

**TOWN OF
VINALHAVEN
Carrying Place
Crossing
Replacement**

**Bidding Documents
For
Construction**



41 Hutchins Drive
Portland, ME 04102
800.426.4262

woodardcurran.com
COMMITMENT & INTEGRITY DRIVE RESULTS

**0232140.02
Town of Vinalhaven**

April 2020

SECTION 00 01 07

SEALS PAGE

The engineering material and data contained in these Bidding Documents were prepared under the supervision and direction of the undersigned, whose seal as registered professional engineer is affixed below.

Date of Issue: April 2020

Megan McDevitt, P.E.
Project Manager
Woodard & Curran, Inc.

SECTION 00 01 10

TABLE OF CONTENTS – BIDDING DOCUMENTS

DIVISION 00 PROCUREMENT AND CONTRACTING REQUIREMENTS

INTRODUCTORY INFORMATION

00 01 07	Seals Page
00 01 10	Table of Contents
00 01 15	List of Drawing Sheets

PROCUREMENT/BIDDING REQUIREMENTS

00 11 16	Invitation to Bid
00 21 13	Instructions to Bidders
00 31 00	Available Project Information <i>Geotechnical Report</i>
00 41 01	Bid Form Bid Bond – Penal Sum Form (C-00 43 13)
00 43 36	Proposed Subcontractors Form
00 43 37	Proposed Suppliers Form
00 43 93	Bid Submittal Checklist
00 45 05	Bidder's Representations and Certifications
00 45 13	Bidder's Qualifications
00 45 19	Non-Collusion Affidavit

CONTRACTING REQUIREMENTS

	Sample Notice of Award (C-00 51 00)
00 52 10	Agreement Form
00 54 00	<u>Agreement Form Supplements (listing)</u> <i>Performance Bond Form (C-00 61 13.13)</i> <i>Payment Bond Form (C-00 61 13.16)</i> <i>Sample Notice to Proceed (C-00 55 00)</i>
00 60 00	<u>Project Forms</u> <i>Application for Payment Form (C-00 62 76)</i> <i>Request for Interpretation/Information Form (C-00 63 15)</i> <i>Field Order Form (C-00 63 36)</i> <i>Work Change Directive Form (C-00 63 49)</i> <i>Change Request Form (C- 00 63 60)</i> <i>Change Order Form (C-00 63 63)</i> <i>Notice of Substantial Completion Form (C-00 65 15)</i> <i>Certificate of Substantial Completion Form (C-00 65 16)</i> <i>Notice of Completion Form (C-00 65 18)</i>
00 72 05	Standard General Conditions of the Construction Contract (EJCDC C-700, 2007) <i>Including modifications</i>
00 73 05	<u>Supplementary Conditions (listing)</u> 00 73 10 Project Specific Requirements 00 73 19 Health and Safety Requirements

SPECIFICATIONS

DIVISION 01 GENERAL REQUIREMENTS

- 01 11 00 Summary of Work
- 01 15 00 Specific Project Requirements and Procedures
- 01 15 30 Payment and Administrative Procedures and Quality Requirements
- 01 50 00 Temporary Facilities and Controls
- 01 60 00 Product Requirements
- 01 70 00 Execution and Closeout Requirements

DIVISION 02 - EXISTING CONDITIONS

- 02 41 13 Selective Site Demolition

DIVISION 03 - CONCRETE

- 03 41 01 Precast Box Culvert

DIVISION 31 - EARTHWORK

- 31 00 00 Earthwork
- 31 32 19 Geotextiles
- 31 50 00 Excavation Support and Protection
- 31 66 15 Helical Pile Foundations

DIVISION 32 - EXTERIOR IMPROVEMENTS

- 32 12 16 Asphalt Paving
- 32 17 23 Pavement Markings
- 32 32 12 Segmental Granite Block Retaining Walls
- 32 92 19 Seeding

END OF SECTION

SECTION 00 01 15

LIST OF DRAWING SHEETS

DRAWING NUMBER	DRAWING TITLE
G-000	Cover Sheet
G-001	General Notes, Legend and Abbreviations
C-001	Existing Conditions Plan & Profile
C-002	Proposed Plan & Profile
C-003	Erosion & Sediment Control and Temporary Road Plan & Profile
C-300	Erosion & Sediment Control Details
C-301	Project Details
C-302	Guardrail Details

SECTION 00 11 16

INVITATION TO BID

The Town of Vinalhaven (Owner) invites Bidders to submit sealed Bids for the Carrying Place Bridge Replacement, which includes, but is not limited to removal and replacement of Carrying Place Bridge with a pre-cast concrete culvert supported by helical piles and bedrock; and all materials and equipment, services and construction inherent to the Work.

The in-water Work shall begin on or after October 1, 2020, and all work shall be substantially complete by November 20, 2020, and shall be completed and ready for final payment by December 11, 2020.

A non-mandatory pre-Bid conference will be held at **10:00AM** local time on **May 14, 2020** via web conference. Bidders are encouraged to attend and participate in the conference. Instructions for participating in the pre-Bid web conference will be provided separately.

Sealed Bids will be received until **3:00PM** local time on **June 4, 2020** at Owner's offices at the Town Office of Vinalhaven, 19 Washington School Road, Vinalhaven, ME 04863, Attention: Andrew Dorr. Bids shall be submitted in a plain envelope with the upper left-hand corner marked with the company name and "Carrying Place Crossing Replacement Bid". Bids will then be publicly opened and read aloud via a web conference. Bids received after the time of announced opening will not be accepted.

Bidding Documents may be obtained on or after **May 1, 2020** at **10:00 AM electronically** at no cost by registering via email with the Engineer (**Megan McDevitt, mmcdevitt@woodardcurran.com**) with the subject line "Town of Vinalhaven Carrying Place Bridge Replacement" to be included on the Bidder's list. Instructions for accessing the Bidding Documents will then be provided by email. Printed copies of the Bidding Documents will not be made available.

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

Bid security in the amount of 5 percent of the Bid must accompany the Bid in accordance with the Instructions to Bidders.

Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner further reserves the right to reject the Bid of any Bidder whom it finds, after reasonable inquiry and evaluation, to not be responsive or responsible. Owner may also reject the Bid of any Bidder if Owner believes that it would not be in the best interest of the Project or the public to make an award to that Bidder. Owner also reserves the right to waive all informalities not involving price, time, or changes in the Work and to negotiate contract terms with the Successful Bidder.

023214.02
Issue Date: April 2020

CARRYING PLACE CROSSING REPLACEMENT
VINALHAVEN, MAINE

END OF SECTION

SECTION 00 21 13

INSTRUCTIONS TO BIDDERS

ARTICLE 1 – DEFINED TERMS

- 1.01 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions, if any. Additional terms used in these Instructions to Bidders have the meanings indicated below and as may be included in the Supplementary Instructions to Bidders.
- A. *Issuing Office* – The office from which the Bidding Documents are to be issued and where the bidding procedures are to be administered identified in the Invitation to Bid.
- B. *Supplements* – Those portions of the Bidding Requirements to be submitted with and made a condition of a Bid including required submittals.
- C. *Notice of Intent to Award* – The written notice to the Successful Bidder indicating, conditions precedent to receiving a Notice of Award and Agreement for execution.

ARTICLE 2 – COPIES OF BIDDING DOCUMENTS

- 2.01 Sets of Bidding Documents may be examined and obtained as stated in the Invitation to Bid.
- 2.02 Complete sets of Bidding Documents shall be used in preparing Bids; neither Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents, Bidding Documents provided by third parties, or for modifications to the Bidding Documents not made by official Addenda, including electronic conversion.
- 2.03 Owner and Engineer, in making copies of Bidding Documents available on the above terms, do so only for the purpose of obtaining Bids for the Work and do not authorize or confer a license for any other use.

ARTICLE 3 – QUALIFICATIONS OF BIDDERS

- 3.01 To demonstrate Bidder's qualifications to perform the Work, Bidder shall submit written evidence such as financial data, previous experience, present commitments, and such other data requested in the Bidding Documents, and within the time frames stipulated upon Owner's request.
- 3.02 Bidders shall meet minimum criteria regarding experience and qualifications set forth in the General Requirements and the Specifications.

ARTICLE 4 – EXAMINATION OF BIDDING DOCUMENTS, OTHER RELATED DATA, AND SITE

4.01 *Subsurface and Physical Conditions*

- A. Section 00 73 10 of the Supplementary Conditions identifies:
 - 1. those reports known to Owner of explorations and tests of subsurface conditions at or contiguous to the Site; and
 - 2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).
- B. Copies of reports and drawings referenced in Section 00 73 10, if any, are included in the Bidding Documents as indicated in Section 00 31 00, if included. Those reports and drawings are not part of the Contract Documents, but the “technical data” contained therein upon which Bidder is entitled to rely as provided in Paragraph 4.02 of the General Conditions, has been identified and established in Section 00 73 10 of the Supplementary Conditions.
- C. Bidder is responsible for any interpretation or conclusion Bidder draws from any “technical data” or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.

4.02 *Underground Facilities*

- A. Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or contiguous to the Site is based upon information and data furnished to Owner and Engineer by owners of such Underground Facilities, including Owner, or others.

4.03 *Hazardous Environmental Condition*

- A. Section 00 73 10 of the Supplementary Conditions identifies any reports and drawings known to Owner relating to a Hazardous Environmental Condition identified at the Site.
- B. Copies of reports and drawings referenced in Section 00 73 10, if any, are included in the Bidding Documents as indicated in Section 00 31 00 if included. Those reports and drawings are not part of the Contract Documents, but the “technical data” contained therein upon which Bidder is entitled to rely as provided in Paragraph 4.06 of the General Conditions has been identified and established in Section 00 73 10 of the Supplementary Conditions.
- C. Bidder is responsible for any interpretation or conclusion Bidder draws from any “technical data” or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.

- 4.04 Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to subsurface conditions, other physical conditions, and Underground Facilities, and possible changes in the Bidding Documents due to differing or unanticipated subsurface or physical conditions appear in Paragraphs 4.02, 4.03, and 4.04 of the General Conditions and Section 00 73 10 of the Supplementary Conditions. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to a Hazardous Environmental Condition at the Site, if any, and possible changes in the Contract Documents due to any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work, appear in Paragraph 4.06 of the General Conditions and Section 00 73 10 of the Supplementary Conditions.
- 4.05 Upon request, Owner may provide Bidder access to the Site to conduct such examinations, investigations, explorations, tests, and studies as Bidder deems necessary for submission of a Bid. Bidder shall be responsible for obtaining permission and necessary permits and insurance for access to the Site. Bidder shall clean up and restore the Site to its former condition upon completion of any such explorations, investigations, tests, and studies. Bidder shall comply with all applicable Laws and Regulations relative to excavation and utility locates.
- 4.06 Reference is made to Article 7 of the General Conditions and Section 00 73 10 of the Supplementary Conditions for the identification of the general nature of other work that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) that relates to the Work contemplated by these Bidding Documents. On request, Owner will provide to each Bidder for examination access to or copies of contract documents (other than portions thereof related to price) for such other work.

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

- A. examine and carefully study the Bidding Documents, and the other related data identified in the Bidding Documents;
- B. visit the Site and become familiar with and satisfy Bidder as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work;
- C. become familiar with and satisfy Bidder as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work;
- D. carefully study all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) that have been identified in Section 00 73 10, as containing reliable "technical data," and (2) reports and drawings of Hazardous Environmental Conditions, if any, at the Site that have been identified in Section 00 73 10, as containing reliable "technical data";
- E. consider the information known to Bidder; information and observations obtained from visits to the Site; the Bidding Documents; and the Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents; and (3) Bidder's safety precautions and programs;
- F. agree at the time of submitting its Bid that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for performance of the Work at the price(s) bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents;
- G. become aware of the general nature of the work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents;
- H. correlate the information known to Bidder, information and observations obtained from visits to the Site, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Bidding Documents;

- I. promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by Engineer is acceptable to Bidder; and
 - J. determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work.
- 4.08 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 Bidding Documents and applying any specific means, methods, techniques, sequences, and procedures of construction that may be shown or indicated or expressly required by the Bidding Documents, that Bidder has given Engineer written notice of all conflicts, errors, ambiguities, and discrepancies that Bidder has discovered in the Bidding Documents and the written resolutions thereof by Engineer are acceptable to Bidder, and that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work.

ARTICLE 5 – PRE-BID CONFERENCE

- 5.01 A pre-Bid conference will be held at the time, date and location as indicated in the Invitation to Bid. Bidders are encouraged to attend and participate in the conference.
- 5.02 Addenda will be issued to all prospective Bidders of record considered necessary in response to questions arising at the conference. Oral statements may not be relied upon and will not be binding or legally effective.

ARTICLE 6 – SITE AND OTHER AREAS

- 6.01 The Site is identified in the Bidding Documents. Easements for permanent structures or permanent changes in existing facilities are to be obtained and paid for by Owner unless otherwise provided in the Bidding Documents. All additional lands and access thereto required for temporary construction facilities, construction equipment, or storage of materials and equipment to be incorporated in the Work are to be obtained and paid for by Contractor.

ARTICLE 7 – INTERPRETATIONS AND ADDENDA

- 7.01 All questions about the meaning or intent of the Bidding Documents are to be submitted to the Engineer in writing as follows. Submission of questions via email is acceptable.

Woodard & Curran
41 Hutchins Drive
Portland, ME 04102
Attention: Megan McDevitt
Telephone: (207) 558-3785
Email: mmcdevitt@woodardcurran.com

- 7.02 Interpretations or clarifications considered necessary in response to such questions will be issued by Addenda to all parties recorded as having received the Bidding Documents. Questions received less than 7 days prior to the date for opening of Bids will not be answered. Only answers in the Addenda will be binding. Oral statements, interpretations, and clarifications may not be relied upon and will not be binding or legally effective.
- 7.03 Addenda may be issued to clarify, correct, or change the Bidding Documents as deemed advisable by Owner or Engineer, will be available for examination at the Issuing Office.
- 7.04 All parties recorded as having received the Bidding Documents will be notified by email on record that Addenda has been posted on the website along with instructions for accessing the Addenda.

ARTICLE 8 – BID SECURITY

- 8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of 5 percent of Bidder's maximum Bid price and in the form of a certified check, treasurer's or cashier's check, or money order, or a Bid bond on or consistent with the form included in the Bidding Documents in Section 00 43 13 issued by a surety meeting the requirements of Paragraphs 5.01 and 5.02 of the General and Supplementary Conditions, if any.
- 8.02 The Bid security of the Successful Bidder will be retained until such Bidder has furnished the required contract security, met the conditions of the Notice of Intent to Award (if any) and Notice of Award, and executed the Agreement, whereupon the Bid security will be returned. If the Successful Bidder fails to comply with the conditions set forth in the Notice of Intent to Award (if any) and Notice of Award within the time specified therein, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited. Such forfeiture shall be Owner's exclusive remedy if Bidder defaults. 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 7 days after the Effective Date of the Agreement or 91 days after the Bid opening, whereupon Bid security furnished by such Bidders will be returned. See Supplementary Instructions to Bidders (if any) for additional information.

- 8.03 Bid security of other Bidders whom Owner believes do not have a reasonable chance of receiving the award will be returned within 5 days after the Bid opening.

ARTICLE 9 – CONTRACT TIMES

- 9.01 The number of days within which, or the dates by which, the Work is to be substantially completed and ready for final payment are set forth in the Agreement.

ARTICLE 10 – LIQUIDATED DAMAGES

- 10.01 Provisions for liquidated damages, if any, are set forth in the Agreement.

ARTICLE 11 – SUBSTITUTE AND “OR-EQUAL” ITEMS

- 11.01 The Contract, if awarded, will be on the basis of materials and equipment and construction methods or procedures specified or described in the Bidding Documents without consideration of possible substitute or “or-equal” items. Whenever it is specified or described in the Bidding Documents that a substitute or “or-equal” item of material or equipment and construction methods or procedures 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.

ARTICLE 12 – SUBCONTRACTORS, SUPPLIERS AND OTHERS

- 12.01 The Bidding Documents may require the identity of certain Subcontractors, Suppliers, individuals, or entities to be submitted to Owner with the Bid.
- 12.02 As required in the Bidding Documents, or within 5 days after Bid opening if requested by Owner, Bidder shall submit a listing and experience statement with pertinent information regarding similar projects and other evidence of qualification for each Subcontractor, Supplier, individual, or entity. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, individual, or entity, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit a substitute without an increase in the Bid.
- 12.03 If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest responsible Bidder that proposes to use acceptable Subcontractors, Suppliers, individuals, or entities. Declining to make requested substitutions will not constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor, Supplier, individual, or entity so listed and against which Owner or Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to revocation of such acceptance after the Effective Date of the Agreement as provided in Paragraph 6.06 of the General and Supplementary Conditions, if any.

- 12.04 Contractor shall not be required to employ any Subcontractor, Supplier, individual, or entity against whom Contractor has reasonable objection.

ARTICLE 13 – PREPARATION OF BID

- 13.01 The Bid Form and Supplements are included with the Bidding Documents.
- 13.02 Bids are to be submitted as indicated in the Bid Form. All blanks on the Bid Form shall be completed in ink or typewritten and the Bid Form signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid Form.
- 13.03 A Bid by a corporation shall be executed in the corporate name by the president or a vice-president or other corporate officer accompanied by evidence of authority to sign. The corporate seal shall be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation shall be shown.
- 13.04 A Bid by a partnership shall be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership shall be shown.
- 13.05 A Bid by a limited liability company shall be executed in the name of the firm by a member and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm shall be shown.
- 13.06 A Bid by an individual shall show the Bidder's name and official address.
- 13.07 A Bid by a joint venture shall be executed by each joint venturer in the manner indicated on the Bid Form. The official address of the joint venture shall be shown.
- 13.08 All names shall be printed in ink below the signatures.
- 13.09 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form.
- 13.10 Postal and e-mail addresses and telephone numbers for communications regarding the Bid shall be shown.
- 13.11 The Bid shall contain evidence of Bidder's authority and qualification to do business in the state where the Project is located, or Bidder shall covenant in writing to obtain such authority and qualification prior to award of the Contract and attach such covenant to the Bid. Bidder's state contractor license number, if any, shall also be shown on the Bid Form. See Supplementary Instructions to Bidders for additional requirements, if any.
- 13.12 Bidders are advised to carefully review those portions of the Bid Form and Supplements requiring Bidder's representations and certifications that are to be submitted with a Bid or subsequent to the Bid opening, and made a condition of the Bid.

ARTICLE 14 – BASIS OF BID; COMPARISON OF BIDS

14.01 *Bid Pricing*

- A. Bidders shall submit a Bid on a unit price basis for each item of Work listed in the Bid Form. Bid prices shall be stated in both words and figures.
- B. The total of all estimated prices will be the sum of the products of the estimated quantity of each item and the corresponding unit price included in the Bid Form. The final quantities and Contract Price will be determined in accordance with Paragraph 11.03 of the General and Supplementary Conditions, if any.
- C. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum. Discrepancies between prices written in words and prices written in figures will be resolved in favor of prices written in words.

14.02 *Completion Time Comparisons*

- A. Bid prices will be compared after adjusting for exceptions taken by Bidders for the number of days or dates set for Substantial Completion per Article 9 above if allowed in Bid Form. The adjusting amount will be determined at the rate set forth in the Agreement for liquidated damages for failing to achieve Substantial Completion.

ARTICLE 15 – SUBMITTAL OF BID

- 15.01 With each copy of the Bidding Documents, a Bidder is furnished a copy of the Bid Form, the Bid Security Form and Supplements. An original signed hard copy of the Bid Form, the original of the Bid security, Supplements (as listed in the Bid Submittal Checklist), and the Bid Submittal Checklist are to be completed and submitted. Bidders shall also submit a scanned version of the hardcopy, signed original of the above documents saved in Portable Document Format (PDF) format and submit by email.
- 15.02 A Bid shall be submitted no later than the date and time prescribed and at the place indicated in the Invitation to Bid and shall be enclosed in a plainly marked package with the Project title, the name and address of Bidder, and shall be accompanied by the Bid security and other required documents.
- 15.03 If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate package plainly marked on the outside with the notation “**BID ENCLOSED.**” **A Bid sent by mail or courier shall be addressed to Owner at the Town Office of Vinalhaven, 19 Washington School Road, Vinalhaven, ME 04863, Attention: Andrew Dorr, Town Manager.**

- 15.04 Bidders shall be responsible to confirm the ability of overnight mailing or courier services to deliver to the Owner's offices.

ARTICLE 16 – MODIFICATION AND WITHDRAWAL OF BID

- 16.01 A Bid may be modified or withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids.
- 16.02 If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Work is re-Bid, that Bidder will be disqualified from submitting a Bid on the Work.

ARTICLE 17 – OPENING OF BIDS

- 17.01 Bids will be opened at the time and place indicated in the Invitation to Bid and, unless obviously non-responsive, read aloud publicly.

ARTICLE 18 – BIDS TO REMAIN SUBJECT TO ACCEPTANCE

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

ARTICLE 19 – EVALUATION OF BIDS AND AWARD OF CONTRACT

- 19.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner further reserves the right to reject the Bid of any Bidder whom it finds, after reasonable inquiry and evaluation, to not be responsible or does not meet the specified qualification or quality requirements, based on poor references or otherwise. Owner may also reject the Bid of any Bidder if Owner believes that it would not be in the best interest of the Project or public to make an award to that Bidder. Owner also reserves the right to waive all informalities not involving price, time, or changes in the Work and to negotiate Contract terms with the Successful Bidder.
- 19.02 More than one Bid for the same Work from an individual or entity under the same or different names will not be considered. Reasonable grounds for believing that any Bidder has an interest in more than one Bid for the Work may be cause for disqualification of that Bidder and the rejection of all Bids in which that Bidder has an interest.
- 19.03 In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices and other data as may be requested in the Bid Form or prior to the Notice of Award.

- 19.04 In evaluating Bidders, Owner will consider the qualifications of Bidders and may consider the qualifications and experience of Subcontractors, Suppliers, and other individuals or entities proposed for those portions of the Work for which the identity of Subcontractors, Suppliers, and other individuals or entities are submitted.
- A. Owner may also consider the operating costs, maintenance requirements, performance data and guarantees of major items of materials and equipment proposed for incorporation in the Work when such data is required to be submitted prior to the Notice of Award.
- 19.05 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders, proposed Subcontractors, Suppliers, individuals, or entities proposed for those portions of the Work in accordance with the Contract Documents.
- A. Owner may conduct reference checks for the projects listed by the Bidder. Poor references may be a basis for deeming Bidder as not responsible. Reference questions will include, but are not limited to, product quality and durability, overall work quality, performance, timely delivery/completion, customer service, and general customer satisfaction.
- 19.06 If the Contract is to be awarded, Owner may award the Contract to the responsive and responsible Bidder, offering the lowest price for the Bid and whose Bid is in the best interests of the Project or public.

ARTICLE 20 – CONTRACT SECURITY AND INSURANCE

- 20.01 Article 5 of the General Conditions and Supplementary Conditions, if any, set forth Owner's requirements as to performance and payment bonds and insurance. The Successful Bidder shall deliver such bonds and evidence of insurance coverage within 10 days of receipt of the Notice of Award.

ARTICLE 21 – SIGNING OF AGREEMENT

- 21.01 The Owner will issue a Notice Award to the Successful Bidder in the form included in Bidding Documents. Within 10 days of receipt of the Notice of Award, the Successful Bidder shall comply with the conditions set forth therein and provide requested information.
- 21.02 Based on required reviews and approvals, Owner will thereafter provide the required number of counterparts of the Agreement and other Contract Documents which are identified in the Agreement. The Successful Bidder shall sign and deliver the required number of counterparts of the Agreement and other Contract Documents to Owner within the time specified by the Owner. After obtaining required reviews and approvals for Contract execution, Owner shall return one fully signed counterpart of the Agreement and other Contract Documents.

ARTICLE 22 – RETAINAGE

22.01 Provisions concerning retainage are set forth in the Agreement.

ARTICLE 23 – CONTRACTOR’S WARRANTY AND GUARANTEES; CORRECTION PERIOD

23.01 Provisions concerning Contractor’s general warranty and guarantees and correction period are set forth in Articles 6.19, 13.06, 13.07, 13.09 and 14.03 of the General and Supplementary Conditions, if any.

ARTICLE 24 – EQUAL EMPLOYMENT OPPORTUNITY, ANTI-DISCRIMINATION, AND AFFIRMATIVE ACTION

24.01 Provisions regarding the requirements for equal employment opportunity, anti-discrimination, and affirmative action programs, if any, are set forth in the Supplementary Conditions.

ARTICLE 25 – SAFETY AND HEALTH REGULATIONS

25.01 This Project is subject to the Safety and Health Regulations of the U.S. Department of Labor set forth in Title 29 CFR, Part 1926 and to all subsequent amendments and other requirements identified in Section 00 73 19 of the Supplementary Conditions.

END OF SECTION

SECTION 00 31 00

AVAILABLE PROJECT INFORMATION

INFORMATION	LOCATION OF INFORMATION
Easements, Permits, Rights-of-Way	Available from Owner
Geotechnical Data Geotechnical Report Soil Boring Data, Results of Laboratory Testing	Attached
Survey	Shown on Drawings
Department of the Army General Permit for the State of Maine	To be provided

END OF SECTION

The key to success starts with a solid foundation.
ENGINEERING | EXPLORATION | EXPERIENCE

Geotechnical Report



Carrying Place Bridge
Calderwood Neck Road Vinalhaven, ME
3/27/2017



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SUMMIT GEOENGINEERING SERVICES
PIN 17011

March 27, 2017
Summit #17011

Gartley & Dorsky Engineering & Surveying, Inc.
Attn: William T. Lane, P.E.
59B Union Street / PO Box 1031
Camden, Maine 04843

Reference: Geotechnical Engineering Services
Carrying Place Bridge – Calderwood Neck Road Vinalhaven, Maine

Dear Mr. Lane;

We have completed our preliminary geotechnical investigation for Carrying Place Bridge located on Calderwood Neck Road in Vinalhaven, Maine. Our scope of services included performing subsurface explorations at the site and preparing this report summarizing our findings and geotechnical recommendations. The geotechnical considerations identified for this site include:

- The presence of marine deposits and its impact to foundations
- The presence of bedrock and its impact to foundations
- The presence of granite block cribbing and its potential for reuse
- The presence of saltwater and its potential for corrosive conditions

This report includes preliminary design for foundations in accordance with AASHTO LRFD Bridge Design Specifications. In summary, we consider the following options for bridge support:

- Reuse of granite block abutments
- Mechanical stabilized earth (MSE) wall supported abutments
- Cast-in-place concrete abutments
- CON/SPAN® anchored wall with pre-cast drainage structure
- Pile support foundations

We appreciate the opportunity to serve you during this phase of your project. If there are any questions or additional information is required, please do not hesitate to call.

Sincerely yours,
Summit Geoengineering Services



Craig W. Coolidge, P.E.
Vice President & Principal Engineer



TABLE OF CONTENTS

1.0 Project and Site Description	3
2.0 Explorations and Laboratory Testing	5
3.0 Subsurface Conditions	6
3.1 Soil Layers	6
3.2 Bedrock	8
3.3 Groundwater	9
4.0 Geotechnical Evaluation	9
5.0 Abutment Recommendations	10
5.1 Reuse of Granite Block Abutments	10
5.2 Mechanical Stabilized Earth (MSE) Wall Support Abutments	10
5.3 Cast-In-Place Concrete Abutments	11
5.4 Pile Foundations	13
5.5 Seismic Considerations	13
6.0 Pavement Recommendations	14
7.0 Earthwork Considerations	15
8.0 Closure	15
Site Location Plan, Exploration Location Plan	Appendix A
Test Boring Logs, Soil Resistivity Reports	Appendix B
Laboratory Test Results	Appendix C

1.0 Project and Site Description

Summit Geoengineering Services (SGS) was asked to conduct a preliminary geotechnical investigation for Carrying Place Bridge located on Calderwood Neck Road in Vinalhaven, Maine.



Carrying Place Bridge at Low Tide (South Side)

The existing bridge is constructed of steel I-beams, wood decking, and granite block abutments. The east abutment consists of elevated granite block or fill overlying saltmarsh. The west abutment consists of granite block overlying dipping bedrock. The saltmarsh includes grass to frequent cobbles at the tidal channel. The site topography along the abutments are further described as follows:

- Northwest – Steep Fill to Grass Mud to Cobble Channel
- Northeast – Flat Grass Mud to Cobble Channel
- Southwest – Steep Bedrock to Mud to Cobble Channel
- Southeast – Dipping Bedrock to Mud/Ledge to Cobble Channel



Northwest Abutment - Steep Fill to Grass Mud to Cobble Channel



Northeast Abutment – Flat Grass Mud to Cobble Channel



Southeast Abutment – Steep Bedrock to Mud to Cobble Channel



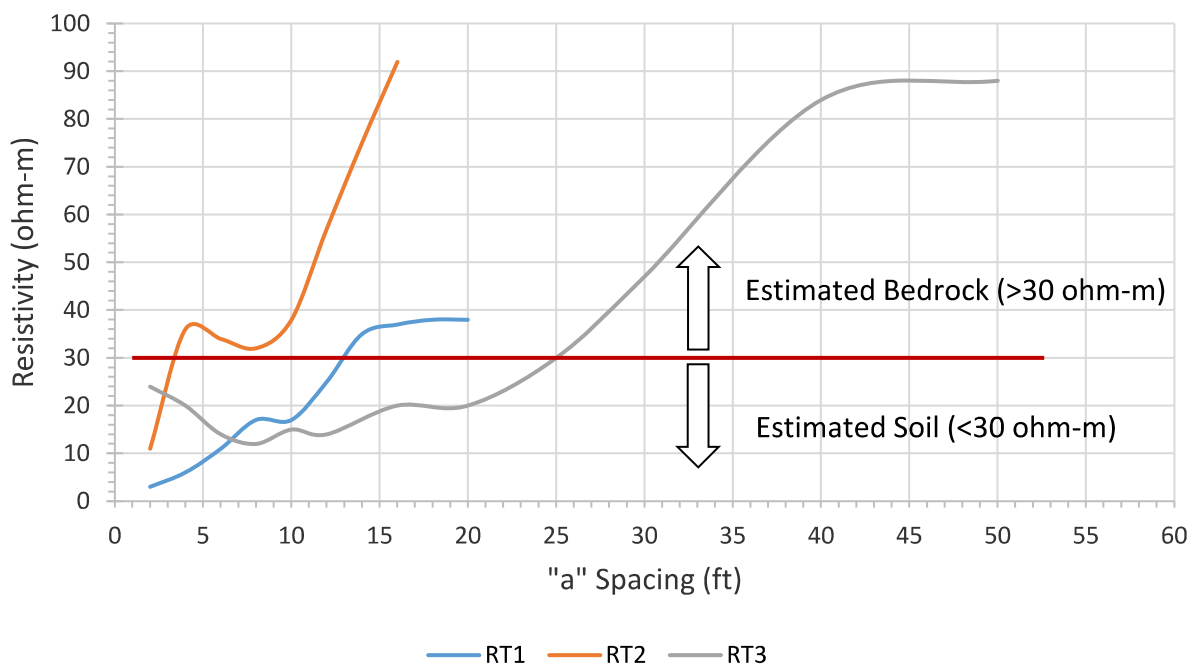
Southwest Abutment – Dipping Ledge to Mud/Ledge to Cobble Channel

2.0 Explorations and Laboratory Testing

Summit Geoengineering Services (SGS) observed the subsurface conditions with 2 test borings. Borings were performed by East Coast Explorations using a CME 550 and advanced to depths of 8.5 to 24.3 feet using 3-inch casing with rotary wash. Soil was sampled with SPT split spoon per ASTM D1586 and rock sampled by ASTM D2113. Borings were backfilled upon completion.

Field resistivity testing was performed at 3 locations perpendicular to the abutments during low tide using the Wenner Four Probe method in accordance with ASTM G57. Probe spacing ranged from 2 to 50 feet. Graphic results of the resistivity testing are shown below:

Wenner Resistivity Testing



Resistivity test RT-2 was conducted along the saltmarsh overlying bedrock outcrops at the southwest abutment. Test results from RT-2 were used to “calibrate” resistivity values for the granitic bedrock. Probe spacing from 4 to 16 feet resulted in values of 32 to 92 ohm-meter. Resistivity test RT-1 and RT-2 were performed along the north or east abutment where refusal was encountered at boring B-1 at a depth of 24 feet, elevation -11 feet. Resistivity values for RT-1 and RT-3 approach 30 ohm-meter or higher at approximate elevations of -11 feet (RT-1) to between -13 to -19 feet (RT-3) which correlates with the boring refusal. Resistivity test results are likely influence due to the presence of salt water resulting in lower than normal values.

Exploration locations are shown on the Exploration Location Plan in Appendix A. Boring logs and resistivity field reports are provided in Appendix B. The explorations (test borings and resistivity tests) were approximately located by SGS by taping from existing site features.

Two samples of the marine deposit were tested for moisture content in accordance with ASTM D2216 with moisture ranging from 26.0% to 33.1%. One sample was tested for Atterberg Limits in accordance with ASTM D4318. One sample of granular fill was tested for grain size analysis in accordance with ASTM D6913. Reports of the laboratory tests can be found in Appendix C. Summary of the laboratory test results are as follows:

LABORATORY TEST SUMMARY								
Boring	Depth	Moist. Content	Gradation Analysis			Atterberg		Notes
			Gravel	Sand	Fines	LL	PI	
B-2	0.5'-2.5'	8.8%	20%	68%	12%	--	--	Granular Fill
B-1	14'-16'	26.0%	--	--	--	28	10	Marine Deposit

3.0 Subsurface Conditions

The subsurface conditions consist of roadway **granular fill** overlying **rock cribbing** (granite) overlying **marine deposit**. Bituminous **pavement** was present at the surface of the test borings with a thickness of 4 inches. **Bedrock** was encountered at depths of 3.5 to 24.3 feet.

3.1 Soil Layers

Granular Fill, 3 feet in thickness, is described as brown sand, some gravel, little silt and is classified as SW-SM in accordance with the USCS. Standard penetration tests (SPT-N₆₀) indicates compact conditions. The fill is frozen to humid.



Boring B-1 (0.5 to 2.5 feet) – Granular Fill (Gravelly Sand w/Ash)

Rock Cribbing, up to 13 feet in thickness, is described as reddish gray granite blocks mixed with occasional sand with little silt classified as SM in accordance with the USCS. Granite blocks range in thickness of 1 to 2 feet with various stacking. Voids are present within the cribbing. Shotcrete facing is present along portions of the outer granite blocks.



Granite Block Cribbing (Portions with Shotcrete) – Southwest Abutment

Marine deposit is described as an upper and lower subunit. The upper subunit consist of gray silty clay and is classified as CL in accordance with USCS. Standard penetration tests (SPT-N₆₀) for the upper subunit indicates very soft conditions. Moisture content ranges from 26.0% to 33.1% with liquid limit of 28 and plasticity index of 10 suggesting the clay is mostly saturated (wet). The lower subunit consist of gray sand with some gravel and silt and is classified as SM in accordance with USCS. The lower marine deposit is compact and wet.



Boring B-1 (14 to 16 feet) – Marine Deposit (Gray Clay)

3.2 Bedrock

Bedrock was encountered at depths of 3.5 feet (boring B-2) and 24.3 feet (boring B-1). Outcrops are widely present along the shoreline both north and south, particularly along the west abutment. Field resistivity testing indicate an approximate depth range of 4 to 25 feet, where performed.



Bedrock Outcrops South of Bridge at Low Tide (Winter Harbor)

Mapping by the Maine Geological Survey indicates bedrock is plutonic biotite-hornblende granite and quartz-monzonite. A rock core was obtained in boring B-2 from a depth of 3.5 to 8.5 feet.



Boring B-2 (3.5 to 8.5 feet) – Rock Core (Granite)

The rock is estimated as having a hardness value of 7 using the Mohs hardness scale. The percent recovery of the core, referred to as the ratio of total recovered sample length divided by the total coring length, was 88 percent. The Rock Quality Designation (RQD) of the rock core is expressed as the sum of rock pieces 4 inches or greater in length compared to the length of the core sample. The RQD of the cored rock was 96 percent. Detailed information of the rock core is provided on boring log B-2 in Appendix B. Results of the rock core and visual inspection of outcrops indicate the bedrock is generally hard and intact of competent quality.

