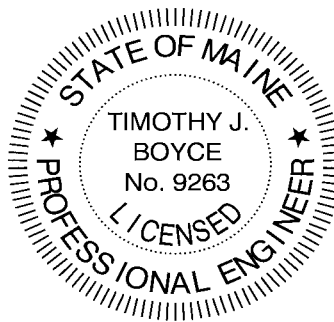
It has been a pleasure to be of assistance to you with this phase of your project. We look forward to working with you during the construction phase of the project.

Sincerely,

**S. W. Cole Engineering, Inc.**



Timothy J. Boyce, P.E.  
Senior Geotechnical Engineer



EMW/MAS:tjb

## **Attachment A Limitations**

This report has been prepared for the exclusive use of Sebago Technics, Inc. for specific application to the Proposed Pavement Reconstruction of Middle Road from Woods Road in Falmouth to the Cumberland Town Line. S. W. Cole Engineering, Inc. (S.W.COLE) has endeavored to conduct the work in accordance with generally accepted soil and foundation engineering practices. No warranty, expressed or implied, is made.

The soil profiles described in the report are intended to convey general trends in subsurface conditions. The boundaries between strata are approximate and are based upon interpretation of exploration data and samples.

The analyses performed during this investigation and recommendations presented in this report are based in part upon the data obtained from subsurface explorations made at the site. Variations in subsurface conditions may occur between explorations and may not become evident until construction. If variations in subsurface conditions become evident after submission of this report, it will be necessary to evaluate their nature and to review the recommendations of this report.

Observations have been made during exploration work to assess site groundwater levels. Fluctuations in water levels will occur due to variations in rainfall, temperature, and other factors.

S.W.COLE's scope of work has not included the investigation, detection, or prevention of any Biological Pollutants at the project site or in any existing or proposed structure at the site. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria, and viruses, and the byproducts of any such biological organisms.

Recommendations contained in this report are based substantially upon information provided by others regarding the proposed project. In the event that any changes are made in the design, nature, or location of the proposed project, S.W.COLE should review such changes as they relate to analyses associated with this report. Recommendations contained in this report shall not be considered valid unless the changes are reviewed by S.W.COLE.



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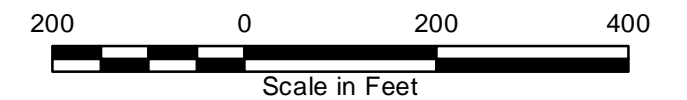


#### LEGEND

 APPROXIMATE BORING LOCATION

#### NOTES:

1. EXPLORATION LOCATION PLAN PREPARED FROM IMAGERY FROM STATE OF MAINE AERIAL ORTHOPHOTOS ENTITLED "GEOLIBRARY\_3IN\_2012," PROVIDED BY THE STATE OF MAINE, MAINE OFFICE OF GIS AND MAINE GEOLIBRARY BOARD.
2. THE BORINGS WERE LOCATED IN THE FIELD BY S. W. COLE ENGINEERING, INC. BY TAPED MEASUREMENTS FROM STAKED LOCATIONS SELECTED AND LOCATED IN THE FIELD BY SEBAGO TECHNICS.
3. THIS PLAN SHOULD BE USED IN CONJUNCTION WITH THE ASSOCIATED S. W. COLE ENGINEERING, INC. GEOTECHNICAL REPORT.
4. THE PURPOSE OF THIS PLAN IS ONLY TO DEPICT THE LOCATION OF THE EXPLORATIONS IN RELATION TO THE EXISTING CONDITIONS AND PROPOSED CONSTRUCTION AND IS NOT TO BE USED FOR CONSTRUCTION.



SEBAGO TECHNICS

### EXPLORATION LOCATION PLAN

PROPOSED PAVEMENT RECONSTRUCTION  
MIDDLE ROAD  
FALMOUTH, MAINE

Job No.	15-1089	Scale	1"=200'
Date:	12/23/2015	Sheet	1A



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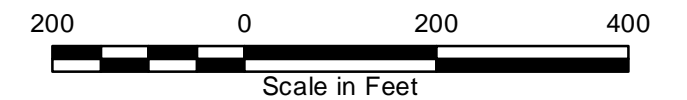
#### LEGEND



APPROXIMATE BORING LOCATION

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SEBAGO TECHNICS

### EXPLORATION LOCATION PLAN

PROPOSED PAVEMENT RECONSTRUCTION  
MIDDLE ROAD  
FALMOUTH, MAINE

Job No.	15-1089	Scale	1"= 200'
Date:	12/23/2015	Sheet	1B



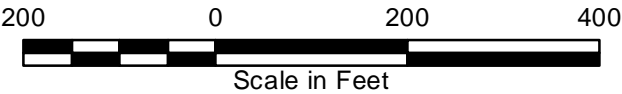


**LEGEND**

 APPROXIMATE BORING LOCATION

**NOTES:**

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SEBAGO TECHNICS

**EXPLORATION LOCATION PLAN**

PROPOSED PAVEMENT RECONSTRUCTION  
MIDDLE ROAD  
FALMOUTH, MAINE

Job No.	15-1089	Scale	1"= 200'
Date:	12/23/2015	Sheet	1C



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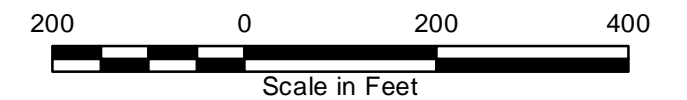
#### LEGEND



APPROXIMATE BORING LOCATION

#### NOTES:

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**S.W.COLE**  
ENGINEERING, INC.

SEBAGO TECHNICS

### EXPLORATION LOCATION PLAN

PROPOSED PAVEMENT RECONSTRUCTION  
MIDDLE ROAD  
FALMOUTH, MAINE

Job No.	15-1089	Scale	1"= 200'
Date:	12/23/2015	Sheet	1D





BORING NO.:	<b>B-1</b>
SHEET:	1 OF 1
PROJECT NO.:	15-1089
DATE START:	11/10/2015
DATE FINISH:	11/10/2015
ELEVATION:	NOT AVAILABLE
SWC REP.:	E. WALKER

PROJECT:	PROPOSED PAVEMENT RECONSTRUCTION			
CLIENT :	SEBAGO TECHNICS, INC.			
LOCATION:	MIDDLE ROAD, FALMOUTH, MAINE			
DRILLING FIRM:	S.W. COLE EXPLORATIONS, LLC		DRILLER:	BOB MARCOUX
	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	SSA	4" O.D.		
SAMPLER:	SS	1 3/8"	140 LBS.	30"
CORE BARREL:				

ALL SOILS MOIST

[illegible]

SAMPLES:	SOIL CLASSIFIED BY:	
D = SPLIT SPOON		DRILLER - VISUALLY
C = 3" SHELBY TUBE	X	SOIL TECH. - VISUALLY
U = 3.5" SHELBY TUBE	X	LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: **B-1**



BORING NO.:	<b>B-2</b>
SHEET:	1 OF 1
PROJECT NO.:	15-1089
DATE START:	11/9/2015
DATE FINISH:	11/9/2015
ELEVATION:	NOT AVAILABLE
SWC REP.:	E. WALKER

**WATER LEVEL INFORMATION**  
SOILS MOIST BELOW 2' +/-

CASING BLOWS  PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA	
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24			
									5"	ASPHALT PAVEMENT	
									2.0'	BROWN TO BLACK GRAVELLY SAND, SOME SILT (FILL)	
	1D	24"	20"	2.5'	18	21	10	5	2.5'	GRAY-BROWN SILTY SAND, SOME GRAVEL (PROBABLE FILL)	
	2D	24"	16"	4.5'	6	7	11	11		GRAY-BROWN SILTY FINE SAND	
										BOTTOM OF EXPLORATION @ 4.5'	
SAMPLES:	SOIL CLASSIFIED BY:				REMARKS:						
D = SPLIT SPOON	<div style="text-align:center;"><div>X</div></div>				DRILLER - VISUALLY SOIL TECH. - VISUALLY LABORATORY TEST						
C = 3" SHELBY TUBE					STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.						
U = 3.5" SHELBY TUBE					BORING NO.: <div>B-2<div>3</div></div>						



**S.W. COLE**  
ENGINEERING, INC.

## BORING LOG

PROJECT: PROPOSED PAVEMENT RECONSTRUCTION  
CLIENT: SEBAGO TECHNIQS, INC.  
LOCATION: MIDDLE ROAD, FALMOUTH, MAINE  
DRILLING FIRM: S.W. COLE EXPLORATIONS, LLC DRILLER: BOB MARCOUX  
TYPE SIZE I.D. HAMMER WT. HAMMER FALL  
CASING: SSA 4" O.D.  
SAMPLER: SS 1 3/8" 140 LBS. 30"  
CORE BARREL:

BORING NO.: B-3  
SHEET: 1 OF 1  
PROJECT NO.: 15-1089  
DATE START: 11/9/2015  
DATE FINISH: 11/9/2015  
ELEVATION: NOT AVAILABLE  
SWC REP.: E. WALKER

### WATER LEVEL INFORMATION

SOILS MOIST BELOW 2' +/-,  
SATURATED BELOW 4' +/-

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
									4.5"	ASPHALT PAVMENT
									0.8'	BLACK GRAVELLY SAND, SOME SILT (FILL - POSSIBLE RECLAIM)
	1D	24"	18"	2.5'	13	12	14	10	2.5'	BROWN GRAVELLY SAND, SOME SILT (FILL)
									3.0'	DARK BROWN SILTY SAND, SOME GRAVEL (FILL)
	2D	24"	12"	4.5'	7	12	20	26		WEATHERED BEDROCK
										REFUSAL @ 4.6' PROBABLE BEDROCK

SAMPLES: SOIL CLASSIFIED BY:  
D = SPLIT SPOON  
C = 3" SHELBY TUBE  
U = 3.5" SHELBY TUBE  
DRILLER - VISUALLY  
SOIL TECH. - VISUALLY  
LABORATORY TEST

REMARKS:  
STRATIFICATION LINES REPRESENT THE  
APPROXIMATE BOUNDARY BETWEEN SOIL TYPES  
AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-3



BORING NO.:	<b>B-4</b>
SHEET:	1 OF 1
PROJECT NO.:	15-1089
DATE START:	11/9/2015
DATE FINISH:	11/9/2015
ELEVATION:	NOT AVAILABLE
SWC REP.:	E. WALKER

**WATER LEVEL INFORMATION**  
SOILS MOIST BELOW 3' +/-

[illegible]



BORING NO.:	<b>B-5</b>
SHEET:	1 OF 1
PROJECT NO.:	15-1089
DATE START:	11/9/2015
DATE FINISH:	11/9/2015
ELEVATION:	NOT AVAILABLE
SWC REP.:	E. WALKER

PROJECT:	PROPOSED PAVEMENT RECONSTRUCTION			
CLIENT :	SEBAGO TECHNICS, INC.			
LOCATION:	MIDDLE ROAD, FALMOUTH, MAINE			
DRILLING FIRM:	S.W. COLE EXPLORATIONS, LLC		DRILLER:	BOB MARCOUX
	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	SSA	4" O.D.		
SAMPLER:	SS	1 3/8"	140 LBS.	30"
CORE BARREL:				

SOILS MOIST BELOW 1' +/-,  
SATURATED BELOW 2.5' +/-

[illegible]

SAMPLES:	SOIL CLASSIFIED BY:	
D = SPLIT SPOON		DRILLER - VISUALLY
C = 3" SHELBY TUBE	X	SOIL TECH. - VISUALLY
U = 3.5" SHELBY TUBE		LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: **B-5**



BORING NO.:	<b>B-6</b>
SHEET:	1 OF 1
PROJECT NO.:	15-1089
DATE START:	11/9/2015
DATE FINISH:	11/9/2015
ELEVATION:	NOT AVAILABLE
SWC REP.:	E. WALKER

**WATER LEVEL INFORMATION**  
SOILS SATURATED BELOW 4.3' +/-

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA	
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24			
									4.5"	ASPHALT PAVEMENT	
									0.8'	BLACK GRAVELLY SILTY SAND (FILL - POSSIBLE RECLAIM)	
	1D	24"	16"	2.5'	7	8	12	8	4.5'	ORANGE-BROWN SAND, SOME GRAVEL, SOME SILT WITH SEAMS OF REWORKED GRAY-BROWN SILTY CLAY (FILL)	
										~ MEDIUM DENSE ~	
	2D	24"	16"	4.5'	5	6	8	11		BROWN SILTY CLAY ~ VERY STIFF ~ <span style="float: right;">q<sub>p</sub> = 7 KSF</span>	
										BOTTOM OF EXPLORATION @ 7.0'	
	3D	24"	16"	7.0'	2	2	3	5			

SAMPLES:

D = SPLIT SPOON

C = 3" SHELBY TUBE

U = 3.5" SHELBY TUBE

X

SOIL CLASSIFIED BY:

DRILLER - VISUALLY

SOIL TECH. - VISUALLY

LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.:

B-6

7



BORING NO.:	<b>B-7</b>
SHEET:	1 OF 1
PROJECT NO.:	15-1089
DATE START:	11/9/2015
DATE FINISH:	11/9/2015
ELEVATION:	NOT AVAILABLE
SWC REP.:	E. WALKER

PROJECT:	PROPOSED PAVEMENT RECONSTRUCTION			
CLIENT :	SEBAGO TECHNICS, INC.			
LOCATION:	MIDDLE ROAD, FALMOUTH, MAINE			
DRILLING FIRM:	S.W. COLE EXPLORATIONS, LLC		DRILLER:	BOB MARCOUX
	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	SSA	4" O.D.		
SAMPLER:	SS	1 3/8"	140 LBS.	30"
CORE BARREL:				

NO FREE WATER OBSERVED

CASING BLOWS  PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA			
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24					
									6"	ASPHALT PAVEMENT			
	1D	15"	14"	1.8'	15	42	50-3"		0.8'	BLACK SILTY SAND, SOME GRAVEL (FILL - POSSIBLE RECLAIM)			
										BROWN SAND, SOME GRAVEL, SOME SILT ~ DENSE ~			
										REFUSAL @ 1.8' PROBABLE BEDROCK			
SAMPLES:					SOIL CLASSIFIED BY:				REMARKS:				
D = SPLIT SPOON C = 3" SHELBY TUBE U = 3.5" SHELBY TUBE					<div><div></div><div>X</div><div></div></div> DRILLER - VISUALLY SOIL TECH. - VISUALLY LABORATORY TEST				STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.			<div>8</div> <div>BORING NO.: B-7</div>	



BORING NO.:	<b>B-8</b>
SHEET:	1 OF 1
PROJECT NO.:	15-1089
DATE START:	11/9/2015
DATE FINISH:	11/9/2015
ELEVATION:	NOT AVAILABLE
SWC REP.:	E. WALKER

**WATER LEVEL INFORMATION**  
NO FREE WATER OBSERVED

[illegible]





BORING NO.:	<b>B-9</b>
SHEET:	1 OF 1
PROJECT NO.:	15-1089
DATE START:	11/9/2015
DATE FINISH:	11/9/2015
ELEVATION:	NOT AVAILABLE
SWC REP.:	E. WALKER

**WATER LEVEL INFORMATION**  
NO FREE WATER OBSERVED

CASING BLOWS  PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA	
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24			
									5.5"	ASPHALT PAVEMENT	
	1D	24"	6"	2.5'	20	21	23	22	3.1'	BROWN GRAVELLY SAND, SOME SILT (FILL) ~ DENSE ~	
	2D	15"	15"	3.8'	14	20	50-3"			3.9'	WEATHERED BEDROCK
										REFUSAL @ 3.9' PROBABLE BEDROCK	



**S.W. COLE**  
ENGINEERING, INC.

## BORING LOG

PROJECT: PROPOSED PAVEMENT RECONSTRUCTION  
CLIENT: SEBAGO TECHNIQS, INC.  
LOCATION: MIDDLE ROAD, FALMOUTH, MAINE  
DRILLING FIRM: S.W. COLE EXPLORATIONS, LLC DRILLER: BOB MARCOUX  
TYPE SIZE I.D. HAMMER WT. HAMMER FALL  
CASING: SSA 4" O.D.  
SAMPLER: SS 1 3/8" 140 LBS. 30"  
CORE BARREL:

BORING NO.: B-10  
SHEET: 1 OF 1  
PROJECT NO.: 15-1089  
DATE START: 11/9/2015  
DATE FINISH: 11/9/2015  
ELEVATION: NOT AVAILABLE  
SWC REP.: E. WALKER

### WATER LEVEL INFORMATION

SOILS WET BELOW 2.5' +/-

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
									4.5"	ASPHALT PAVEMENT
									0.7'	BLACK GRAVELLY SILTY SAND (FILL - POSSIBLE RECLAIM)
	1D	24"	18"	2.5'	11	11	8	9	2.5'	BROWN GRAVELLY SAND, SOME SILT (FILL) ~ MEDIUM DENSE ~
									3.0'	GRAY SILTY SAND ~ MEDIUM DENSE ~
	2D	24"	18"	4.5'	5	6	6	19	4.3'	ORANGE-BROWN GRAVELLY SILTY SAND ~ MEDIUM DENSE ~
										WEATHERED BEDROCK
										REFUSAL @ 5.0' PROBABLE BEDROCK