3.3 Groundwater

Due to the close proximity of the bridge abutments to saltmarsh, we estimate groundwater is inundated saltwater with tidal ebb-flow. The highest annual tide is mapped as 6.2 feet. The channel appears mostly drained during low tide to an elevation of 0 feet. Seasonal runoff water through rain or snowmelt may infiltrate the granite cribbing and perch along the marine deposit and/or bedrock surface during wet periods.

4.0 Geotechnical Evaluation

The geotechnical considerations identified for this site include:

- The presence of marine deposits and its impact to foundations
- The presence of bedrock and its impact to foundations
- The presence of existing granite block cribbing and its impact to foundations
- The presence of saltwater and its potential for corrosive conditions

Marine deposits were encountered at the north or east abutment (boring B-1) from a depth of 13 to 24 feet, elevations 0 to -11 feet. The marine deposits include portions of soft clay which is considered compressible under long-term loading such as fill. Additionally, the soft clay will have lower bearing for foundation elements. Depending on the amount of fill or type of foundations, additional investigation to include consolidation testing and/or shear testing may be necessary to further evaluate the properties of the marine clay.

Bedrock was encountered at the south or west abutment (boring B-2) at a depth of 3.5 feet, elevation 9.5 feet. Bedrock is observed to be dipping along the southwest abutment. In general, the bedrock consists of hard and intact granite of competent quality for foundation anchors or pinning. Design for anchors or pinning should account for bedrock undulation and dipping beneath the existing abutment. The bedrock is considered suitable for high bearing of foundation elements.

Granite block cribbing is present for both abutments with a tapering thickness of 2 to 13 feet. The granite blocks are various in size, cut to sharp irregular blocks, and generally competent in nature. Voids have been filled locally with smaller rounded or square rocks. Outer portions of the blocks are coated with shotcrete or similar. While the overall abutments appear intact, it is difficult to evaluate the internal integrity for global stability and bearing capacity of foundations. Results from the test borings suggest loose rock or rubble fill was placed inside the outer block facing as fill. Ground penetrating radar (GPR) may provide better evaluation for the presence of voids.

Due to the location being adjacent to tidal (salt) water, corrosive conditions to concrete and steel should be considered. Corrosion protection such as concrete admixtures, coating of steel elements, or similar should be incorporated into new foundation design.

5.0 Abutment Recommendations

The following are geotechnical recommendations for preliminary abutment concepts.

- Reuse of granite block abutments
- Mechanical stabilized earth (MSE) wall supported abutments
- Cast-in-place concrete abutments
- CON/SPAN® anchored wall with pre-cast drainage structure
- Pile support foundations

Preliminary design considerations for each of the abutment concepts are provided below.

5.1 Reuse of Granite Block Abutments

We understand consideration is being made for the reuse of the existing granite block abutments. In summary, the existing abutments are approximately 20 to 40 feet in length, 24 feet in width, and 2 to 13 feet in height. The granite blocks are stacked in a near vertical batter. Consideration and limitations to the reuse of the granite block abutments include:

- Potential for voids and unknown interlocking structure for design
- Relatively narrow width, limiting potential for roadway widening
- Difficulty in excavation or penetration for deep foundations

In summary, we consider the granite block abutments to be in fair to stable condition. However, reuse to support an increase bridge structure for width and elevation may be limited or difficult to meet current design standards. We recommend, if reused, the new bridge structure incorporate new abutments located behind existing cribbing as practical. Portions of the cribbing may be reconstructed to permit integration of new foundations suitable for support of new bridge structures.

5.2 Mechanical Stabilized Earth (MSE) Wall Support Abutments

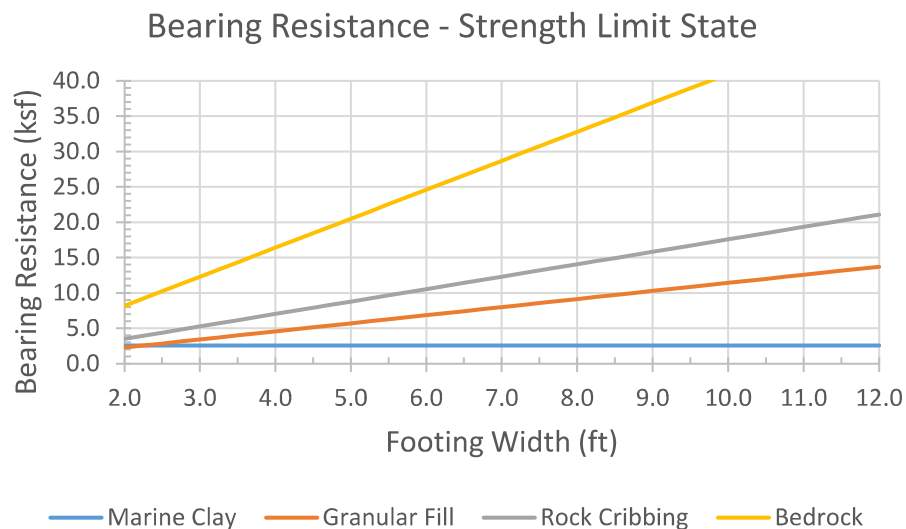
An alternative to granite block abutments is mechanical stabilized earth (MSE) wall support abutments. Precast retaining walls to include a gravity block or a reinforced block such as Stone Strong or similar may be suitable to support short bridge foundation loads. Abutment foundations may include concrete spread footing or pile support foundation bearing within the reinforced or gravity block retaining wall. Use of a MSE wall support abutment would essentially replace the current granite block abutments. Construction of the mechanical stabilized earth wall support abutments would utilize relatively common construction methodology. Design should consider bearing capacity, settlement, and global stability of the underlying marine clay and bedrock. The precast wall system should be designed to accommodate a salt water application.

5.3 Cast-In-Place Concrete Abutments

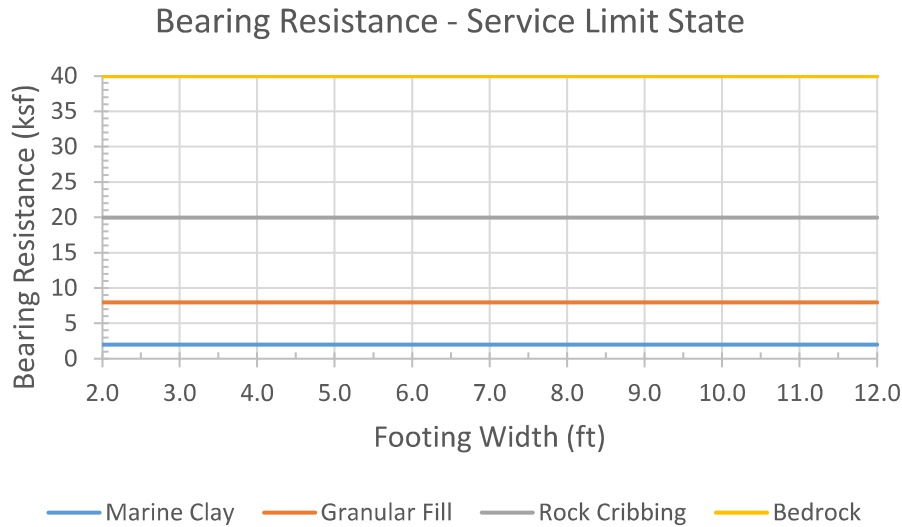
Concrete abutments consist of cast-in-place concrete bearing on bedrock or soil. The abutments would be subject to compressive, uplift, and lateral loads imposed by the bridge loads and any retained soil or bedrock. We recommend the following preliminary design parameters for evaluation potential use for cast-in-place concrete foundations:

PARAMETER	GLACIAL MARINE	GRANULAR BACKFILL	ROCK CRIBBING	GRANITE BEDROCK
Natural Unit Weight (γ_t)	115 pcf	130 pcf	125 pcf	150 pcf
Friction Coefficient (f_c)	0.30	0.50	0.60	0.70
Friction Angle (ϕ')	--	33 ⁰	36 ⁰	40 ⁰
Undrained Shear Strength (S_u)	500 psf	--	--	--
Active Earth Pressure (K_a)	--	0.32	0.26	0.22
Passive Earth Pressure (K_p)	--	3.40	3.85	4.60
Bearing Resistant Factor (ϕ_b)	0.50	0.45	0.45	0.45
Passive Resistant Factor (ϕ_{ep})	0.50	0.50	0.50	0.50
Sliding Resistant Factor (ϕ_s)	0.90	0.80	0.80	0.80

The following graph represents (un-factored) bearing resistance for Strength Limit State in accordance with AASHTO LRFD Bridge Design Specifications:



The following graph represents (un-factored) bearing resistance for Service Limit State in accordance with AASHTO LRFD Bridge Design Specifications:



Settlement associated with bearing resistance should be evaluated once foundation loads and dimensions are determined. We recommend SGS be made available to review foundation loads for evaluating settlement potential.

Cast-in-place concrete foundations should have a minimum embedment depth for frost protection using a design freezing index of 1,000*F-days as follows:

- Granular Fill (Depth = 5.5 feet)
- Marine Clay (Depth = 3.0 feet)
- Bedrock (No Minimum Depth)

Scour protection should be considered to prevent the undermining of foundations. At a minimum, we recommend foundations constructed with soil be placed a minimum of 2 feet below bottom of tidal channel. Alternatively, foundations may be constructed and pinned to bedrock or other suitable scour protection measures incorporated.

The following are bedrock design values from AASHTO LRFD Bridge Design Specifications:

- Rock Mass Rating (RMR) = 85
- Elastic Modulus (E_m) = 7,600 ksi
- Poisson's Ratio (ν) = 0.20
- Grout/Rock Ultimate Bond Stress = 36 ksf
- Anchor Pullout Resistance Factor = 0.50

5.4 CON/SPAN® Pre-Cast Structure

Due to the relatively short bridge span of approximately 20 feet or less, a CON/SPAN® anchored wall with pre-cast drainage structure may be applicable. We recommend prior to use, a preliminary design be prepared by a qualified CON/SPAN® contractor to evaluate suitable pre-fabricated structures available for the site conditions. Preliminary design to include foundation loads should then be made available to SGS for suitable bearing and settlement analysis.

5.5 Pile Foundations

Foundations constructed upon marine deposits (soft clay) may require pile support foundations. If used, we recommend the following piles for consideration:

- Timber Piles (Marine Application)
- Steel H or Pipe Piles (Epoxy Coated or Similar)
- Concrete/Grout Micropiles (Cast-in-place)
- Helical Anchor or Similar (To Be Determined)

Due to the low lateral loading capacity of the marine deposit (soft clay) and relatively short depth to bedrock, battered piles may be necessary for lateral loads. Alternatively, drilled socketing of piles into bedrock may be considered. Piles, if used, should be design to account for corrosive saltwater application.

5.6 Seismic Considerations

The seismic profile was evaluated using data from the test borings. Based on the results for standard penetration resistance and depth to bedrock, we recommend the following:

- NEHRP Site Classification = Site Class B (Bedrock), Site Class C (Soil)
- FHWA Seismic Hazard Level = Class I
- Peak Ground Acceleration (PGA) = 0.08g (Site Class B)
- Peak Ground Acceleration (PGA_M) = 0.10g (Site Class C)
- 0.2s Spectral Acceleration (S_{D5}) = 0.14g
- 1.0s Spectral Acceleration (S_{D1}) = 0.08g

The existing fill and marine deposit (clay) is considered resistance to earthquake induced liquefaction for the above mapped peak ground accelerations.

6.0 Pavement Recommendations

The project may include new bituminous pavement sections. We recommend a minimum total bituminous pavement section thickness of 22 inches where subjected to moderate to heavy truckloads. We further recommend that the bituminous pavement sections consist of the following materials.

MATERIAL	THICKNESS (in)	SPECIFICATION
Asphalt Surface Course	1.5	MDOT 703.09 Type 9.5 mm or Type 12.5 mm
Asphalt Binder Course	2.5	MDOT 703.09 Type 19 mm
Base Soil	3	MDOT 703.06 Type A
Subbase Soil	15	MDOT 703.06 Type D

For portions of the bituminous pavement subjected to light traffic loads of cars and light trucks we recommend MDOT Type 9.5mm surface course. Where heavy duty sections are needed for trucks we suggest MDOT 703.09 Type 12.5mm for improved strength and durability of the asphalt surface.

Base and Subbase (MDOT Type A and Type D) should be free from organic matter, balls of clay, and other deleterious substances. The portion of soil passing a 3-inch sieve shall meet the following gradation specification:

Sieve Designation	Percent Passing a 3-inch Sieve	
	MDOT Type A (Base)	MDOT Type D (Subbase)
2 Inch	100	--
½ Inch	45 – 70	35 – 80
¼ Inch	30 – 55	25 – 65
No. 40	0 – 20	0 – 30
No. 200	0 – 6	0 – 7

Reference: MDOT Specification 703.06, Aggregate for Base and Subbase (2014)

Additional fill required beneath pavement sections should consist of compacted Granular Borrow, as specified in Section 5.6 Granular Borrow. Granular Borrow should be placed in 6 to 12 inch lifts and compacted to 95 percent of its maximum dry density determined in accordance with ASTM D1557.

7.0 Earthwork Considerations

Foundations bearing on bedrock should incorporate provisions for inspection and account for potential of undulation and/or dipping. We recommend anchor or pinning within bedrock, if planned, should be reviewed and inspected by the geotechnical engineer to evaluate bedrock competency for support of foundation loads.

Subgrade stabilization or ground improvement such as preload may be necessary for abutment foundations constructed upon marine deposits (soft clay). Requirement for stabilization and/or ground improvement should be evaluated once abutment foundation type has been selected.

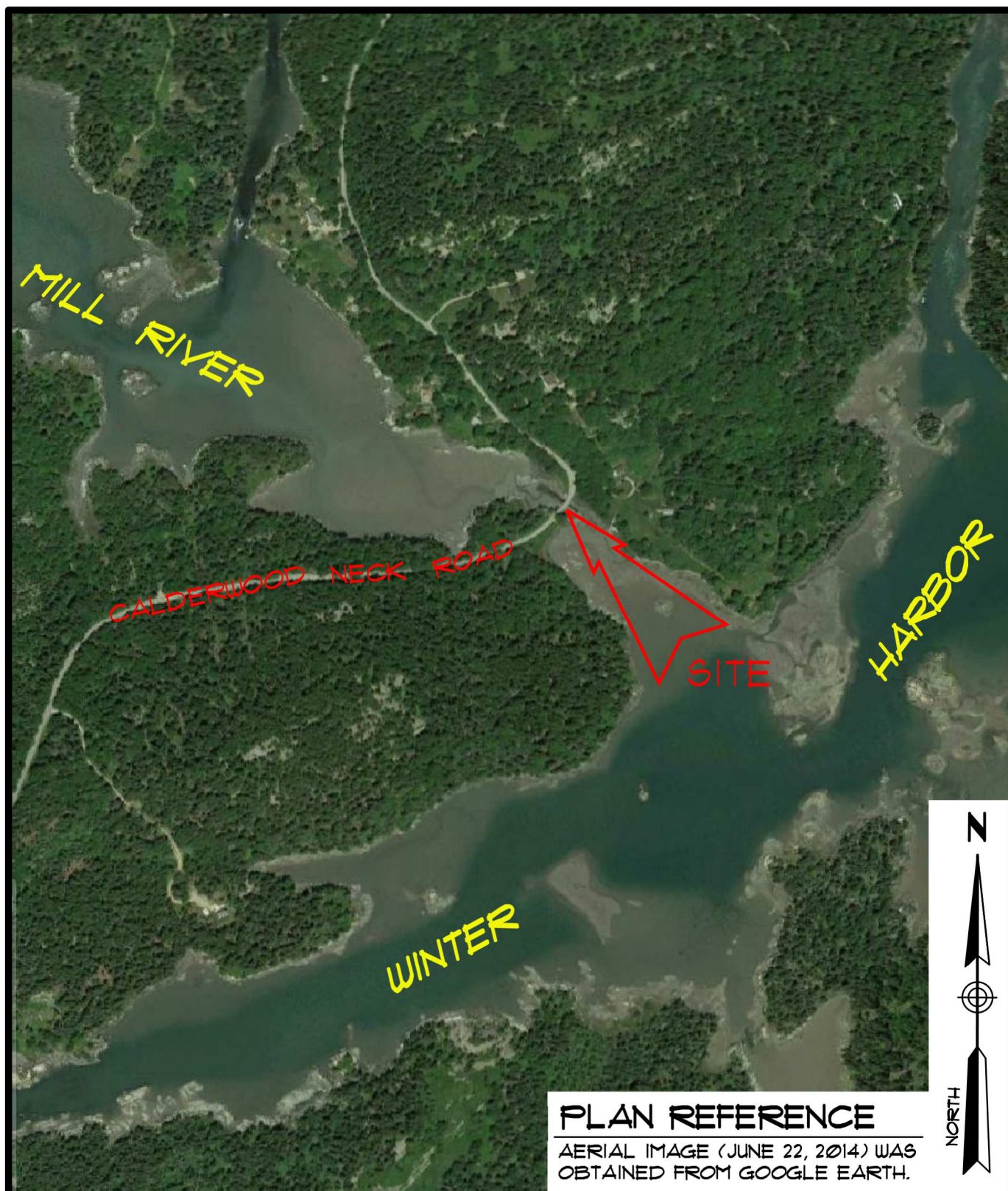
Depending on type of abutment foundations and construction methods selected, temporary cofferdams such as shallow sheeting and/or sand bags may be used to reduce the amount of tidal water infiltration within the excavation. We recommend submersible sump pumps be installed at the base of the rock fill behind the cofferdam to dewater the base of excavation. Excavation, placement of backfill, and/or wall blocks should be performed at or near low tide.

8.0 Closure

Our recommendations are based on professional judgment and generally accepted principles of geotechnical engineering and project information provided by others. Some changes in subsurface conditions from those presented in this report may occur. Should these conditions differ materially from those described in this report, SGS should be notified so that we can re-evaluate our recommendations.

We appreciate the opportunity to serve you during this phase of your project. If there are any questions or additional information is required, please do not hesitate to call.

APPENDIX A
SITE LOCATION MAP
EXPLORATION LOCATION PLAN



PLAN REFERENCE

AERIAL IMAGE (JUNE 22, 2014) WAS
OBTAINED FROM GOOGLE EARTH.

SITE LOCATION PLAN CARRY PLACE BRIDGE

CALDERWOOD NECK ROAD - VINALHAVEN, MAINE
PREPARED FOR

GARTLEY & DORSKY

145 LISBON ST. - SUITE 601
LEWISTON, ME 04240
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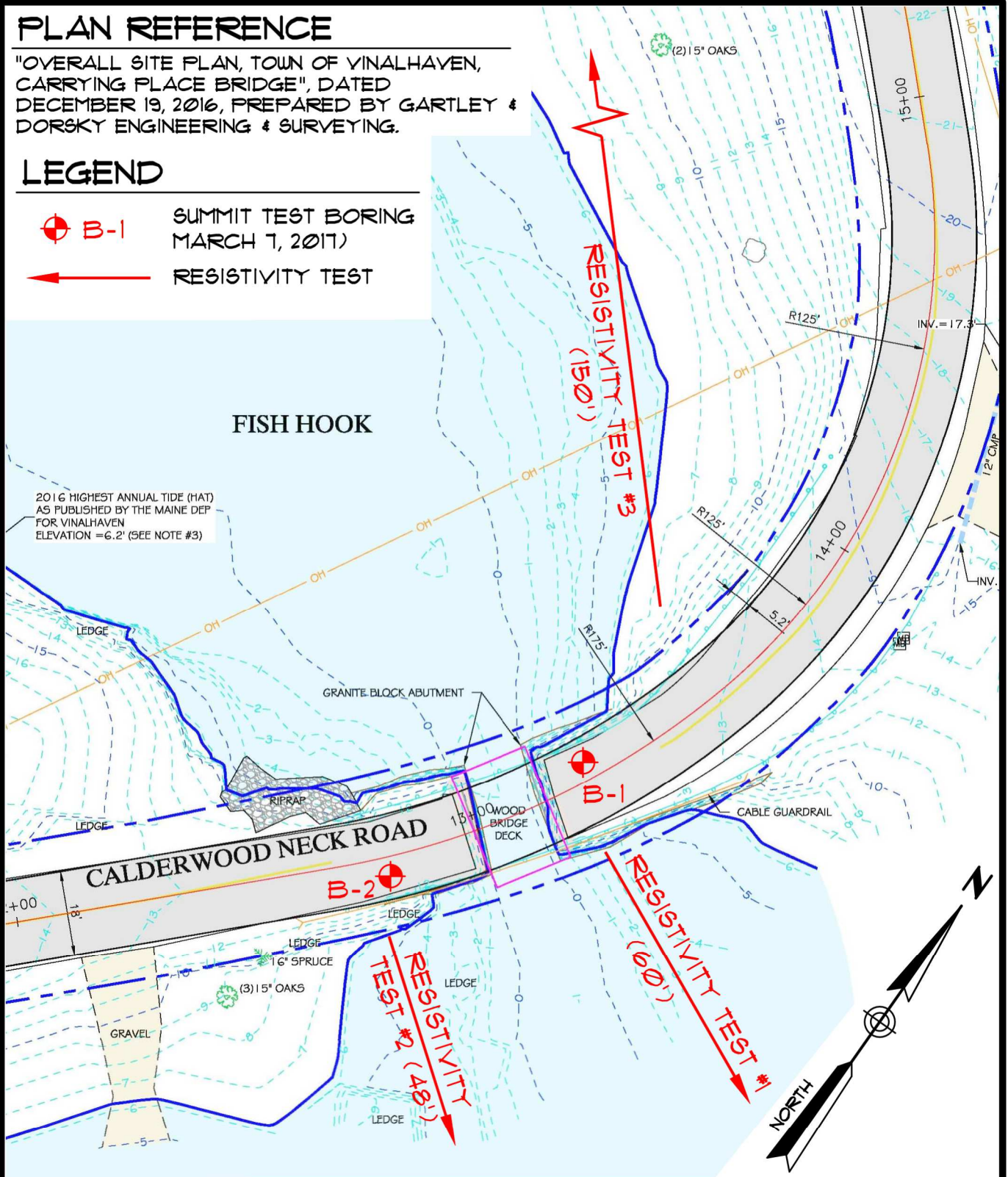
DATE: 3-29-2017	DRAWN BY: KRF	CHECKED BY: CWC
JOB: 17011	SCALE: 1" = 600'	FILE: 17011 MAPS

PLAN REFERENCE

"OVERALL SITE PLAN, TOWN OF VINALHAVEN, CARRYING PLACE BRIDGE", DATED DECEMBER 19, 2016, PREPARED BY GARTLEY & DORSKY ENGINEERING & SURVEYING.

LEGEND

-  **B-1** SUMMIT TEST BORING MARCH 7, 2017
-  **RESISTIVITY TEST**



EXPLORATION LOCATION PLAN CARRY PLACE BRIDGE

CALDERWOOD NECK ROAD - VINALHAVEN, MAINE
PREPARED FOR

GARTLEY & DORSKY

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SUMMIT
GEOENGINEERING SERVICES
www.summitgeoeng.com

DATE: 3-14-2017	DRAWN BY: KRF	CHECKED BY: CWC
JOB: 17011	SCALE: 1" = 30'	FILE: 17011 MAPS

APPENDIX B
TEST BORING LOGS
RESISTIVITY REPORTS

EXPLORATION COVER SHEET

The exploration logs are prepared by the geotechnical engineer from both field and laboratory data. Soil descriptions are based upon the Unified Soil Classification System (USCS) per ASTM D2487 and/or ASTM D2488 as applicable. Supplemental descriptive terms for estimated particle percentage, color, density, moisture condition, and bedrock may also be included to further describe conditions.

Drilling and Sampling Symbols:

S = Split Spoon Sample	Hyd = Hydraulic Advancement of Drilling Rods
UT = Thin Wall Shelby Tube	Push = Direct Push of Drilling Rods
SSA = Solid Stem Auger	WOH = Weight of Hammer
HSA = Hollow Stem Auger	WOR = Weight of Rod
RW = Rotary Wash	PI = Plasticity Index
SV = Lab Shear Vane (Torvane)	LL = Liquid Limit
PP = Pocket Penetrometer	MC = Natural Moisture Content
C = Rock Core Sample	USCS = Unified Soil Classification System
FV = Field Vane Shear Test	Su = Undrained Shear Strength
SP = Concrete Punch Sample	Su(r) = Remolded Shear Strength

Water Level Measurements:


Water levels indicated on the boring logs are the levels measured in the boring at the times indicated. In pervious soils, the indicated elevations are considered reliable groundwater levels. In impervious soils, the accurate determination of groundwater elevations may not be possible, even after several days of observations. Groundwater monitoring wells may be required to record accurate depths and fluctuation.

Gradation Description and Terminology:

Boulders:	Over 12 inches	Trace:	Less than 5%
Cobbles:	12 inches to 3 inches	Little:	5% to 15%
Gravel:	3 inches to No.4 sieve	Some:	15% to 30%
Sand:	No.4 to No. 200 sieve	Silty, Sandy, etc.:	Greater than 30%
Silt:	No. 200 sieve to 0.005 mm		
Clay:	less than 0.005 mm		


Density of Granular Soils and Consistency of Cohesive Soils:


CONSISTENCY OF COHESIVE SOILS		DENSITY OF GRANULAR SOILS	
SPT N-value blows/ft	Consistency	SPT N-value blows/ft	Relative Density
0 to 2	Very Soft	0 to 4	Very Loose
2 to 4	Soft	5 to 10	Loose
5 to 8	Firm	11 to 30	Compact
9 to 15	Stiff	31 to 50	Dense
16 to 30	Very Stiff	>50	Very Dense
>30	Hard		

					SOIL BORING LOG				Boring #: B-1	
Drilling Co: East Coast Explorations					Project: Carrying Place Bridge				Project #: 17011	
Driller: Chris Palmer					Location: Calderwood Neck Road				Sheet: 1 of 2	
Summit Staff: Craig Coolidge, P.E.					City, State: Vinalhaven, Maine				Chkd by: CWC	
Boring Elevation: 13 ft +/-					Reference: Existing Conditions & Topographic Survey Plan C-1 by Gartley & Dorsky					
Date started: 3/7/2017					Date Completed: 3/7/2017					
DRILLING METHOD		SAMPLER			ESTIMATED GROUND WATER DEPTH					
Vehicle: ATV		Length: 24" SS			Date	Depth	Elevation	Reference		
Model: CME-550		Diameter: 2"OD/1.5"ID			3/7/2017	13 ft	0 ft	Observed moisture content		
Method: Rotary Wash		Hammer: 140 lb								
Hammer Style: Auto Drop		Method: ASTM D1586								
Depth (ft.)	No.	Pen/Rec (in)	Depth (ft)	blows/6"	Elev. (ft.)	SAMPLE DESCRIPTION		Geological/ Test Data	Geological Stratum	
1	S-1	24/12	0.5 - 2.5	40	12.7'	4" Bituminous Pavement			PAVEMENT	
				20		Brown SAND, Some Gravel, black Ash, frozen to humid, compact, SW-SM			0.3'	
2				7					GRANULAR FILL	
				3						
3										
4					10'	Rocky drilling at 3', occasional voids			3'	
									ROCK RUBBLE	
5	S-2	24/5	5 - 7	6		Reddish brown rock fragments (Granite), little Sand, compact, moist, SM				
6				12						
				7						
7				18						
8										
9										
	S-3	24/4	9 - 11	25		Reddish brown rock fragments (Granite), little Sand, loose, wet, SM				
10				5						
				2						
11				2						
12										
13										
					0'	Change to gray clay in drilling water			13'	
14						Gray Sandy SILT, little Clay, soft, wet, ML			MARINE DEPOSIT	
	S-4	24/22	14 - 16	3						
15				1						
				WOH	-2'	Gray Silty CLAY, trace Sand, soft, wet, CL		MC = 26.0% LL = 28 PI = 10	15'	
16				WOH						
17										
18										
19										
	S-5	24/5	19 - 21	WOH		Gray Silty CLAY, trace Sand, soft, wet, CL		MC = 33.1%		
20				1						
				WOH						
21				1						
22					-9'	Change to sandy wash, denser drilling			22'	

Granular Soils		Cohesive Soils		% Composition ASTM D2487	NOTES: WOH = Weight of Hammer LL = Liquid Limit, PI = Plastic Index, MC = Moisture Content	Soil Moisture Condition
Blows/ft.	Density	Blows/ft.	Consistency			Dry: S = 0% Humid: S = 1 to 25% Damp: S = 26 to 50% Moist: S = 51 to 75% Wet: S = 76 to 99% Saturated: S = 100%
0-4	V. Loose	<2	V. soft			
5-10	Loose	2-4	Soft	< 5% Trace		
11-30	Compact	5-8	Firm	5-15% Little		
31-50	Dense	9-15	Stiff	15-30% Some		
>50	V. Dense	16-30	V. Stiff	> 30% With		
		>30	Hard			

Boulders = diameter > 12 inches, Cobbles = diameter < 12 inches and > 3 inches
Gravel = < 3 inch and > No 4, Sand = < No 4 and >No 200, Silt/Clay = < No 200

					SOIL BORING LOG			Boring #: B-1		
					Project: Carrying Place Bridge			Project #: 17011		
					Location: Calderwood Neck Road			Sheet: 2 of 2		
					City, State: Vinalhaven, Maine			Chkd by: CWC		
Drilling Co: East Coast Explorations					Boring Elevation: 13 ft +/-					
Driller: Chris Palmer					Reference: Existing Conditions & Topographic Survey Plan C-1 by Gartley & Dorsky					
Summit Staff: Craig Coolidge, P.E.					Date started: 3/7/2017 Date Completed: 3/7/2017					
DRILLING METHOD			SAMPLER		ESTIMATED GROUND WATER DEPTH					
Vehicle: ATV			Length: 24" SS		Date	Depth	Elevation	Reference		
Model: CME-550			Diameter: 2"OD/1.5"ID		3/7/2017	13 ft	0 ft	Observed moisture content		
Method: Rotary Wash			Hammer: 140 lb							
Hammer Style: Auto Drop			Method: ASTM D1586							
Depth (ft.)	No.	Pen/Rec (in)	Depth (ft)	blows/6"	Elev. (ft.)	SAMPLE DESCRIPTION		Geological/ Test Data	Geological Stratum	
23						Gray SAND, some Gravel and Silt, compact, wet, SM			MARINE DEPOSIT	
24										
	S-6	3/3	24 - 24.3	50/3"						
25					-11.3	End of Exploration at 24.3', Bedrock Refusal			24.3' BEDROCK	
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
41										
42										
43										
44										
Granular Soils		Cohesive Soils		% Composition ASTM D2487	NOTES: PP = Pocket Penetrometer, MC = Moisture Content LL = Liquid Limit, PI = Plastic Index, FV = Field Vane Test (S _u) _{iv} = Peak / Remolded Undrained Shear Strength Boulders = diameter > 12 inches, Cobbles = diameter < 12 inches and > 3 inches Gravel = < 3 inch and > No 4, Sand = < No 4 and >No 200, Silt/Clay = < No 200				Soil Moisture Condition	
Blows/ft.	Density	Blows/ft.	Consistency						Dry: S = 0% Humid: S = 1 to 25% Damp: S = 26 to 50% Moist: S = 51 to 75% Wet: S = 76 to 99% Saturated: S = 100%	
0-4	V. Loose	<2	V. soft	< 5% Trace 5-15% Little 15-30% Some > 30% With						
5-10	Loose	2-4	Soft							
11-30	Compact	5-8	Firm							
31-50	Dense	9-15	Stiff							
>50	V. Dense	16-30	V. Stiff							
		>30	Hard							

					SOIL BORING LOG				Boring #: B-2		
Drilling Co: East Coast Explorations					Boring Elevation: 13 ft +/-				Project #: 17011		
Driller: Chris Palmer					Reference: Existing Conditions & Topographic Survey Plan C-1 by Gartley & Dorsky				Project #: 17011		
Summit Staff: Craig Coolidge, P.E.					Date started: 3/7/2017 Date Completed: 3/7/2017				Sheet: 1 of 1		
City, State: Vinalhaven, Maine					Chkd by: CWC						
DRILLING METHOD		SAMPLER			ESTIMATED GROUND WATER DEPTH						
Vehicle: ATV		Length: 24" SS			Date	Depth	Elevation	Reference			
Model: CME-550		Diameter: 2"OD/1.5"ID			3/7/2017	N/E	N/E	None Encountered			
Method: Rotary Wash		Hammer: 140 lb									
Hammer Style: Auto Drop		Method: ASTM D1586									
Depth (ft.)	No.	Pen/Rec (in)	Depth (ft)	blows/6"	Elev. (ft.)	SAMPLE DESCRIPTION		Geological/ Test Data		Geological Stratum	
1	S-1	24/16	0.5 - 2.5	40	12.7'	4" Bituminous Pavement				PAVEMENT	
2				16		Brown SAND, some Gravel, little Silt, frozen to humid, SW-SM		Gravel = 20% Sand = 68% Fines = 12%	0.3'	GRANULAR FILL	
3				9		Mottled soil color at 2.5'					
4				7							
ROCK CORE DATA											
	RUN	RECOVERY	DEPTH	RQD							
4	C-1	88%	3.5 - 8.5	96%	9.5'	Hard, slightly weathered to fresh, sound, coarse-grained, gray-white GRANITE w/fine Quartz			3.5'	BEDROCK	
5						Mohs Hardness = 7					
6						Joint at surface (3.5' to 4.0'), steep, slightly weathered					
7						Joint at 4.4', planar, rough, tight to loose					
8					4.5'	End of Exploration at 8.5'			8.5'		
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
Granular Soils		Cohesive Soils		% Composition	NOTES: WOH = Weight of Hammer LL = Liquid Limit, PI = Plastic Index, MC = Moisture Content RQD = Rock Quality Designation Boulders = diameter > 12 inches, Cobbles = diameter < 12 inches and > 3 inches Gravel = < 3 inch and > No 4, Sand = < No 4 and >No 200, Silt/Clay = < No 200					Soil Moisture Condition	
Blows/ft.	Density	Blows/ft.	Consistency	ASTM D2487						Dry: S = 0% Humid: S = 1 to 25% Damp: S = 26 to 50% Moist: S = 51 to 75% Wet: S = 76 to 99% Saturated: S = 100%	
0-4	V. Loose	<2	V. soft	< 5% Trace							
5-10	Loose	2-4	Soft	5-15% Little							
11-30	Compact	5-8	Firm	15-30% Some							
31-50	Dense	9-15	Stiff	> 30% With							
>50	V. Dense	16-30	V. Stiff								
		>30	Hard								



WENNER 4 PIN RESISTIVITY FIELD REPORT

Date: 3/7/2017

Project: Carrying Place Bridge

Project #: 17011

Performed By: Craig Coolidge, P.E.

Site Location: Calderwood Neck Road, Vinalhaven, Maine

Elevation: 3 ft +/-

Test Procedure: Resistivity testing was performed using the Wenner Four Probe method in accordance with ASTM G57-06. Probe spacing ranged from 2 to 100 feet. Resistivity results for the pin spacing are presented in the following table. Resistivity values were calculated using the following equations:

Resistivity (p) in ohm-cm = $2\pi \cdot a \cdot R$ (a=electrode spacing in cm, R=resistance in ohms)

Resistivity (p) in ohm-cm = $191.5 \cdot a \cdot R$ (a=electrode spacing in ft, R=resistance in ohms)

Test Results:

Wenner 4 Pin Resistivity Test 1					
Material	Spacing (feet)	Dial	Reading	Resistivity (ohm-cm)	Resistivity (ohm-m)
Soil	2	0.1	7.3	300	3
Soil	4	0.1	7.2	600	6
Soil	6	0.1	9.7	1,100	11
Soil	8	1.0	1.1	1,700	17
Soil	10	1.0	0.9	1,700	17
Soil	12	1.0	1.1	2,500	25
Bedrock	14	1.0	1.3	3,500	35
Bedrock	16	1.0	1.2	3,700	37
Bedrock	18	1.0	1.1	3,800	38
Bedrock	20	1.0	1.0	3,800	38

MIN	300	3
MAX	3,800	38
AVG	2,489	25
STD	1,258	13

Remarks: Performed at low tide along base of tidal water channel south of east bridge abutment.



WENNER 4 PIN RESISTIVITY FIELD REPORT

Date: 3/7/2017

Project: Carrying Place Bridge

Project #: 17011

Performed By: Craig Coolidge, P.E.