SAMPLES: SOIL CLASSIFIED BY:  
D = SPLIT SPOON  
C = 3" SHELBY TUBE  
U = 3.5" SHELBY TUBE  
DRILLER - VISUALLY  
SOIL TECH. - VISUALLY  
LABORATORY TEST

REMARKS:  
STRATIFICATION LINES REPRESENT THE  
APPROXIMATE BOUNDARY BETWEEN SOIL TYPES  
AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-10



**S.W. COLE**  
ENGINEERING, INC.

## BORING LOG

PROJECT: PROPOSED PAVEMENT RECONSTRUCTION  
CLIENT: SEBAGO TECHNIQS, INC.  
LOCATION: MIDDLE ROAD, FALMOUTH, MAINE  
DRILLING FIRM: S.W. COLE EXPLORATIONS, LLC DRILLER: BOB MARCOUX  
TYPE SIZE I.D. HAMMER WT. HAMMER FALL  
CASING: SSA 4" O.D.  
SAMPLER: SS 1 3/8" 140 LBS. 30"  
CORE BARREL:

BORING NO.: B-11  
SHEET: 1 OF 1  
PROJECT NO.: 15-1089  
DATE START: 11/9/2015  
DATE FINISH: 11/9/2015  
ELEVATION: NOT AVAILABLE  
SWC REP.: E. WALKER

### WATER LEVEL INFORMATION

SOILS MOIST BELOW 3' +/-

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
									6"	ASPHALT PAVEMENT
									0.8'	BLACK SILTY SAND, SOME GRAVEL (FILL - POSSIBLE RECLAIM)
	1D	24"	16"	2.5'	13	14	18	11	2.3'	BROWN GRAVELLY SAND, SOME SILT (FILL)
									2.5'	BROWN CLAYEY SILT AND SAND (FILL)
	2D	24"	16"	4.5'	6	7	10	8	5.0'	BROWN FINE TO MEDIUM SAND, SOME SILT
	3D	4"	4"	5.3'	50-4"					WEATHERED BEDROCK
										REFUSAL @ 5.5' PROBABLE BEDROCK

SAMPLES: SOIL CLASSIFIED BY:  
D = SPLIT SPOON  
C = 3" SHELBY TUBE  
U = 3.5" SHELBY TUBE  
DRILLER - VISUALLY  
SOIL TECH. - VISUALLY  
LABORATORY TEST

REMARKS:  
STRATIFICATION LINES REPRESENT THE  
APPROXIMATE BOUNDARY BETWEEN SOIL TYPES  
AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-11



**S.W. COLE**  
ENGINEERING, INC.

## BORING LOG

PROJECT: PROPOSED PAVEMENT RECONSTRUCTION  
CLIENT: SEBAGO TECHNIQS, INC.  
LOCATION: MIDDLE ROAD, FALMOUTH, MAINE  
DRILLING FIRM: S.W. COLE EXPLORATIONS, LLC DRILLER: BOB MARCOUX  
TYPE SIZE I.D. HAMMER WT. HAMMER FALL  
CASING: SSA 4" O.D.  
SAMPLER: SS 1 3/8" 140 LBS. 30"  
CORE BARREL:

BORING NO.: **B-12**  
SHEET: 1 OF 1  
PROJECT NO.: 15-1089  
DATE START: 11/9/2015  
DATE FINISH: 11/9/2015  
ELEVATION: NOT AVAILABLE  
SWC REP.: E. WALKER

### WATER LEVEL INFORMATION

SOILS MOIST BELOW 2.5' +/-  
SOILS SATURATED BELOW 5' +/-

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
									4.5"	ASPHALT PAVEMENT
									0.7'	BLACK SILTY GRAVELLY SAND (FILL - POSSIBLE RECLAIM)
	1D	24"	16"	2.5'	9	12	13	11	2.3'	BROWN GRAVELLY SAND, SOME SILT (FILL) w=5.8%
									2.5'	BROWN CLAYEY SILT (FILL)
	2D	24"	18"	4.5'	10	11	8	6	5.0'	GRAY-BROWN SILTY SAND, SOME GRAVEL (FILL)
									5.5'	DARK GRAY SILTY SAND ~ LOOSE ~
	3D	24"	20"	7.0'	2	2	3	4	7.0'	BROWN SILTY CLAY ~ VERY STIFF ~ $q_p = 7$ KSF
										BOTTOM OF EXPLORATION @ 7.0'

SAMPLES: SOIL CLASSIFIED BY:  
D = SPLIT SPOON  
C = 3" SHELBY TUBE  
U = 3.5" SHELBY TUBE  
DRILLER - VISUALLY  
SOIL TECH. - VISUALLY  
LABORATORY TEST

REMARKS:  
STRATIFICATION LINES REPRESENT THE  
APPROXIMATE BOUNDARY BETWEEN SOIL TYPES  
AND THE TRANSITION MAY BE GRADUAL.



BORING NO.:	<b>B-13</b>
SHEET:	1 OF 1
PROJECT NO.:	15-1089
DATE START:	11/9/2015
DATE FINISH:	11/9/2015
ELEVATION:	NOT AVAILABLE
SWC REP.:	E. WALKER

**WATER LEVEL INFORMATION**  
NO FREE WATER OBSERVED

[illegible]



BORING NO.:	<b>B-14</b>
SHEET:	1 OF 1
PROJECT NO.:	15-1089
DATE START:	11/9/2015
DATE FINISH:	11/9/2015
ELEVATION:	NOT AVAILABLE
SWC REP.:	E. WALKER

PROJECT:	PROPOSED PAVEMENT RECONSTRUCTION			
CLIENT :	SEBAGO TECHNICS, INC.			
LOCATION:	MIDDLE ROAD, FALMOUTH, MAINE			
DRILLING FIRM:	S.W. COLE EXPLORATIONS, LLC		DRILLER:	BOB MARCOUX
	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	SSA	4" O.D.		
SAMPLER:	SS	1 3/8"	140 LBS.	30"
CORE BARREL:				

SOILS MOIST TO WET BELOW 2.5' +/-

[illegible]

SAMPLES:	SOIL CLASSIFIED BY:	
D = SPLIT SPOON		DRILLER - VISUALLY
C = 3" SHELBY TUBE	X	SOIL TECH. - VISUALLY
U = 3.5" SHELBY TUBE		LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: **B-14**



**S.W. COLE**  
ENGINEERING, INC.

## BORING LOG

PROJECT: PROPOSED PAVEMENT RECONSTRUCTION  
CLIENT: SEBAGO TECHNIQS, INC.  
LOCATION: MIDDLE ROAD, FALMOUTH, MAINE  
DRILLING FIRM: S.W. COLE EXPLORATIONS, LLC DRILLER: BOB MARCOUX  
TYPE SIZE I.D. HAMMER WT. HAMMER FALL  
CASING: SSA 4" O.D.  
SAMPLER: SS 1 3/8" 140 LBS. 30"  
CORE BARREL:

BORING NO.: **B-15**  
SHEET: 1 OF 1  
PROJECT NO.: 15-1089  
DATE START: 11/9/2015  
DATE FINISH: 11/9/2015  
ELEVATION: NOT AVAILABLE  
SWC REP.: E. WALKER

**WATER LEVEL INFORMATION**  
NO FREE WATER OBSERVED

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
									4"	ASPHALT PAVEMENT
									1.2'	DARK GRAY GRAVELLY SILTY SAND (FILL)
	1D	22"	18"	2.2'	18	22	49	50-3"	2.0'	BROWN GRAVELLY SAND, SOME SILT (FILL)
										WEATHERED BEDROCK
										REFUSAL @ 4.5' PROBABLE BEDROCK

SAMPLES: SOIL CLASSIFIED BY:  
D = SPLIT SPOON  
C = 3" SHELBY TUBE  
U = 3.5" SHELBY TUBE  
DRILLER - VISUALLY  
SOIL TECH. - VISUALLY  
LABORATORY TEST

REMARKS:  
STRATIFICATION LINES REPRESENT THE  
APPROXIMATE BOUNDARY BETWEEN SOIL TYPES  
AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: **B-15**







BORING NO.:	<b>B-17</b>
SHEET:	1 OF 1
PROJECT NO.:	15-1089
DATE START:	11/10/2015
DATE FINISH:	11/10/2015
ELEVATION:	NOT AVAILABLE
SWC REP.:	E. WALKER

**WATER LEVEL INFORMATION**  
NO FREE WATER OBSERVED

[illegible]



BORING NO.:	<b>B-18</b>
SHEET:	1 OF 1
PROJECT NO.:	15-1089
DATE START:	11/10/2015
DATE FINISH:	11/10/2015
ELEVATION:	NOT AVAILABLE
SWC REP.:	E. WALKER

**WATER LEVEL INFORMATION**  
NO FREE WATER OBSERVED

PROJECT:	PROPOSED PAVEMENT RECONSTRUCTION			
CLIENT :	SEBAGO TECHNICS, INC.			
LOCATION:	MIDDLE ROAD, FALMOUTH, MAINE			
DRILLING FIRM:	S.W. COLE EXPLORATIONS, LLC		DRILLER:	BOB MARCOUX
	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	SSA	4" O.D.		
SAMPLER:	SS	1 3/8"	140 LBS.	30"
CORE BARREL:				

[illegible]

SAMPLES:	SOIL CLASSIFIED BY:
D = SPLIT SPOON	
C = 3" SHELBY TUBE	X
U = 3.5" SHELBY TUBE	

DRILLER - VISUALLY	SOIL TECH. - VISUALLY	LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.