Site Location: Calderwood Neck Road, Vinalhaven, Maine

Elevation: 4 to 5 ft +/-

Test Procedure: Resistivity testing was performed using the Wenner Four Probe method in accordance with ASTM G57-06. Probe spacing ranged from 2 to 100 feet. Resistivity results for the pin spacing are presented in the following table. Resistivity values were calculated using the following equations:

Resistivity (p) in ohm-cm = $2\pi a^2 R$ (a=electrode spacing in cm, R=resistance in ohms)

Resistivity (p) in ohm-cm = $191.5 a^2 R$ (a=electrode spacing in ft, R=resistance in ohms)

Test Results:

Wenner 4 Pin Resistivity Test 2					
Material	Spacing (feet)	Dial	Reading	Resistivity (ohm-cm)	Resistivity (ohm-m)
Soil	2	1.0	3.0	1,100	11
Bedrock	4	1.0	4.7	3,600	36
Bedrock	6	1.0	3.0	3,400	34
Bedrock	8	1.0	2.1	3,200	32
Bedrock	10	1.0	2.0	3,800	38
Bedrock	12	1.0	2.5	5,700	57
Bedrock	14	1.0	2.8	7,500	75
Bedrock	16	1.0	3.0	9,200	92

MIN	1,100	11
MAX	9,200	92
AVG	5,200	52
STD	2,356	24

Remarks: Performed at low tide along bedrock outcrops south of west bridge abutment.



WENNER 4 PIN RESISTIVITY FIELD REPORT

Date: 3/7/2017

Project: Carrying Place Bridge

Project #: 17011

Performed By: Craig Coolidge, P.E.

Site Location: Calderwood Neck Road, Vinalhaven, Maine

Elevation: 6 to 7 ft +/-

Test Procedure: Resistivity testing was performed using the Wenner Four Probe method in accordance with ASTM G57-06. Probe spacing ranged from 2 to 100 feet. Resistivity results for the pin spacing are presented in the following table. Resistivity values were calculated using the following equations:

Resistivity (p) in ohm-cm = $2\pi \cdot a \cdot R$ (a=electrode spacing in cm, R=resistance in ohms)

Resistivity (p) in ohm-cm = $191.5 \cdot a \cdot R$ (a=electrode spacing in ft, R=resistance in ohms)

Test Results:

Wenner 4 Pin Resistivity Test 3					
Material	Spacing (feet)	Dial	Reading	Resistivity (ohm-cm)	Resistivity (ohm-m)
Soil	2	1.0	6.3	2,400	24
Soil	4	1.0	2.6	2,000	20
Soil	6	1.0	1.2	1,400	14
Soil	8	0.1	7.7	1,200	12
Soil	10	0.1	7.6	1,500	15
Soil	12	0.1	6.2	1,400	14
Soil	16	0.1	6.6	2,000	20
Soil	20	0.1	5.2	2,000	20
Bedrock	25	0.1	6.2	3,000	30
Bedrock	30	0.1	8.1	4,700	47
Bedrock	40	1.0	1.1	8,400	84
Bedrock	50	0.1	9.2	8,800	88

MIN	1,200	12
MAX	8,800	88
AVG	3,309	33
STD	2,797	28

Remarks: Performed at low tide along north of east bridge abutment along edge of high tide

APPENDIX C
LABORATORY TEST RESULTS



GRAIN SIZE ANALYSIS - ASTM D6913

PROJECT NAME: Carrying Place Bridge
 PROJECT LOCATION: Calderwood Neck Rd, Vinalhaven, ME
 CLIENT: Gartley & Dorsky Engineering & Surveying
 TECHNICIAN: Erika Stewart, E.I.
 SOIL DESCRIPTION: SAND, some Gravel, little Silt, SW-SM to SM

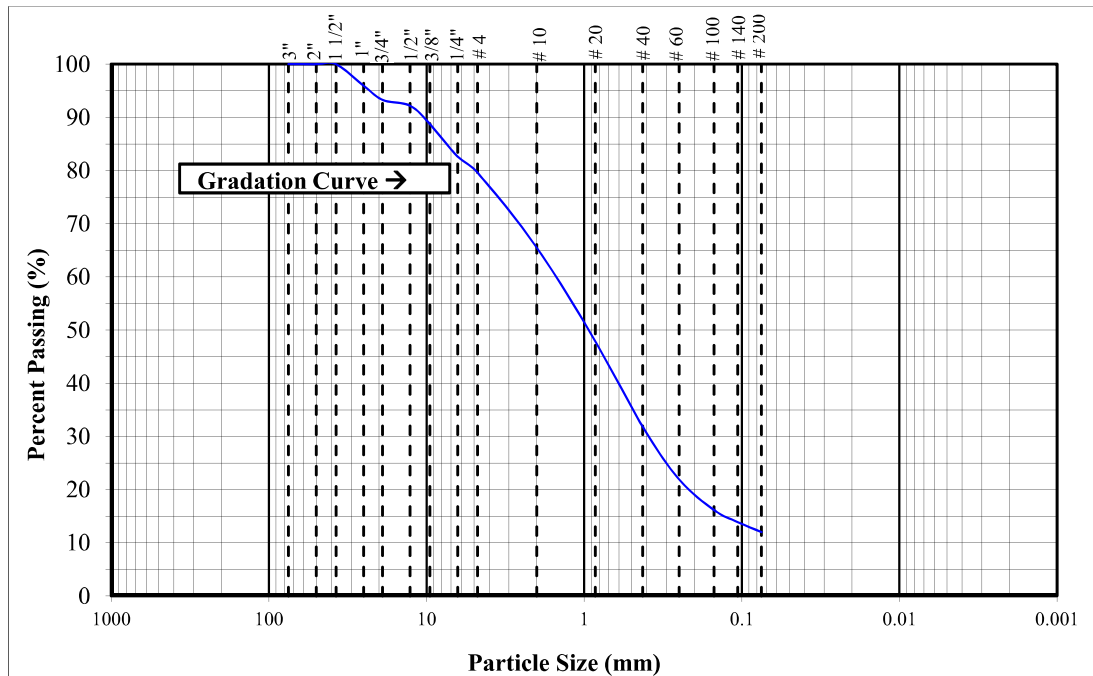
PROJECT #: 17011
 EXPLORATION #: B-2
 SAMPLE #: S-1
 SAMPLE DEPTH: 0.5' - 2.5'
 TEST DATE: 3/14/2017

TEST PROCEDURE

Sample Source: Split Spoon	Sieve Stack: Composite	Specimen Procedure: Moist
Test Method: Method A	Separating Sieve(s): 3/8 Inch	Dispersion Type: Tap Water

DATA

<u>STANDARD SIEVE</u> <u>DESIGNATION (mm)</u>	<u>ALTERNATIVE SIEVE</u> <u>DESIGNATION (in)</u>	<u>PERCENT</u> <u>PASSING</u> <u>(%)</u>
75	(3 in)	100
50	(2 in)	100
37.5	(1-1/2 in)	100
25.0	(1 in)	96
19.0	(3/4 in)	93
12.7	(1/2 in)	92
9.5	(3/8 in)	89
6.35	(1/4 in)	83
4.75	(No. 4)	80
2.00	(No. 10)	66
0.850	(No. 20)	48
0.425	(No. 40)	32
0.250	(No. 60)	22
0.150	(No. 100)	16
0.106	(No. 140)	14
0.075	(No. 200)	12



REMARKS: Moisture Content = 8.8%.



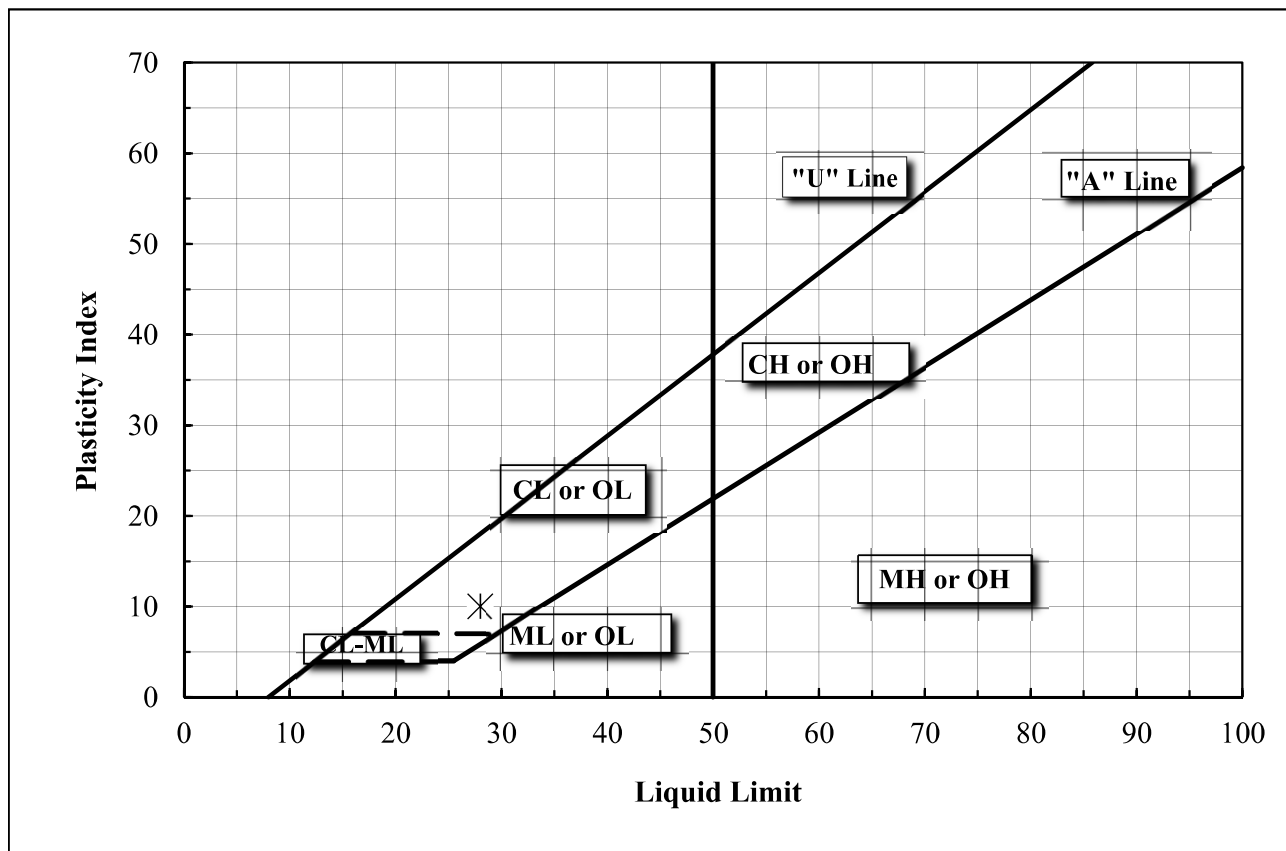
ATTERBERG LIMIT TEST - ASTM D4318

Method "A" (Multi-point)

PROJECT NAME:	Carrying Place Bridge	PROJECT NUMBER:	17011
CLIENT:	Gartley & Dorsky Engineering & Surveying	SAMPLE NUMBER:	S-4
SOURCE:	Boring B-4	DEPTH:	14' - 16'
TEST DATE:	3/14/2017	TECHNICIAN:	Erika Stewart, E.I.

DATA

Source	Depth	LL	PL	PI	Classification
B-4	14' - 16'	28	18	10	Gray Silty CLAY, trace Sand, CL



Notes: Moisture Content = 26.0%



Laboratory Determination of Water (Moisture) Content of Soil ASTM D2216

PROJECT NAME:	Carrying Place Bridge	PROJECT #:	17011
PROJECT LOCATION:	Calderwood Neck Road	DRYING METHOD:	Oven Dried
CLIENT:	Gartley & Dorskey Engineering & Surveying	DESCRIPTION:	Glacial Marine Clay
SOURCE:	Test Borings	TECHNICIAN:	Erika Stewart, E.I.
COLLECTION DATE:	03/07/17	TESTING DATE:	03/14/17

<u>Location</u>	<u>Sample No.</u>	<u>Depth</u>	<u>Moisture Content</u>	<u>Remarks</u>
B-1	S-4	14' - 16'	26.0%	
B-1	S-5	19' - 21'	33.1%	

REMARKS:

SECTION 00 41 01

BID FORM

ARTICLE 1 – DEFINED TERMS

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

ARTICLE 2 – BID RECIPIENT

- 2.01 This Bid is submitted to:

**Town Office of Vinalhaven
Attention: Andrew Dorr, Town Manager
19 Washington School Road
Vinalhaven, ME 04863**

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

ARTICLE 3 – BIDDER’S ACKNOWLEDGEMENTS

- 3.01 Bidder accepts all of the terms and conditions of the Bidding Documents including, without limitation:
- A. those dealing with disposition of Bid security;
 - B. those included in the Supplementary Instructions to Bidders;
 - C. insurance and bonding requirements (Payment Bond and Performance Bond each equal to 100% of the total Contract Price) set forth in the General Conditions and Supplementary Conditions, if any;
 - D. Contract Times as set forth in the Agreement; and
 - E. provisions for liquidated damages as set forth in the Agreement.
- 3.02 This Bid will remain subject to acceptance for 90 days after the Bid opening or for such longer period of time that Bidder may agree to in writing upon request of Owner.
- 3.03 Bidder acknowledges receipt of the following Addenda.

Addendum No.

Addendum Date

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

- 3.04 Bidder acknowledges the representations and certifications included in Section 00 45 05 are made a condition of the Bid.

ARTICLE 4 – BASIS OF BID

- 4.01 Bidder will complete the Work in accordance with the Contract Documents for the following price(s) based on unit prices included in the following schedule. **Bidder must complete all items.**

BID PRICES SHALL EXCLUDE SALES AND USE TAX.

Item No.	Item Description with Unit or Lump Sum Price in Written Words	Estimated Quantity & Unit	Unit Bid Price (Figures)	Total Bid Item Price (Figures)
1	Precast Concrete Culvert	1		
	@ _____			
	Dollars and _____ Cents PER [INSERT UNIT]	LS		
2	Helical Pile Installation	150*		
	@ _____			
	Dollars and _____ Cents PER [INSERT UNIT]	LF		
3	Bedrock Removal	25*		
	@ _____			
	Dollars and _____ Cents PER [INSERT UNIT]	CY		

Item No.	Item Description with Unit or Lump Sum Price in Written Words	Estimated Quantity & Unit	Unit Bid Price (Figures)	Total Bid Item Price (Figures)
4	Temporary Road	1		
	@ _____			
	Dollars and _____ Cents PER [INSERT UNIT]	LS		
5	Guardrail	560*		
	@ _____			
	Dollars and _____ Cents PER [INSERT UNIT]	LF		
6	Road Reconstruction	1		
	@ _____			
	Dollars and _____ Cents PER [INSERT UNIT]	LS		
7	Erosion and Sedimentation Control	1		
	@ _____			
	Dollars and _____ Cents PER [INSERT UNIT]	LS		
8	Mobilization and Demobilization	1		
	@ _____			
	Dollars and _____ Cents PER [INSERT UNIT]	LS		

TOTAL BID PRICE (based on Unit Price Schedule above)

_____ \$ _____
 _____ Dollars and (Use figures)
 _____ Cents
 (Use words)

- 4.02 Unit Prices have been computed in accordance with Paragraph 11.03.A of the General Conditions and Supplementary Conditions, if any.
- 4.03 Bidder acknowledges that estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for unit price items will be based on actual quantities determined and based on the unit prices included above, as provided in the General Conditions and Supplementary Conditions, if any.

WOODARD & CURRAN

BID FORM
00 41 01-3

ARTICLE 5 – TIME OF COMPLETION

- 5.01 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 14.07 of the General Conditions and Supplementary Conditions, if any, on or before the dates or within the number of calendar days indicated in the Agreement.
- 5.02 Bidder accepts the provisions of the Agreement as to liquidated damages.

ARTICLE 6 – ATTACHMENTS TO THIS BID

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

00 43 13 Bid Bond – Penal Sum Form

OR

Required Bid security in the form of _____

Supplements:

00 43 36 Proposed Subcontractors Form

00 43 37 Proposed Suppliers Form

00 43 93 Bid Submittal Checklist

00 45 05 Bidder's Representations and Certifications including required submittals

00 45 13 Bidder's Qualifications

00 45 19 Non-collusion Affidavit

ARTICLE 7 – BID SUBMITTAL

7.01 This Bid is submitted by:

A Corporation

Corporation Name: _____

State of incorporation: _____

Type: _____
(General Business, Professional, Service, other)

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

Name (typed or printed): _____

Title: _____

(CORPORATE SEAL)

Attest: _____
(Signature of Corporate Secretary)

Business Address: _____

Phone & Facsimile Nos: _____

Email address: _____

Date of qualification to do business as out-of-state corporation: _____

A Limited Liability Company (LLC)

LLC Name: _____

State in which organized: _____

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

Name (typed or printed): _____

Title: _____

Business Address: _____

Phone & Facsimile Nos: _____

Email address: _____

A Joint Venture

First Joint Venturer Name: _____

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

Name (typed or printed): _____

Title: _____

Business Address: _____

Phone & Facsimile Nos: _____

Email address: _____

Second Joint Venturer Name: _____

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

Name (typed or printed): _____

Title: _____

Business Address: _____

Phone & Facsimile Nos: _____

Email address: _____

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

A Partnership

Partnership Name: _____ (SEAL)

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

Name (typed or printed): _____

Business Address: _____

Phone & Facsimile Nos: _____

Email address: _____

An Individual

Name (typed or printed): _____

By: _____
(Individual's signature)

Doing business as: _____

Business Address: _____

Phone & Facsimile Nos: _____

Email address: _____

SUBMITTED ON:
EIN/FEIN:

Communications concerning this Bid shall be addressed to:

Name: _____

Title: _____

Business Address: _____

Phone & Facsimile Nos: _____

Email address: _____

END OF SECTION

SECTION 00 43 36

PROPOSED SUBCONTRACTORS FORM

The following Subcontractors, other persons and organizations are proposed to be employed to furnish portions of the Work. Attach additional sheets as necessary.

CONSTRUCTION

[illegible]

DESIGN PROFESSIONALS

Name	Address	Area of Responsibility	% of Total Contract

END OF SECTION

SECTION 00 43 37

PROPOSED SUPPLIERS FORM

The following Suppliers are proposed to furnish the identified products, material and equipment to be incorporated into the Work. Attach additional sheets as necessary.

Name	Address	Product, Material, Equipment

END OF SECTION

SECTION 00 43 93

BID SUBMITTAL CHECKLIST

Bidder confirms that the following documents are fully completed, included in and made part of its Bid.

- ☐ 00 41 01 Bid Form
- ☐ 00 43 13 Bid Bond – Penal Sum Form
- OR*
- ☐ Required Bid security in the form of _____

Supplements

- ☐ 00 43 36 Proposed Subcontractors Form
- ☐ 00 43 37 Proposed Suppliers Form
- ☐ 00 45 05 Bidder's Representations and Certifications
 - ☐ **including required documents and submittals**
- ☐ 00 45 13 Bidder's Qualifications
- ☐ 00 45 19 Non-collusion Affidavit
- ☐ One original signed hardcopy (with original Bid security) has been submitted to the Owner in accordance with Section 00 21 13.

CONFIRMED BY BIDDER ON:
By:
<i>Authorized person per Bid Form</i>

END OF SECTION

SECTION 00 45 05

BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

The undersigned, under the penalties of perjury, represents and certifies the following which is made a condition of the Bid.

1.01 Bidder's Representations

- A. Bidder has examined and carefully studied the Bidding Documents and other related data identified in the Bidding Documents.
- B. Bidder 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. Bidder is familiar with and is satisfied as to all Laws and Regulations that may affect cost, progress, and performance of the Work.
- D. Bidder 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 relating to existing surface or subsurface structures at the Site (except Underground Facilities) that have been identified in Section 00 73 10 of the Supplementary Conditions Paragraph 4.02 as containing reliable "technical data," and (2) reports and drawings of Hazardous Environmental Conditions, if any, at the Site that have been identified in Section 00 73 10 of the Supplementary Conditions Paragraph 4.06 as containing reliable "technical data."
- E. Bidder has considered the information known to Bidder; information and observations obtained from visits to the Site; the Bidding Documents; and the Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying the specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents; and (3) Bidder's safety precautions and programs.
- F. Based on the information and observations referred to in Paragraph E above, Bidder does not consider that further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of the Bid for performance of the Work at the price(s) bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.
- G. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.

**BIDDER'S REPRESENTATIONS
AND CERTIFICATIONS
00 45 05-1**

- H. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution thereof by Engineer is acceptable to Bidder.
- I. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which the Bid is submitted.

1.02 Bidder's Certifications

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

- D. Bidder will comply with the requirements of the Safety and Health provisions in the Contract Documents, and if Bidder is awarded a Contract, it shall incorporate these provisions into all subcontracts and Purchase Orders so that such provisions will be binding upon each Subcontractor or Supplier.
- E. Bidder will comply with the requirements of the Equal Employment Opportunity, Anti-discrimination, and Affirmative Action Program provisions in the Contract Documents, if any, and if Bidder is awarded a Contract, it shall incorporate these provisions into all subcontracts and Purchase Orders so that such provisions will be binding upon each Subcontractor or Supplier.

SUBMITTED ON:
By:
<i>Authorized person per Bid Form</i>

END OF SECTION

SECTION 00 45 13

BIDDER'S QUALIFICATIONS

The following data, statements of experience, personnel, equipment and general qualifications of the Bidder are submitted as a part of the Bid and the Bidder represents and guarantees the truthfulness and accuracy thereof and **its ability to meet the qualifications requirements specified forth in the General Requirements**. Attach additional sheets as necessary properly cross referenced.

- A. Bidder's organization is a _____
(entity type) and has been in business continuously from the year _____.
- B. Bidder's organization has had experience in construction comparable to that required by the Contract Documents as a prime contractor for _____ years and as a subcontractor for _____ years.
- C. Following is a list of **at least 5 projects** Bidder's organization has completed **in the state the Project is located, within the last 10 years which are similar** in type, character and magnitude to that required by the Contract.

Client/Owner Name/Address	Project Name/Location	CURRENT Contact Name, Phone, Email	Time Period

Client/Owner Name/Address	Project Name/Location	CURRENT Contact Name, Phone, Email	Time Period

- D. The following supervisory personnel are currently employed by the Bidder and available for assignment to the Project (project manager, superintendents, principal foremen and engineers).

Name	Title	Years of Experience

Attach detailed resumes of qualifications, previous employers and experience for each.

- E. Describe Bidder's 24 hour/7 days per week emergency response and communication capabilities.

- F. Following is a list of all projects Bidder has undertaken in the last 5 years which have resulted in partial or final settlement of the contract by arbitration or litigation.

Name of Client and Project	Contact Name/ Telephone No.	Original Contract Amount	Total Claims	Arbitrated or Litigated Amount of Settlement of Claims

- G. Following is a list of safety citations issued to the Bidder over the last 5 years.

Name of Client and Project	Contact Name/ Telephone No.	Type of Citation	Issued by

- H. Following is a list of labor disputes the Bidder has been the subject of, or otherwise been involved in, during the last 5 years. For these purposes, "labor disputes" shall include picketing or any other activity which disrupted or delayed the work. Attach additional sheets as necessary.

Name and Location of the Project	
Nature of the Dispute	
Duration and dates during which the dispute took place	
How the dispute was resolved	
Name and Location of the Project	
Nature of the Dispute	
Duration and dates during which the dispute took place	
How the dispute was resolved	

END OF SECTION

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SECTION 00 45 19

NON-COLLUSION AFFIDAVIT

_____, being duly sworn,
depose and, under the penalty of perjury, say that the following is true:

1. I am the person responsible within my firm for the final decision as to the price(s) and amount of this Bid or, if not, that I have written authorization, enclosed herewith, from that person to make the statements set out below on his or her behalf and on the behalf of my firm.
2. The price(s) and amount of this Bid have been arrived at independently, without collusion, consultation, communication, or agreement for the purpose of restricting competition with any other contractor, competitor, Bidder, or potential Bidder.
3. Unless otherwise required by law, neither the price(s) nor the amount of this Bid have been disclosed to any other firm or person who is a Bidder, competitor, or potential Bidder on the Project, and will not be so disclosed either directly or indirectly prior to Bid opening.
4. No attempt has been made or will be made to solicit, cause, or induce any firm, partnership, corporation, or person to submit or not submit a Bid on this Project, or to submit a Bid higher than the Bid of this firm, or submit an intentionally high or noncompetitive Bid or other form of complementary Bid, or for the purpose of restricting competition.
5. The Bid of my firm is made in good faith and not pursuant to any agreement or discussion with, or inducement from, any firm or person to submit a complementary Bid.
6. My firm has not offered or entered into a subcontracting agreement regarding the purchase of materials or services from any firm or person, or offered, promised, or paid cash or anything of value to any firm or person, whether in connection with this or any other Project, in consideration for an agreement or promise by any firm or person to refrain from proposing or to submit a complementary Bid on the Project.
7. My firm has not accepted nor been promised any subcontract or agreement regarding the sale of materials or services to any firm or person, and has not been promised or paid cash or anything of value to any firm or person, whether in connection with this or any other project, in consideration for my firm's submitting a complementary Bid or agreeing to do so, on the Project.

8. I have made a diligent inquiry of all members, officers, employees, and agents of my firm with responsibilities relating to the preparation, approval, or submission of my firm's Bid on the Project and have been advised by each of them that he or she has not participated in any communication, consultation, discussion, agreement, collusion, act, or other conduct inconsistent with any of the statements and representations made in this affidavit.

Company Name

Signature

Company Position

Date: _____

Attest: _____

Date: _____

END OF SECTION

SAMPLE NOTICE OF AWARD (C-00 51 00)

Date: _____

Project:

Owner:

Owner's Contract No.:

Contract:

Engineer's Project No.:

Bidder:

Bidder's Address:

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 [_____] subject to the following conditions being met and subject to required reviews and approvals. [*and specifically, *funding* approval by [_____]].*]

The *Lump Sum* *Total* Contract Price of your Contract is _____ Dollars (\$ _____).

You must comply with the following conditions precedent **within 10 days** of the date you receive this Notice of Award.

1. Deliver the Contract security (Bonds) as specified in the General Conditions and Supplementary Conditions (Articles 2 and 5);
2. Deliver the insurance certificates indicating coverages as specified in the General Conditions and Supplementary Conditions (Articles 2 and 5);
3. Deliver the following completed and executed certifications and documents:
 - a. *LIST ITEMS FOR CONTRACTOR TO PROVIDE*
 - b. Items to be provided by Subcontractors:

LIST

SAMPLE NOTICE OF AWARD (C-00 51 00)

Other conditions precedent:

LIST OTHERS IF ANY

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

After confirming that you have complied with the above conditions *and required approvals are obtained,* Owner will deliver the conformed Contract Documents for execution.

Owner

By: _____
Authorized Signature

Title

Copy to Engineer

SECTION 00 52 10

AGREEMENT FORM

THIS AGREEMENT is by and between Town of Vinalhaven, Maine (“Owner”) and _____ (“Contractor”). Owner and Contractor hereby agree as follows

ARTICLE 1 – WORK

- 1.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as replacement of Carrying Place Bridge with a pre-cast concrete culvert and includes the following principal features:
- A. Installation of erosion and sedimentation control and water control measures.
 - B. Installation of temporary bypass road.
 - C. Demolition of roadway and existing bridge; disassembly of granite block abutment.
 - D. Installation of pre-cast concrete culvert and reassembly of granite blocks around culvert abutments.
 - E. Reconstruction of roadway and installation of guardrail.
 - F. Removal of temporary bypass road, erosion and sedimentation control and water control measures.

ARTICLE 2 – THE PROJECT

- 2.01 The Project under the Contract Documents is generally described as the Vinalhaven Carrying Place Bridge Replacement Project. This involves removing an existing bridge structure and installing a precast culvert.

ARTICLE 3 – ENGINEER

- 3.01 The Project has been designed by Woodard & Curran, Inc. (Engineer), which 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

- 4.01 *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.

4.02 *Substantial Completion and Final Payment*

- A. The Work shall be substantially complete by November 20, 2020 and completed and ready for final payment by December 11, 2020 in accordance with Paragraph 14.07 of the Standard General and Supplementary Conditions, if any.

4.03 *Liquidated Damages*

- A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial loss if the Work is not completed within the times specified in Paragraph 4.02 above, plus any extensions thereof allowed in accordance with Article 12 of the Standard General Conditions and Supplementary Conditions, if any. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty), Contractor shall pay Owner **\$1,000.00** for each day that expires after the time specified in Paragraph 4.02 above for Substantial Completion until the Work is substantially complete. After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Time or any proper extension thereof granted by Owner, Contractor shall pay Owner **\$1,000.00** for each day that expires after the time specified in Paragraph 4.02 above for completion and readiness for final payment until the Work is completed and ready for final payment.

ARTICLE 5 – CONTRACT PRICE

- 5.01 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 Paragraph 5.01.A below based on unit pricing stated in Contractor's Bid attached hereto:

TOTAL PRICE

[IN WORDS] Dollars and [# OF CENTS] Cents

[\$[DOLLAR AMOUNT]]

- A. Unit Prices have been computed in accordance with Paragraph 11.03.A of the Standard General Conditions and Supplementary Conditions, if any.
- B. The prices for Unit Price Work set forth as of the Effective Date of the Agreement are based on estimated quantities. As provided in Paragraph 11.03 of the Standard General Conditions and Supplementary Conditions, if any, estimated quantities are not guaranteed (except for those that may be estimated by the Contractor), and determinations of actual quantities and classifications are to be made by Engineer as provided in Paragraph 9.07 of the Standard General Conditions and Supplementary Conditions, if any. Final payment for unit price items will be based on actual quantities determined and based on the unit prices in the Bid Form.

- C. When the accepted quantity of any item of Unit Price Work performed by the Contractor (as measured in accordance with 9.07 of the General and Supplementary Conditions, if any) differs from the estimated quantity indicated in the attachment(s) to this Agreement for an item of Unit Price Work, no adjustment or allowance will be made for any increased expenses, loss of expected reimbursement, or loss of anticipated profits suffered or claimed by the Contractor resulting either directly or indirectly from such increased or decreased quantities, or from unbalanced allocation of overhead expense among the Unit Price Work items on the part of the Contractor, or subsequent loss of expected reimbursements therefor.

ARTICLE 6 – PAYMENT PROCEDURES

6.01 *Submittal and Processing of Payments*

- A. Contractor shall submit Applications for Payment in accordance with Article 14 of the Standard General Conditions and Supplementary Conditions, if any. Applications for Payment will be processed by Engineer as provided in the Standard General Conditions and Supplementary Conditions, if any, and the General Requirements.

6.02 *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 1st day of each month during performance of the Work as provided in Paragraph 6.02.A.1 below. All such payments will be measured by the schedule of values established as provided in Paragraph 2.07.A of the Standard General Conditions and Supplementary Conditions, if any, (and in the case of Unit Price Work based on the number of units completed).
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 Standard General Conditions and Supplementary Conditions, if any, and additional retainage allowed by Laws and Regulations.
 - a. Progress Payments of 90 percent for Work completed (with the balance of 10 percent being retainage). If the Work has been 50 percent completed as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, then as long as the character and progress of the Work remain satisfactory to Owner and Engineer, there may be no additional retainage withheld at Owner's discretion; and
 - b. 90 percent of cost of materials and equipment not incorporated in the Work (with the balance of 10 percent being retainage).

2. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to 95 percent of the Work completed (with the balance of 5 percent being retainage), less such amounts as Engineer shall determine in accordance with Paragraph 14.02.B.5 of the General and Supplementary Conditions, if any, and less the Engineer's estimate of the value of Work to be completed or corrected as shown on the tentative list of items to be completed or corrected (Punch List) attached to the certificate of Substantial Completion and subject to Paragraph 14.04 of the General and Supplementary Conditions, if any.

6.03 *Final Payment*

- A. Upon final completion and acceptance of the Work in accordance with Paragraph 14.07 of the General and Supplementary Conditions, if any, Owner shall pay the remainder of the Contract Price as recommended by Engineer as provided in said Paragraph 14.07.

ARTICLE 7 – INTEREST

- 7.01 All moneys not paid when due as provided in Article 14 of the General and Supplementary Conditions, if any, shall bear interest comparable to current short term lending rates in the state where the Project is located or allowed by Laws and Regulations. Interest shall not be accrued on retainage.

ARTICLE 8 – CONTRACTOR'S REPRESENTATIONS AND CERTIFICATIONS

- 8.01 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 relating to existing surface or subsurface structures at the Site (except Underground Facilities), if any, that have been identified in Paragraph SC-4.02 of the Supplementary Conditions as containing reliable "technical data," and (2) reports and drawings of Hazardous Environmental Conditions, if any, at the Site that have been identified in Paragraph SC-4.06 of the Supplementary Conditions as containing reliable "technical data."
 - E. Contractor has considered the information known to Contractor; information commonly known to contractors doing business in the locality of the Site; information and observations obtained

from visits to the Site; the Contract Documents; and the Site-related reports and drawings identified in the Contract Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, including any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Contract Documents; and (3) Contractor's safety precautions and programs.

- F. Based on the information and observations referred to in Paragraph 8.01.E above, Contractor does not consider that 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 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.
- I. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

8.02 The Contractor certifies, under the penalties of perjury, that:

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

5. The representations and certifications Contractor submitted with its Bid remain shall valid during the period of this Agreement.
6. Contractor agrees to incorporate the applicable provisions of the Contract Documents into all subcontracts and Purchase Orders so that such provisions will be binding upon each Subcontractor or Supplier.

ARTICLE 9 – CONTRACT DOCUMENTS

9.01 *Contents*

- A. The Contract Documents consist of the following:
 1. This Agreement
 2. Items listed in Section 00 54 00
 3. Forms listed in 00 60 00
 4. Standard General Conditions in Section 00 72 05
 5. Supplementary Conditions listed in Section 00 73 05
 6. General Requirements, Specifications and Drawings as listed in the table of contents of the Contract Documents
 7. The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:
 - a. Notice to Proceed
 - b. Work Change Directives
 - c. Change Orders
- B. The documents listed in Paragraph 9.01.A are attached to this Agreement and made a part hereof.
- 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 Standard General Conditions and Supplementary Conditions, if any.

ARTICLE 10 – MISCELLANEOUS

10.01 *Terms*

- A. Terms used in this Agreement will have the meanings stated in the Standard General Conditions and Supplementary Conditions, if any.

10.02 *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.

10.03 *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.

10.04 *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. Counterparts have been delivered to Owner and Contractor. All portions of the Contract Documents have been signed or have been identified by Owner and Contractor or on their behalf.

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

OWNER:
Town of Vinalhaven, Maine

CONTRACTOR:

By:
Printed Name
Title

By:
Printed Name
Title

By:
Printed Name
Title

License No.

Attest:
Title
Address for giving notices:

Attest:
Title
Address for giving notices:

Agent for service of process:

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

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

PERFORMANCE BOND (Form C-006113.13)

CONTRACTOR *(name and address):*

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

OWNER *(name and address):*

CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description *(name and location):*

BOND

Bond Number:

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

Amount:

Modifications to this Bond Form: ☐ None ☐ See Paragraph 16

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

CONTRACTOR AS PRINCIPAL

SURETY

(seal)

Contractor's Name and Corporate Seal

(seal)

Surety's Name and Corporate Seal

By: _____

Signature

By: _____

Signature *(attach power of attorney)*

Print Name

Print Name

Title

Title

Attest: _____

Signature

Attest: _____

Signature

Title

Title

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

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

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

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

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

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

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

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

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

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

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

5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owners concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 7 in excess of the Balance of

the Contract Price incurred by the Owner as a result of the Contractor Default; or

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

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

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

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

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

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

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

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

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

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

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

11. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within

two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum periods of limitations available to sureties as a defense in the jurisdiction of the suit shall be applicable.

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

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

14. Definitions

14.1 Balance of the Contract Price: The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made including allowance for the Contractor for any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

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

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

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

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

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

16. Modifications to this Bond are as follows:

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PAYMENT BOND (Form C-006113.16)

CONTRACTOR *(name and address):*

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

OWNER *(name and address):*

CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description *(name and location):*

BOND

Bond Number:

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

Amount:

Modifications to this Bond Form: ☐ None ☐ See Paragraph 18

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

CONTRACTOR AS PRINCIPAL

SURETY

Contractor's Name and Corporate Seal

Surety's Name and Corporate Seal

By: _____
Signature

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

Print Name

Print Name

Title

Title

Attest: _____
Signature

Attest: _____
Signature

Title

Title

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

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

(2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

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

16. Definitions

16.1 **Claim:** A written statement by the Claimant including at a minimum:

1. The name of the Claimant;
2. The name of the person for whom the labor was done, or materials or equipment furnished;
3. A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Construction Contract;
4. A brief description of the labor, materials, or equipment furnished;
5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;
7. The total amount of previous payments received by the Claimant; and
8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.

16.2 **Claimant:** An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond

shall be to include without limitation in the terms of "labor, materials, or equipment" that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

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

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

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

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

18. Modifications to this Bond are as follows:

This page intentionally left blank

SAMPLE NOTICE TO PROCEED (C-00 55 00)

COMPLETE AFTER AWARD – MAY BE ISSUED ON OWNER'S LETTERHEAD – DELETE TITLE AND FORM NUMBER

OPTIONAL LANGUAGE [* *]

Date: _____

Project:

Owner:

Owner's Contract No.:

Contract:

Engineer's Project No.:

Contractor:

Contractor's Address: [send Certified Mail, Return Receipt Requested]

NOTICE TO PROCEED

You are notified that the Contract Times under the above Contract will commence to run on _____. On or before that date, you are to start performing your obligations under the Contract Documents [* for the following portion(s) of the Work: *]
[*Describe the limits of the Work covered*]

[*A Notice to Proceed for the remaining Work will follow. *]

In accordance with Article 4 of the Agreement, the date of Substantial Completion is _____, and the date of readiness for final payment is _____ [OR the number of days to achieve Substantial Completion is _____, and the number of days to achieve readiness for final payment is _____].

Before you may start any Work at the Site, Paragraph 2.01.B of the General Conditions, and Supplementary Conditions if any, provide that you and Owner must each deliver to the other (with copies to Engineer and other identified additional insureds and loss payees) certificates of insurance which each is required to purchase and maintain in accordance with the Contract Documents.

SAMPLE NOTICE TO PROCEED (C-00 55 00)

Also, before you may start any Work at the Site, you must:

Comply with Articles 2.05 and 2.06 of the General and Supplementary Conditions (if any)

*[*add other requirements*]*

Owner

Given by: _____

Authorized Signature

Title

Date

Copy to Engineer

SECTION 00 60 00

PROJECT FORMS

The following forms are included in this Section and shall be used for the Project as specified in the General Conditions and Supplementary Conditions if any, and the General Requirements. Completed and execution versions of these forms used during the Project shall be incorporated into the Agreement and made a part thereof.

Application for Payment Form (C-00 62 76)
Request for Interpretation/Information Form (C-00 63 15)
Field Order Form (C-00 63 36)
Work Change Directive Form (C-00 63 49)
Change Request Form (C- 00 63 60)
Change Order Form (C-00 63 63)
Notice of Substantial Completion Form (C-00 65 15)
Certificate of Substantial Completion Form (C-00 65 16)
Notice of Completion Form (C-00 65 18)

This page intentionally left blank

		Application Date:
Application Period:		
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
TOTALS		
NET CHANGE BY CHANGE ORDERS		

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 on Progress Estimate)..... \$ _____

5. RETAINAGE:

 a. X _____ Work Completed..... \$ _____

 b. X _____ Stored Material..... \$ _____

 c. Total Retainage (Line 5a + Line 5b)..... \$ _____

6. AMOUNT ELIGIBLE TO DATE (Line 4 - Line 5c)..... \$ _____

7. LESS PREVIOUS PAYMENTS (Line 6 from prior Application)..... \$ _____

8. AMOUNT DUE THIS APPLICATION..... \$ _____

9. BALANCE TO FINISH, PLUS RETAINAGE
(Column G on Progress Estimate + Line 5 above)..... \$ _____

Contractor's Certification

The undersigned Contractor certifies that to the best of its knowledge: (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 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 Agency (if applicable) (Date)

Approved by: _____

FORM C-00 62 76

Contractor's Application

For (Contract):						Application Number:			
Application Period:						Application Date:			
			Work Completed		E	F		G	
A		B	C	D	Materials Presently Stored (not in C or D)	Total Completed and Stored to Date (C + D + E)	% (F / B)	Balance to Finish (B - F)	
Specification Section No.	Description	Scheduled Value (\$)	From Previous Application (C+D)	This Period					
	Totals								

Progress Estimate - Unit Price Work

FORM C-00 62 76

Contractor's Application

[illegible]

Stored Material Summary FORM C-00 62 76

Contractor's Application

[illegible]

**REQUEST FOR
INTERPRETATION/INFORMATION
(Form C-00 63 15)**

RFI #: _____ ☐ **Attachment**

To: _____

From: _____

Attn: _____

Issue Date: _____

Project: _____

Required Reply Date: _____

DISTRIBUTION:

Contractor

Owner

Engineer

☐ _____

☐ _____

☐ _____

☐ _____

☐ _____

☐ _____

☐ _____

☐ _____

☐ _____

REFERENCES:

- Specifications: _____ Section: _____ Page/Paragraph: _____
- Drawings: _____ Issue Date: _____ Detail/Sections: _____
- Work Area: _____ Grid/Level: _____

RFI DESCRIPTION:

From: _____

Tel No: _____ Fax: No: _____

Initial: _____

E-mail: _____

RFI REPLY: (response may be transmitted in separate document)

Possible Cost Effect Yes: ☐ No: ☐

Possible Schedule Effect Yes: ☐ No: ☐

From: _____

Reply Date: _____ xc: _____

Initial: _____

This page intentionally left blank

Field Order (C-00 63 36)

No. _____

Date of Issuance: _____ Effective Date: _____

Project:	Owner:	Owner's Contract No.:
Contract:		Date of Contract:
Contractor:		Engineer's Project No.:

Attention:

You are hereby directed to promptly execute this Field Order issued in accordance with General Conditions Paragraph 9.04.A, for minor changes in the Work without changes in Contract Price or Contract Times. If you consider that a change in Contract Price or Contract Times is required, please notify the Engineer immediately and before proceeding with this Work.

Reference: _____
(Specification Section(s)) (Drawing(s) / Detail(s))

Description:

Attachments:

Engineer:

Receipt Acknowledged by Contractor:	Date:
-------------------------------------	-------

Copy to Owner

This page intentionally left blank

Work Change Directive (Form C-00 63 49)

No. _____

Date of Issuance: _____ Effective Date: _____

Project:	Owner:	Owner's Contract No.:
Contract:		Date of Contract:
Contractor:		Engineer's Project No.:

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

Item No.	Description

Attachments (list documents supporting change):

Purpose for Work Change Directive:

Authorization for Work described herein to proceed on the basis of Cost of the Work due to:

- ☐ Nonagreement on pricing of proposed change.
- ☐ Necessity to expedite Work described herein prior to agreeing to changes on Contract Price and Contract Time.

Estimated change in Contract Price and Contract Times:

Contract Price \$ _____ (increase/decrease) Contract Time _____ (increase/decrease)
days

Recommended for Approval by Engineer:	Date
Authorized for Owner by:	Date
Received for Contractor by:	Date
Received by Funding Agency (if applicable):	Date:

This page intentionally left blank

CHANGE REQUEST (FORM C-00 63 60)
(Design Changes/Deviations/Substitutions)

CR NO.
DATE

Project:

Request Initiated by:

- ☐ Contractor
- ☐ Owner
- ☐ Engineer

Impact to Contract Price expected ☐

Impact to Contract Time expected ☐

Change Orders will be processed separately

Request submitted as (format):

Description of Change (☐ documentation attached)

Reason for Change

Response: ☐ This constitutes a Written Amendment to the Agreement.

Review of the proposed change/deviation/substitution by Engineer is for general compatibility with the design concept of the Project. This review does not extend to means, methods, sequences, or procedures of construction or to issues of safety incident thereto. This review shall not relieve the Contractor from responsibility for full compliance with the requirements specified in the Contract Documents and to determine and verify the information contained therein.

<div>Recommended By Engineer for Acceptance (subject to above comments if any)</div> <div><input type="checkbox"/> recommended for processing and approval under a separate Change Order</div> <div>NAME:</div> <div><div>Signature</div><div>Date</div></div>	<div><input type="checkbox"/> Approved by Owner (no schedule or cost impact)</div> <div><input type="checkbox"/> Acknowledged by Owner – to be processed and approved under a separate Change Order</div> <div>NAME:</div> <div><div>Signature</div><div>Date</div></div>
<div>Approved by Contractor</div> <div><input type="checkbox"/> Change Order to be requested</div> <div>NAME:</div> <div><div>Signature</div><div>Date</div></div>	

This page intentionally left blank

Change Order (Form C-00 63 63)

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:

Original Contract Price:

\$ _____

[Increase] [Decrease] from previously approved Change Orders No. _____ to No. _____

\$ _____

Contract Price prior to this Change Order:

\$ _____

[Increase] [Decrease] of this Change Order:

\$ _____

Contract Price incorporating this Change Order:

\$ _____

CHANGE IN CONTRACT TIMES:

Original Contract Times: ☐ Working ☐ Calendar days

Substantial completion (days or date): _____

Ready for final payment (days or date): _____

[Increase] [Decrease] from previously approved Change Orders No. _____ to No. _____:

Substantial completion (days): _____

Ready for final payment (days): _____

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:

Substantial completion (days or date): _____

Ready for final payment (days or date): _____

Contract Times with all approved Change Orders:

Substantial completion (days or date): _____

Ready for final payment (days or date): _____

RECOMMENDED:

By: _____

Engineer (Authorized Signature)

Date: _____

Approved by Funding Agency (if applicable):

Date: _____

ACCEPTED:

By: _____

Owner (Authorized Signature)

Date: _____

Approved by Funding Agency (if applicable):

Date: _____

ACCEPTED:

By: _____

Contractor (Authorized Signature)

Date: _____

Approved by Funding Agency (if applicable):

Date: _____

Change Order

Instructions

A. GENERAL INFORMATION

This document was developed to provide a uniform format for handling contract changes that affect Contract Price or Contract Times. Changes that have been initiated by a Work Change Directive must be incorporated into a subsequent Change Order if they affect Price or Times.

Changes that affect Contract Price or Contract Times should be promptly covered by a Change Order. The practice of accumulating Change Orders to reduce the administrative burden may lead to unnecessary disputes.

If Milestones have been listed in the Agreement, any effect of a Change Order thereon should be addressed.

For supplemental instructions and minor changes not involving a change in the Contract Price or Contract Times, a Field Order should be used.

B. COMPLETING THE CHANGE ORDER FORM

Engineer normally initiates the form, including a description of the changes involved and attachments based upon documents and proposals submitted by Contractor, or requests from Owner, or both.

Once Engineer has completed and signed the form, all copies should be sent to Owner or Contractor for approval, depending on whether the Change Order is a true order to the Contractor or the formalization of a negotiated agreement for a previously performed change. After approval by one contracting party, all copies should be sent to the other party for approval. Engineer should make distribution of executed copies after approval by both parties.

If a change only applies to price or to times, cross out the part of the tabulation that does not apply.

Notice of Substantial Completion (C-00 65 15)

Project:	Owner:	Owner's Contract No.:
Contract:		Date of Contract:
Contractor:		

This NOTICE of Substantial Completion applies to:

☐ The following Systems, Equipment or specified portions ☐ : All Work under the Contract Documents
:

_____ Date of Substantial Completion for above

The following documents are attached to and made part of this Notice.

_____ Submitted by Contractor _____ Date

This page intentionally left blank

Certificate of Substantial Completion (Form C-00 65 16)

Project:

Owner:

Owner's Contract No.:

Contract:

Engineer's Project No.:

This [tentative] [definitive] Certificate of Substantial Completion applies to:

- ☐ All Work under the Contract Documents: ☐ The following specified portions of the Work:

Date of Substantial Completion

The Work to which this Certificate applies has been inspected by authorized representatives of Owner, Contractor, and Engineer, and found to be substantially complete. The Date of Substantial Completion of the Project or portion thereof designated above is hereby declared and is also the date of commencement of applicable warranties required by the Contract Documents, except as stated below.

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

The responsibilities between Owner and Contractor for security, operation, safety, maintenance, heat, utilities, insurance and warranties shall be as provided in the Contract Documents except as amended as follows:

- ☐ Amended Responsibilities ☐ Not Amended

Owner's Amended Responsibilities:

Contractor's Amended Responsibilities:

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

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

_____ Executed by Engineer	_____ Date
-------------------------------	---------------

_____ Accepted by Contractor	_____ Date
---------------------------------	---------------

_____ Accepted by Owner	_____ Date
----------------------------	---------------

Notice of Completion (Form C-00 65 18)

Project:	Owner:	Owner's Contract No.:
Contract:		Date of Contract:
Contractor:		

This NOTICE of Completion applies to:

- ☐ All Work under the Contract Documents: ☐ The following specified portions:

Date of final Completion

The Work to which this Notice applies is ready for inspection by authorized representatives of Engineer and Owner. Contractor has completed all corrections, delivered all required documentation, and the Project, or portion designated above, is complete. The Date of Completion of the Project or portion thereof designated above is hereby declared by the Contractor.

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

Final Punchlist

Final Application for Payment

Only the **making and acceptance of final payment** will constitute:

1. A waiver of all claims by Owner against Contractor, except claims arising from any unsettled liens, from Defective Construction appearing after final inspection; 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 timely made in writing and still unsettled.

Submitted by Contractor

Date

This page intentionally left blank

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

SECTION 00 72 05 STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

and

Issued and Published Jointly by



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AMERICAN SOCIETY OF CIVIL ENGINEERS

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A Practice Division of the
NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

Endorsed by



CONSTRUCTION SPECIFICATIONS INSTITUTE

REVISIONS HIGHLIGHTED WITHIN THE TEXT OF THIS SECTION
HAVE BEEN PREPARED BY WOODARD & CURRAN

These General Conditions have been prepared for use with the Suggested Forms of Agreement Between Owner and Contractor (EJCDC C-520 or C-525, 2007 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other. Comments concerning their usage are contained in the Narrative Guide to the EJCDC Construction Documents (EJCDC C-001, 2007 Edition). For guidance in the preparation of Supplementary Conditions, see Guide to the Preparation of Supplementary Conditions (EJCDC C-800, 2007 Edition).

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SECTION 00 72 05
STANDARD GENERAL CONDITIONS OF THE
CONSTRUCTION CONTRACT

TABLE OF CONTENTS

	Page
Article 1 – Definitions and Terminology	1
1.01 Defined Terms.....	1
1.02 Terminology.....	6
Article 2 – Preliminary Matters.....	7
2.01 Delivery of Bonds and Evidence of Insurance.....	7
2.02 Copies of Documents.....	7
2.03 Commencement of Contract Times; Notice to Proceed	7
2.04 Starting the Work.....	8
2.05 Before Starting Construction	8
2.06 Preconstruction Conference; Designation of Authorized Representatives	8
2.07 Initial Acceptance of Schedules	9
Article 3 – Contract Documents: Intent, Amending, Reuse.....	9
3.01 Intent.....	9
3.02 Reference Standards	10
3.03 Reporting and Resolving Discrepancies	10
3.04 Amending and Supplementing Contract Documents	11
3.05 Reuse of Documents	11
3.06 Electronic Data.....	12
Article 4 – Availability of Lands; Subsurface and Physical Conditions; Hazardous Environmental Conditions; Reference Points	12
4.01 Availability of Lands	12
4.02 Subsurface and Physical Conditions	13
4.03 Differing Subsurface or Physical Conditions.....	13
4.04 Underground Facilities	15
4.05 Reference Points	16
4.06 Hazardous Environmental Condition at Site.....	16
Article 5 – Bonds and Insurance	18
5.01 Performance, Payment, and Other Bonds	18
5.02 Licensed Sureties and Insurers	18
5.03 Certificates of Insurance	19
5.04 Contractor’s Insurance.....	19
5.05 Owner’s Liability Insurance	22

5.06	Property Insurance	22
5.07	Waiver of Rights	23
5.08	Receipt and Application of Insurance Proceeds (Not used)	24
5.09	Acceptance of Bonds and Insurance; Option to Replace.....	25
5.10	Partial Utilization, Acknowledgment of Property Insurer	25
Article 6 – Contractor’s Responsibilities		25
6.01	Supervision and Superintendence	25
6.02	Labor; Working Hours.....	26
6.03	Services, Materials, and Equipment	26
6.04	Progress Schedule	26
6.05	Substitutes and “Or-Equals”	27
6.06	Concerning Subcontractors, Suppliers, and Others	29
6.07	Patent Fees and Royalties	31
6.08	Permits.....	31
6.09	Laws and Regulations	32
6.10	Taxes	32
6.11	Use of Site and Other Areas	32
6.12	Record Documents.....	33
6.13	Safety and Protection	33
6.14	Safety Representative	34
6.15	Hazard Communication Programs	34
6.16	Emergencies	35
6.17	Shop Drawings and Samples	35
6.18	Continuing the Work	37
6.19	Contractor’s General Warranty and Guarantee.....	37
6.20	Indemnification	39
6.21	Delegation of Professional Design Services	40
Article 7 – Other Work at the Site.....		40
7.01	Related Work at Site	40
7.02	Coordination.....	41
7.03	Legal Relationships.....	41
Article 8 – Owner’s Responsibilities		42
8.01	Communications to Contractor.....	42
8.02	Replacement of Engineer.....	42
8.03	Furnish Data	42
8.04	Pay When Due	42
8.05	Lands and Easements; Reports and Tests	42
8.06	Insurance	42
8.07	Change Orders.....	42
8.08	Inspections, Tests, and Approvals	42
8.09	Limitations on Owner’s Responsibilities	43
8.10	Undisclosed Hazardous Environmental Condition.....	43
8.11	Evidence of Financial Arrangements	43

8.12 Compliance with Safety Program.....	43
Article 9 – Engineer’s Status During Construction	43
9.01 Owner’s Representative	43
9.02 Visits to Site	43
9.03 Project Representative	44
9.04 Authorized Variations in Work	47
9.05 Rejecting Defective Work	47
9.06 Shop Drawings, Change Orders and Payments	48
9.07 Determinations for Unit Price Work	48
9.08 Decisions on Requirements of Contract Documents and Acceptability of Work	48
9.09 Limitations on Engineer’s Authority and Responsibilities.....	49
9.10 Compliance with Safety Program.....	49
Article 10 – Changes in the Work; Claims	50
10.01 Authorized Changes in the Work	50
10.02 Unauthorized Changes in the Work	50
10.03 Execution of Change Orders.....	50
10.04 Notification to Surety.....	51
10.05 Claims.....	51
Article 11 – Cost of the Work; Allowances; Unit Price Work.....	52
11.01 Cost of the Work	52
11.02 Allowances	55
11.03 Unit Price Work	55
Article 12 – Change of Contract Price; Change of Contract Times	56
12.01 Change of Contract Price.....	56
12.02 Change of Contract Times	57
12.03 Delays	58
Article 13 – Tests and Inspections; Correction, Removal or Acceptance of Defective Work.....	58
13.01 Notice of Defects	58
13.02 Access to Work	59
13.03 Tests and Inspections	59
13.04 Uncovering Work.....	60
13.05 Owner May Stop the Work.....	60
13.06 Correction or Removal of Defective Work.....	60
13.07 Correction Period	61
13.08 Acceptance of Defective Work	62
13.09 Owner May Correct Defective Work	62
Article 14 – Payments to Contractor and Completion.....	63
14.01 Schedule of Values	63
14.02 Progress Payments	63
14.03 Contractor’s Warranty of Title	66

14.04 Substantial Completion.....	66
14.05 Partial Utilization	67
14.06 Final Inspection.....	68
14.07 Final Payment	68
14.08 Final Completion Delayed.....	69
14.09 Waiver of Claims	70
Article 15 – Suspension of Work and Termination	70
15.01 Owner May Suspend Work	70
15.02 Owner May Terminate for Cause.....	70
15.03 Owner May Terminate For Convenience.....	72
15.04 Contractor May Stop Work or Terminate	72
Article 16 – Dispute Resolution	73
16.01 Methods and Procedures	73
Article 17 – Miscellaneous	74
17.01 Giving Notice	74
17.02 Computation of Times	74
17.03 Cumulative Remedies	74
17.04 Survival of Obligations.....	75
17.05 Controlling Law	75
17.06 Headings.....	75
17.07 Professional Fees and Court Costs Included.....	75

ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
 2. *Agreement*—The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.
 3. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
 4. *Asbestos*—Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.
 5. *Bid*—The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed. May also be referred to as “Proposal” which may be used interchangeably and shall have the same meaning.
 6. *Bidder*—The individual or entity who submits a Bid directly to Owner.
 7. *Bidding Documents*—The Bidding Requirements and the proposed Contract Documents (including all Addenda).
 8. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Supplementary Instructions to Bidders, Bid security of acceptable form, if any, and the Bid Form with any supplements.
 9. *Change Order*—A document recommended by Engineer which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.
 10. *Claim*—A demand or assertion by Owner or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.
 11. *Contract*—The entire and integrated written agreement between the Owner and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

12. *Contract Documents*—Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents. Approved Shop Drawings, other Contractor submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.
13. *Contract Price*—The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.03 in the case of Unit Price Work).
14. *Contract Times*—The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any; (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Engineer's written recommendation of final payment.
15. *Contractor*—The individual or entity with whom Owner has entered into the Agreement.
16. *Cost of the Work*—See Paragraph 11.01 for definition.
17. *Drawings*—That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor and complement the Specifications. Shop Drawings and other Contractor submittals are not Drawings as so defined. May also be referred to as "Plans", which may be used interchangeably and shall have the same meaning. Notes on Drawings are directed to Contractor unless specifically noted otherwise.
18. *Effective Date of the Agreement*—The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.
19. *Engineer*—The individual or entity named as such in the Agreement.
20. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.
21. *General Requirements*—Sections of Division 01 of the Specifications which govern the Work in all sections of the Specifications.
22. *Hazardous Environmental Condition*—The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto.
23. *Hazardous Waste*—The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.
24. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

25. *Liens*—Charges, security interests, or encumbrances upon Project funds, real property, or personal property.
26. *Milestone*—A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.
27. *Notice of Award*—The written notice by Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Owner will sign and deliver the Agreement.
28. *Notice to Proceed*—A written notice given by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents.
29. *Owner*—The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed.
30. *PCBs*—Polychlorinated biphenyls.
31. *Petroleum*—Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.
32. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times. May also be referred to as "Construction Schedule", which may be used interchangeably and shall have the same meaning.
33. *Project*—The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.
34. *Project Manual*—The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.
35. *Radioactive Material*—Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.
36. *Resident Project Representative*—The authorized representative of Engineer who may be assigned to the Site or any part thereof.
37. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

38. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.
39. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.
40. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.
41. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.
42. *Specifications*—That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto. The Specifications are based on the guidelines of the Construction Specifications Institute (CSI) Project Resource Manual, and are directed to Contractor unless specifically noted otherwise. The words "shall be" are included by inference where a colon (:) is used within sentences or phrases in the Specifications.
43. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.
44. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.
45. *Successful Bidder*—The Bidder submitting a responsive Bid to whom Owner makes an award.
46. *Supplementary Conditions*—That part of the Contract Documents which amends or supplements these General Conditions.
47. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or Subcontractor.

48. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
49. *Unit Price Work*—Work to be paid for on the basis of unit prices.
50. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.
51. *Work Change Directive*—A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Owner and recommended by Engineer ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

B. Additional Terms

1. *Final Completion*—The time at which all Work is completed and ready for final payment in accordance with Paragraph 14.07 of these General Conditions.
2. *Industry Practice*—The written practices, methods, materials, supplies and equipment, as changed from time to time, that are commonly used in the industry applicable to the Project to design, construct and operate facilities and plants, or any practices, methods and acts, which in the exercise of reasonable judgment in light of the facts known at the time, could have been expected to accomplish the desired results consistent with good business practices, reliability, safety and expedition.
3. *Installer*—The entity engaged by Contractor or a Subcontractor for installation, erection, application and similar required operations of a particular portion of the Work at the Site, including who has specialty experience in the Work they are engaged to perform.
4. *Punch List*—A list of open items representing portions of the Work which Contractor, Engineer, Owner reasonably agree is not complete on the date of Substantial Completion but which items will not significantly interfere with the safe, reliable operation and integrity of the Project or its intended use.
5. *Purchase Order*—A written agreement between Contractor and a Supplier for provision of material and equipment.

6. Warranty Period—The correction period after the date of Substantial Completion per Paragraph 13.07 of these General Conditions.

1.02 Terminology

- A. The words and terms discussed in Paragraph 1.02.B through F are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.
- B. Intent of Certain Terms or Adjectives:
1. The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.09 or any other provision of the Contract Documents.
- C. Day:
1. The word “day” means a calendar day of 24 hours measured from midnight to the next midnight. See also Paragraph 17.02 of these General Conditions.
- D. Defective:
1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
 - a. does not conform to the Contract Documents; or
 - b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
 - c. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 14.04 or 14.05).
- E. Furnish, Install, Perform, Provide:
1. The word “furnish,” when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

2. The word “install,” when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.
 3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.
 4. When “furnish,” “install,” “perform,” or “provide” is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, “provide” is implied.
- F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

- A. ~~When Contractor delivers the executed counterparts~~Prior to execution of the Agreement ~~to Owner~~, Contractor shall ~~also~~ deliver to Owner such bonds as Contractor may be required to furnish.
- B. *Evidence of Insurance:* Prior to execution of the Agreement and b~~B~~efore any Work at the Site is started, Contractor and Owner shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Contractor and Owner respectively are required to purchase and maintain in accordance with Article 5.

2.02 *Copies of Documents*

- A. Owner shall furnish to Contractor up to ~~ten~~5 printed or hard copies of the Contract Documents or Drawings and Project Manual. Additional copies will be furnished upon request at the cost of reproduction.

2.03 *Commencement of Contract Times; Notice to Proceed*

- A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Agreement. In no event will the Contract Times commence to run later than the ~~sixtieth~~90th day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, unless mutually agreed otherwise, whichever date is earlier.

2.04 *Starting the Work*

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

2.05 *Before Starting Construction*

- A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), Contractor shall submit to Engineer for timely review:

1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents and the lead times for equipment and materials per the listing in subparagraph 2.05.A.4;
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 which will be confirmed in writing by Contractor at the time of submission. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work; and-
4. a complete listing of equipment and materials with lead times between placing orders and delivery, including normal allowances of time for processing and correcting Shop Drawings.

- B. *Evidence of Insurance:* In accordance with Paragraph 2.01.

2.06 *Preconstruction Conference; Designation of Authorized Representatives*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.05.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.
- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit instructions, receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.07 Initial Acceptance of Schedules

- A. At least 10 days before submission of the first Application for Payment a conference attended by Contractor, Engineer, and others as appropriate will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.05.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.
1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.
 2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
 3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.
 4. Contractor's listing of equipment and materials with lead times must be reflected in the Progress Schedule. All orders for long lead items shall be placed within 30 days after Effective Date of the Agreement if delivery is critical to scheduling. Failure to place orders in accordance with the Progress Schedule may result in full liability for liquidated damages if Milestones and Contract Times are not met.

ARTICLE 3 – CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.01 Intent

- A. The Contract Documents are complementary; what is required by one is as binding as if required by all and comprise the entire agreement between Owner and Contractor concerning the Work. If any term or provision of any of the Contract Documents, or the application thereof to any party or circumstance shall, to any extent, be determined to be invalid or unenforceable, the remaining provisions of the Contract Documents, or the application of such term or provision to parties or circumstances other than those as to which it is held invalid or unenforceable, shall not be affected thereby, and each term and provision of each of the Contract Documents shall be valid and shall be enforced to the fullest extent permitted by Laws and Regulations.
- B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that reasonably may be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the indicated result will be provided whether or not specifically called for, at no additional cost to Owner.
- C. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in Article 9.

3.02 Reference Standards

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

1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
2. No provision of any such standard, specification, manual, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 Reporting and Resolving Discrepancies

A. Reporting Discrepancies:

1. *Contractor's Review of Contract Documents Before Starting Work:* Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Contractor discovers, or has actual knowledge of, and shall obtain a written interpretation or clarification from Engineer before proceeding with any Work affected thereby.
2. *Contractor's Review of Contract Documents During Performance of Work:* If, during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) any standard, specification, manual, or code, or (c) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04.
3. Contractor shall ~~not~~ be liable to Owner or Engineer for failure to report any such conflict, error, ambiguity, or discrepancy in the Contract Documents unless-if Contractor had actual knowledge knew or reasonably should have known of such conflict, error, ambiguity, or discrepancy thereof.

B. Resolving Discrepancies:

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:
 - a. the provisions of any standard, specification, manual, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference in the Contract Documents); or
 - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Amending and Supplementing Contract Documents*

- A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by either a Change Order or a Work Change Directive.
- B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways:
 1. A Field Order;
 2. Engineer's approval of a Shop Drawing or Sample (subject to the provisions of Paragraph 6.17.D.3); or
 3. Engineer's written interpretation or clarification.

3.05 *Reuse of Documents*

- A. Contractor and any Subcontractor or Supplier shall not:
 1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions; or
 2. reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer.
- B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

3.06 *Electronic Data*

- A. ~~Unless otherwise stated in the Supplementary Conditions, the~~ The data furnished by Owner or Engineer to Contractor, or by Contractor to Owner or Engineer, that may be relied upon are limited to the printed copies (also known as hard copies), files transmitted in in portable document format (PDF), and other electronic media formats of text, data, graphics or other file types supported by any digital document exchange system implemented for the Project, all of which are understood by all parties to constitute official Project correspondence and submittals. ~~Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk.~~ If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.
- B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party.
- C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

ARTICLE 4 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS

4.01 *Availability of Lands*

- A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in Owner's furnishing the Site or a part thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.
- B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.02 *Subsurface and Physical Conditions*

A. *Reports and Drawings:* The Supplementary Conditions identify:

1. those reports known to Owner of explorations and tests of subsurface conditions at or contiguous to the Site; and
2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).

B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the “technical data” contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such “technical data” is identified in the Supplementary Conditions. Except for such reliance on such “technical data,” Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:

1. the completeness of such reports and drawings for Contractor’s purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or
2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
3. any Contractor interpretation of or conclusion drawn from any “technical data” or any such other data, interpretations, opinions, or information.

4.03 *Differing Subsurface or Physical Conditions*

A. *Notice:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed either:

1. is of such a nature as to establish that any “technical data” on which Contractor is entitled to rely as provided in Paragraph 4.02 is materially inaccurate; or
2. is of such a nature as to require a change in the Contract Documents; or
3. differs materially from that shown or indicated in the Contract Documents; or
4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

- B. ~~(Not Used) 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~~may 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, or
 - e-d. written notice is submitted after final payment.
3. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.05. However, neither Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

4.04 *Underground Facilities*

- A. *Shown or Indicated:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:
1. Owner and Engineer shall not be responsible for the accuracy or completeness of any such information or data provided by others; and
 2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
 - a. reviewing and checking all such information and data;
 - b. locating all Underground Facilities shown or indicated in the Contract Documents;
 - c. coordination of the Work with the owners of such Underground Facilities, including Owner, during construction; and
 - d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.
- B. *Not Shown or Indicated:*
1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer. Engineer will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
 2. If Engineer concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated ~~or not shown or indicated with reasonable accuracy~~ in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, Owner or Contractor may make a Claim therefor as provided in Paragraph 10.05.

3. Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, shall not be liable to Contractor for any Claims for losses or damages incurred by Contractor related to Underground Facilities not shown or indicated (including but not limited to all fees and changes of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs).

4.05 *Reference Points*

- A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.06 *Hazardous Environmental Condition at Site*

- A. *Reports and Drawings:* The Supplementary Conditions identify those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at the Site.
- B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:
1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or
 2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
 3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work unless Contractor caused or contributed to such Hazardous Environmental Condition. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.

- D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 4.06.E.
- E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered written notice to Contractor: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, either party may make a Claim therefor as provided in Paragraph 10.05.
- F. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 7.
- G. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- H. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of

or relating to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.H shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

- I. The provisions of Paragraphs 4.02, 4.03, and 4.04 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 5 – BONDS AND INSURANCE

5.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish performance and payment bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 13.07, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other bonds as are required by the Contract Documents.
- B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed each bond.
- C. If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 5.01.B, Contractor shall promptly notify Owner and Engineer and shall, within 20-5 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 5.01.B and 5.02.

5.02 *Licensed Sureties and Insurers*

- A. All bonds and insurance required by the Contract Documents to be purchased and maintained by Owner or Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

5.03 *Certificates of Insurance*

- A. Contractor shall deliver to Owner, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance and a letter from Contractor's insurance company(s) and agents confirming types and limits of coverage (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain.
- B. Owner shall deliver to Contractor, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Contractor or any other additional insured) which Owner is required to purchase and maintain.
- C. Failure of Owner to demand such certificates or other evidence of Contractor's full compliance with these insurance requirements or failure of Owner to identify a deficiency in compliance from the evidence provided shall not be construed as a waiver of Contractor's obligation to maintain such insurance.
- D. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor.
- E. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner in the Contract Documents.

5.04 *Contractor's Insurance*

- A. Contractor shall purchase and maintain such insurance as is appropriate for the Work being performed, complies with the requirements of Article 5, 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-;
- 7. claims arising out of violation of Laws or Regulations; and
- 8. claims for damages because of negligent acts, errors and omissions arising out of performing or providing professional services.

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.~~68~~ inclusive, be written on an occurrence basis, include as additional insureds (subject to any customary exclusion regarding professional liability) Owner and Engineer, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be ~~listed-included~~ as additional insureds, and include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;
- 2. include at least the specific coverages and be written for not less than the limits of liability provided herein and in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;
- 3. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 6.11 and 6.20;
- 4. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until ~~at least 30 days~~ prior written notice has been given to Owner and Contractor and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.03 will so provide) and will contain waiver provisions in accordance with Paragraph 5.07;
- 5. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07; and
- 6. include completed operations coverage:
 - a. Such insurance shall remain in effect for two years after final payment.

- b. Contractor shall furnish Owner and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter.
7. In the event general liability insurance is provided on a claims-made policy, the retroactive date of such policy shall not be later than the date of the Notice to Proceed or the Effective Date of the Agreement, whichever is earlier. For construction periods extending beyond the expiration date of an initial claims-made policy, the retroactive date of all subsequent claims-made policies shall not be later than the date of the Notice to Proceed.
- 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 coverage:

<u>Minimum limit of liability</u>	<u>Statutory</u>
<u>Applicable Federal (e.g., Longshoreman's)</u>	<u>Statutory</u>
<u>Employer's Liability</u>	<u>\$1,000,000</u>

2. Contractor's General Liability:

\$1,000,000 per occurrence; \$2,000,000 general aggregate; including:

- Broad Form Property Damage Liability including coverage for acts of terrorism
- Completed Operations and Product Liability
- Contractual Liability
- Independent Contractors
- Explosion, Collapse & Underground Hazards
- Personal Injury Coverage, Exclusion Deleted
- Damage to Rented Premises
- Medical Expenses

Pollution Liability (covering third-party injury and property damage claims, including clean-up costs, as a result of pollution conditions arising from the Contractor's operations and completed operations maintained for no less than three years after final completion): \$1,000,000

Excess or Umbrella Liability: \$5,000,000 per occurrence; \$5,000,000 general aggregate

3. Automobile Liability under Paragraph 5.04.A.6 of the General Conditions:

Combined Single Limit of \$1,000,000 for bodily injury & property damage covering Contractor and any vehicles owned, hired and non-owned by the Contractor

See various sections of the Supplementary Conditions for additional modifications and supplements

4. Professional Liability (E&O for engineers, architects or surveyors): \$1,000,000 for each claim with an annual aggregate of at least \$2,000,000 if professional services are required under the Specifications

5. Owners Protective Liability: as may be specified in the Supplementary Conditions

D. Any self-insured retention (not allowed for Worker's Compensation) and/or deductibles must be identified and cannot exceed \$100,000 per occurrence without the prior approval of the Owner. Contractor must provide either an audited financial statement to confirm solvency or a letter of credit guaranteeing the \$100,000 in case of loss for the duration of the Project and for the Correction Period.