BORING NO.:	<b>B-19</b>
SHEET:	1 OF 1
PROJECT NO.:	15-1089
DATE START:	11/10/2015
DATE FINISH:	11/10/2015
ELEVATION:	NOT AVAILABLE
SWC REP.:	E. WALKER

PROJECT:	PROPOSED PAVEMENT RECONSTRUCTION			
CLIENT :	SEBAGO TECHNICS, INC.			
LOCATION:	MIDDLE ROAD, FALMOUTH, MAINE			
DRILLING FIRM:	S.W. COLE EXPLORATIONS, LLC		DRILLER:	BOB MARCOUX
	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	SSA	4" O.D.		
SAMPLER:	SS	1 3/8"	140 LBS.	30"
CORE BARREL:				

NO FREE WATER OBSERVED

[illegible]

SAMPLES:	SOIL CLASSIFIED BY:	
D = SPLIT SPOON		DRILLER - VISUALLY
C = 3" SHELBY TUBE	X	SOIL TECH. - VISUALLY
U = 3.5" SHELBY TUBE		LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: **B-19**



BORING NO.:	<b>B-20</b>
SHEET:	1 OF 1
PROJECT NO.:	15-1089
DATE START:	11/10/2015
DATE FINISH:	11/10/2015
ELEVATION:	NOT AVAILABLE
SWC REP.:	E. WALKER

**WATER LEVEL INFORMATION**  
SOILS MOIST BELOW 2.5' +/-

[illegible]



BORING NO.:	<b>B-21</b>
SHEET:	1 OF 1
PROJECT NO.:	15-1089
DATE START:	11/10/2015
DATE FINISH:	11/10/2015
ELEVATION:	NOT AVAILABLE
SWC REP.:	E. WALKER

PROJECT:	PROPOSED PAVEMENT RECONSTRUCTION			
CLIENT :	SEBAGO TECHNICS, INC.			
LOCATION:	MIDDLE ROAD, FALMOUTH, MAINE			
DRILLING FIRM:	S.W. COLE EXPLORATIONS, LLC		DRILLER:	BOB MARCOUX
	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	SSA	4" O.D.		
SAMPLER:	SS	1 3/8"	140 LBS.	30"
CORE BARREL:				

SOILS SATURATED BELOW 5' +/-

[illegible]

SAMPLES:	SOIL CLASSIFIED BY:	
D = SPLIT SPOON		DRILLER - VISUALLY
C = 3" SHELBY TUBE	X	SOIL TECH. - VISUALLY
U = 3.5" SHELBY TUBE		LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: **B-21**



BORING NO.:	<b>B-22</b>
SHEET:	1 OF 1
PROJECT NO.:	15-1089
DATE START:	11/10/2015
DATE FINISH:	11/10/2015
ELEVATION:	NOT AVAILABLE
SWC REP.:	E. WALKER

PROJECT:	PROPOSED PAVEMENT RECONSTRUCTION			
CLIENT :	SEBAGO TECHNICS, INC.			
LOCATION:	MIDDLE ROAD, FALMOUTH, MAINE			
DRILLING FIRM:	S.W. COLE EXPLORATIONS, LLC		DRILLER:	BOB MARCOUX
	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	SSA	4" O.D.		
SAMPLER:	SS	1 3/8"	140 LBS.	30"
CORE BARREL:				

SOILS SATURATED BELOW 2.5' +/-

[illegible]

SAMPLES:	SOIL CLASSIFIED BY:	
D = SPLIT SPOON		DRILLER - VISUALLY
C = 3" SHELBY TUBE	X	SOIL TECH. - VISUALLY
U = 3.5" SHELBY TUBE		LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: **B-22**



BORING NO.:	<b>B-23</b>
SHEET:	1 OF 1
PROJECT NO.:	15-1089
DATE START:	11/10/2015
DATE FINISH:	11/10/2015
ELEVATION:	NOT AVAILABLE
SWC REP.:	E. WALKER

PROJECT:	PROPOSED PAVEMENT RECONSTRUCTION			
CLIENT :	SEBAGO TECHNICS, INC.			
LOCATION:	MIDDLE ROAD, FALMOUTH, MAINE			
DRILLING FIRM:	S.W. COLE EXPLORATIONS, LLC		DRILLER:	BOB MARCOUX
	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	SSA	4" O.D.		
SAMPLER:	SS	1 3/8"	140 LBS.	30"
CORE BARREL:				

SOILS MOIST BELOW 0.5' +/-

[illegible]

SAMPLES:	SOIL CLASSIFIED BY:	
D = SPLIT SPOON		DRILLER - VISUALLY
C = 3" SHELBY TUBE	X	SOIL TECH. - VISUALLY
U = 3.5" SHELBY TUBE		LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: **B-23**



## BORING LOG

PROJECT: PROPOSED PAVEMENT RECONSTRUCTION  
CLIENT: SEBAGO TECHNIQS, INC.  
LOCATION: MIDDLE ROAD, FALMOUTH, MAINE  
DRILLING FIRM: S.W. COLE EXPLORATIONS, LLC DRILLER: BOB MARCOUX  
TYPE SIZE I.D. HAMMER WT. HAMMER FALL  
CASING: SSA 4" O.D.  
SAMPLER: SS 1 3/8" 140 LBS. 30"  
CORE BARREL:

BORING NO.: B-24  
SHEET: 1 OF 1  
PROJECT NO.: 15-1089  
DATE START: 11/10/2015  
DATE FINISH: 11/10/2015  
ELEVATION: NOT AVAILABLE  
SWC REP.: E. WALKER

**WATER LEVEL INFORMATION**  
NO FREE WATER OBSERVED

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
									6"	ASPHALT PAVEMENT
	1D	24"	16"	2.5'	12	20	16	18		BROWN GRAVEL AND SAND, SOME SILT (FILL) w=1.7% ~ MEDIUM DENSE TO DENSE ~ ASPHALT @ 6' - 6.4'
	2D	24"	20"	4.5'	10	16	15	16		
	3D	24"	18"	7.0'	47	25	13	8	6.8'	BROWN SILTY SAND WITH ROOTS ~ MEDIUM DENSE ~
										BOTTOM OF EXPLORATION @ 7.0'

SAMPLES: SOIL CLASSIFIED BY:  
D = SPLIT SPOON  
C = 3" SHELBY TUBE  
U = 3.5" SHELBY TUBE  
DRILLER - VISUALLY  
SOIL TECH. - VISUALLY  
LABORATORY TEST

REMARKS:  
STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.  
BORING NO.: B-24





BORING NO.:	<b>B-25</b>
SHEET:	1 OF 1
PROJECT NO.:	15-1089
DATE START:	11/10/2015
DATE FINISH:	11/10/2015
ELEVATION:	NOT AVAILABLE
SWC REP.:	E. WALKER

PROJECT:	PROPOSED PAVEMENT RECONSTRUCTION			
CLIENT :	SEBAGO TECHNICS, INC.			
LOCATION:	MIDDLE ROAD, FALMOUTH, MAINE			
DRILLING FIRM:	S.W. COLE EXPLORATIONS, LLC		DRILLER:	BOB MARCOUX
	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	SSA	4" O.D.		
SAMPLER:	SS	1 3/8"	140 LBS.	30"
CORE BARREL:				

NO FREE WATER OBSERVED

[illegible]

SAMPLES:	SOIL CLASSIFIED BY:	
D = SPLIT SPOON		DRILLER - VISUALLY
C = 3" SHELBY TUBE	X	SOIL TECH. - VISUALLY
U = 3.5" SHELBY TUBE		LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: **B-25**



BORING NO.:	<b>B-26</b>
SHEET:	1 OF 1
PROJECT NO.:	15-1089
DATE START:	11/10/2015
DATE FINISH:	11/10/2015
ELEVATION:	NOT AVAILABLE
SWC REP.:	E. WALKER

**WATER LEVEL INFORMATION**  
NO FREE WATER OBSERVED

CASING BLOWS  PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA	
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24			
									4"	ASPHALT PAVEMENT	
									0.8'	BLACK SILTY GRAVELLY SAND (FILL - POSSIBLE RECLAIM)	
	1D	24"	18"	2.5'	11	9	10	13	2.5	BROWN GRAVELLY SAND, TRACE SILT (FILL)	
	2D	7"	4"	3.1'	48	50-1"				WEATHERED BEDROCK	
										REFUSAL @ 3.9' PROBABLE BEDROCK	
SAMPLES:					SOIL CLASSIFIED BY:				REMARKS:		
D = SPLIT SPOON C = 3" SHELBY TUBE U = 3.5" SHELBY TUBE					<div> <div></div> <div>X</div> <div></div> </div> DRILLER - VISUALLY SOIL TECH. - VISUALLY LABORATORY TEST				STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.		
									BORING NO.: <b>B-26</b>		



BORING NO.:	<b>B-27</b>
SHEET:	1 OF 1
PROJECT NO.:	15-1089
DATE START:	11/9/2015
DATE FINISH:	11/9/2015
ELEVATION:	NOT AVAILABLE
SWC REP.:	E. WALKER

PROJECT:	PROPOSED PAVEMENT RECONSTRUCTION			
CLIENT :	SEBAGO TECHNICS, INC.			
LOCATION:	MIDDLE ROAD, FALMOUTH, MAINE			
DRILLING FIRM:	S.W. COLE EXPLORATIONS, LLC		DRILLER:	BOB MARCOUX
	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	SSA	4" O.D.		
SAMPLER:	SS	1 3/8"	140 LBS.	30"
CORE BARREL:				

SOILS MOIST BELOW 3' +/-  
SOILS SATURATED BELOW 4' +/-

[illegible]

SAMPLES:	SOIL CLASSIFIED BY:	
D = SPLIT SPOON		DRILLER - VISUALLY
C = 3" SHELBY TUBE	X	SOIL TECH. - VISUALLY
U = 3.5" SHELBY TUBE		LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: **B-27**

## KEY TO NOTES & SYMBOLS

### Test Boring and Test Pit Explorations

All stratification lines represent the approximate boundary between soil types and the transition may be gradual.

#### Key to Symbols Used:

w	-	water content, percent (dry weight basis)
q <sub>u</sub>	-	unconfined compressive strength, kips/sq. ft. - laboratory test
S <sub>v</sub>	-	field vane shear strength, kips/sq. ft.
L <sub>v</sub>	-	lab vane shear strength, kips/sq. ft.
q <sub>p</sub>	-	unconfined compressive strength, kips/sq. ft. – pocket penetrometer test
O	-	organic content, percent (dry weight basis)
W <sub>L</sub>	-	liquid limit - Atterberg test
W <sub>P</sub>	-	plastic limit - Atterberg test
WOH	-	advance by weight of hammer
WOM	-	advance by weight of man
WOR	-	advance by weight of rods
HYD	-	advance by force of hydraulic piston on drill
RQD	-	Rock Quality Designator - an index of the quality of a rock mass.
γ <sub>T</sub>	-	total soil weight
γ <sub>B</sub>	-	buoyant soil weight

#### Description of Proportions:

Trace:	0 to 5%
Some:	5 to 12%
"Y"	12 to 35%
And	35+%
With	Undifferentiated

#### Description of Stratified Soils

Parting:	0 to 1/16" thickness
Seam:	1/16" to 1/2" thickness
Layer:	½" to 12" thickness
Varved:	Alternating seams or layers
Occasional:	one or less per foot of thickness
Frequent:	more than one per foot of thickness

**REFUSAL: Test Boring Explorations** - Refusal depth indicates that depth at which, in the drill foreman's opinion, sufficient resistance to the advance of the casing, auger, probe rod or sampler was encountered to render further advance impossible or impracticable by the procedures and equipment being used.

**REFUSAL: Test Pit Explorations** - Refusal depth indicates that depth at which sufficient resistance to the advance of the backhoe bucket was encountered to render further advance impossible or impracticable by the procedures and equipment being used.

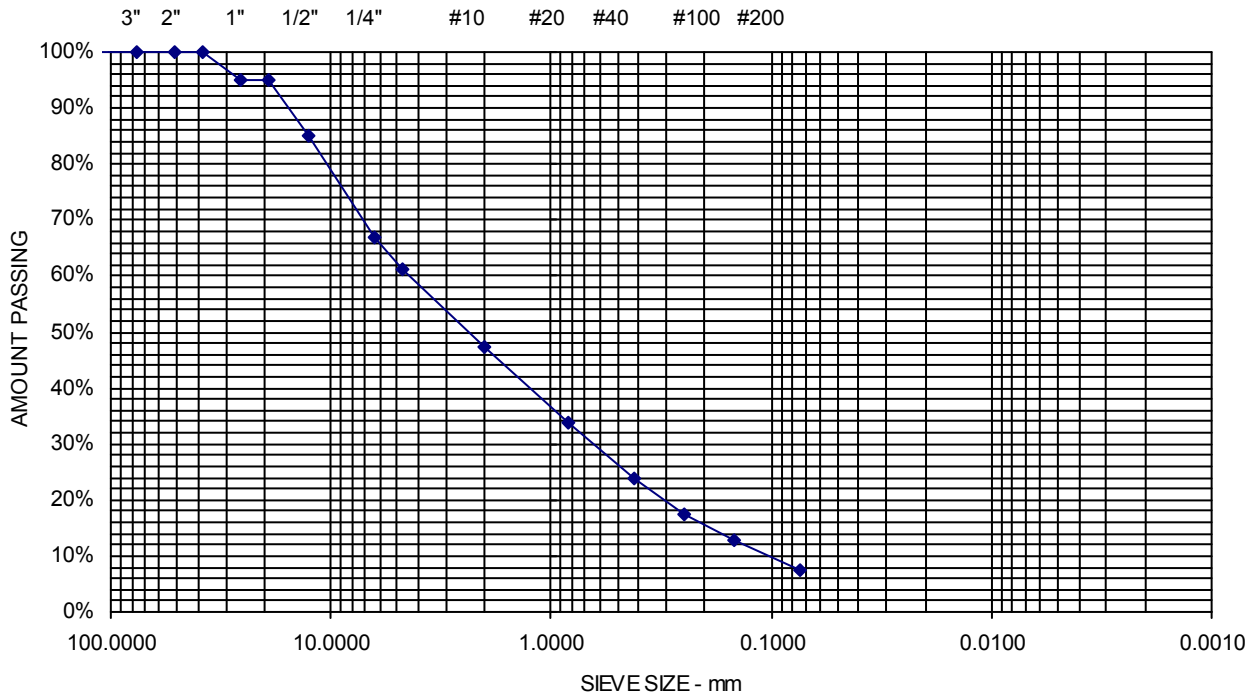
Although refusal may indicate the encountering of the bedrock surface, it may indicate the striking of large cobbles, boulders, very dense or cemented soil, or other buried natural or man-made objects or it may indicate the encountering of a harder zone after penetrating a considerable depth through a weathered or disintegrated zone of the bedrock.

Project Name FALMOUTH ME - MIDDLE ROAD REHABILITATION - GEOTECHNICAL  
ENGINEERING SERVICES  
Client SEBAGO TECHNICS, INC.

Project Number 15-1089  
Lab ID 20378G  
Date Received 12/29/2015  
Date Completed 1/4/2016  
Tested By JUSTIN BISSON

Material Source **B-1 (0.4 - 2.0')**

<u>STANDARD DESIGNATION (mm/μm)</u>	<u>SIEVE SIZE</u>	<u>AMOUNT PASSING (%)</u>	
150 mm	6"	100	
125 mm	5"	100	
100 mm	4"	100	
75 mm	3"	100	
50 mm	2"	100	
38.1 mm	1-1/2"	100	
25.0 mm	1"	95	
19.0 mm	3/4"	95	
12.5 mm	1/2"	85	
6.3 mm	1/4"	67	
4.75 mm	No. 4	61	38.7% Gravel
2.00 mm	No. 10	47	
850 μm	No. 20	34	
425 μm	No. 40	24	53.8% Sand
250 μm	No. 60	18	
150 μm	No. 100	13	
75 μm	No. 200	7.5	7.5% Fines