5.05 *Owner's Liability Insurance*

- A. In addition to the insurance required to be provided by Contractor under Paragraph 5.04, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations (ongoing and completed) under the Contract Documents.

5.06 *Property Insurance*

- A. ~~Unless otherwise provided in the Supplementary Conditions,~~ Owner may, in its discretion, purchase and maintain property insurance upon the Work at the Site. 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 ~~(subject to such~~ deductible amounts or self-insured retention ~~)~~ as may be provided in the Supplementary Conditions or required by Laws and Regulations. This insurance shall:
1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee;
 2. be written on a Builder's Risk "all-risk" or Special Forms 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 special form~~ perils or causes of loss, including but not limited to: fire, lightning, flood, pollution, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage (other than that caused by flood), and such other perils or causes of loss as may be specifically required by the Supplementary Conditions.
 3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);

4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;
5. allow for partial utilization of the Work by Owner;
6. include testing and startup; and
7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other loss payee to whom a certificate of insurance has been issued; and

7.8. comply with the requirements of Paragraph 5.06.C of the General Conditions.

- B. ~~(Not used) Owner shall purchase and maintain such equipment breakdown insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee.~~
- C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other loss payee to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 5.07.
- D. Owner shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.06 to protect the interests of Contractor, Subcontractors, or others in the Work, ~~to the extent of any deductible amounts that are identified in the Supplementary Conditions.~~ The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, ~~and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.~~
- E. If Contractor requests in writing that other special insurance be included in the property insurance policies provided under this Paragraph 5.06, Owner shall, if possible, include such insurance, and the cost thereof will be charged to Contractor by appropriate Change Order. Prior to commencement of the Work at the Site, Owner shall in writing advise Contractor whether or not such other insurance has been procured by Owner.

5.07 *Waiver of Rights*

- A. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or

causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or loss payees thereunder. Owner and Contractor waive all rights against each other and their respective officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner as trustee or otherwise payable under any policy so issued.

- B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for:
1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and
 2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.
- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them.

5.08 *Receipt and Application of Insurance Proceeds* (Not used)

- ~~A. Any insured loss under the policies of insurance required by Paragraph 5.06 will be adjusted with Owner and made payable to Owner as fiduciary for the loss payees, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.08.B. Owner shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order.~~
- ~~B. Owner as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to Owner's exercise of this power. If such objection be made, Owner as fiduciary shall make settlement with~~

~~the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, Owner as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, Owner as fiduciary shall give bond for the proper performance of such duties.~~

5.09 *Acceptance of Bonds and Insurance; Option to Replace*

- A. If ~~either Owner or Contractor~~ has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the ~~other party~~ Contractor in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the ~~objecting party~~ Owner shall so notify the ~~other party~~ Contractor 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 Owner, such additional information in respect of insurance provided as the other may be reasonably requested.~~ If ~~either party~~ Contractor does not purchase or maintain all of the bonds and insurance required ~~of such party~~ by the Contract Documents, ~~such party~~ Contractor shall notify the ~~other party~~ Owner 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~~ Owner may elect to obtain equivalent bonds or insurance to protect ~~such other party's~~ Owner's interests at the expense of the ~~party Contractor who was required to provide such coverage~~, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

- A. If Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 14.05, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to Paragraph 5.06 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

ARTICLE 6 – CONTRACTOR'S RESPONSIBILITIES

6.01 *Supervision and Superintendence*

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

6.02 *Labor; Working Hours*

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.
- B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours. Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without Owner's written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.

6.03 *Services, Materials, and Equipment*

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.
- B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.
- C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

D. Provision of any instructions:

- 1. will not be effective to assign to Owner, or any of Owner'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 8.09; and
- 2. will not 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 9.09.

6.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.07 as it may be adjusted from time to time as provided below.

1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.07) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.
2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

6.05 *Substitutes and “Or-Equals”*

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item, make or catalogue number, or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or “or-equal” item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.
 1. *“Or-Equal” Items:* If in Engineer’s sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an “or-equal” item, in which case review and approval of the proposed item may, in Engineer’s sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:
 - a. in the exercise of reasonable judgment Engineer determines that:
 - 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
 - 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole; and
 - 3) it has a proven record of performance and availability of responsive service.
 - b. Contractor certifies that, if approved and incorporated into the Work:
 - 1) there will be no increase in cost to the Owner or increase in Contract Times; and
 - 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

2. Substitute Items:

- a. If in Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.
- b. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.
- c. The requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented by the General Requirements, and as Engineer may decide is appropriate under the circumstances.
- d. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:
 - 1) shall certify that the proposed substitute item will:
 - a) perform adequately the functions and achieve the results called for by the general design,
 - b) be similar in substance to that specified, and
 - c) be suited to the same use as that specified;
 - 2) will state:
 - a) the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time,
 - b) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and
 - c) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;
 - 3) will identify:
 - a) all variations of the proposed substitute item from that specified, and
 - b) available engineering, sales, maintenance, repair, and replacement services; and

- 4) shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change.
- B. *Substitute Construction Methods or Procedures:* If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.
 - C. *Engineer's Evaluation:* Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by a Change Order in the case of a substitute and an approved Shop Drawing for an "or equal." Engineer will advise Contractor in writing of any negative determination.
 - D. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
 - E. *Engineer's Cost Reimbursement:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.
 - F. *Contractor's Expense:* Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.

6.06 *Concerning Subcontractors, Suppliers, and Others*

- A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Owner as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.
- B. If the Bidding Requirements or 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 the Contractor has submitted a list thereof in accordance with the Bidding Requirements or Supplementary Conditions (which shall be included as an attachment to the Agreement), Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated

for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Engineer to reject defective Work.

- C. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:
 - 1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity; nor
 - 2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.
- D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.
- E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.
- F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer.
 - 1. Whenever any such agreement is with a Subcontractor or Supplier who is listed as a loss payee on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner, Contractor, Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any

such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

2. Such agreement between Contractor and the Subcontractor or Supplier shall specifically include dispute resolution provisions similar to those in Article 16 (if any) and provisions required by Laws and Regulations identified in the various Supplementary Conditions.

6.07 *Patent Fees and Royalties*

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

6.08 *Permits*

- A. Unless otherwise provided in the Supplementary Conditions, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

6.09 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor 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 set forth in Paragraph 3.04. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work. However, it shall not be Contractor's responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.
- C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

6.10 *Taxes*

- A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work, except as may be set forth in the Supplementary Conditions.

6.11 *Use of Site and Other Areas*

- A. Limitation on Use of Site and Other Areas:
 - 1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.
 - 2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.

3. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.
- B. *Removal of Debris During Performance of the Work:* During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.
- C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work, Contractor shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.
- D. *Loading Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

6.12 *Record Documents*

- A. Contractor shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to Engineer for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings and other closeout submittals specified will be delivered to Engineer for Owner.

6.13 *Safety and Protection*

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

3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.
- C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs (if any) and other safety requirements that are applicable to the Work.
- D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.
- E. All damage, injury, or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).
- F. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.14 *Safety Representative*

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

6.15 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

6.16 *Emergencies*

- A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

6.17 *Shop Drawings and Samples*

- A. Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals (as required by Paragraph 2.07). Each submittal will be identified as Engineer may require.
 1. Shop Drawings:
 - a. Submit number of copies specified in the General Requirements.
 - b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 6.17.D.
 2. Samples:
 - a. Submit number of Samples specified in the Specifications.
 - b. Clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 6.17.D.
- B. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.
- C. Submittal Procedures:
 1. Before submitting each Shop Drawing or Sample, Contractor shall have:
 - a. reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
 - b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

- c. determined and verified the suitability of all materials offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
 - d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.
2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review and approval of that submittal.
 3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop Drawings or Sample submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.

D. Engineer's Review:

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1. or for errors or omissions in a Shop Drawing or Sample.

E. Resubmittal Procedures:

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.
2. Contractor shall furnish required submittals with sufficient information and accuracy in order to obtain required approval of an item with no more than 3 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.
3. In the event that Contractor requests a change of a previously approved item, Contractor shall reimburse Owner for Engineer's charges for its review time unless the need for such change is beyond the control of Contractor.

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 in accordance with Subcontractor warranties, manufacturers and Suppliers warranties on equipment and material, and extended or special warranties and will not be defective for the correction period specified in 13.07. Owner and Engineer and ~~its~~ their officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on representation of Contractor's warranty and guarantee.

1. Contractor shall obtain and preserve for the benefit of the Owner:

- a. manufacturers' and Suppliers' written warranties and guarantees on equipment and material incorporated into the Work;
- b. written warranties and guarantees from each Subcontractor engaged in the performance of the Work; and

2. extended or special warranties.

- 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; or;
 8. any acceptance by Owner or any failure to do so.
- D. Contractor shall prepare and execute a written general warranty and guarantee applicable to the Work reflecting the provisions of this Paragraph 6.19, Article 13 and other applicable provisions of the Contract Documents pertaining to warranties and guarantees, Subcontractor, manufacturers and Supplier warranties and guarantees, and extended or special warranties and guarantees. Contractor shall submit this written general warranty and guarantee in accordance with Article 14 and the General Requirements.
- E. Provision of any warranties or guarantees:
1. will not be effective to assign to Owner, or any of Owner'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 8.09; and
 - 8.2. will not 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 9.09.
- ~~D.F.~~ The warranty and guarantee provisions of this Paragraph 6.19 shall be in addition to and not in limitation of any other warranties, guarantees or remedies allowed by Law or required by the Contract Documents.

6.20 Indemnification

- A. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify, defend, and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property ~~(other than the Work itself)~~, including the loss of use resulting therefrom but only to the extent caused by any negligent or wrongful act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable .
- B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.
1. Without limiting the generality of the preceding Paragraph, the Contractor hereby specifically agrees to indemnify, defend, and hold harmless the Owner and Engineer from all such claims, losses or expenses which arise out of injuries of employees of the Contractor or any of its Subcontractors or Suppliers of any tier related to performance of the Work. It is the Owner's intention that all financial risk of injuries related to the Work be borne by the Contractor, and that the Owner have no financial responsibility, direct or indirect, for any such claims.
- C. The indemnification obligations of Contractor under Paragraph 6.20.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:
1. the preparation or approval of ~~;~~ ~~or the failure to prepare or approve~~ maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications, provided however, that if the claim, cost, loss or damage referred to in this Paragraph 6.20 results from failure of the Engineer to discover a condition, Underground Facilities or object which is underground or otherwise not reasonably observable by the Engineer, and if said failure to discover either was or should have been apparent to the Contractor in that the said condition or object is omitted from the Engineer's maps, Drawings, opinions, reports, surveys, Change Orders, designs or Specifications, then the Contractor shall be liable for indemnification of the Engineer and Owner under Paragraph 6.20 for claims, costs, losses and damages resulting from said failure to discover unless Contractor shall have notified Engineer of the existence

See various sections of the Supplementary Conditions for additional modifications and supplements

and location of such condition or object prior to the occurrence of such claims, costs, losses and damages and in sufficient time for Engineer to have made provisions therefor; or

2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage; or

3. caused by the negligent acts, errors or omissions of any of them.

6.21 *Delegation of Professional Design Services*

- A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable law.
- B. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.
- C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.
- D. Pursuant to this Paragraph 6.21, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 6.17.D.1.
- E. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

ARTICLE 7 – OTHER WORK AT THE SITE

7.01 *Related Work at Site*

- A. Owner may perform other work related to the Project at the Site with Owner's employees, or through other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:
 1. written notice thereof will be given to Contractor prior to starting any such other work; and

2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.05.
- B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and properly coordinate the Work with theirs. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected. ~~The duties and responsibilities of Contractor under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Owner and such utility owners and other contractors.~~
- C. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 7, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

7.02 *Coordination*

- A. If Owner intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:
1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;
 2. the specific matters to be covered by such authority and responsibility will be itemized; and
 3. the extent of such authority and responsibilities will be provided.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

7.03 *Legal Relationships*

- A. Paragraphs 7.01.A and 7.02 are not applicable for utilities not under the control of Owner.
- B. Each other direct contract of Owner under Paragraph 7.01.A shall provide that the other contractor is liable to Owner and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor's wrongful actions or inactions.

- C. Contractor shall be liable to Owner and any other contractor under direct contract to Owner for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's wrongful action or inactions.

ARTICLE 8 – OWNER'S RESPONSIBILITIES

8.01 *Communications to Contractor*

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

8.02 *Replacement of Engineer*

- A. In case of termination of the employment of Engineer, Owner shall appoint an engineer ~~to whom Contractor makes no reasonable objection~~, whose status under the Contract Documents shall be that of the former Engineer.

8.03 *Furnish Data*

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

8.04 *Pay When Due*

- A. Owner shall make payments to Contractor when they are due as provided in Paragraphs 14.02.C and 14.07.C.

8.05 *Lands and Easements; Reports and Tests*

- A. Owner's duties with respect to providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. Paragraph 4.02 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of subsurface conditions and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

8.06 *Insurance*

- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 5.

8.07 *Change Orders*

- A. Owner is obligated to execute Change Orders as indicated in Paragraph 10.03.

8.08 *Inspections, Tests, and Approvals*

- A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 13.03.B.

8.09 *Limitations on Owner's Responsibilities*

- A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. However, the Owner shall have the right to direct the Contractor to perform the Work according to any sequence schedule set forth in the Contract Documents or established pursuant thereto. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

8.10 *Undisclosed Hazardous Environmental Condition*

- A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 4.06.

8.11 *Evidence of Financial Arrangements*

- A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents.

8.12 *Compliance with Safety Program*

- A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed pursuant to Paragraph 6.13.D.

ARTICLE 9 – ENGINEER'S STATUS DURING CONSTRUCTION

9.01 *Owner's Representative*

- A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract Documents.

9.02 *Visits to Site*

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 9.09. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. However, the Engineer shall have the right to direct the Contractor to perform the Work according to any sequence schedule set forth in the Contract Documents or established pursuant thereto.

9.03 *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 herein~~, 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.
- B. The Resident Project Representative (RPR) will be Engineer's employee or agent at the Site, will act as directed by and under the supervision of Engineer, and will confer with Engineer regarding RPR's actions. RPR's dealings in matters pertaining to the Work in general shall be with Engineer and Contractor. RPR's dealings with Subcontractors shall be through or with the full knowledge and approval of Contractor. The RPR shall perform the following.
1. Schedules: Review the Progress Schedule, schedule of Shop Drawing and Samples 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 authorized representative, to assist in providing information regarding the intent of the Contract Documents.
 - b. Assist Engineer in serving as Owner's liaison with Contractor when Contractor's operations affect Owner's on-Site operations.
 - c. Assist in obtaining from Owner additional details or information, when required for proper execution of the Work.

4. 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.

5. Shop Drawings and Samples:

- a. Record date of receipt of Samples and approved Shop Drawings.
- b. Receive Samples which are furnished at the Site by Contractor, and notify Engineer of availability of Samples for examination.

6. Modifications:

- a. Consider and evaluate Contractor's suggestions for modifications in Drawings or Specifications and report such suggestions, together with RPR's recommendations, to Engineer.
- b. Transmit to Contractor in writing, decisions as issued by Engineer.

7. Review of Work and Rejection of Defective Work:

- a. Conduct onSite observations of Contractor's 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 part of Contractor's Work in progress will not produce a completed Project that conforms generally to the Contract Documents or will imperil the integrity of the design concept of the completed Project as a functioning whole as indicated in 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 that part of Work in progress that RPR believes should be corrected or rejected or should be uncovered for observation, or requires special testing, inspection or approval.

8. Inspections, Tests, and System Startups:

- a. Verify that tests, equipment, and systems start-ups and operating and maintenance training are conducted in the presence of appropriate Owner's personnel, and that Contractor maintains adequate records thereof.
- b. Observe, record, and report to Engineer appropriate details relative to the test procedures and systems start-ups.

9. Records:

- a. Record names, addresses, fax numbers, e-mail addresses, web site locations, and telephone numbers of Contractor, Subcontractors, and major Suppliers.
- b. Maintain records for use in preparing Project documentation.

10. Reports:

- a. Furnish periodic reports to Engineer 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. Draft and recommend to Engineer proposed Change Orders, Work Change Directives, and Field Orders. Obtain backup material from Contractor.
- c. Immediately notify Engineer of the occurrence of any Site accidents, emergencies, acts of God endangering the Work, damage to property by fire or other causes, or the discovery of any Hazardous Environmental Condition or conditions that may impede the compliant operation of existing facilities on Site.

11. 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.

12. Certificates, Operation and Maintenance Manuals: During the course of the Work, verify that materials and equipment certificates, operation and maintenance manuals and other data required by the Specifications to be assembled and furnished by Contractor are applicable to the items actually installed and in accordance with the Contract Documents, and have these documents delivered to Engineer for review and forwarding to Owner prior to payment for that part of the Work.

13. Completion:

- a. Participate in a Substantial Completion inspection, assist in the determination of Substantial Completion and the preparation of the Punch List (lists of items to be completed or corrected).
- b. Participate in a final inspection in the company of Engineer, Owner, and Contractor and prepare a final Punch List (list of items to be completed and deficiencies to be remedied).
- c. Observe whether all items on the final Punch List have been completed or corrected and make recommendations to Engineer concerning acceptance and issuance of the Notice of Acceptability of the Work.

C. The RPR shall not:

1. Authorize any deviation from the Contract Documents or substitution of materials or equipment, including “or-equal” items.
2. Exceed limitations of Engineer’s authority as set forth in the Contract Documents.
3. Undertake any of the responsibilities of Contractor, Subcontractors, Suppliers, or Contractor’s superintendent.
4. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of Contractor’s Work unless such advice or directions are specifically required by the Contract Documents.
5. Advise on, issue directions regarding, or assume control over safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor.
6. Participate in specialized field or laboratory tests or inspections conducted off-Site by others except as specifically authorized by Engineer.
7. Accept Shop Drawing or Sample submittals from anyone other than Contractor.
8. Authorize Owner to occupy the Project in whole or in part or determine operational protocol that may affect the compliant operation of existing facilities.

9.04 *Authorized Variations in Work*

- A. Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on Owner and also on Contractor, who shall perform the Work involved promptly. If Owner or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, and the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

9.05 *Rejecting Defective Work*

- A. Engineer will have authority to reject Work which Engineer believes to be defective, or that Engineer believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Engineer will also have authority to require special inspection or testing of the Work as provided in Paragraph 13.04, whether or not the Work is fabricated, installed, or completed.

9.06 *Shop Drawings, Change Orders and Payments*

- A. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.
- B. In connection with Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21.
- C. In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.
- D. In connection with Engineer's authority as to Applications for Payment, see Article 14.

9.07 *Determinations for Unit Price Work*

- A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of Paragraph 10.05.

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

- A. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question.
- B. Engineer will, with reasonable promptness, render a written decision on the issue referred. If Owner or Contractor believes that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.
- C. Engineer's written decision on the issue referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.05.
- D. When functioning as interpreter and judge under this Paragraph 9.08, Engineer will not show partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.09 *Limitations on Engineer's Authority and Responsibilities*

- A. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.
- B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. However, the Engineer shall have the right to direct the Contractor to perform the Work according to any sequence schedule set forth in the Contract Documents or established pursuant thereto. 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.
- F. Engineer will have no responsibility or authority:
 - 1. To order changes in construction which will result in additional costs or which will require extensions of Contract Times;
 - 2. To suspend all or any portion of Contractor's operations;
 - 3. To terminate all or any portion of the Work;
 - 4. To make final acceptance of all or any portion of the Work; and
 - 5. To operate or maintain any portion of the Work.

9.10 *Compliance with Safety Program*

- A. While at the Site, Engineer's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Engineer has been informed pursuant to Paragraph 6.13.D.

ARTICLE 10 – CHANGES IN THE WORK; CLAIMS

10.01 *Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).
- B. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 10.05.

10.02 *Unauthorized Changes in the Work*

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in Paragraph 3.04, except in the case of an emergency as provided in Paragraph 6.16 or in the case of uncovering Work as provided in Paragraph 13.04.D.

10.03 *Execution of Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders recommended by Engineer covering:
 - 1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.01.A, (ii) required because of acceptance of defective Work under Paragraph 13.08.A or Owner's correction of defective Work under Paragraph 13.09, or (iii) agreed to by the parties;
 - 2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and
 - 3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Engineer pursuant to Paragraph 10.05; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the Progress Schedule as provided in Paragraph 6.18.A.

10.04 Notification to Surety

- A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

10.05 Claims

- A. *Engineer's Decision Required:* All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.
- B. *Notice:* Written notice stating the general nature of each Claim shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than ~~30~~14 days) after the start of the event giving rise thereto. Failure to comply with this notice requirement shall constitute a waiver of the Claim. 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~~30 days after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract Times shall be prepared in accordance with the provisions of Paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to Engineer and the claimant within 30 days after receipt of the claimant's last submittal (unless Engineer allows additional time).
- C. *Engineer's Action:* Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:
 - 1. deny the Claim in whole or in part;
 - 2. approve the Claim; or
 - 3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer's sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.
- D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.

- E. Engineer's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial.
- F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.05.

G. Contractor shall not have the right to stop performance of the Work pending resolution of a Claim.

ARTICLE 11 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

11.01 *Cost of the Work*

- A. *Costs Included:* The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 11.01.B, and shall include only the following items:
 - 1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.
 - 2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.

3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.01.
4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
5. Supplemental costs including the following:
 - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
 - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
 - c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work. Small tools and manual equipment are not allowable and considered to be included in overhead.
 - 1) Rentals of construction equipment and machinery and the parts thereof whether rented from Contractor or others in accordance with rates published in current edition of the Rental Rate Blue Book® for construction equipment published by EquipmentWatch® (www.equipmentwatch.com). When Contractor-owned equipment is ordered by Owner or Engineer to be held at standby, equipment rental rates shall be 50% of normal rate. Rental or standby shall not include time that equipment is inoperative because of malfunction or breakdown and shall cease when the use thereof is no longer necessary for the Work. The rental rate, shall be determined as follows.
 - a) For equipment already on the Project: the monthly prorated rental rate by hourly use.
 - b) For equipment not on the Project: most cost effective daily, weekly or monthly rate. 1 month normal use = 176 hours.

- d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
- e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
- f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 5.06.D), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.
- g. The cost of utilities, fuel, and sanitary facilities at the Site.
- h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, express and courier services, and similar petty cash items in connection with the Work.
- i. The costs of premiums for all bonds and insurance Contractor is required by the Contract Documents to purchase and maintain.

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

- 1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, 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.
- C. *Contractor's Fee:* When all the Work is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 12.01.C.
- D. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.01.A and 11.01.B, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

11.02 Allowances

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

- B. Cash Allowances: (Not used)

~~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. Owner's Contingency Allowances:

1. Contractor agrees that Owner's a contingency allowance, if any, is for the sole use of Owner to cover ~~unestimated~~ anticipated costs for certain items.
- 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 Owner's contingency allowances, and the Contract Price shall be correspondingly adjusted. Contractor shall not receive payment for any unused portion of the contingency allowance.

11.03 Unit Price Work

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of Paragraph 9.07.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- ~~D. Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 if:~~
 - ~~1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and~~
 - ~~2. there is no corresponding adjustment with respect to any other item of Work; and~~
 - ~~3. Contractor believes that Contractor is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.~~

ARTICLE 12 – CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.01 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.
- B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:
 - 1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or
 - 2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or
 - 3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).

- C. *Contractor's Fee:* The Contractor's fee for overhead and profit shall be determined as follows:
1. a mutually acceptable fixed fee; or
 2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
 - a. for costs incurred under Paragraphs 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be ~~15~~10 percent;
 - b. for costs incurred under Paragraph 11.01.A.3, the Contractor's fee shall be five percent;
 - c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 12.01.C.2.a and 12.01.C.2.b is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of ~~15~~10 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, provided, however, that on any subcontracted work the total maximum fee to be paid by Owner under this subparagraph shall be no greater than 27 percent of the costs incurred by the Subcontractor who actually performs the Work;
 - d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;
 - e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and
 - f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

12.02 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Claim for an adjustment in the Contract Times shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.
- B. Any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this Article 12.

12.03 Delays

- A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.02.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, acts of war or terrorism, or acts of God (force majeure).
- 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 war or terrorism, acts of God, acts or failures to act of utility owners not under the control of Owner, or other causes not the fault of and beyond control of Owner and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays described in this Paragraph 12.03.C.
- D. Owner, Engineer, and their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.
- E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

ARTICLE 13 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.01 Notice of Defects

- A. Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor. Defective Work may be rejected, corrected, or accepted as provided in this Article 13.

13.02 Access to Work

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

13.03 Tests and Inspections

- A. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.
- B. ~~(Not Used) Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:~~
 - ~~1. for inspections, tests, or approvals covered by Paragraphs 13.03.C and 13.03.D below;~~
 - ~~2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in Paragraph 13.04.C; and~~
 - ~~3. as otherwise specifically provided in the Contract Documents.~~
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.
- D. Except where responsibility for a specific inspection or test is expressly allocated to Owner in the Specifications or by Laws and Regulations, Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.
- E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation.
- F. Uncovering Work as provided in Paragraph 13.03.E shall be at Contractor's expense, ~~unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.~~

13.04 *Uncovering Work*

- A. If any Work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense.
- B. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment.
- C. If it is found that the uncovered Work is defective, Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05.
- D. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

13.05 *Owner May Stop the Work*

- A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

13.06 *Correction or Removal of Defective Work*

- A. Promptly after receipt of written notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).
- B. When correcting defective Work under the terms of this Paragraph 13.06 or Paragraph 13.07, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

13.07 Correction Period

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents) or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by Owner or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
1. repair such defective land or areas; or
 2. correct such defective Work; or
 3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom.
- B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor and may be deducted from amounts otherwise due the 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, including materials, equipment and supplies or as defined in manufacturers' and Suppliers' warranties (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 and the terms of this Paragraph 13.07 will continue to apply.
- E. Contractor's obligations under this Paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

13.08 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner (and, prior to Engineer's recommendation of final payment, Engineer) prefers to accept it, Owner may do so. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness) and for the diminished value of the Work to the extent not otherwise paid by Contractor pursuant to this sentence. If any such acceptance occurs prior to Engineer's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner.

13.09 *Owner May Correct Defective Work*

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer in accordance with Paragraph 13.06.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Owner may, after seven days written notice to Contractor, or immediately in the case of an emergency, correct, or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 13.09, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this Paragraph.
- C. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefor as provided in Paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 13.09.

ARTICLE 14 – PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 *Schedule of Values*

- A. The Schedule of Values established as provided in Paragraph 2.07.A will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed.

14.02 *Progress Payments*

A. Applications for Payments:

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.
2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

B. Review of Applications:

1. Engineer will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Owner or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.

2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:
 - a. the Work has progressed to the point indicated;
 - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, and any other qualifications stated in the recommendation); and
 - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
 - a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract Documents; or
 - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.
4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
 - a. to supervise, direct, or control the Work, or
 - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or
 - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or
 - d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or
 - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.

5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:
 - a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;
 - b. the Contract Price has been reduced by Change Orders;
 - c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or
 - d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

C. Payment Becomes Due:

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.02.D) become due, and when due will be paid by Owner to Contractor.

D. Reduction in Payment:

1. Owner may refuse to make payment of the full amount recommended by Engineer because:
 - a. claims have been made against Owner on account of Contractor's performance or furnishing of the Work;
 - b. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens and provides an indemnity satisfactory to Owner for all claims, costs, losses and damages arising out of such Liens;
 - c. there are other items entitling Owner to a set-off against the amount recommended including liability for liquidated damages and correction of defective work by Owner or others; or
 - d. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.c or Paragraph 15.02.A.

2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, when Contractor remedies the reasons for such action.
3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.02.C.1 and subject to interest as provided in the Agreement.

14.03 *Contractor's Warranty of Title*

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

14.04 *Substantial Completion*

- A. When Contractor considers the entire Work ready for its intended use and final testing has been completed in accordance with the General Requirements, Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete (except for items specifically listed by Contractor in the Punchlist as incomplete) using the Notice of Substantial Completion form included in the Contract Documents, submit the Contractor's written general warranty and guarantee per Paragraph 6.19.D., and request that Engineer issue a certificate of Substantial Completion.
- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion using the Certificate of Substantial Completion included in the Contract Documents. There shall be attached to the certificate a Punch List (tentative list of items to be completed or corrected before final payment). Owner shall have seven days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the tentative certificate to Owner, notify Contractor in writing, stating the reasons therefor. If, after consideration of Owner's objections, Engineer considers the Work substantially complete, Engineer will, within said 14 days, execute and deliver to Owner and Contractor a definitive certificate of Substantial Completion (with a revised Punch List (tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Owner.

- D. At the time of delivery of the tentative certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial Completion, Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.
- E. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the ~~tentative list~~Punch List.

14.05 *Partial Utilization*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:
 - 1. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 14.04.A through D for that part of the Work.
 - 2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready for its intended use and substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
 - 3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
 - 4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 5.10 regarding property insurance.
- B. Owner may request in writing that Contractor permit Owner to separately operate any part of the Work although it is not substantially complete subject to the following conditions.
 - 1. 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 not substantially complete to determine the status of completion and will prepare a Punch List before final payment.

2. If Contractor does not indicate in writing to Owner and Engineer that such part of the Work is not ready for separate operation by Owner, Engineer will finalize the Punch List and will deliver such list to Owner and Contractor, together with a written recommendation as to the division of responsibilities between Owner and Contractor with respect to security, operation, safety, maintenance, utilities, insurance, warranties and guarantees for that part of the Work pending final payment.
3. The Engineer's recommendation and Punch List will become binding upon Owner and Contractor at the time the Owner takes over and separately operates such part of the Work unless otherwise agreed in writing and so informed Engineer.
4. During such separate operation by Owner and prior to Substantial Completion of such part of the Work, Owner shall allow Contractor reasonable access to complete or correct Punch List and to complete other related Work.

14.06 *Final Inspection*

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

14.07 *Final Payment*

A. Application for Payment:

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, warranties, updated Contractor's written general warranty and guarantee per Paragraph 6.19.D if modified, bonds, certificates or other evidence of insurance, certificates of inspection, marked-up record documents (as provided in Paragraph 6.12), and other documents, and Engineer has indicated that the Work is acceptable (subject to the provisions of Paragraph 14.09). Contractor may make application for final payment following the procedure for progress payments.
2. The final Application for Payment shall be accompanied (except as previously delivered) by:
 - a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.04.B.6;
 - b. consent of the surety, if any, to final payment;
 - c. a list of all Claims against Owner that Contractor believes are unsettled;
 - e-d. Notice of Completion; and

~~d.e.~~ complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of or Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in Paragraph 14.07.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien.

B. Engineer's Review of Application and Acceptance:

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract Documents have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of payment and present the Application for Payment to Owner for payment. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable subject to the provisions of Paragraph 14.09. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. Payment Becomes Due:

1. Thirty days after the presentation to Owner of the Application for Payment and accompanying documentation, the amount recommended by Engineer, less any sum Owner is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages, will become due and will be paid by Owner to Contractor.

14.08 *Final Completion Delayed*

- A. If, through no fault of Contractor, final completion of the Work is significantly delayed, and if Engineer so confirms, Owner shall, upon receipt of Contractor's final Application for Payment (for Work fully completed and accepted) and recommendation of Engineer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted as detailed on the Notice of Completion. If the remaining balance to be held by Owner for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if bonds have been furnished as required in Paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by Contractor to Engineer with the Application for

such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

14.09 *Waiver of Claims*

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

1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and
2. a waiver of all Claims by Contractor against Owner other than those previously made in accordance with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.

ARTICLE 15 – SUSPENSION OF WORK AND TERMINATION

15.01 *Owner May Suspend Work*

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to Contractor and Engineer which will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be granted an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if Contractor makes a Claim therefor as provided in Paragraph 10.05.

15.02 *Owner May Terminate for Cause*

A. The occurrence of any one or more of the following events will justify termination for cause:

1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);
2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;
3. Contractor's repeated disregard of the authority of Engineer; or
4. Contractor's violation in any substantial way of any provisions of the Contract Documents; or;
5. 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 Laws and Regulations in effect at such time relating to the bankruptcy or insolvency; or

6. 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 Laws and Regulations in effect at the time relating to bankruptcy or insolvency; or
 7. Contractor makes a general assignment for the benefit of creditors; or
 8. 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; or
 9. Contractor admits in writing its inability to pay its debts generally as they become due.
- B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:
1. exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion);
 2. incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere; and
 3. complete the Work as Owner may deem expedient.
- C. If Owner proceeds as provided in Paragraph 15.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this Paragraph, Owner shall not be required to obtain the lowest price for the Work performed.
- D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.

- E. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.
- F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.02.B and 15.02.C.

15.03 *Owner May Terminate For Convenience*

- A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
 - 1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
 - 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;
 - 3. ~~all~~reasonable claims, costs, losses, and damages (including but not limited to ~~all~~reasonable fees and charges of engineers, architects, attorneys, and other professionals and ~~all~~reasonable court or arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and
 - 4. reasonable expenses directly attributable to termination.
- B. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (iii) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Paragraph 15.03.

- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this Paragraph 15.04 are not intended to preclude Contractor from making a Claim under Paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this Paragraph.

ARTICLE 16 – DISPUTE RESOLUTION

16.01 *Methods and Procedures*

- A. Subject to the requirements in Paragraph 10.05, Owner and Contractor shall attempt in good faith to resolve all unsettled Claims, counterclaims, disputes and other matters in question between them arising out of or relating to the Contract Documents ("Disputes") promptly by negotiation, as follows. All negotiations pursuant to this clause are confidential and shall be treated as compromise and settlement negotiations for purposes of the Federal Rules of Evidence and state Rules of Evidence.
1. Either party may give the other party written notice of any Dispute not resolved.
 2. Managers of both parties at levels at least one level above the Project personnel involved in the dispute shall meet at a mutually acceptable time and place within 5 business days after delivery of such notice, and thereafter as often as they reasonably deem necessary, to exchange relevant information and to attempt to resolve the Dispute.
 3. If the matter has not been resolved within 30 days from the referral of the Dispute to the managers, or if no meeting has taken place within 10 days after such referral, either party may initiate mediation as provided hereinafter.
- A.B. Subject to Paragraph 16.01.A, either Owner or Contractor may request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.05 before such decision becomes final and binding. The mediation will be governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.
- B.C. 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.D. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:

1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions; or
2. agrees with the other party to submit the Claim to another dispute resolution process; or
3. gives written notice to the other party of the intent to submit the Claim to a court of competent jurisdiction.

ARTICLE 17 – MISCELLANEOUS

17.01 Giving Notice

- A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:
 1. delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended; or
 2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

17.02 Computation of Times

- A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

17.03 Cumulative Remedies

- A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents. The provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

17.04 *Survival of Obligations*

- A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

17.05 *Controlling Law*

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

17.06 *Headings*

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

17.07 *Professional Fees and Court Costs Included*

- A. In any action or proceeding to enforce or interpret any contractual provision or to resolve any conflict or dispute relating to or arising from this Contract, the prevailing party shall be entitled to recover, as part of its claim, award or judgment, reasonable attorneys' fees and associated costs and expenses, including expenses of engineering, claims and other consultants.

END OF SECTION

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SECTION 00 73 05

SUPPLEMENTARY CONDITIONS

The following sections modify or supplement the Standard General Conditions of the Construction Contract (“General Conditions”) included in Section 00 72 05 and are in addition to the modifications highlighted within the text thereof. All provisions which are not so modified or supplemented remain in full force and effect. The Supplementary Conditions may include certain provisions required by Laws and Regulations. Contractor is responsible to determine and obtain applicable Laws and Regulations and to review and interpret the full text of such Laws and Regulations.

The terms used in these Supplementary Conditions have the meanings stated in the Standard General Conditions and as may be included within the Sections listed below.

- 00 73 10 Project Specific Requirements
- 00 73 19 Health and Safety Requirements

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SECTION 00 73 10

PROJECT SPECIFIC REQUIREMENTS

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

This Section may include certain provisions required by Laws and Regulations but does not represent or reflect all applicable provisions and policies or Laws and Regulations, and may only include excerpts and portions thereof. Other required provisions and policies, and Laws and Regulations, shall be deemed to be so included and incorporated herein. Contractor is solely responsible to determine, obtain, review and interpret the full text of applicable provisions and policies, Regulations, and Laws.

SC-1.01.B Additional Terms: Add the following new definition.