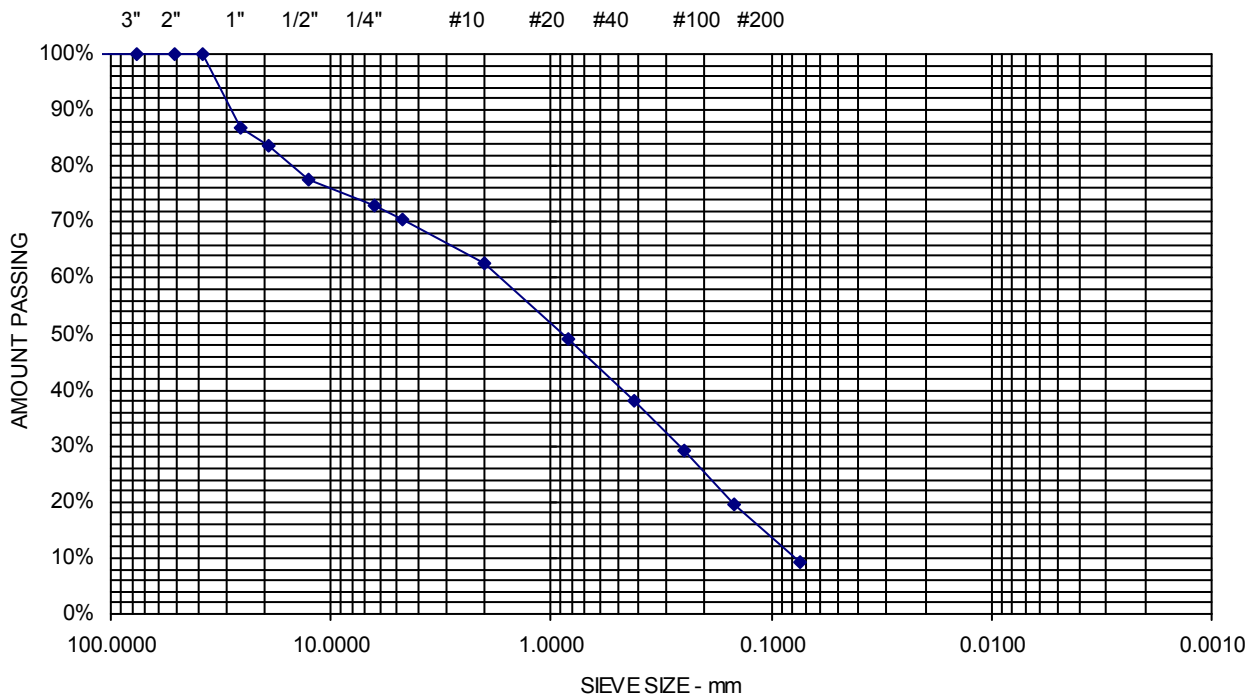


Project Name FALMOUTH ME - MIDDLE ROAD REHABILITATION - GEOTECHNICAL  
 ENGINEERING SERVICES  
 Client SEBAGO TECHNICS, INC.

Project Number 15-1089  
 Lab ID 20375G  
 Date Received 12/29/2015  
 Date Completed 1/5/2016  
 Tested By JUSTIN BISSON

Material Source **B-12, 1D (0.5 - 2.3')**

<u>STANDARD DESIGNATION (mm/μm)</u>	<u>SIEVE SIZE</u>	<u>AMOUNT PASSING (%)</u>	
150 mm	6"	100	
125 mm	5"	100	
100 mm	4"	100	
75 mm	3"	100	
50 mm	2"	100	
38.1 mm	1-1/2"	100	
25.0 mm	1"	87	
19.0 mm	3/4"	84	
12.5 mm	1/2"	77	
6.3 mm	1/4"	73	
4.75 mm	No. 4	70	29.6% Gravel
2.00 mm	No. 10	63	
850 μm	No. 20	49	
425 μm	No. 40	38	61.2% Sand
250 μm	No. 60	29	
150 μm	No. 100	20	
75 μm	No. 200	9.2	9.2% Fines

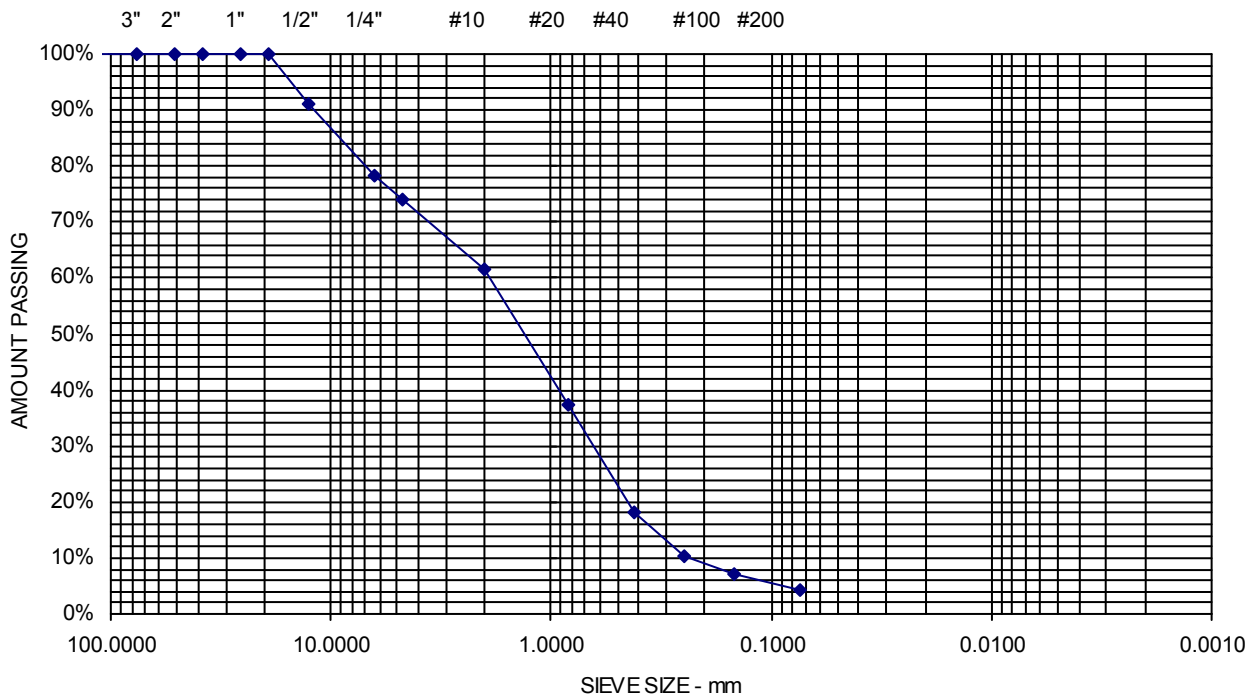


Project Name FALMOUTH ME - MIDDLE ROAD REHABILITATION - GEOTECHNICAL  
 ENGINEERING SERVICES  
 Client SEBAGO TECHNICS, INC.

Project Number 15-1089  
 Lab ID 20376G  
 Date Received 12/29/2015  
 Date Completed 1/4/2016  
 Tested By JUSTIN BISSON

Material Source **B-16, 1D (0.5 - 2.5')**

<u>STANDARD DESIGNATION (mm/μm)</u>	<u>SIEVE SIZE</u>	<u>AMOUNT PASSING (%)</u>	
150 mm	6"	100	
125 mm	5"	100	
100 mm	4"	100	
75 mm	3"	100	
50 mm	2"	100	
38.1 mm	1-1/2"	100	
25.0 mm	1"	100	
19.0 mm	3/4"	100	
12.5 mm	1/2"	91	
6.3 mm	1/4"	78	
4.75 mm	No. 4	74	25.8% Gravel
2.00 mm	No. 10	61	
850 μm	No. 20	37	
425 μm	No. 40	18	69.9% Sand
250 μm	No. 60	10	
150 μm	No. 100	7	
75 μm	No. 200	4.3	4.3% Fines

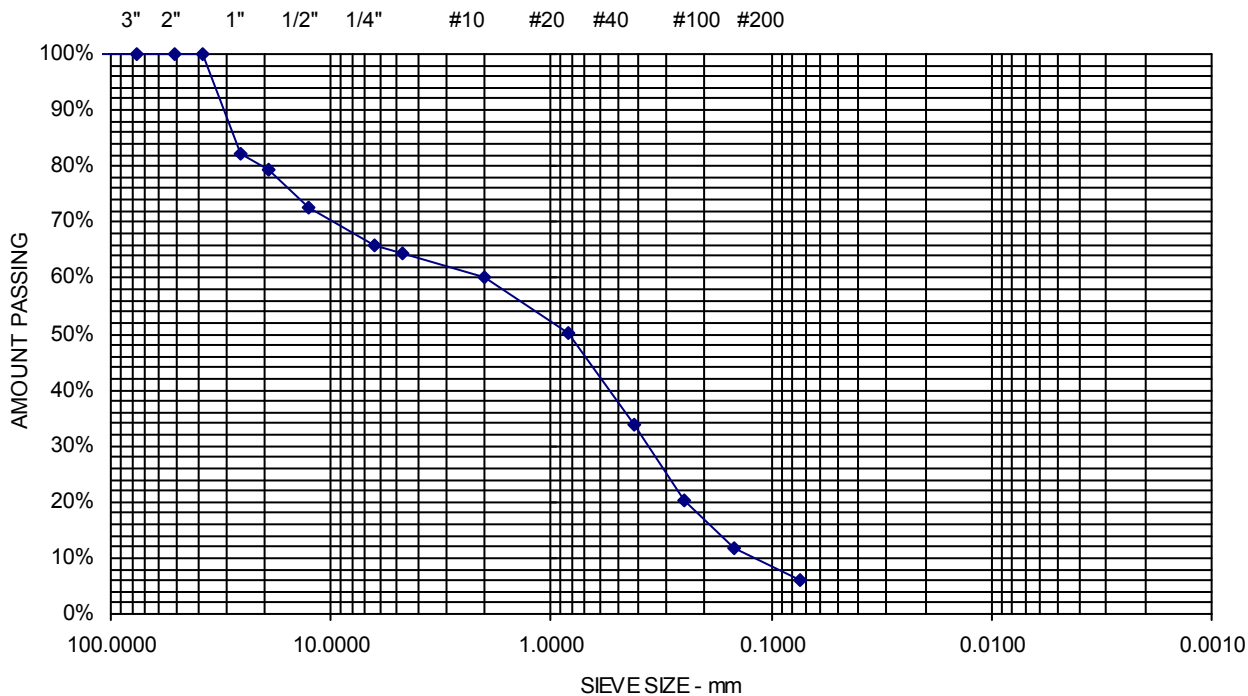


Project Name FALMOUTH ME - MIDDLE ROAD REHABILITATION - GEOTECHNICAL  
 ENGINEERING SERVICES  
 Client SEBAGO TECHNICS, INC.

Project Number 15-1089  
 Lab ID 20377G  
 Date Received 12/29/2015  
 Date Completed 1/5/2016  
 Tested By JUSTIN BISSON

Material Source **B-24, 1D (0.5 - 2.5')**

<u>STANDARD DESIGNATION (mm/μm)</u>	<u>SIEVE SIZE</u>	<u>AMOUNT PASSING (%)</u>	
150 mm	6"	100	
125 mm	5"	100	
100 mm	4"	100	
75 mm	3"	100	
50 mm	2"	100	
38.1 mm	1-1/2"	100	
25.0 mm	1"	82	
19.0 mm	3/4"	79	
12.5 mm	1/2"	73	
6.3 mm	1/4"	66	
4.75 mm	No. 4	65	35.5% Gravel
2.00 mm	No. 10	60	
850 μm	No. 20	50	
425 μm	No. 40	34	58.4% Sand
250 μm	No. 60	20	
150 μm	No. 100	12	
75 μm	No. 200	6.1	6.1% Fines





## APPENDIX A

## BORING SUMMARY

15-1089, MIDDLE ROAD, FALMOUTH, MAINE

Boring Number	Exploration Depth (ft)	Depth to Weathered Bedrock (ft)	Refusal Depth (ft)	Depth to Water (ft)	Pavement Thickness				Subgrade Type	Comments
					HMA (in)	Unbound (in)	Subbase (in)	Total (in)		
B-1	3.6	3.3	3.6	n/a	4	0	20	24	Silty Sand (Fill)	
B-2	4.5	n/a	n/a	n/a	5	0	19	24	Silty Sand (Fill)	
B-3	4.6	3.0	4.6	4	4.5	4.5	21	30	Silty Sand (Fill)	
B-4	4.5	n/a	n/a	n/a	4.5	7.5	24	36	Very Stiff Silty Clay	
B-5	4.5	3.2	4.5	2.5	6	6	0	12	Silty Sand	No Distinct Subbase Gravel
B-6	7.0	n/a	n/a	4.3	4.5	4.5	0	9	Sand, Some Silt (Fill)	No Distinct Subbase Gravel
B-7	1.8	n/a	1.8	n/a	6	3	12	21	Bedrock	Low Portion of Gravel in Subbase
B-8	4.5	3.0	4.5	n/a	5.5	0	3.5	9	Sand, Some Gravel, Some Silt	
B-9	3.9	3.1	3.9	n/a	5.5	0	31.5	37	Bedrock	
B-10	5.0	4.3	5	2.5	4.5	3.5	22	30	Silty Sand	
B-11	5.5	5.0	5.5	n/a	6	3	27	36	Clayey Silt and Sand (Fill)	
B-12	7.0	n/a	n/a	5	4.5	3.5	19	27	Clayey Silt / Silty Sand (Fill)	
B-13	4.7	2.5	4.7	n/a	5	0	13	18	Silty Sand to Bedrock	
B-14	7.0	n/a	n/a	2.5	5	4	9	18	Silty Sand (Fill)	
B-15	4.5	2.0	4.5	n/a	4	0	20	24	Bedrock	
B-16	7.3	6.8	7.3	n/a	4.5	0	25.5	30	Silty Glacial Till	
B-17	4.5	n/a	n/a	n/a	6	0	24	30	Gravelly Sand (Fill)	No Distinction Between Subbase/Subgrade
B-18	4.9	2.5	4.9	n/a	6	0	23	29	Silty Glacial Till	
B-19	3.5	2.5	3.5	n/a	6	0	24	30	Bedrock	
B-20	5.4	5.3	5.4	n/a	5	0	25	30	Gravelly Silty Sand (Fill)	Reclaim Layer In Subbase 0.8' to 1.1'
B-21	6.3	6.1	6.3	5	6	0	7	13	Silty Sand (Fill)	
B-22	5.6	4.0	6.3	2.5	4	0	20	24	Silty Sand (Fill)	
B-23	2.7	2.0	2.7	n/a	4	0	20	24	Bedrock	
B-24	7.0	n/a	n/a	n/a	6	0	24	30	Gravel and Sand (Fill)	No Distinction Between Subbase/Subgrade
B-25	7.0	n/a	n/a	n/a	4	0	26	30	Sand (Fill)	
B-26	3.9	2.5	3.9	n/a	4	5	21	30	Gravelly Sand/Bedrock	
B-27	5.0	n/a	n/a	4	6	6	18	30	Silty Sand	
				AVG	5.037		18.5	25.4		

## APPENDIX B

NOMOGRAPH SOLVES:

$$\log_{10} \frac{W_{18}}{18} = Z_R * S_o + 9.36 * \log_{10}(SN+1) - 0.20 + \frac{\log_{10} \left[ \frac{\Delta PSI}{4.2 - 1.5} \right]}{0.40 + \frac{1094}{(SN+1)^{5.19}}} + 2.32 * \log_{10} M_R - 8.07$$