6. *Installer* -- The entity engaged by Contractor or a Subcontractor for installation, erection, application and similar required operations of a particular portion of the Work at the Site, including who has specialty experience in the Work they are engaged to perform.

SC-2.05 Before Starting Construction

Pursuant to subparagraph 2.05.A.3 regarding the Schedule of Values, the prices in the Bid Form will constitute the preliminary Schedule of Values for this Project.

SC-2.07 Initial Acceptance of Schedules

Add the following immediately after subparagraph 2.07.A.4.

5. Contractor's Construction Operations Plan submitted pursuant to Paragraph 2.05.C. will be acceptable to Engineer if it accurately and reasonably addresses all aspects of the Work.

SC 4.01 Availability of Lands

Pursuant to Paragraph 4.01.A, easements and rights-of-way exist for the Project. and are reflected on the Drawings.

SC-5.04 Contractor's Insurance

Pursuant to subparagraph 5.04.C.5, also provide Owner's Protective Liability in the amount of *\$3,000,000* general aggregate *\$1,000,000* per occurrence for bodily injury & property damage.

SC-6.02 Labor; Working Hours

Pursuant to Paragraph 6.02.B, regular working hours for this Project are 7:00 a.m. to 6:00 p.m., Monday through Friday.

SC-6.08 Permits

Add the following after Paragraph A.

- B. Contractor shall comply with the following licenses and permits Owner has obtained for the Project.
- Department of the Army General Permit for the State of Maine, , included in Section 00 31 00

SC-7.01 Related Work at Site

Pursuant to Paragraph 7.01, Owner has not and does not intend to separately contract for other work on the Project at the Site.

SC-14.02 Progress Payments

Add the following at the end of Paragraph 14.02.C.1.

For the purposes of this Paragraph, “Owner” shall mean “Owner’s approving authorities”.

SC-14.07 Final Payment

Add the following at the end of Paragraph 14.07.C.1.

For the purposes of this Paragraph, “Owner” shall mean “Owner’s approving authorities”.

SC-16 DISPUTE RESOLUTION

Add the following new paragraphs immediately after Paragraph 16.01.D.

16.02 Arbitration

- A. All Claims or counterclaims, disputes, or 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 14.09) including but not limited to those not resolved under the provisions of Paragraphs 10.05 or 16.01, will be subject to arbitration in accordance with the rules of Construction Industry Rules of the American Arbitration Association, subject to the conditions and

limitations of this Paragraph 16.02. This agreement to arbitrate, and any other agreement or consent to arbitrate entered into, will be specifically enforceable under the prevailing Laws of any court having jurisdiction.

- B. The demand for arbitration will be filed in writing with the other party to this Contract and with the selected arbitrator or arbitration provider, and a copy will be sent to Engineer for information. The demand for arbitration will be made within the 30-day period specified in Paragraph 16.01.D, and in all other cases, within a reasonable time after the Claim or counterclaim, 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 or other dispute or matter in question would be barred by the applicable statute of limitations.
- C. No arbitration arising out of or relating to the Contract Documents shall include by consolidation, joinder, or in any other manner any other individual or entity (including Engineer, and Engineer's consultants and the officers, directors, partners, agents, employees or consultants of any of them) who is not a party to this Contract unless:
 - 1. the inclusion of such other individual or entity is necessary if complete relief is to be afforded among those who are already parties to the arbitration; and
 - 2. such other individual or entity is substantially involved in a question of law or fact which is common to those who are already parties to the arbitration and which will arise in such proceedings.
- D. Consolidation shall be by order of the arbitrator(s) in any pending case, or if the arbitrator(s) fail to make an order, a party may apply to a court of competent jurisdiction for such order. The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity shall be specifically enforceable in accordance with the Laws of any court having jurisdiction thereof.
- E. The award rendered by the arbitrator(s) shall be consistent with the agreement of the parties, in writing, and include: (i) a concise breakdown of the award; (ii) a written explanation of the award specifically citing the Contract Document provisions deemed applicable and relied on in making the award.
- F. The award will be final. Judgment may be entered upon it in any court having jurisdiction thereof, and it will not be subject to modification or appeal, subject to provisions of the controlling Laws relating to vacating or modifying an arbitral award.
- G. If the parties decline to arbitrate, such Claims, disputes and other matters shall be decided by a court having jurisdiction.

16.03 General

- A. The Contractor will require similar dispute resolution provisions in agreements with its Subcontractors and Suppliers.
- B. Contractor shall not have the right to stop performance of the Work pending resolution of a Claim or dispute.
- C. Notwithstanding any provision contained in this Article or elsewhere in the Contract Documents, the Owner reserves the following rights in connection with Claims and disputes between the Owner and the Contractor:
 - 1. The right to institute legal action against the Contractor in any court of competent jurisdiction in lieu of demanding arbitration pursuant to this Article, in which case the Claims or disputes which are the subject of such action shall be decided by such court, and not by arbitration.
 - 2. The right to obtain from any court of competent jurisdiction a stay of any arbitration instituted by the Contractor, provided that the application for such stay is made before the appointment of the neutral arbitrator in such arbitration, in which case the Claims or disputes which are the subject of such arbitration shall be decided by such court, and not by arbitration.

The right to require the Contractor to join as a party in any arbitration between the Owner and the Engineer relating to the Project, in which case the Contractor agrees to be bound by the decision of the arbitrator or arbitrators in such arbitration.

END OF SECTION

SECTION 00 73 19

HEALTH AND SAFETY REQUIREMENTS

Contractor shall comply with the following minimum requirements and is solely responsible to determine, obtain, review and interpret the full text of applicable Laws and Regulations.

- A. Code of Federal Regulations, Chapter XVII-Occupational Safety and Health Administration (OSHA), Department of Labor, Title 29, Part 1926, Safety and Health Regulations for Construction
 - 1. Contractor shall strictly comply with the Hazard Communication Standard 1910.1200 regulated by OSHA, including providing and maintaining Safety Data Sheets, labeling of hazardous substances, and providing required protective equipment and training and instruction to personnel on the Site including Owner and Engineer's personnel.
 - 2. Perform confined space work in accordance with OSHA General Industry 1910.146: Permit Required Confined Space Entry.
- B. ANSI/ASSE A10 series of safety construction standards including the "Manual of Accident Prevention In Construction" published by The Associated General Contractors of America
- C. AASHTO Guide on Occupational Safety on Highway Construction Projects, Subpart N, 1926.550, relating to protection of personnel and equipment under electric lines and construction equipment clearances at overhead electric lines especially during operations using large vehicles

END OF SECTION

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SECTION 01 11 00

SUMMARY OF WORK

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Project Description
- B. Description of the Work
- C. Work Sequence and Coordination
- D. Special Requirements

1.02 PROJECT DESCRIPTION

- A. The Project is generally described as replacement of Carrying Place Bridge with a pre-cast concrete culvert

1.03 DESCRIPTION OF THE WORK

- A. The Work includes labor, material and equipment, services required for construction, testing, and commissioning of the Project in accordance with the Contract Documents and as more specifically described in the Specifications and Drawings and includes, but is not limited to, the following principal features.
 - 1. Installation of erosion and sedimentation control and water control measures.
 - 2. Installation of temporary bypass road.
 - 3. Demolition of roadway and existing bridge; disassembly of granite block abutment.
 - 4. Installation of pre-cast concrete culvert and reassembly of granite blocks around culvert abutments.
 - 5. Reconstruction of roadway and installation of guardrail.
 - 6. Removal of temporary bypass road, erosion and sedimentation control and water control measures.
- B. Work Site locations: generally as shown on the Drawings.
- C. Existing conditions and Site data: per the Drawings.

1.04 SPECIAL REQUIREMENTS

- A. Portions of the Work are subject to the jurisdiction of the U.S. Army Corps of Engineers. Comply with the special requirements of the General Permit included in Section 00 31 00.
 - 1. All in-water work must be completed between October 1, 2020 and November 20, 2020.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 15 00

SPECIFIC PROJECT REQUIREMENTS AND PROCEDURES

The following supplement the requirements and procedures of Sections 01 15 30, 01 50 00, 01 60 00, and 01 70 00 using the same titles, headings, and paragraph numbers to which the supplement applies.

Certain provisions required by Laws and Regulations may be referenced. Contractor is responsible to determine and obtain applicable Laws and Regulations and to review and interpret the full text of such Laws and Regulations.

SECTION 01 15 30 - PAYMENT AND ADMINISTRATIVE PROCEDURES AND QUALITY REQUIREMENTS

1.03 ADMINISTRATIVE REQUIREMENTS

Pursuant to Paragraph A. **Project Management and Coordination; Meetings**,
subparagraph 4, **identify documents** and items for the Project as follows.

Carrying Place Bridge Crossing Replacement

Pursuant to Paragraph C. **Submittal Procedures**, subparagraph 1., address submittals as follows.

Engineer:

Woodard & Curran
41 Hutchins Drive
Portland, ME 04102
Attention: Megan McDevitt
Telephone: (207) 558-3785

Owner:

Town of Vinalhaven
19 Washington School Road
Attn: Andrew Dorr
Phone: (207) 863-4471
Email: townmanager@townofvinalhaven.com

1.04 QUALITY REQUIREMENTS

Pursuant to Paragraph A. **Reference Standards and Regulatory Requirements**, specific requirements applicable to the Project include the following.

- Department of the Army General Permit for the State of Maine available pursuant to Section 00 31 00

SECTION 01 50 00 – TEMPORARY FACILITIES AND CONTROLS

1.04 TEMPORARY CONTROLS

Pursuant to Paragraph B. **Water Control and Dewatering**, comply with the following additional requirements.

- Department of the Army Corps of Engineers General Permit for the State of Maine available pursuant to Section 00 31 00
- Maine DEP requirements and Best Management Practices

Pursuant to Paragraph C. **Erosion and Sediment Control**, comply with the following additional requirements.

- Department of the Army Corps of Engineers General Permit for the State of Maine available pursuant to Section 00 31 00
- Maine DEP requirements and Best Management Practices

SECTION 01 70 00 - EXECUTION AND CLOSEOUT REQUIREMENTS

1.02 OVERALL EXECUTION REQUIREMENTS

Pursuant to Paragraph B. **Existing Conditions**,

subparagraph 1. regarding **availability of lands**, easement information for the Project is available pursuant to Section 00 31 00.

subparagraph 2. regarding **subsurface/physical conditions**, the geotechnical report for the Project is available pursuant to Section 00 31 00.

subparagraph 3. regarding **underground utilities**, comply with the following additional requirements.

- Contact DIGSAFE (www.digsafe.com) by dialing 811.

END OF SECTION

SECTION 01 15 30

PAYMENT AND ADMINISTRATIVE PROCEDURES AND QUALITY REQUIREMENTS

PART 1 – GENERAL

1.01 SUMMARY

- A. This Section specifies administrative and procedural requirements relating to payment, the process of contract administration, and the methods of communicating, controlling, and assuring quality, and applies to all Specifications and Drawings.

1. In certain Paragraphs, checked items indicate those requirements applicable to the Project.
2. Provisions of this Section may be supplemented in the **Specific Project Requirements and Procedures** or other sections of Division 01.

B. Section Includes

1.02 PAYMENT PROCEDURES

Schedule of Values

Payment Procedures

Change Procedures

Measurement and Payment Procedures

Correlation of Submittals

1.03 ADMINISTRATIVE REQUIREMENTS

Project Management and Coordination; Meetings

Documentation of Progress

Submittal Procedures

Closeout Procedures

1.04 QUALITY REQUIREMENTS

Reference Standards and Regulatory Requirements

Qualifications

1.05 ATTACHMENTS

1.02 PAYMENT PROCEDURES

- A. **Schedule of Values:** in accordance with Article 2 of the Standard General and Supplementary Conditions, if any.

1. Provide sufficient detail to allow for determination of the value of the Work at any degree of completion.

☒ For each line item, identify number and title of Specification section in accordance with the Table of Contents.

☐ See **Specific Project Requirements and Procedures** for additional requirements.

Number of hardcopies: **1**

Submit electronically: ☒ by email ☐ on CD
☐ via digital document exchange system in PDF format

- B. **Payment Procedures:** in accordance with Article 14 of Standard General and Supplementary Conditions, if any.

1. Submit Application for Payment using the form included in the Project Forms section. Utilize latest approved Schedule of Values for listing items in Application for Payment. Provide supporting documentation for items included in the Application for Payment.

Number of hardcopies: **1**

Submit electronically: ☒ by email ☐ on CD
☐ via digital document exchange system in PDF format

2. Payment Period: at intervals stipulated in the Agreement.

3. Submit an updated Progress Schedule with each Application for Payment.

☐ See **Specific Project Requirements and Procedures** for additional requirements.

- C. **Change Procedures:** in accordance with Articles 10 and 12 of Standard General and Supplementary Conditions, if any, utilizing forms included in Section 00 60 00 Project Forms.

Number of hardcopies: 1 of each type of form and accompanying documentation.

Submit electronically: ☒ by email ☐ on CD
☐ via digital document exchange system in PDF format

- ☐ See **Specific Project Requirements and Procedures** for additional requirements.

1. Field Order: as authorized by Paragraph 9.04 of the Standard General and Supplementary Conditions, if any.
2. Change Request: issued by Engineer, Owner or Contractor to request or authorize minor variations and deviations, amendments or supplements to the Contract Documents. Initiate requests for substitute items per Paragraph 6.05 of the Standard General and Supplementary Conditions, if any, using a Change Request.
 - a. Engineer or Owner to include a detailed description of a proposed change with supplementary or revised Drawings and Specifications, including a change in Contract Times related to the change (with a stipulation for any overtime work required) and the period of time during which the requested price (if any) will be considered valid. Prepare and submit an estimate within 15 days.
 - b. Describe the proposed change and its full effect on the Work. Describe the reason for the change and the effect on the Contract Price and Contract Time with full documentation (and a statement describing the effect on Work by separate or other contractors).
3. Work Change Directive: as defined in Paragraph 1.01.A.51 of the Standard General and Supplementary Conditions, if any.
4. Change Order: in accordance with Articles 10 and 12 of the Standard General and Supplementary Conditions, if any.
 - a. *Stipulated Price Change Order*: based on Contractor's maximum price quotation or Contractor's request for a Change Order as approved by Engineer or Owner.

- b. *Unit Price Change Order*: for pre-determined unit prices and quantities and executed on a fixed unit price basis. Execute Work under a Work Change Directive for unit costs or quantities of Work not pre-determined. Changes in Contract Price and Contract Time to be computed as specified for Time and Material Change Order.
 - c. *Time and Material Change Order*: based on itemized account and supporting data after completion of change within time limits indicated in the Standard General and Supplementary Conditions, if any. Engineer or Owner and Contractor to determine the change allowable in Contract Price and Contract Time as provided in the Standard General and Supplementary Conditions, if any. Maintain detailed records of Work completed on this basis, provide full information for evaluation of proposed changes, and substantiate costs for changes in the Work.
5. “Or Equals” and Substitutes: Request “Or-Equal” and substitute items as a Change Request per subparagraph 1.02.C.2 above, with complete data substantiating compliance with Contract Documents.
- a. “Or-Equal” and substitute items will be processed in accordance with Paragraph 6.05 of the Standard General and Supplementary Conditions, if any, and subparagraph 1.03.C.6 below.

D. Measurement and Payment Procedures

- 1. Payment includes full compensation for required labor, material and equipment, tools, plant, transportation, services and incidentals; erection, application or installation and construction of an item of the Work; and overhead and profit, unless otherwise indicated.
- ☒ See Section 01 20 25 Measurement and Payment
- ☐ See **Specific Project Requirements and Procedures** for additional requirements.

E. Correlation of Submittals

- 1. Promptly revise Schedule of Values and Applications for Payment to record each authorized Change Order as a separate line item and adjust the Contract Price.
- 2. Promptly revise Progress Schedule to reflect any change in Contract Times and revise sub-schedules to adjust time for other items of the Work affected by the change.
- 3. Promptly enter changes in Project Record Documents.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Project Management and Coordination; Meetings

1. Contact information for Owner and other entities related to the Project and special coordination requirements and contacts during prosecution of the Work **will be provided at the Preconstruction Conference and Site Mobilization Meeting.**
2. Inform Owner and Engineer of the address for sending official correspondence and the address and telephone number of Contractor's representative who will be project manager and Site superintendent for the Contract.
3. During periods of construction and testing keep Owner and Engineer informed in writing with name, address, and telephone number of Contractor's representative who will be responsible and available outside of normal working hours for emergency repairs and the maintenance of safety devices.
 - ☒ Identify the 24 hour, 7 days per week emergency response telephone or cell phone number that is staffed by a person (not a passive answering machine) or provide that a phone call will be returned within one hour.
4. Identify correspondence, submittals, drawings, data and materials, packing slips or other items associated with this Contract as specified in the **Specific Project Requirements and Procedures.**
5. Coordinate scheduling, submittals, and Work of the various Specifications to effectuate an efficient and orderly sequence for installing interdependent construction elements, with provisions for accommodating items installed later.
6. Preconstruction Conference and Site Mobilization Meeting
 - a. Owner to schedule an initial preconstruction conference in accordance with Paragraph 2.06 of the Standard General and Supplementary Conditions, if any.
 - b. Attendance required by Owner, Contractor, Engineer, Contractor's Superintendent, Project Manager, and Subcontractors as a minimum.

c. Sample Agenda

- Distribute Contract Documents
- Discuss design concepts
- Discuss preliminary Progress Schedule, Schedule of Submittals, Schedule of Values and preliminary cash flow projections.
- Designate personnel representing each party; communication procedures
- Procedures and processing of submittals, substitutions, applications for payments, Change Orders and Contract closeout procedures
- Scheduling
- Use of premises by Owner and Contractor
- Owner's requirements and partial occupancy
- Construction facilities and controls provided by Owner
- Temporary utilities provided by Owner and Contractor
- Survey and Site Layout
- Security and housekeeping procedures
- Schedules
- Procedures for testing
- Procedures for maintaining record documents
- Requirements for start-up
- Inspection and acceptance of equipment put into service during construction period
- Access, laydown and coordination with others

- d. Engineer will record minutes and distribute draft copies promptly after meeting to Owner and Contractor for review, then revise as required and distribute thereafter to meeting participants, with copies to Owner and Contractor, and those affected by decisions made.

7. Progress Meetings

- a. Owner to schedule progress meetings beginning no later than 60 days after the Initial Conference and continue thereafter on a **Choose an item** basis throughout progress of the Work.
- b. Attendance required by Contractor, Contractor's Superintendent, major Subcontractors and Suppliers, Owner and Engineer as appropriate to agenda topics for each meeting.

- c. Sample Agenda
 - Review minutes of previous meetings – unresolved issues
 - Overall project status
 - Work Completed
 - Anticipated Work
 - Schedule
 - Pay Applications
 - Change Orders
 - Submittals
 - Observations, problems, and decisions
 - General Discussion/Comments
 - Action Items
 - Date and time for next meeting
 - d. Engineer will record minutes and distribute draft copies promptly after meeting to Owner and Contractor for review, then revise as required and distribute thereafter to meeting participants, with copies to Owner and Contractor, and those affected by decisions made.
8. Pre-installation Conference and Coordination Meetings
- a. When required, convene a pre-installation conference at Site before commencing certain Work that requires coordination or has special requirements or approval.
 - b. Convene coordination meetings as may be generally required.
 - c. Attendance required by parties directly affecting, or affected by, Work of the specific Specification section.
 - 1) For pre-installation conference, notify Owner and Engineer 5 days in advance.
 - 2) For coordination meetings, party requesting coordination meeting to notify other party(s).
 - d. Review conditions, preparation and procedures, and coordination with related Work.

B. Documentation of Progress

1. Submit preliminary and final Progress Schedules as specified in Paragraphs 2.05 and 2.07 of the Standard General and Supplementary Conditions, if any, or as established in Notice to Proceed.

Number of hardcopies: **1**

Submit electronically: ☒ by email ☐ on CD
☐ via digital document exchange system in PDF format

- a. 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.
 - b. Indicate estimated percentage of completion for each item of Work at each submission.
 - c. Indicate dates for fabrication, factory testing, delivery, shipping and field testing, and material and equipment delivery dates, including those furnished by Owner. Coordinate with Schedule of Submittals.
2. Submit revised Progress Schedule on monthly basis and with each Application for Payment, identifying changes since previous version. Coordinate content with Schedule of Values, if any.
 3. Documentation of pre-construction conditions, construction progress, and final conditions:

☐ Not Required for the Project

☒ Construction Photographs: to record Site conditions. Ensure existing conditions of roadway surfaces, curbing, berms, sidewalks, driveways, property bounds, landscaped areas, abutters property and any other items that might be affected by the Work are clearly recorded.

☒ Submit prior to starting construction.

☐ Submit photographs with Payment Application:

☐ monthly during progress of Work.

☐ for final payment to record final condition.

Construction photographs: electronic in PDF or JPG format, minimum 300 dpi quality and a minimum resolution of 6.0 megapixels. Identify photographs with date, time, orientation and Project identification.

Number of copies: 1 on 8-1/2 by 11 sheets.

Submit electronically: ☐ by email ☐ on CD
☒ via digital document exchange system

- ☐ Digital Video Recording: Video record, in color, all areas of the Project Site. Ensure existing conditions of roadway surfaces, curbing, berms, sidewalks, driveways, property bounds, landscaped areas, abutters' property and any other items that might be affected by the Work are clearly recorded.

☐ Submit prior to the starting construction.

☐ Submit at completion of construction.

Arrange for video recordings to be conducted by a professional videographer in digital videodisc (DVD) format. Include clear and concise audio descriptions of the existing Project Site conditions.

Submit 1 copy of the first completed video recording to the Engineer for review of visual and audio quality. Re-record any recording furnished which, in the opinion of the Engineer, are poor quality or incomplete at no additional cost to Owner. Submit [Click here to enter text](#). copies of approved videos.

4. Reports

a. Submit weekly Safety Reports signed by the Safety Representative.

b. Other reports to be submitted:

☒ None

☐ Specified in **Specific Project Requirements and Procedures**

Number of hardcopies: 1

Submit electronically: ☒ by email ☐ on CD
☐ via digital document exchange system in PDF format

C. **Submittal Procedures**

1. Schedule submittals to expedite the Project and coordinate with schedules required by Paragraph 1.03.B above. Deliver each submittal in the quantity and electronic form indicated to Engineer (with copy to Owner where required) at the addresses specified **at the Preconstruction Conference and Site Mobilization Meeting**. Coordinate submission of related items.
2. Present submittals in a clear and thorough manner, in English and using English units. Provide space for Contractor, Engineer, and Owner's review stamps. Use sheet size of not less than 8 1/2 by 11 inches and not more than 24 by 36 inches.
3. Revise and resubmit documents as required. Identify all changes made since previous submittal. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions. Submittals not requested on the submittal schedule may not be recognized or processed.
4. Submit preliminary and final Schedule of Submittals as specified in Article 2 of the Standard General and Supplementary Conditions, if any, or as established in Notice to Proceed. Include all submittals specified in the Standard General and Supplementary Conditions, if any, General Requirements, and other Specification sections.

Number of hardcopies: **1**

Submit electronically: ☒ by email ☐ on CD
☒ via digital document exchange system in PDF format

- a. Include description of each submittal, date by which each submittal will be delivered to Engineer and Owner date by which each submittal must be approved to maintain project schedule, and relevant section reference.
 - b. Allow 10-15 days from receipt of submittal/resubmittal for Engineer review of submittals and possible resubmittal.
-

5. Shop Drawings and Samples: Submit in accordance with Paragraph 6.17 of the Standard General and Supplementary Conditions, if any, and as follows, and coordinate with the Schedule of Submittals required in subparagraph 4 above.

Number of prints: **1**

Electronic format: ☒ PDF ☐ DWG ☐ DXF

☐ OTHER (as specified in **Specific Project Requirements and Procedures**)

Submit electronically: ☒ by email ☐ on CD

☐ via digital document exchange system

- a. Complete the submittal transmittal form included as an attachment to this Section as is indicated, numbering each submittal consecutively. Assign resubmittals the same transmittal number as the original with a suffix of a sequential letter to indicate the resubmittal (e.g. the first resubmittal of submittal 25 would be number 25A.) Include only those documents previously issued under original transmittal number in resubmittals. Do not combine new submittals with resubmittals.
 - b. Attach a transmittal form to each group of Shop Drawings, manufacturer's literature, equipment data and Samples submitted. Use a sufficient number of transmittal forms so that: items on a single transmittal form pertain to the same equipment item, Specification section or element of Work; items on a single transmittal form are either original submittals or the same number resubmittal; and each Sample is listed on a separate transmittal form.
 - c. Engineer to complete review in accordance with Paragraph 6.17.D. of the Standard General and Supplementary Conditions, if any.
 - d. Submittals which do not have a fully completed transmittal form will be returned along with unreviewed attachments. Returned submittals, even though incomplete, will be counted as a submittal.
 - e. Contractor shall reimburse Owner for Engineer's time for resubmittals per Paragraph 6.17.E. of the Standard General and Supplementary Conditions.
 - f. Submission of any Shop Drawing or Sample bearing Contractor's and Engineer's approval shall constitute a representation to Owner that the requirements of Paragraph 6.17 of the Standard General and Supplementary Conditions, if any, have been fulfilled.
6. Variations: Identify variations from Contract Documents and material and equipment or system limitations which may be detrimental to successful

performance of the completed Work and identify reasons therefor in accordance with subparagraph 6.17.C.3 of the Standard General and Supplementary Conditions, if any.

- a. Clearly identify requests for “Or-Equal” and substitute items and submit per Paragraph 6.05 of Standard General and Supplementary Conditions, if any, and subparagraph 1.02.C.5 above. Substitute items will not be considered when indicated or implied on Shop Drawing or material and equipment data submittals without separate written request, or when acceptance will require revision to the Contract Documents.

7. Manufacturers' Installation Instructions and Certificates: Submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing.

Number of prints: **1**

Electronic format: ☒ PDF ☐ DWG ☐ DXF

☐ OTHER (as specified in **Specific Project Requirements and Procedures**)

Submit electronically: ☒ by email ☐ on CD

☐ via digital document exchange system

- a. Indicate special procedures, perimeter conditions requiring special attention and special environmental criteria required for application or installation.
- b. Submit manufacturers' certificates for recent or previous test results on material or equipment, but they must be acceptable to Engineer and Owner. Indicate material or equipment conforms to or exceeds specified requirements and provide supporting reference date, affidavits, and certifications as appropriate.
- c. Submit test results, data, and reports and certifications to Engineer based on tests performed. Submit test reports and certifications for independent testing services specified.

8. Record Documents and Closeout Submittals: submit in accordance with Paragraph 6.12 of the Standard General and Supplementary Conditions, if any, and Paragraph 1.03.D below.

a. *As-Builts for Material and Equipment:*

Number of prints: **1**

Electronic format: ☒ PDF ☒ DWG ☐ DXF

☐ OTHER (as specified in **Specific Project Requirements and Procedures**)

Submit electronically: ☒ by email ☐ on CD

☒ via digital document exchange system

Indicate "As-Supplied" in revision block and sign. Show all changes and revisions to Final Completion per Execution and Closeout Requirements. Include with subparagraph d. Operation and Maintenance Data per Part 2 below.

b. *Drawings Conformed by Contractor to Construction Records:*
Submit the following.

Number of prints: **1**

Electronic format: ☒ PDF ☐ DWG ☐ DXF

☐ OTHER (as specified in **Specific Project Requirements and Procedures**)

Submit electronically: ☒ by email ☐ on CD

☐ via digital document exchange system

Indicate "Conformed by Contractor to Construction Records" in revision block and sign. Show all changes and revisions to Final Completion per Execution and Closeout Requirements.

c. *Warranties and Guarantees:* Submit duplicate notarized copies of warranty documents which are executed and transferable from Subcontractors, Suppliers, and manufacturers. For items of Work delayed beyond date of Substantial Completion, provide updated submittal within 10 days after acceptance, listing date of acceptance as start of Warranty Period.

In PDF format: ☐ on CD

☒ via digital document exchange system

☒ Submit 1 copies in ring binders with durable plastic covers and table of contents.

D. Closeout Procedures

1. Substantial Completion shall have been achieved when the following has been completed and the requirements of Paragraph 14.04 of the Standard General and Supplementary Conditions, if any, have been met.
 - a. Work is complete, systems are successfully operating, and final testing has been successfully completed.
 - b. A full inventory of the spare parts and special tools purchased by the Owner are replenished and in the custody of the Owner.
 - c. The Site has been restored to the satisfaction of the Owner.
 - d. An inspection of the Work has been completed by the Engineer and the Owner.
 - e. An updated Punch List is provided.
 - f. The Contractor's written warranty and guarantee has been submitted as required by Paragraph 6.19.D. of the Standard General and Supplementary Conditions, if any.
 - g. A Certificate of Substantial Completion has been provided in accordance with Paragraph 14.04.C. of the Standard General and Supplementary Conditions, if any.
2. The Contractor shall have sole care, custody, and control of the Work until achievement of Substantial Completion. During the period between Substantial Completion and the date for Final Completion, Contractor shall be given access to correct items on the Punch List and achieve Final Completion.
3. The date of achieving Substantial Completion is the date set forth in the Certificate of Substantial Completion that is accepted and signed by the Owner.
4. Final Completion shall have been achieved when the Work is complete, the requirements of Paragraphs 14.06 and 14.07 of the Standard General and Supplementary Conditions, if any, have been met, and when the following is complete.
 - a. Substantial Completion has been achieved and liquidated damages for failure to meet Substantial Completion Date have been paid.
 - b. All Work including Punch List Items has been completed.
 - c. Final cleaning has been conducted and Contractor equipment and supplies including waste materials have been removed from the Site and legally disposed of.

- d. A full set of record documents have been submitted as specified in subparagraph 1.03.C.8 above and Contractor's written warranty and guarantee has been resubmitted if adjusted.
- e. Inspections required by Laws and Regulations are complete. Certificates and permits to occupy and operate have been issued if required.
- f. Spare parts, maintenance and extra materials have been delivered in quantities specified to Project Site and stored as directed.
- g. A request for final inspection in accordance with Paragraph 14.06 of the Standard General and Supplementary Conditions, if any, has been submitted to the Engineer and the inspection has been completed and the results accepted by the Owner.
- h. A Final Application for Payment has been submitted to the Engineer identifying total adjusted Contract Price, previous payments, and balance due along with required documentation in accordance with Paragraph 14.07.A. of the Standard General and Supplementary Conditions, if any.

1.04 QUALITY REQUIREMENTS

A. Reference Standards and Regulatory Requirements

- 1. Reference to standards, specifications, manuals or codes of any technical society, organization or association, or Laws or Regulations of any governmental authority are used in accordance with Paragraph 3.02 of the Standard General and Supplementary Conditions, if any.
- 2. Acronyms and abbreviations used are defined in the applicable versions of the Encyclopedia of Associations published by Gale (part of Cengage Learning) generally available in large libraries and on the internet.
- ☒ See **Specific Project Requirements and Procedures** for additional requirements.

B. Qualifications

- 1. Meet or provide capability to meet the criteria specified in individual Specification sections in connection with various portions of the Work of the Contract Documents.
- 2. As a minimum, Contractor shall:
 - a. have been regularly and actively engaged in similar Work as described in the Contract Documents, operating under the same

business name and business organization structure, for the last 10 years on at least 5 projects;

- b. have successfully completed at least 5 projects involving construction of similar facilities in the same state as the Project covered by the Contract Documents;
- c. have a full-time project manager in responsible charge of the Work with at least 10 years' experience as project manager on comparable projects; and
- d. carry at least the insurance coverage and amounts required in Article 5 of the Standard General and Supplementary Conditions, if any.

☐ See **Specific Project Requirements and Procedures** for additional requirements.

1.05 ATTACHMENTS

- A. Transmittal form

END OF SECTION

TRANSMITTAL FORM

☐ The material and equipment and requirements for construction/installation contained in Submittal No. (s) _____ have been reviewed and we certify that they are correct and in strict conformance with the requirements specified except for the following deviations (list below or attach listing):

DATE:

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SECTION 01 20 25

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section describes the measurement and payment for the Work to be completed under each item in Section 00 41 01 Bid Form which may also be referred to as “pay item”.
- B. Payment procedures are in accordance with the Agreement, Article 14 of the General Conditions, the Supplementary Conditions (if any), and the General Requirements.
- C. Measurement: as determined, verified, or approved by Engineer or Owner in accordance with Paragraph 11.03 of the General Conditions, the Supplementary Conditions (if any), and the General Requirements, except as otherwise specified.
- D. The Work described in each pay item shall be as described in the Specifications and shown on the Drawings and not included in other pay items.
 - 1. Pay item descriptions are general and may not specifically describe all associated Work or elements thereof, do not constitute Specifications, and do not supersede the content of the Specifications and Drawings.
 - 2. Review the Specifications and Drawings for Work associated with each pay item. Claims for being unfamiliar with the content of the Specifications and Drawings will not be considered.
- E. The following Work is not specifically described or designated as a pay item, is considered incidental to all pay items, and shall not be measured separately for payment.
 - 1. Division 01 General Requirements EXCEPT those items included in Mobilization/Demobilization and included as a separate pay item.
 - 2. Materials, equipment, and services necessary to verify existing field conditions and the location, size, type, material, and orientation of existing pipes and utilities shown on the Drawings including test pits.
 - 3. Restoration of all areas disturbed by the Contractor within the limits of Work.

- 4. Field and laboratory testing and reporting by independent laboratory, including but not limited to compaction of backfill materials; aggregate gradation; and concrete testing
- F. Payment will not be made for restoration of areas disturbed by the Contractor outside the limits of Work.
- G. Payment will only be made for those utility services, including water and fire services, specifically identified for replacement on the Drawings. Relocation or replacement for the Contractor's convenience or due to breakage by the Contractor of any other utility services shown on the Drawings, or at locations which could reasonably be assumed, shall be at no cost to Owner.
- H. Design, installation and removal of excavation support systems, temporary and permanent utility/structure support systems associated with a pay item shall be considered incidental to that pay item.
- I. Additional dewatering and erosion control (including installation, operation, maintenance, removal and off-Site disposal of erosion control devices) associated with a pay item shall be considered incidental to that pay item.
- J. Pay items identified as a Contingency Allowance will be processed per Article 11.02 of the General Conditions and Supplementary Conditions.

1.02 MEASUREMENT AND PAYMENT BASIS

ITEM 1: Precast Concrete Culvert	
Measurement	Portion of Work completed and accepted
Payment	Percent of lump sum price based on Schedule of Values
Schedule of Payment	Monthly based on progress
Material, labor, and equipment, services, installation, construction and testing inherent to the Work for furnishing and installing a precast culvert including but not limited to: removal of existing bridge structure, granite block wall abutment disassembly, excavation, bracing and shoring, and subgrade preparation; culvert design services by Professional Engineer licensed in the State of Maine; culvert fabrication, material testing, and delivery to the Site; placement of the footings and helical pile cap, placement of culvert with monolithic curbs, in place compaction testing, structural and flowable fill, geotextile fabrics, compacted backfill to subgrade; reconstruction of granite block wall and all other incidental work associated with excavation, installation, backfill and restoration of the crossing as shown and described within the Contract Documents and for all other work incidental thereto that is not covered under a separate Pay Item.	

ITEM 2: Helical Pile Installation	
Measurement	Per linear foot in place
Payment	Unit price per linear foot
Schedule of Payment	Monthly based on total linear feet installed as measured
Material, labor, and equipment, services, installation, construction and testing inherent to the Work for installation of helical piles including but not limited to: Design services by Professional Engineer licensed in the State of Maine; pile driving, testing, and all other incidental work associated with the installation of helical piles as shown and described within the Contract Documents and for all other work incidental thereto that is not covered under a separate Pay Item.	

ITEM 3: Bedrock Removal	
Measurement	Per cubic yard in place
Payment	Unit price per cubic yard
Schedule of Payment	Monthly based on total cubic yards removed as measured
Material, labor, and equipment, services, installation, construction and testing inherent to the Work for excavation, removal and disposal of ledge and removal and backfill of any adjacent materials removed in the process of ledge removal as shown and described within the Contract Documents and for all other work incidental thereto that is not covered under a separate Pay Item.	

ITEM 4: Temporary Road	
Measurement	Portion of Work completed and accepted
Payment	Percent of lump sum price based on Schedule of Values
Schedule of Payment	Monthly based on progress
Material, labor, and equipment, services, installation, construction and testing inherent to the Work for providing and maintaining a temporary road throughout the duration of construction including but not limited to: temporary and permanent traffic signage; placement of geotextile fabrics, roadway materials, temporary culvert; and complete removal of the road upon completion of the project, restoration of the area disturbed by the temporary road and related activities; and all other incidental work associated with the installation of the temporary road as shown and described within the Contract Documents and for all other work incidental thereto that is not covered under a separate Pay Item.	

ITEM 5: Guardrail	
Measurement	Per linear foot in place
Payment	Unit price per linear foot
Schedule of Payment	Monthly based on total linear feet installed as measured
Material, labor, and equipment, services, installation, construction and testing inherent to the Work for providing new guardrail including but not limited to: guardrail end treatments, connections to monolithic concrete curb for shallow post installation, guardrail sections, posts, bolts, and other hardware as shown and described within the Contract Documents and recommended by the manufacturer, and for all other work incidental thereto that is not covered under a separate Pay Item.	

ITEM 6: Road Reconstruction	
Measurement	Portion of Work completed and accepted
Payment	Percent of lump sum price based on Schedule of Values
Schedule of Payment	Monthly based on progress
Material, labor, and equipment, services, installation, construction and testing inherent to the Work for reconstruction of the roadway including but not limited to: removal of existing pavement, excavation necessary to meet subgrade, subgrade preparation, placement and compaction of aggregate base material, placement, grading and compaction of base material, laboratory testing; bituminous concrete, placement, grading, butt joints, tack coat and compaction of bituminous concrete new stacked granite wall construction, placement of riprap, lane striping, loam and seed as shown and described within the Contract Documents and for all other work incidental thereto that is not covered under a separate Pay Item.	

ITEM 7: Erosion and Sedimentation Control	
Measurement	Portion of Work completed and accepted
Payment	Percent of lump sum price based on Schedule of Values
Schedule of Payment	Monthly based on progress
Material, labor, and equipment, services, installation, construction and testing inherent to the Work for providing erosion and sedimentation controls including but not limited to sediment and turbidity barriers, stabilized construction Work areas and entrances, protection of trees and other vegetation, cofferdam installation, maintenance, and removal, dewatering discharge sediment control, and erosion control blankets as shown and described within the Contract Documents and for all other work incidental thereto that is not covered under a separate Pay Item.	

ITEM 8: Mobilization/Demobilization	
Measurement	Portion of Work completed and accepted
Payment	Lump Sum per Bid Form (Not to Exceed 5% of the Total Cost)
Schedule of Payment	50 percent at Project commencement - 50 percent at Substantial Completion
Includes delivery to and removal of equipment sufficient to perform the Work from the Project Site, including, but not limited to: temporary utilities, facilities and controls, obtaining necessary permits including associated fees, signage, development of pre-construction schedules and plans required by the General Conditions, Supplementary Conditions and General Requirements; necessary pre-construction investigations, verifying existing field conditions, coordination, and Site clean-up, restoration and closeout.	

023214.02
Issue Date: April 2020

CARRYING PLACE CROSSING REPLACEMENT
VINALHAVEN, MAINE

END OF SECTION

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 – GENERAL

1.01 SUMMARY

- A.** This Section specifies temporary facilities and controls for execution of the Work put into place for use only during the period of construction, that will be removed when no longer required for construction operations, and applies to all Specifications and Drawings.
1. In certain paragraphs, checked items indicate requirements applicable to the Project.
 2. Provisions of this Section may be supplemented in the **Specific Project Requirements and Procedures** or other sections of Division 01.

B. Section Includes

1.02 TEMPORARY CONSTRUCTION FACILITIES

Barriers
Protection of Work
Security
Safety Facilities
Access Roads
Parking
Field Offices
Staging Area
Project Identification
Progress Cleaning and Waste Removal

1.03 TEMPORARY UTILITIES

1.04 TEMPORARY CONTROLS

Dust Control
Water Control and Dewatering
Erosion and Sediment Control
Noise Control
Pollution Control
Traffic Regulation

1.05 REMOVAL OF TEMPORARY UTILITIES, FACILITIES, AND CONTROLS

1.02 TEMPORARY CONSTRUCTION FACILITIES

A. Barriers

1. Comply with the requirements of Paragraph 6.11. of the Standard General Conditions and Supplementary Conditions, if any.
2. Furnish barriers to prevent unauthorized entry to and clear delineation of construction areas, to allow for Owner's use of Site, and to protect existing facilities and adjacent properties from damage from construction operations as recommended by OSHA and as otherwise required for the protection of life and property during construction.
3. Construct barricades and protective facilities in accordance with local and state regulations. Furnish and install signs, lights, reflectors, and such protection facilities as may be required.
4. Furnish barricades required by governing authorities for public rights of way.
5. Provide protection for plant life designated to remain. Replace damaged plant life.
6. Protect non owned vehicular traffic, stored materials, Site and structures from damage.
7. If required, furnish commercial grade, minimum 8 foot high chain link fence around construction Site. Equip with vehicular gates with locks.

B. Protection of Work

1. Protect Work during working and non-working hours.
2. Provide special protection where specified in Specifications or Drawings and in accordance with manufacturer recommendations.
3. Furnish temporary and removable protection for installed equipment and material. Control activity in immediate Work area to minimize damage.
4. Protect exterior areas of Work from damage. Prohibit traffic from landscaped areas.

5. Buildings and Enclosures
 - a. Furnish protective coverings at walls, projections, jambs, sills, and soffits of openings and protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
 - b. 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.
6. Whenever gale or high winds are forecast, take measures to secure loose material, equipment or other items that could be blown and be damaged or cause damage. Do not leave such loose items unsecured at end of a working day. Particular attention shall be taken with scaffolding and items placed or stored on roofs or within a structure prior to being enclosed.
7. Provide for removal of snow and ice which may impede Work, damage the finishes or materials, be detrimental to workers, or impede trucking, delivery, or moving of materials at the Site, or prevent adequate drainage of the Site or adjoining areas.

C. Security

1. Provide protection to stored items, the Work and Owner's operations from unauthorized entry, vandalism, or theft, and against fire, storms and other losses during working and non-working hours.
2. Coordinate with Owner's security program.

D. Safety Facilities

1. Provide first aid and other safety facilities required by Laws and Regulations during working and non-working hours.

E. Access Roads

1. Construct and maintain temporary roads accessing public thoroughfares to serve construction area. Control dust and water.
2. Extend and relocate as Work progress requires. Provide detours necessary for unimpeded traffic flow.
3. Provide for emergency access and maintain throughout the Work Site.

F. Parking

1. Do not allow construction vehicle parking on existing pavement or sidewalks.
 - ☐ Available parking areas at the Project Site are identified on the Drawings
 - ☒ Off-Site construction parking area to be established at a location determined by Contractor.

G. Field Offices

- ☒ Delete - not required for the Project.
- ☐ Provide for the Project as follows.
 1. Furnish weather tight office with lighting, electrical outlets, heating, cooling and ventilating equipment, and equip with furnishings and accessories to accommodate supervision of Work, maintenance of records, and project meetings, including, but not limited to the following.
 - ☐ Also furnish Choose an item. for use by Engineer and Resident Project Representative with a door sign on them main entrance displaying the Woodard & Curran logo, minimum 8.5 inches by 11 inches, fade resistant with magnetic backing, and similarly equipped with fully functional equipment and furniture.
 - Desk and chairs (2 cushioned office desk chairs and 4 metal fold chairs)
 - Plan table with light and stool
 - 3 locking file cabinets
 - Hanging plan rack
 - Book case with 4 shelves
 - “All-in-one” color copier, printer, scanner and fax machine, capable of 11 by 17 output (OR separate color copier, color printer, color scanner, all capable of 11 by 17 output, and fax machine)
 - Paper stock for duration of Project
 - Telephone with answering machine (or telephone service with voicemail feature)
 - Refrigerator, microwave, and water cooler with bottled water supply for duration of Project
 - First aid kit
 2. Maintain utilities per Article 1.03 below for the duration of the Project.

3. Location of Field Offices

- ☐ Locate as shown on the Drawings.
- ☐ Locate as specified in the **Specific Project Requirements and Procedures.**

H. Staging Area

- ☐ Locate as shown on the Drawings.
- ☐ Locate as specified in the **Specific Project Requirements and Procedures.**
- ☒ Owner is not providing a location for staging area. Determine and secure a location for staging area.

I. Project Identification

- ☒ Delete - not required for the Project.
- ☐ Provide for the Project
 - ☐ as specified in the **Specific Project Requirements and Procedures.**
 - ☐ as shown on the Drawings.

J. Progress Cleaning and Waste Removal

1. Comply with the requirements of Paragraph 6.11. B and C of the Standard General Conditions and Supplementary Conditions, if any.
2. Maintain areas free of waste materials, debris, and rubbish and maintain the Site in a clean and orderly condition.
3. Remove debris and rubbish from spaces and other closed or remote spaces before enclosing the space.
4. Collect and remove waste materials, debris, and rubbish from Site at least weekly and legally dispose off-Site.

1.03 TEMPORARY UTILITIES

A. Power service

- ☒ Delete - not required for the Project.
- ☐ Provide for the Project as follows.
 1. Arrange for and pay for required power service from local electric utility for duration of Project. Exercise measures to conserve energy. Furnish and install required equipment including pole of sufficient height to provide proper clearance and install weatherproof box of such size to house service disconnect, overcurrent protection, electric meter, and other required equipment.
 - ☐ Locate as shown on the Drawings.
 - ☐ Locate as designated by Owner.
- ☐ See the **Specific Project Requirements and Procedures** for additional requirements.

B. Telephone service and internet access to field offices

- ☒ Delete - not required for the Project.
- ☐ Provide for the Project as follows.
 1. Arrange for, pay for, and maintain telephone service and internet access to field offices at time of Project mobilization and for duration of Project.
 2. Obtain voicemail feature if answering machine not provided.
 3. Provide wireless, high speed broadband internet access via DSL, cable, satellite, or T1.
- ☐ See the **Specific Project Requirements and Procedures** for additional requirements.

C. Water service

- ☒ Delete - not required for the Project.
- ☐ Provide for the Project as follows.
 - 1. Arrange for, pay for and maintain suitable quality water service as required for duration of Project.
 - ☐ Owner will provide water at no charge for construction.
 - ☐ See the **Specific Project Requirements and Procedures** for additional requirements.

D. Furnish and maintain required sanitary facilities and enclosures. Do not use existing facilities.

E. Furnish lighting for construction operations. Furnish lighting for exterior staging and storage areas and for security purposes. Maintain lighting and provide routine repairs.

F. Furnish heat devices and heat and cooling devices as required to maintain specified conditions for construction operations.

G. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

H. Fire Protection

- 1. Provide temporary fire protection equipment and services during construction per NFPA and local fire code and regulations, and fire marshal's requirements.
- 2. Use Work procedures that minimize fire hazards to the extent practicable and materials that are fire resistant where possible. Collect and remove combustible debris and waste materials from the Site each day. Store fuels, solvents, and other volatile or flammable materials away from the construction and storage areas in well-marked, safe containers in accordance with Laws and Regulations.

1.04 TEMPORARY CONTROLS

- A. Pest Control:** Provide methods, means, and facilities to control and prevent spread of pests during construction operations. If required, provide for extermination of pests in accordance with Laws and Regulations. For extensive infestations, obtain the services of a licensed exterminator and coordinate plan with Owner and Engineer.
- B. Dust Control:** Execute Work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere. Utilize the application of sprinkled water to reduce the emission of air-borne soil particulates from the Project Site.
- C. Water Control and Dewatering**
- ☐ Delete - not required for the Project.
 - ☒ Provide for the Project as follows.
 - ☒ See the **Specific Project Requirements and Procedures** for additional requirements.

Grade Site to drain away from excavations to approved drainage collection facilities. Ensure collected surface drainage water meets permitted criteria for sediment content prior to discharge.

1. Maintain excavations free of water. Furnish, operate and maintain pumping equipment.
2. Dewater excavations and legally dispose of water in a manner that will not cause injury to public and private property.
3. Protect Site from puddling, ponding or running water.
4. Design, furnish, install, maintain, operate and remove temporary dewatering systems as required to lower and control water levels and hydrostatic pressures in excavations during construction; legally dispose of pumped water; construct, maintain, observe and, except where indicated or required to remain in place, remove dewatering equipment and system at the completion of construction.
 - a. Dewatering may include: lowering the water table, intercepting and collecting seepage which may penetrate the support of excavation, slopes or bottom of the excavation; increasing the stability of excavated slopes; preventing loss of material from beneath the slopes or bottom of the excavation; reducing lateral loads on sheeting and bracing; limiting horizontal displacements and stresses in support of excavation to tolerable and allowable levels;

preventing displacements of existing structures, utilities, pavements, and sidewalks; improving the excavation and hauling characteristics of sandy soil; preventing rupture or heaving of the bottom of any excavation; and disposing of pumped water.

- b. *Normal dewatering* is defined as using conventional pumps installed in open excavations, ditches, or sumps to control water and allow for installation of the pipe in a dry trench.
- c. *Special dewatering* is defined as installing wellpoints, deep wells, or eductor and ejector systems to control groundwater and hydrostatic pressures to allow for installation of the work. Special dewatering includes design of the dewatering system by a Professional Engineer currently registered in the state where the Project is located in good standing, and conducting additional borings or subsurface explorations deemed necessary by the Contractor, and approved by the Engineer, to support design.
 - 1) For Special Dewatering, retain the services of a Professional Engineer currently registered in the state where the Project is located in good standing, experienced in design of dewatering systems, to independently evaluate the boring logs and other soils information available to determine those areas that will require special dewatering techniques and to design the required system. If, in the opinion of the Contractor or Contractor's Dewatering Professional Engineer, additional borings are needed to design special dewatering systems or determine areas where special dewatering techniques will be required, the Contractor shall retain and pay for the services of a boring subcontractor. Contractor's Dewatering Professional Engineer shall provide sufficient on-Site inspection and supervision to assure that the dewatering is carried out in accordance with the approved design.
- d. Design a dewatering system capable of:
 - 1) effectively reducing the hydrostatic pressure and lowering the groundwater levels to a minimum of 2 feet below excavation subgrade in the existing fills and any organic peat, and below the excavation subgrade in the existing organic silts/clays unless otherwise directed by the Engineer, so that all excavation bottoms are firm and dry;
 - 2) maintaining a dry and stable subgrade until the structures, pipes, appurtenances, and drainage pipe and structure bedding to be built therein have been completed to the extent that structures, pipes, and appurtenances will not be floated or otherwise damaged;

- 3) lowering of the groundwater level within the work area without adversely affecting existing structures, utilities, pavements, sidewalks or wells outside of the Work area.
- e. Submit the following.
 - 1) Plans and description of the Normal and/or Special Dewatering systems, including the number, location and depth of wells, wellpoints or sumps; designs of filters to prevent pumping of fine soil; method and location for filtering, sedimentation tanks and legal disposal of pumped water; and flow capacity of proposed system, accounting for groundwater level relative to tide cycles if applicable
 - 2) Design calculations, description and complete layout drawings, stamped and signed by Contractor's Dewatering Professional Engineer, at least two weeks prior to scheduled installation of Special Dewatering system
 - 3) Locations of observation wells
 - 4) Records of pump operation and groundwater elevations
5. Dewatering Operations and Procedures
 - a. Provide electrically operated dewatering equipment, powered with dedicated generators adequately sized to operate the dewatering system and capable of running on commercial power. Provide standby equipment independent of commercial power and provide for dewatering within 24 hours upon primary pump or power failure. No work shall be performed by the Contractor below the pre-construction groundwater level during dewatering system failure.
 - b. Provide suitable temporary pipes, flumes or channels for water that may flow along or across the Site of the Work.
 - c. Provide dewatering equipment with noise attenuation systems capable of meeting the governing noise regulation requirements.
 - d. Encapsulate the suction end of the pump with crushed stone, filter fabric, and other materials to minimize the amount of silt discharged to the amount allowed by the construction dewatering permit.
 - e. Do not operate equipment on paved surfaces to prevent damaging these surfaces.

- f. Locate dewatering facilities to prevent interference with utilities and construction work to be done by others.
 - g. For dewatering operations with relatively minor flows, direct pump discharges using filtration bag or system per Erosion and Sediment Control below, or pump into hay bale sedimentation traps lined with filter fabric. Filter water through the hay bales and filter fabric prior to seepage into storm drainage or any natural water course.
 - h. For dewatering operations with larger flows, provide pump discharges into a steel dewatering/sedimentation basin. Use steel baffle plates to slow water velocities, to increase the contact time, and allow adequate settlement of sediment prior to discharge into waterways, storm drainage or discharge point allowed by the construction dewatering permit.
 - i. Utilize silt sacks in catch basins when excess silt is suspended in the discharge water per Erosion and Sediment Control below.
 - j. If siltation basin is used, size to effectively filter for the volume and discharge rate of water anticipated without overflow.
 - k. Provide treatment necessary to prevent discharge of silty and/or contaminated ground water caused by the Contractor's operations, or any contaminated ground water that may pass from excavated surfaces and/or through the excavation support system selected by the Contractor.
 - l. Dispose of water pumped or drained from the Work in accordance with permit requirements and in a manner to prevent undue interference with other work or damage to adjacent properties, pavements and other surfaces, buildings, structures and utilities.
 - m. Obtain necessary regulatory approvals for the disposal of dewatering flows, including, among others, approval by the Environmental Protection Agency under the National Pollutant Discharge Elimination System (NPDES) program for construction dewatering activities. Submit the completed and approved construction dewatering permit to the Engineer immediately upon receipt.
6. Special Dewatering
- a. Use Special Dewatering as necessary if Normal Dewatering methods are inadequate to ensure dry and stable excavation subgrade conditions.

- b. Special Dewatering techniques may consist of one- or two-stage wellpoint systems, deep wells, or eductor and ejector type systems. Design with suitable screens to prevent pumping of fines and to address specified Work Site conditions.
- c. In areas requiring special dewatering, lower the groundwater level to a minimum of 2 feet below the existing fill and/or organic peat subgrades or to the excavation subgrade for organic silt/clay subgrades prior to any installation and maintain that groundwater level until the excavation has been backfilled and provide monitoring by Contractor's Dewatering Professional Engineer to ensure conformance with the requirements herein.
- d. Furnish materials and install at least two observation wells at each excavation area. The location of the wells shall be proposed in the field by the Contractor's Dewatering Professional Engineer and reviewed and approved by the Engineer.

D. Erosion and Sediment Control

- ☐ Delete - not required for the Project.
 - ☒ Provide for the Project as follows.
 - ☒ See the **Specific Project Requirements and Procedures** for additional requirements.
- 1. Plan and execute construction using methods to control surface drainage from cuts and fills, from borrow and waste disposal areas and prevent erosion and sedimentation.
 - 2. Submit erosion and sediment control plan to Engineer prior to the start of construction.
 - 3. Install erosion and sediment controls as may be shown on the Drawings and as required by Laws and Regulations. Install additional erosion and sedimentation control measures beyond those shown on the Drawings as necessary to stabilize the Site. Coordinate temporary erosion controls with permanent erosion controls to the extent practical. Provide and maintain devices to control erosion, siltation, and sedimentation that occur during construction operations. Undertake reasonable precautions and measures to avoid erosion of soil and to prevent silting of drainage ditches, storm sewers, rivers, streams, and lakes.

4. Employ pollution prevention measures, erosion and sedimentation control before, during, and after soils are exposed. Implement measures prior to soil disturbance or soil storage to the extent possible to ensure that such measures are in place before activity occurs and employ additional measures as the Work progresses. Implement and maintain as necessary until the Site is permanently stabilized.
5. Perform inspections of disturbed soil areas, material storage areas exposed to precipitation, and erosion control measures with Engineer a minimum of once every 14 days and also within 24 hours after any storm event greater than 0.5-inches of rainfall. Immediately correct deficiencies in the erosion control measures identified or indicated by failures or erosion by implementing additional measures or different techniques to correct and prevent subsequent erosion at no additional cost to Owner.
6. In the event that silt or debris breaches erosion control, immediately remove and clean silt or debris from drainage ditches and storm sewers and revise erosion control measures as required by the Conservation Commission or the Engineer. Should silt or debris breach erosion controls and reach rivers, streams or lakes, immediately notify local, state or Federal representatives as required and implement required remediation methods at no additional cost to Owner.
7. Limit duration of the exposure of soils on embankments, excavations, and graded areas to a minimum.
8. Provide temporary measures such as berms, dikes and drains to prevent water flow. Install erosion control measures in any ditch, swale or channel before water is allowed to flow in the waterway. Handle water pumped from trenches to minimize discharge of silty water to the maximum extent practicable.
9. Stabilize storm drain outfalls as shown on the Drawings before the discharge points become operational. Install inlet protection immediately upon construction of culverts.
10. Stabilize disturbed areas with temporary and permanent erosion control practices as soon as practicable, but no more than 14 days after construction activity on a particular portion of the Site has temporarily or permanently ceased. Exceptions to this time requirement include: a) where construction activities will resume on the particular portion of the Site within 21 days; and b) where snow cover delays initiation of stabilization measures.

11. Place stockpiled topsoil on the Site away from natural drainages, in piles with side slopes of 50 percent to 70 percent. Install siltation fence around the base of the pile to prevent eroding soil from washing into drainages. Cover topsoil piles which are to remain for a period of 21 days or more with temporary seed and mulch immediately following stockpiling.
12. Conduct pavement sweeping to remove sediment and soil debris accumulation on pavement resulting from construction activity
13. Siltation/Silt Fence
 - a. Filter fabric: suitable for erosion control.
 - b. Wood posts: oak, 2 inches by 2 inches in section, and at least 4.5 feet in length.
 - c. Erosion control fencing: heavy-duty filter fabric towed into the existing soil as shown on the Drawings.
 - d. Construct as shown on Drawings or as directed by Engineer. Install parallel to contours where possible, prior to Site clearing and grading activities.
 - 1) Dig a 6 inch by 6 inch minimum trench where the fence is to be installed. Position the fence in the trench with the fence posts set at 8 feet on center (maximum). Curve ends of fence uphill to prevent flow around ends.
 - 2) Staple sedimentation control fabric and the industrial netting to each post. When joints are necessary, splice filter fabric together only at support posts with 6-inch overlap and securely seal.
 - 3) Bury lower edge of fabric at least 6 inches below ground surface to prevent underflow. Backfill trench and compact soil over filter fabric.
 - 4) Installed height: minimum 2.5 feet and 36 inches maximum.
 - 5) Inspect frequently; repair or replace any damaged sections.
14. Temporary Erosion Control Matting
 - a. Rolled matting blanket consisting of curled wood excelsior, coconut fiber, straw or paper bound with a weave of twisted craft paper, cotton cord or plastic mesh.

- b. Provide staples for fastening matting to the ground. Staples: fabricated in a "U" shape from 11 gage or heavier stiff steel wire, 6 to 12 inches in length and 1 to 2 inches across.
- c. Surface Preparation and Installation
 - 1) Conform to grades and cross sections for slopes and ditches shown on the Drawings. Finish to a smooth and even condition with all debris, roots, stones, and lumps raked out and removed. Loosen soil surface to permit bedding of the matting.
 - 2) Unless otherwise directed, apply seed prior to placement. When directed, spread additional seed over matting, particularly at those locations disturbed by building slots. Press matting onto the ground with a light lawn roller or by other similar means.
 - 3) Bury edges of matting around the edges of catch basins and other structures.

15. Seeding

- a. Select seed variety and applied rates based upon the date of application per the following table. Equivalent seed mixture based on suitability for use in controlling erosion of the various soil types and slopes may be used as approved by the Engineer.

Dates	Seed	Applied Rate (pounds per 1,000 feet ²)
4/1 to 7/1 8/15 to 9/15	Oats	1.8
4/1 to 7/1	Annual Ryegrass	0.9
5/15 to 8/15	Sundangrass	0.9
9/15 to 10/15	Winter Ryegrass	2.6

- 1) Sow seed at the rates indicated, on the pure live seed basis.
- 2) Mulch areas where temporary seeding has been applied. Do not mulch seeded areas where matting will be immediately installed. If temporary seeding does not achieve adequate growth by November 1, apply an additional layer of mulch.
- 3) Mulch temporarily or permanently seeded areas, areas which cannot be seeded within the recommended seeding dates, and any soil stockpile areas, immediately following seeding. Straw or hay mulch, wood fiber mulch, and hydromulch are recommended.

16. Sod: grown from certified seed of adapted varieties to produce high quality sod free of any serious thatch, weeds, insects, diseases and other pest problem, be at least one year old and not older than three years, and cut with a 1/2 inch to 1 inch layer of soil.
- a. Lay sod strips on the prepared soil, perpendicular to the slope or direction of water flow, starting at the lowest elevation. Butt the edges and ends of the sod strips together and tamp or roll. Stagger joints.
 - b. Staple sod strips at ends and at 3-foot intervals along the center of the strip.
 - c. Irrigate sodded area immediately after installation.

17. Catch Basin Silt Sacks

- a. Style: Silt Sack Regular Flow.
- b. Test Method: ASTM D-4884 165.0 lbs./inch.
- c. Silt sack seams: certified average wide width strength.
- d. Meet the following ASTM D-4884 standards. Properties are Minimum Average Roll Values (MARV).

Property	Test Method	Units	Test Results
Grab Tensile	ASTM D-4632	lbs.	315x300
Grab Elongation	ASTM D-4632	%	15x15
Puncture	ASTM D-4833	lbs.	125
Mullen Burst	ASTM D-3786	psi	650
Trapezoid Tear	ASTM D-4533	lbs	120x150
UV Resistance	ASTM D-4355	%	90
Apparent Opening	ASTM D-4751	US Sieve	40
Flow Rate	ASTM D-4491	gal/min/ft ²	40
Permittivity	ASTM D-4491	sec -1	0.55

- 1) Utilize silt sacks in catch basins as required when excess silt is suspended in discharge water.

18. Filtration Bag or System for Discharge from Excavation Dewatering

- a. Meet the following standards. Properties are Minimum Average Roll Values (MARV).

Property	Test Method	Units	Test Results
Flow Rate	ASTM D-4491	gal/min/ft ²	40
Permittivity	ASTM D-4491	sec -1	0.55

- b. For discharge from excavation dewatering, install filtration bag or system or dewatering siltation basin constructed of a hay bale barrier lined with filter fabric sized to handle the volume of dewatering without overflowing.
- 19. Compost Filter Socks
 - a. Furnish and install biodegradable mesh “socks” filled with mature, clean compost per EPA National Pollutant Discharge Elimination System (NPDES) specifications.
 - 1) Install per EPA and manufacturers recommendations.
 - 2) Install parallel to contours where possible. Stake socks as needed to stabilize. Inspect frequently and repair as necessary.
- 20. Provide detention basins or water filtration systems for dewatering and coordinate locations with Engineer. See Dewatering in Paragraph B. above.
- 21. Other Temporary Measures
 - a. Provide and maintain temporary slope drains as required.
 - b. Employ other temporary erosion control measures as directed by the Engineer or local Conservation Commission.
- 22. Maintenance
 - a. Inspect erosion control practices immediately after each rainfall and at least daily during prolonged rainfall or snowmelt for damage. Make appropriate repairs or replacement until Final Completion at no additional cost to the Owner.
 - b. Remove silt from siltation fence and/or haybale when it has reached one-quarter of the bale and/or fence height, or prior to expected heavy runoff or siltation.
 - c. Repair matting if any staples become loosened or raised, or if any matting becomes loose, torn, or undermined, make satisfactory repairs immediately.
 - d. Maintain areas mulched or matted until Final Completion, at no additional cost to the Owner.
 - e. Maintain sediment basins by removing silt that reaches a depth of over one foot, at no additional cost to the Owner, until Final Completion.

23. Removal of Temporary Erosion Control

- a. Remove temporary materials and devices upon completion of the Work when permanent soil stabilization has been achieved. Re-use materials in good condition if approved by Engineer.
 - 1) If silt socks are used, remove in paved areas or cut open and disperse media in unpaved areas.
- b. Level and grade to preconstruction conditions and to the extent required to prevent any obstruction of the flow of water or any other interference with the operation of or access to the permanent works.
- c. Remove siltation fences only when adequate grass growth has been established.
- d. Repair areas damaged by silt fences and hay bales to preconstruction conditions to the satisfaction of the local Conservation Commission and the Engineer.
- e. Remove unsuitable materials from Site and dispose of in a lawful manner.

E. Noise Control

1. Provide methods, means, and facilities to minimize noise from construction operations.
2. Provide noise attenuation systems capable of meeting the federal and state Department of Environmental Protection Air Quality Control Regulations.
3. Construct sound enclosures or utilize other noise reduction techniques if the equipment does not meet the noise level requirements.

F. Pollution Control

- ☐ Delete - not required for the Project.
- ☒ Provide for the Project as follows.
- ☐ See the **Specific Project Requirements and Procedures** for additional requirements.

1. 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.
 - a. Water Pollution Control
 - 1) Assure that sediment, debris, petroleum, chemicals, or other contaminants will not enter existing drainage facilities and channels. Use construction methods that will prevent entrance of pollutants and wastes into existing streams, rivers, lakes, and flowing and dry watercourses.
 - 2) Obtain legal disposal sites and dispose of pollutants and wastes in a legal manner.
 - 3) Respond immediately to emergencies as directed when water quality of existing streams, rivers, lakes and flowing and dry watercourses is threatened. Take corrective action to remove or contain pollutants until a permanent solution is determined.
 - b. Air Pollution Control
 - 1) Equipment and vehicles that exhibit excessive exhaust emissions due to poor engine adjustments or inefficient operation will not be permitted to operate until corrective repairs or adjustments are made.
 - 2) Burning of materials from clearing or grubbing operations, combustible construction materials, and rubbish will not be allowed.

G. Traffic Regulation

- ☐ Delete - not required for the Project.
- ☐ See the **Specific Project Requirements and Procedures** for additional requirements.
- ☒ Provide for the Project as follows.

1. Control and maintain traffic within the Project area.
 - ☒ Submit traffic control plans and coordinate with Owner and local agencies. Submit plan for traffic control to Owner for review 14 days in advance of any Work within public right-of-way, street closure or detour.
 - ☐ A traffic control plan is not required for the Project.
2. Provide and maintain traffic control and maintenance devices in accordance with Part 6, Temporary Traffic Control, of the "*Manual on Uniform Traffic Control Devices for Streets and Highways*", published by the U.S. Department of Transportation, Federal Highway Administration and other applicable codes and standards as specified. Operate devices 24 hours per day as required.
3. Provide for access by emergency vehicles, such as police, fire, and disaster units at all times. Contractor shall be liable for damages resulting from failure to provide such access.
4. During construction hours, traffic flow must be controlled by uniformed traffic police officers or other traffic controllers allowed by Laws and Regulations. The services of traffic controllers shall in no way relieve the Contractor of its responsibilities under the Contract.
5. Maintain minimum of one moving lane on roadways at all times.
 - a. Where detours are permitted, provide necessary barricades, flashers, flashing arrows and signs in accordance with referenced Manuals and Laws and Regulations.
 - b. Provide gravel borrow and bituminous concrete to maintain temporary passable travel lane ramps, temporary bridging, steel plates, temporary pavement, wood-framed walkways, caution, safety and other necessary signs directing the pedestrian and vehicular traffic towards unblocked and safe areas.
6. Provide safe access/egress to businesses and abutting property owners within the Project area. In areas where the construction activity is in progress, install directional signs in front of businesses indicating "OPEN FOR BUSINESS" or similar for guidance of customers.

- a. Certain construction operations such as utility work and roadway/sidewalk reconstruction may restrict access/egress on some roads and to businesses and abutting property owners. Under these circumstances, schedule operations during off-peak hours or late evenings with Owner approval so that a particular work activity can be completed in the shortest possible time.
 - b. Provide 48 hours notice to businesses and abutting property owners when access/egress will not be available or restrictions will exist.
7. Exercise particular care to establish and maintain such methods and procedures that will not create hazards.
 - a. Remove or properly cover traffic control, safety devices and/or signs having messages that are irrelevant to normal traffic conditions at the end of each Work period. Keep signs clean at all times and provide that legends are distinctive and unmarred.
 - b. Place excavated material and construction equipment so that vehicular and pedestrian traffic is maintained at all times unless road closure permit is obtained. If the Contractor's operations cause traffic hazards, implement appropriate safety measures immediately.
 - c. In areas of high pedestrian and vehicular traffic volume, the remove waste materials and construction equipment from the Work Site on a daily basis. Do not park construction equipment overnight on the Site or the adjacent roads unless permitted by Owner.
 - d. Provide night watchmen where special hazards exist.
8. Post signage clearly stating that any vehicle impeding the progress of construction will be towed at the vehicle owner's expense. Towing charges incurred by Owner for Contractor's failure to post such signs will be borne by the Contractor.

1.05 REMOVAL OF TEMPORARY UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, and facilities before Final Application for Payment inspection.
- B. Remove temporary underground installations and grade Site as indicated. Clean and repair damage caused by installation or use of temporary utilities, facilities, and controls.
- C. Restore existing facilities and areas used during construction to original condition. Restore permanent facilities used during construction to specified condition.

END OF SECTION

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SECTION 01 60 00

PRODUCT REQUIREMENTS

PART 1 – GENERAL

1.01 SUMMARY

- A. This Section specifies general requirements for products, materials and equipment and applies to all Specifications and Drawings.
 - 1. Provisions of this Section may supplemented in individual Specification sections.
- B. **Section Includes**
 - 1.02 SOURCE QUALITY CONTROL
 - General
 - Independent Testing Agency Certification
 - Factory Testing
 - 1.03 PRODUCT REQUIREMENTS
 - General
 - Transportation and Handling
 - Storage and Protection
 - 1.04 WARRANTIES

1.02 SOURCE QUALITY CONTROL

A. General

- 1. Subject material and equipment furnished under the Contract Documents to a complete factory testing program as specified.
- 2. Shop Drawings and submittals: reviewed by Engineer before initiating testing program.
- 3. Perform checks and tests in accordance with manufacturer's recommendations and referenced standards.
- 4. Evaluate test results and advise Owner immediately of any discrepancy between test results and test limits or the failure of any device or system under test. Include test limits for acceptability applicable to each test on the certified test records.
- 5. Record test information, including the evaluation of testing results, on forms approved by Owner and Engineer.

B. Independent Testing Agency Certification

1. If specified, furnish certificates from an independent testing agency.
2. Independent testing agency to certify that material and equipment components have been examined and tested and are in conformance with the requirements specified in the Contract Documents.
3. Take Samples in accordance with the requirements specified in the Contract Documents, as selected by Owner or independent testing agency. Furnish and ship at no additional cost to Owner.

C. Factory Testing

1. Provide 14 days prior written notice of factory inspections and tests to Owner and Engineer.
2. If failure to give proper written notice results in material and equipment being assembled or covered before a factory inspection or test, make material and equipment ready for inspection or test and reassemble or recover at no additional cost to Owner.
3. Owner may inspect any portion of material and equipment furnished at any reasonable time during manufacture and may witness testing of any portion of material and equipment wherever located. Owner and Engineer to witness tests only.
4. Furnish, set up and operate test equipment and facilities.
5. If facilities for conducting required tests are unavailable to the manufacturer, conduct tests elsewhere or have them performed by an independent agency approved by Owner.
6. Protect material and equipment after testing and checking to provide that subsequent testing of other equipment or systems does not disturb, damage or otherwise interfere with functional capability of material and equipment.
7. Assume responsibility for protection of material and equipment and safety of all personnel during factory testing program.
8. Grounds for rejection: failure to withstand tests; failure to meet ratings; failure to meet applicable standards.

9. In the event of failure
 - a. Submit revisions of documents requiring approval for changes required for rectification.
 - b. Obtain Owner's and Engineer's approval before making such changes.
 - c. Provide written details of any changes to be made not requiring approval.
 - d. Notify Owner and Engineer in writing before retesting.
 - e. Furnish new material and equipment which meets requirements of the Specifications if rejected material and equipment cannot be rectified to satisfaction of Owner and Engineer.
 - f. Retest after rectification in presence of Owner or Engineer.
10. Assume responsibility for all costs, including, but not limited to: loss or damage to materials and equipment resulting from testing; retesting; rectification; new material and equipment to replace damaged or non-rectifiable material and equipment; removal, furnishing, transportation, unloading, and installation of replacement material and equipment; and witness of testing by Owner and Engineer including travel, lodging, meals, and payroll.
11. Submit certified test reports which define tests, list results, and are signed by Contractor's representative, and copies of raw data collected during tests. Submission of certified test reports does not relieve Contractor of responsibility for material and equipment meeting requirements of the Contract Documents after installation.