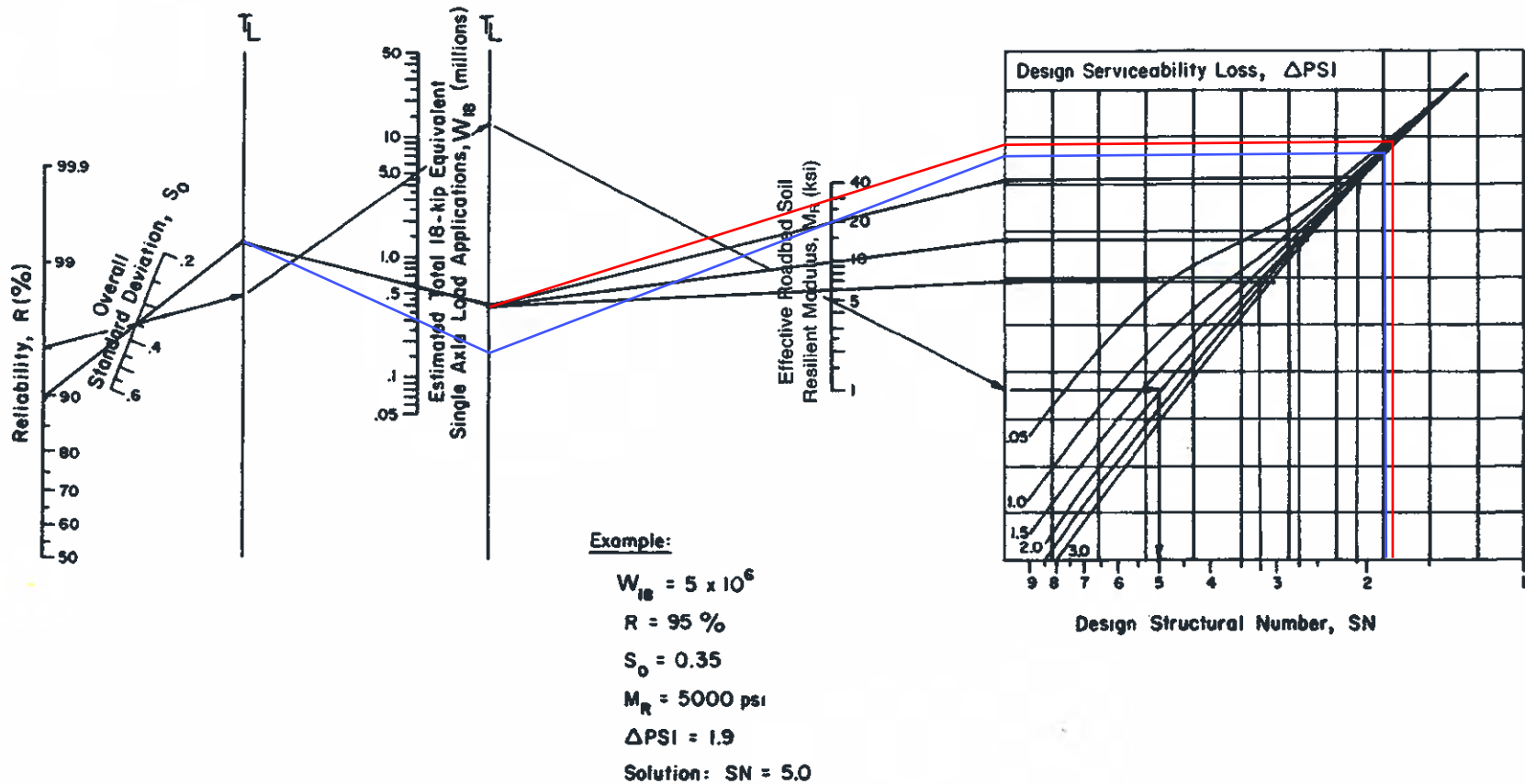


Figure 3.1. Design Chart for Flexible Pavements Based on Using Mean Values for Each Input

Pavement Section Evaluation  
 Full-Depth Reconstruction Pavement Section  
 Middle Road  
 Falmouth, ME

#### Input Parameters

$W_{18} := 288350$  Design ESAL (based on provided E18\_P2.5 of 79 and 10yr Design Life)  
 $p_i := 4.5$  Initial Serviceability  
 $p_t := 2.5$  Terminal Serviceability  
 $R := 0.90$  Reliability Level (%) for Minor Collector  
 $S_o := 0.45$  Standard Deviation (for MaineDOT)  
 $M_{R\_base} := 20000$  Subgrade Resilient Modulus of Subbase (psi)  
 $M_{R\_subbase} := 10000$  Subgrade Resilient Modulus of Subbase (psi)  
 $M_{R\_subgrade} := 6000$  Subgrade Resilient Modulus of Subgrade (psi)

#### Layer Structural Coefficients (From MaineDOT Highway Design Guide - Chapter 13)

$a_{1a} := 0.44$  HMA top 4"  
 $a_{1b} := 0.34$  HMA below 4"  
 $a_2 := 0.12$  Base Course Gravel Type A/B  
 $a_3 := 0.09$  Aggregate Subbase Course Gravel Type D/E  
 $\Delta PSI := p_i - p_t$   $\Delta PSI = 2$

#### Layer 1 - HMA

$SN_1 := 1.8$  Estimated SN (From AASHTO 1993, Figure 3.1)  
 $D_{1a} := 4$   $D_{1b} := 0$   
 $M_1 := 1$   
 $SN_1 := (a_{1a} \cdot D_{1a} + a_{1b} \cdot D_{1b}) \cdot M_1$   
 $SN_1 = 1.8$

#### Layer 2 - Base Course Gravel (Type A/B)

$SN_2 := 2.45$  Estimated SN (From AASHTO 1993, Figure 3.1)  
 $D_2 := 6$  3" Minimum Thickness (per Falmouth Street Standard)  
 $M_2 := 1$   
 $SN_2 := SN_1 + a_2 \cdot D_2 \cdot M_2$   
 $SN_2 = 2.5$

#### Layer 3 - Aggregate Subbase Course Gravel (Type D)

$SN_3 := 2.9$  Estimated SN (From AASHTO 1993, Figure 3.1)  
 $D_3 := 12$  15" Minimum Thickness (per Falmouth Street Standard)  
 $M_3 := 0.8$   
 $SN_3 := SN_2 + a_3 \cdot D_3 \cdot M_3$   
 $SN_3 = 3.3$  **> Overall SN = 2.9 OKAY**

Pavement Section Evaluation  
 Full-Depth Reconstruction Pavement Section  
 Middle Road  
 Falmouth, ME

### Input Parameters

$W_{18} := 576700$  Design ESAL (based on provided E18\_P2.5 of 79 and 20yr Design Life)  
 $p_i := 4.5$  Initial Serviceability  
 $p_t := 2.5$  Terminal Serviceability  
 $R := 0.90$  Reliability Level (%) for Minor Collector  
 $S_o := 0.45$  Standard Deviation (for MaineDOT)  
 $M_{R\_base} := 20000$  Subgrade Resilient Modulus of Subbase (psi)  
 $M_{R\_subbase} := 10000$  Subgrade Resilient Modulus of Subbase (psi)  
 $M_{R\_subgrade} := 6000$  Subgrade Resilient Modulus of Subgrade (psi)

### Layer Structural Coefficients (From MaineDOT Highway Design Guide - Chapter 13)

$a_{1a} := 0.44$  HMA top 4"  
 $a_{1b} := 0.34$  HMA below 4"  
 $a_2 := 0.12$  Base Course Gravel Type A/B  
 $a_3 := 0.09$  Aggregate Subbase Course Gravel Type D/E  
 $\Delta PSI := p_i - p_t$   $\Delta PSI = 2$

### Layer 1 - HMA

$SN_1 := 2.1^{\blacksquare}$  Estimated SN (From AASHTO 1993, Figure 3.1)  
 $D_{1a} := 4$   $D_{1b} := 1$   
 $M_1 := 1$   
 $SN_1 := (a_{1a} \cdot D_{1a} + a_{1b} \cdot D_{1b}) \cdot M_1$   
 $SN_1 = 2.1$

### Layer 2 - Base Course Gravel (Type A/B)

$SN_2 := 2.6^{\blacksquare}$  Estimated SN (From AASHTO 1993, Figure 3.1)  
 $D_2 := 3$  3" Minimum Thickness (per Falmouth Street Standard)  
 $M_2 := 1$   
 $SN_2 := SN_1 + a_2 \cdot D_2 \cdot M_2$   
 $SN_2 = 2.5$

### Layer 3 - Aggregate Subbase Course Gravel (Type D)

$SN_3 := 3.2^{\blacksquare}$  Estimated SN (From AASHTO 1993, Figure 3.1)  
 $D_3 := 15$  15" Minimum Thickness (per Falmouth Street Standard)  
 $M_3 := 0.8$   
 $SN_3 := SN_2 + a_3 \cdot D_3 \cdot M_3$   
 $SN_3 = 3.5$  **> Overall SN = 3.2 OKAY**

Pavement Section Evaluation  
 Full-Depth Reconstruction with Cement Section  
 Middle Road  
 Falmouth, ME

### Input Parameters

$W_{18} := 576700$  Design ESAL (based on provided E18\_P2.5 of 79 and 20yr Design Life)  
 $p_i := 4.5$  Initial Serviceability  
 $p_t := 2.5$  Terminal Serviceability  
 $R := 0.90$  Reliability Level (%) for Minor Collector  
 $S_o := 0.45$  Standard Deviation (for MaineDOT)  
 $M_{R\_stabbase} := 30000$  Subgrade Resilient Modulus of Stabilized Base (psi)  
 $M_{R\_subbase} := 10000$  Subgrade Resilient Modulus of Subbase (psi)  
 $M_{R\_subgrade} := 6000$  Subgrade Resilient Modulus of Subgrade (psi)

### Layer Structural Coefficients (From MaineDOT Highway Design Guide - Chapter 13)

$a_{1a} := 0.44$  HMA top 4"  
 $a_{1b} := 0.34$  HMA below 4"  
 $a_2 := 0.26$  Full-Depth Reclamation with Cement (FDR with Cement)  
 (assumed poor quality recycled material and poor base)  
 $a_3 := 0.09$  Aggregate Subbase Course Gravel Type D/E  
 $\Delta PSI := p_i - p_t$   $\Delta PSI = 2$

### Layer 1 - HMA

$SN_1 := 1.8$  Estimated SN (From AASHTO 1993, Figure 3.1)  
 $D_{1a} := 4$   $D_{1b} := 0$   
 $M_1 := 1$   
 $SN_1 := (a_{1a} \cdot D_{1a} + a_{1b} \cdot D_{1b}) \cdot M_1$   
 $SN_1 = 1.8$

### Layer 2 - FDR with Cement

$SN_2 := 2.6$  Estimated SN (From AASHTO 1993, Figure 3.1)  
 $D_2 := 6$  MaineDOT HDG Chapter 13, Section 13-4 indicates 5-6" thickness  
 $M_2 := 1$   
 $SN_2 := SN_1 + a_2 \cdot D_2 \cdot M_2$   
 $SN_2 = 3.3$  **> Overall SN = 3.2 OKAY**