1.03 PRODUCT REQUIREMENTS

A. General

1. Products include new material and equipment incorporated into the Work and may also include existing material and equipment required for reuse. This does not include machinery and equipment used for preparation, fabrication, conveying, installation and erection of the Work.
2. Do not use materials and equipment removed from existing Work Site, except as specifically permitted.
3. Provide complete with accessories, trim, finished, safety guards, and other devices and details need for a complete installation and for the intended use or effect.

4. Provide standard products which have been produced and used successfully on other similar projects for similar applications. Provide products which are likely to be available to Owner in the future for items required for maintenance and repair or replacement Work.
5. Furnish interchangeable components of the same manufacturer, for similar components.

B. Transportation and Handling

1. Transport and handle material and equipment in accordance with manufacturer's instructions.
2. Notify Engineer and Owner in writing upon acceptance of a shipment.
3. Promptly inspect shipments to assure that material and equipment comply with requirements, quantities are correct, and material and equipment are undamaged.
4. Furnish equipment and personnel to handle material and equipment by methods to prevent soiling, disfigurement, or damage.
5. Uncrate equipment and dispose of packing material properly.

C. Storage and Protection

1. Store and protect material and equipment in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive material and equipment in weather tight, climate controlled enclosures.
2. For exterior storage of fabricated material and equipment, place on sloped supports, above ground.
3. Provide for bonded off Site storage and protection when Site does not permit on Site storage or protection.
4. Cover material and equipment subject to deterioration with impervious sheet covering. Furnish ventilation to avoid condensation or potential degradation of material and equipment.
5. Store loose granular materials on solid flat surfaces in a well-drained area. Avoid mixing with foreign matter.
6. Furnish equipment and personnel to store material and equipment by methods to prevent soiling, disfigurement, or damage.

7. Arrange storage of material and equipment to permit access for inspection. Periodically inspect to assure material and equipment are undamaged and are maintained in acceptable conditions.
8. After receipt of material and equipment, assume responsibility for loss and damage including but not limited to breakage, corrosion, weather damage, and distortion.

1.04 WARRANTIES

- A. Provide warranties for equipment and material in accordance with Paragraphs 6.19 and 14.03 of the Standard General and Supplementary Conditions, if any.
- B. Provide extended or special warranties as indicated in individual Specification sections.

END OF SECTION

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SECTION 01 70 00

EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 – GENERAL

1.01 SUMMARY

- A. This Section specifies general execution requirements and startup/commissioning and performance testing for closeout of the Work and applies to all Specifications and Drawings
 - 1. In certain Paragraphs, checked items indicate requirements applicable to the Project.
 - 2. Provisions of this Section may be supplemented in the **Specific Project Requirements and Procedures** or other sections of Division 01.

B. Section Includes

1.02 OVERALL EXECUTION REQUIREMENTS

- Coordination
- Existing Conditions
- Field Engineering
- Record Documents
- Cutting and Patching
- Electrolytic Corrosion Prevention
- Quality Assurance and Control of Installation
- Manufacturers' Field Services
- Independent Testing

1.03 STARTUP, TESTING, AND COMMISSIONING

- Spare Parts
- Consumables
- Checkout and Starting Systems
- Starting, Adjusting, and Balancing
- Startup and Commissioning/Performance Testing
- Demonstration and Training

1.02 OVERALL EXECUTION REQUIREMENTS

A. Coordination

1. Conduct preconstruction and pre-installation meetings before commencing certain Work that requires coordination or has special requirements or approvals.
 2. Comply with the required Work sequence and coordination as may be specified in Summary of Work and reflect in the Project scheduling.
 3. Coordinate Work such that Work is completed with minimum disruption to residents and businesses.
 4. Coordinate space requirements and installation of Work. Utilize spaces efficiently to maximize accessibility for other installations, maintenance, and repairs.
 5. Coordinate Work of the various Specifications with interdependent responsibilities for installing, connecting to, and placing in service, operating equipment.
 6. Coordinate related Work at the Site in accordance with Article 7 of the Standard General and Supplementary Conditions, if any.
 7. Coordinate completion and cleanup of Work of separate sections in preparation for Substantial Completion and for portions of Work designated for Owner's partial occupancy.
 8. After Owner occupancy of premises, coordinate access to Site for correction of defective Work and/or incomplete Work to minimize disruption of Owner's activities.
- ☐ See the **Specific Project Requirements and Procedures** for additional requirements.

B. Existing Conditions

1. Paragraph 4.01 of the Standard General and Supplementary Conditions, if any, covers Availability of Lands.
 - ☐ No information is identified or available for the Project.
 - ☒ Information identified is included as an attachment to the **Specific Project Requirements and Procedures**.

2. Paragraph 4.02 of the Standard General and Supplementary Conditions, if any, covers Subsurface and Physical Conditions.
- ☐ No information is identified or available for the Project.
- ☒ Information identified is included as an attachment to the **Specific Project Requirements and Procedures**.
3. Pursuant to Paragraph 4.04 of the Standard General and Supplementary Conditions, if any, existence and location of Underground Facilities and other utilities and construction indicated as existing are not guaranteed. Before beginning Work investigate and verify the existence and location of Underground Facilities and other utilities and construction.
- ☒ Conduct test pits and other utility research and properly restore utilities interfered with or damaged during construction at no cost to the Owner.
- ☐ Engage a professional subsurface utility locator to verify the existence and location of underground utilities prior to starting Work
- ☒ See the **Specific Project Requirements and Procedures** for additional requirements.
4. Paragraph 4.05 of the Standard General and Supplementary Conditions, if any, covers Reference Points.
- ☒ No information is identified or available for the Project.
- ☐ Information is included in the **Specific Project Requirements and Procedures**.
5. Paragraph 4.06 of the Standard General and Supplementary Conditions, if any, covers Hazardous Environmental Conditions at Site.
- ☒ No information is identified or available for the Project.
- ☐ Information identified is included as an attachment to the **Specific Project Requirements and Procedures**.
- ☐ Other information is included as an attachment to the **Specific Project Requirements and Procedures**.

C. Field Engineering

- ☒ Delete - not required for the Project.
- ☐ Provide for the Project as follows.
 1. Prior to initiating construction, engage an independent professional land surveyor registered in the state where the Project is located to provide surveys and permanent reference points for all bounds and property markers along the line of the Work that may be disturbed during construction. Submit copies of all ties to the bounds and property markers to the Engineer prior to excavation at the Site(s).
 2. Maintain surveyor's log of control and other survey work. Keep log available for reference.
 3. Verify layout information shown on the Drawings in relation to existing benchmarks before lay out of the Work. Locate and protect existing benchmarks and control points. Preserve permanent reference points during construction.
 4. Promptly report lost or destroyed reference points, benchmarks, or control points. Promptly report requirements relocate reference and control points due to changes in grades. Promptly replace lost or destroyed bounds or markers and control points based on the original survey control points utilizing the services of a professional land surveyor registered in the state where the Project is located. The cost of replacing markers disturbed by the Contractor's operations shall be at the Contractor's expense.
- ☐ See the **Specific Project Requirements and Procedures** for additional requirements.

D. Record Documents

1. Provide Record Documents in accordance with Paragraph 6.12 of the Standard General and Supplementary Conditions, if any, and in accordance with the **Payment and Administrative Procedures**.
2. Store Record Documents separate from documents used for construction. Record information concurrent with construction progress.

3. Legibly mark each item to record description of actual equipment and material installed and actual construction on approved submittals, including the following.
 - a. Manufacturer's name and equipment and material model and number
 - b. Material and equipment substitutions or alternates utilized
 - c. Approved changes
 - d. Measured depths of foundations
 - e. Measured horizontal and vertical locations of Underground Facilities and appurtenances, referenced to permanent surface improvements
 - f. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work
 - g. Field changes of dimension and detail
 - h. Details not on original Contract Documents or Shop Drawings

E. Cutting and Patching

1. Employ skilled and experienced personnel to perform cutting and patching.
2. Submit written request in advance of cutting or alteration which affects:
 - a. structural integrity of any element of Project;
 - b. integrity of weather exposed or moisture resistant elements;
 - c. efficiency, maintenance, or safety element;
 - d. safety, traffic, or hazard barriers;
 - e. visual qualities of sight exposed elements; and
 - f. work of Owner or separate contractor.
3. Execute cutting, fitting, and patching including excavation and fill to complete Work and to:
 - a. fit materials together, to integrate with other work;
 - b. uncover Work to install ill-timed Work;
 - c. remove and replace defective or non-conforming Work;

- d. remove Samples of installed Work for testing when requested; and
 - e. provide openings in element of Work for penetration of mechanical and electrical work.
- 4. Execute Work by methods to avoid damage to other work and which will provide appropriate surfaces to receive patching and finishing.
 - 5. Provide adequate temporary support for Work to be cut.
 - 6. Restore Work with new materials in accordance with requirements of Contract Documents. Use materials identical with original materials where recognized that satisfactory results can be produced.
 - 7. Provide protection from elements for areas which may be exposed by uncovering work.
 - 8. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit. Restore exposed finishes of patched areas; and, where necessary extend finish restoration onto retained adjoining Work in a manner, which will eliminate evidence of patching.
 - 9. Identify any Hazardous Waste, Hazardous Environmental Condition, or hazardous substance exposed during the Work to Owner for decision or remedy in accordance with Paragraph 4.06 of the Standard General and Supplementary Conditions, if any.
 - 10. Cut work by methods least likely to damage Work to be retained and work adjoining. Cut Work with sawing and grinding tools, not with hammering, chopping, or burning tools. Cut masonry and concrete materials with masonry saw or core drill. Do not use pneumatic tools without prior approval. Core drill openings through concrete Work. Adhere to mandatory cutback requirements when saw cutting concrete and roadway openings.
 - 11. Do not cut and patch structural Work in a manner resulting in reduction of load-carrying capacity or load/ deflection ratio.
 - 12. Fit Work tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces. Maintain supports to ensure structural integrity of the Work. Provide devices and methods to protect other portions of Project from damage and seal voids. For interior work at penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire resistant material, to full thickness of the penetrated element.

13. Do not cut and patch operational or safety-related components that reduce capacities to perform in manner intended. Do not cut and patch Work that reduces visual qualities. Remove and replace unsatisfactory cutting patching as directed by Engineer or Owner.

F. Electrolytic Corrosion Prevention

1. Prevent galvanic action, bimetallic corrosion, anodic or cathodic action, and electrolysis at all electrical grounds and for all galvanic scale (electromotive series or table of oxidation potentials). Do not allow contact of dissimilar metals further apart than 0.35 on the galvanic scale (electromotive series or table of oxidation potentials). The electrode potential of common metals is listed below.

	Electrode Potential Volts (Relative to Hydrogen)
Magnesium	+2.37
Aluminum	+1.70
Zinc+	+0.76
Chromium	+0.56
Iron and Steel	+0.44
Cadmium	+0.40
Nickel	+0.25
Tin	+0.14
Lead	+0.13
Copper	-0.34

2. Unless otherwise indicated, provide dielectric insulators between ferrous and nonferrous pipe and equipment.

G. Quality Assurance and Control of Installation

1. Monitor quality control of Subcontractors, Suppliers, manufacturers, material, equipment, services, Site conditions, and workmanship, to produce Work of specified quality. Conduct field quality control and testing specified.
2. Comply fully with manufacturers' installation instructions, including each step in sequence. If manufacturers' instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
3. 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.

4. Perform Work using persons qualified to produce workmanship of specified quality.
5. Install field Samples and mockups at the Site as required in Specifications for review. Acceptable Samples and mockups represent a quality level for the Work. Where field Sample or mockup is specified to be removed, clear area after field Sample or mockup has been accepted by Engineer or after Work is complete when mockup is to serve as a control reference.
6. Protect adjacent construction in accordance with Paragraph 6.13 of the Standard General and Supplementary Conditions, if any.

H. Manufacturers' Field Services

1. If required in the Specifications, arrange and pay for material or equipment Suppliers or manufacturers to provide qualified staff personnel (field representative) to perform the following services and services specified. Submit reports of activities, actions taken and test results to Engineer within 10 days of completion.
 - a. Observe Site conditions, conditions of surfaces and installation, quality of workmanship.
 - b. Report observations and Site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.
 - c. Assist with field assembly as required.
 - d. Furnish, setup, and operate required test equipment and facilities.
 - e. Perform and record results of manufacturer recommended inspections and tests, and tests specified for material and equipment.
 - f. Be responsible for protection of material and equipment and safety of all personnel during testing.
 - g. Perform any other services normally provided by field representative's company.
 - h. Instruct operating personnel in proper use of material and equipment.
 - i. Instruct and supervise field repairs before acceptance by Owner.

I. Independent Testing

1. Employ and pay for specified services of an independent firm in accordance with Paragraph 13.03 of the Standard General and Supplementary Conditions to perform inspection and testing as may be specified except where responsibility for a specific inspection or test is expressly allocated to Owner in the Specifications or by Laws and Regulations.
2. Reports will be submitted by the independent firm to Owner, in duplicate indicating observations and results of tests and indicating compliance or noncompliance with Contract Documents.
3. Inspection, testing, and source quality control may occur on or off the Project Site.
4. Cooperate with independent firm. Furnish samples of materials, design mix, equipment, tools, storage and assistance as requested.
5. Notify Owner and independent firm 24 hours before expected time for operations requiring services.
6. Make arrangements with independent firm and pay for additional Samples and tests required for Contractor's use.
7. Retesting required because of nonconformance to specified requirements will be performed by the same independent firm if instructed by Owner. Payment for retesting will be charged to Contractor by deducting inspection or testing charges from the Contract Price.
8. Testing or inspecting does not relieve Contractor from performing Work in accordance with requirements of the Contract Documents.

1.03 STARTUP, TESTING, AND COMMISSIONING

A. Spare Parts

1. Provide spare parts required for construction, startup, testing and commissioning of the Work prior to achievement of Substantial Completion, including spare parts for flushing and consumable supplies such as bolts, nuts, gaskets, filters, insulating tape, etc., normally consumed in the startup, commissioning and testing.
2. If spare parts are purchased by Owner, Contractor shall have the right to use the spare parts purchased by Owner provided that such spare parts are replaced prior to Substantial Completion at Contractor's expense. Replacement spare parts, replaced by Contractor, shall be new, unused and identical as the original spare part used.

B. Consumables

1. Provide initial fills of consumables including equipment lubricants, resins, chemicals, desiccants, and fuels. Provide subsequent fills if required during Warranty Period if acts or omissions of Contractor cause such consumables to require replacement.
2. Coordinate with Owner for consumables required.

C. Checkout and Starting Systems

1. Coordinate schedule for startup and operation of various equipment and systems with Owner.
2. Notify Owner 7 days before startup of each major piece of equipment or system, including a staffing request for Owner's operations and maintenance personnel required to adequately and safely support each specific start-up and operation activity.
3. Verify that each system or piece of equipment item has been assembled, constructed, or completed in accordance with the Contract and capable of functioning as intended.
4. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, magnetic center alignment, belt tension, control sequence, or other conditions which may cause damage.
5. Verify that each piece of equipment or system has successfully completed construction testing and cold commissioning, including hydrostatic testing, loop checks, relay checks, calibration, and continuity checks and that all tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
6. Verify wiring and support components for equipment are complete and tested.
7. Execute start up under supervision of responsible manufacturers' representative or Contractor's personnel in accordance with manufacturers' instructions utilizing Owner's qualified operations and maintenance staff trained by Contractor.
8. When specified in individual Specification Sections, require manufacturer to provide field representative to be present at Site to inspect, check and approve equipment or system installation before start up, and to supervise placing equipment or system in operation.

D. Adjusting and Balancing

1. Supply necessary equipment, material, construction power, and consumables (except for those provided by Owner) needed to startup and fully test the Work and replenish the same until Substantial Completion is achieved. Contractor may utilize Owner's operating spare parts, such use requiring timely replacement at Contractor's expense.
2. Coordinate as required for conduct of independent testing.
3. Perform specified and required adjusting and balancing concurrently to the maximum extent possible on individual equipment and systems and prior to startup and commissioning/performance testing.

E. Startup and Commissioning/Performance Testing

1. Conduct startup and commissioning/performance tests to demonstrate the Work meets the requirements of the Contract Documents, satisfies the Owner's requirements, and is in accordance with Paragraph 14.04. of the Standard General and Supplementary Conditions, if any. Conduct testing in accordance with
 - ☒ individual Specification sections.
 - ☐ the separate Startup, Commissioning, and Testing section.
 - ☐ the **Specific Project Requirements and Procedures**.
2. Prepare and submit a written startup and commissioning/performance testing procedures no later than 60 days prior to start of testing for review and final test procedures no later than 30 days prior to start of testing. Submit a staffing request for Owner's operations and maintenance personnel.
3. Calibrate test equipment and instrumentation on Site or provide acceptable certificate of calibration conducted within 30 days of testing.
4. Complete functional testing prior to initiating the startup and commissioning/performance testing as specified.
5. Complete specified startup and commissioning/performance tests prior to Substantial Completion. Owner and Engineer will witness Performance Testing. Notify Owner and Engineer in writing at least 7 days prior to starting any startup and commissioning/performance testing. Coordinate for witnessing of tests by required regulatory representatives.
6. Submit written test reports.

F. Demonstration and Training

1. Provide formal demonstration and training of Owner's personnel as specified in
 - ☒ individual Specification sections.
 - ☐ the separate Demonstration and Training section.
 - ☐ the **Specific Project Requirements and Procedures**.

END OF SECTION

SECTION 02 41 13

SELECTIVE SITE DEMOLITION

PART 1 – GENERAL

1.01 SUMMARY

- A. Section includes
 - 1. Perform selective demolition in accordance with this section.
- B. Demolition includes modification, removal, relocation, and disposal of items as shown on Drawings or as specified. This includes, but is not limited to, the following
 - 1. Demolition of above-grade and below-grade portions of structures as indicated on the Drawings, including but not limited to the bridge superstructure, fixtures, utilities, deck, girders, bearings, and any additional items associated with the existing bridge structure.
 - 2. Removal and replacement of utilities as required to accommodate new construction.
 - 3. All other demolition Work required to allow complete installation of the Project.

1.02 PRICE AND PAYMENT PROCEDURES

- A. Measurement and payment requirements: per Division 01 General Requirements.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Coordination, Sequencing, and Scheduling: per Division 01 General Requirements.

1.04 SUBMITTALS

- A. Submit in accordance with Division 01 General Requirements.
 - 1. Submit proposed methods and disposal Plans for demolition to Owner and Engineer for review prior to start of Work as specified.
 - 2. Submit schedule indicating proposed sequence of demolition to Owner and Engineer for review prior to start of Work. Include coordination for shutoff, capping, and continuation of utility services as required, together with details for dust and noise control protection.

3. Submit proper documentation that all lead based paint and Asbestos containing materials have been properly disposed of. Submit documentation to Owner and Engineer promptly after demolition of each structure.
- B. Closeout and Maintenance Material Submittals: per Division 01 General Requirements.

1.05 QUALITY ASSURANCE

- A. Provide in accordance with Division 01 General Requirements.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Provide in accordance with Division 01 General Requirements.

1.07 SITE CONDITIONS

- A. Existing Conditions: per Division 01 General Requirements.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 PREPARATION

- A. Provide interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of structure or element to the demolished and adjacent facilities or Work to remain.
- B. Stop demolition operations and notify Engineer immediately if safety of structure appears to be endangered. Take precautions to support structure until determination is made for continuing operations.
- C. Locate, identify, stub-off, and disconnect utility services that are not indicated to remain in accordance with Plans.

3.02 JOB CONDITIONS

- A. Contractor shall obtain all required permits for demolition.
- B. The Owner assumes no responsibility for actual condition of structures to be demolished.
 1. Conditions existing at time of inspection will be maintained by Owner in so far as practicable. However, variations within structure may occur by Owner's removal and salvage operations prior to start of demolition Work.
- C. Items must be removed from structure as Work progresses. Salvaged items must be transported from the Site as they are removed.

1. Coordinate with Owner before removing any items. Owner reserves the right to retain demolished items at a designated location on Site. Allow Owner to remove components from demolished items. Items Owner does not retain become property of Contractor and must be removed and disposed of properly.
- D. Use of explosives will not be permitted.
- E. Conduct demolition operations and removal of debris to ensure no interference with roads, streets, walks, and other adjacent occupied or used facilities. Do not close or obstruct streets, walks or other occupied or used facilities without permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways.
- F. Provide temporary barricades and other forms of protection to ensure safe passage of personnel around area of demolition. Conduct operations to prevent injury to adjacent buildings, structures, other facilities, and persons.
 1. Provide protective measures as required to provide free and safe passage of people.
 2. Provide interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of structure or element to the demolished and adjacent facilities or Work to remain.
 3. Remove protections at completion of Work.
- G. Promptly repair damages caused to adjacent structures and utilities by demolition operations at no cost to Owner.
- H. Use water sprinkling, temporary enclosures, and other suitable methods to limit dust and dirt rising, and scattering in air to lowest practical level. Comply with governing Regulations, permits, Laws, ordinances, etc.
- I. Upon completion of demolition of below-grade portions of buildings, notify the Owner and Engineer. Filling and backfilling operations shall not commence until a complete record of the plan and vertical limits of demolition has been documented by the Owner and Engineer.

3.03 DEMOLITION

- A. Perform selective demolition Work in a systematic manner. Use such methods as required to complete Work indicated on Drawings or as specified in accordance with demolition schedule and applicable Regulations.
- B. Provide services for effective air and water pollution controls; water sprinkling, temporary enclosures, and other suitable methods to limit dust and dirt rising and

scattering in air to lowest practical level. Comply with governing Regulations, permits, Laws, and ordinances pertaining to environmental protection.

- C. Completely fill below grade areas and voids resulting from demolition Work. Provide fill materials as shown on the Drawing or as specified in Section 31 00 00, Earthwork.
- D. Saw-cut asphalt and concrete paved surfaces before removal. Joint cut should be neat and straight.

3.04 SALAVAGED MATERIALS

- A. Where shown on the Drawings or specified as Salvage, Property of Owner, or Deliver to Owner, carefully remove indicated items, clean, store, and turn over to Owner in area designated by Engineer or Owner.
- B. Any unanticipated items of significant historic or commercial value discovered in the demolition Work shall remain the property of Owner. Contractor will have the option to take possession of all other demolition materials or to dispose of them suitably. No materials assigned to Contractor may remain on Site without written authorization from Engineer or Owner.

3.05 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove from Project Site, debris, rubbish, and other materials resulting from demolition operations. Do not remove from Project Site without prior permission by Owner or Engineer. Store all demolished materials that Owner wishes to retain at location designated by Owner or Engineer.
- B. Burning of removed materials from demolished structures will not be permitted on Site.
- C. Dispose of demolition debris in a lawful manner.
- D. Management of hazardous materials not specifically identified in this Specification shall be extra Work. This provision does not relieve Contractor of his responsibility to respond promptly and appropriately to indications of hazardous material.
- E. In the event that unanticipated hazardous materials are discovered or suspected, Contractor shall carry out suitable measures to minimize hazards and immediately report conditions to Engineer.

3.06 CLEAN-UP

- A. Contractor shall remove from the Site, all debris resulting from the demolition operations as it accumulates. Upon completion of the Work, all materials, equipment, waste, and debris of every sort shall be removed and premises shall be left, clean, neat, and orderly.

3.07 FIELD QUALITY CONTROL

- A. Provide in accordance with Division 01 General Requirements.

3.08 STARTUP & COMMISSIONING

- A. Provide in accordance with Division 01 General Requirements.

3.09 CLOSEOUT ACTIVITIES

- A. Provide in accordance with Division 01 General Requirements.

END OF SECTION

SECTION 03 41 01

PRECAST CONCRETE CULVERT

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:

1. Provide a precast concrete box structure with interior clear dimensions of 9.82' high, 17' long (flow direction) and 19.0' wide per precast manufacturer in accordance with this Section and the applicable reference standards listed in Article 1.03. ALL DIMENSIONS SHALL BE FIELD VERIFIED PRIOR TO FABRICATION.

1.02 PRICE AND PAYMENT PROCEDURES

- A. Measurement and payment requirements: per Division 01 General Requirements.

1.03 REFERENCES

A. Reference Standards

1. American Association of State Highway and Transportation Officials (AASHTO)
 - a. AASHTO HB-17 Standard Specifications for Highway Bridges
 - b. AASHTO T 111 Standard Method of Test for Mineral Matter or Ash in Asphalt Materials
2. ASTM International (ASTM)
 - a. ASTM A48/A48M Standard Specification for Gray Iron Castings
 - b. ASTM A615/A615M Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
 - c. ASTM A1064/1064M Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
 - d. ASTM C33/C33M Standard Specification for Concrete Aggregates
 - e. ASTM C144 Standard Specification for Aggregate for Masonry Mortar
 - f. ASTM C150/C150M Standard Specification for Portland Cement

- g. ASTM C207 Standard Specification for Hydrated Lime for Masonry Purposes
- h. ASTM C260/C260M Standard Specification for Air-Entraining Admixtures for Concrete
- i. ASTM C478 Standard Specification for Precast Reinforced Concrete Manhole Sections
- j. ASTM C494/C494M Standard Specification for Chemical Admixtures for Concrete
- k. ASTM C857 Standard Practice for Minimum Structural Design Loading for Underground Precast Concrete Utility Structures
- l. ASTM C890 Standard Practice for Minimum Structural Design Loading for Monolithic or Sectional Precast Concrete Water and Wastewater Structures
- m. ASTM C990 Standard Specification for Joints for Concrete Pipe, Manholes and Precast Box Sections Using Preformed Flexible Joint Sealants
- n. ASTM D113 Standard Test Method for Ductility of Bituminous Materials
- o. ASTM D1227 Standard Specification for Emulsified Asphalt Used as a Protective Coating for Roofing
- p. ASTM D217 Standard Test Methods for Cone Penetration of Lubricating Grease
- q. ASTM D4 Standard Test Method for Bitumen Content
- r. ASTM D6/D6M Loss on Heating of Oil and Asphaltic Compounds
- s. ASTM D71 Standard Test Method for Relative Density of Solid Pitch and Asphalt (Displacement Method)

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination, Sequencing, and Scheduling: per Division 01 General Requirements.

1.05 SUBMITTALS

- A. Submit in accordance with the Division 01 General Requirements.
- B. Shop Drawings
 - 1. Precast Concrete Structures, including construction details, dimensions, reinforcement, placement, openings, wing walls/head walls, anchoring, cut off walls, etc.
- C. Product Data

1. Joint Sealant
 2. Anchorage Hardware
 3. Any other appurtenant data.
- D. Design Data
1. Structural design calculations sealed by a professional Engineer registered in the Project state, and submitted a minimum of 2 weeks prior to scheduled manufacture. These will be reviewed for consistency with Project intent. The Engineer who seals the calculations and Shop Drawings shall be responsible for the design.
- E. Closeout and Maintenance Material Submittals: per Division 01 General Requirements.

1.06 QUALITY ASSURANCE

- A. Provide in accordance with Division 01 General Requirements.
- B. The materials covered by this Specification are intended to be standard materials of proven ability as manufactured by reputable concerns. Materials shall be designed and constructed in accordance with Industry Practice, and shall be installed in accordance with the manufacturer's recommendations. The Specifications call attention to certain features, but do not purport to cover all details entering into the construction of the materials.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Provide in accordance with Division 01 General Requirements.
- B. Products shall be shipped, stored, and handled in a manner consistent with the written recommendations of the manufacturer so as not to degrade quality, serviceability, and appearance. Any unit found to be defective, either before or after installation, shall be removed from the Project Site and replaced with a sound unit.

1.08 SITE CONDITIONS

- A. Existing Conditions: per Division 01 General Requirements.

1.09 SITE CONDITIONS

- A. Existing Conditions: per Division 01 General Requirements.

PART 2 – PRODUCTS (NOT USED)

2.01 PRECAST CONCRETE STRUCTURES

A. General

1. Precast structures shall have the inside dimensions as shown on the Drawings. Interior dimensions of the boxed culvert shall be 9.82' high, 17' long (direction of flow) and 19.0' wide clear.
2. Each culvert section shall be monolithically cast, with metal or metal faced forms, as a three-sided box section with open ends. The inside surfaces of the culvert shall be smooth with 45° chamfered fillets monolithically cast in all inside corners. The quality of materials, the process of manufacture and the finished box sections shall be subject to inspection by the Engineer.
3. Where required, preformed joint filler shall be glued to the concrete surface by means of an adhesive in accordance with the manufacturer's recommendations. The adhesive shall be in accordance with AASHTO-M220.
4. All areas indicated in the drawings (including boxed culvert connection to existing retaining wall) to be grouted shall be made with a non-shrinking, nonmetallic grout. The concrete surface shall be cleaned and roughened; and then shall be kept continuously moist for 24 hours immediately prior to the application of grout to prevent flash setting. Grout shall be kept moist for a period of seven days.
5. Non-shrink grout for filling the voids between the opening in the precast box culvert section and fastening systems for curtain walls and copings shall be "Non-Corrosive Five Star Grout", made by U.S. Grout Corp., Old Greenwich Connecticut; Master Flow 713 grout made by Master Builders, Cleveland, Ohio; F-100 Grout made by Sauereisen Cements Co., Pittsburgh, Pennsylvania; Upcon made by Upco Co., Cleveland, Ohio. or an approved equal.

B. Precast Materials

1. Concrete
 - a. Concrete compressive strength shall be 5,000 psi after 28 days.
 - b. Minimum concrete thickness shall be 6 inches.
 - c. Portland cement shall be Type II conforming to ASTM C150/C150M.
 - d. Fine aggregate shall consist of natural sand conforming to ASTM C33/C33M.

- e. Coarse aggregate shall consist of 1/2-inch maximum, well-graded crushed stone conforming to ASTM C33/C33M.
 - f. Air entrainment admixture shall conform to ASTM C260/C260M. The air-entrained content shall be not less than 4 percent or greater than 7 percent.
 - g. A super plasticizer shall be used and shall conform to ASTM C494/C494M Type F. Concrete shall be placed at a slump of between 5 and 8 inches.
- 2. Reinforcement
 - a. Wire fabric shall conform to the requirements of ASTM A1064/1064M.
 - b. Reinforcing bars shall be new billet steel, deformed, conforming to the requirements of ASTM A615/A615M, Grade 60.
 - c. Minimum clear concrete cover to reinforcement shall be 1-1/2 inches.
- C. Design Loads
 - 1. Vehicle Loads
 - a. Except as otherwise specified, the design shall meet the requirements of AASHTO HB-17, including a HL-93 vehicle load.
 - b. A lateral vehicle surcharge load of 125 psf shall be applied.
 - 2. Lateral Pressure
 - a. The equivalent lateral fluid pressure shall be 100 psf/lf below flood or design groundwater elevation, and 60 psf/lf above such elevation. The specified lateral vehicle surcharge load shall be added to this load.
 - 3. Water & Wastewater Structures Design Load
 - a. Except where higher loads are specified, water and wastewater structures shall be designed for the loads prescribed in ASTM C890.
 - 4. Utility Structures Design Load
 - a. Except where higher loads are specified, utility structures shall be designed for the loads prescribed in ASTM C857.
- D. Joints
 - 1. Concrete sections shall be provided with bell and spigot, or tongue-in-groove ends to ensure proper connection of the joints.

2. Each joint shall be sealed with a butyl rubber sealant. A compatible primer shall be applied as recommended by the manufacturer. Sealant shall be Conseal CS-102 (CS-202 when the temperature during installation is less than 30 degrees F) by Concrete Sealants, Inc., Kent Seal #2 by Hamilton Kent, Pro-Stik by Press-Seal Gasket Corporation, or approved equal, and shall be applied in accordance with the manufacturer's recommendations. Sealant properties shall be as follows
 - a. AASHTO T 111: 30 percent minimum ash content
 - b. ASTM C990
 - c. ASTM D4: 50 percent minimum hydrocarbon content
 - d. ASTM D6/D6M: 2 percent maximum volatile matter
 - e. ASTM D71: specific gravity between 1.15 - 1.50
 - f. ASTM D113: 5.0 minimum
 - g. ASTM D217: 55-100 mm at 77 degrees F
 - h. FED SS-S-210A: No deterioration, no cracking and no swelling after 30 days immersion in 5 percent solutions of HCl, H₂SO₄, NaOH, KOH, and H₂S.

2.02 DAMPPROOFING

- A. Dampproofing shall be Hydrocide 700 Mastic as made by Sonneborn, Karnak 920 Anti Hydro Mastic Emulsion, or approved equal, conforming to ASTM D 1227.

2.03 ANCHORAGE HARDWARE

- A. Hardware for fastening the precast structure to fasten precast segments together for buoyancy shall be stainless steel.

2.04 SOURCE QUALITY CONTROL

- A. Provide in accordance with Division 01 General Requirements.

PART 3 – EXECUTION

3.01 PRECAST STRUCTURES

- A. Precast structures shall be installed as shown on the Drawings. Precast sections shall be installed so that the entire structure is vertically plumb and aligned, and when not so, shall be removed and replaced. All erection holes shall be filled solid with non-shrink grout. The Contractor shall furnish and use suitable slings, hooks, and cables for the proper handling of the sections. All anchoring and fastening devices shall be provided by the Manufacturer for the proper and satisfactory installation of the units.

- B. The manufacturer shall supply all specific lifting devices for each piece to the successful installation contractor if needed on a temporary basis. The specific lifting devices shall be returned with the manufacturer representative that oversees the installation work for compliance.
- C. No cracked, warped, or broken units, or units which, in the opinion of the Owner or Engineer, show defects that might adversely affect the serviceability of the units, shall be used in the work. Defective units shall be removed from the site and shall be replaced by the Manufacturer with new and sound units at no additional expense to the Owner. Any additional costs associated with replacement of units as described in this section shall be the manufacturers responsibility to pay all costs associated with replacement of said units.
- D. Joints between precast sections and units shall be made in an approved manner to guarantee a leak-proof, watertight joint. Joint designs incorporating O-rings and cement grout will not be accepted. Joint filler shall be provided as required and joint sealant shall be installed on both the interior and exterior sides of the joints. The joints between all units shall be covered with a preformed sheet membrane, in accordance with Section M9.08.0 of the MHD Standard Specifications.
- E. Where patching is permitted by the Owner and Engineer, the patches shall be made using the same material as used in the unit being patched and using a 2-part epoxy compound of a type to produce a proper bonding of the patch to the units.
- F. Patching required due to damage during offloading staging or installation shall be responsibility of the Contractor.
- G. Patching of imperfections at the plant by the Manufacturer shall require the Owner's and Engineer's approval before the unit is shipped from the manufacturer's plant.
- H. The engineer reserves the right to reject any precast sections and the rejected units shall be tagged and removed from the site immediately. The engineer may also require testing of concrete.
- I. Packing, Shipping, Handling, and Unloading:
 - 1. Provide that each shipment of precast concrete headwalls and culverts includes manufacturers' Certificate of Conformance.
 - 2. Inspect upon delivery and reject pipe immediately that does not conform to the specified requirements or has been damaged beyond repair and immediately remove from Site.
- J. The manufacturer shall furnish at no additional expense to the Owner, the services of the respective manufacturer's representatives of the precast concrete units, for such lengths of time as may be necessary to properly instruct the Contractor's

personnel in the proper handling, installation, and jointing of the precast concrete units in accordance with the printed recommendations of the manufacturer. The manufacturer shall witness the complete installation of the box culverts, headwalls and certify they have been installed in accordance with the manufactures recommendations for the supplied products and ancillary items.

- K. All precast concrete units shall be stored, handled, protected and delivered by the manufacturer to be installed and unloaded by the Contractor. The manufacturer shall be present to verify that all supplied units are installed in accordance with the printed recommendations of the manufacturer and in a manner to prevent overstressing, marring or damaging of the units. The manufacturer shall provide a written affidavit that they witnessed and approved the installation means and methods according to the manufactures recommendations
- L. The Contractor shall be responsible for any damage to the existing utilities and properties adjacent to the proposed headwalls and culvert. Such damages shall be repaired by the Contractor to the satisfaction of the Engineer at no additional cost.
- M. The Contractor shall be responsible for protecting the precast culverts against flotation or uplift during construction and shall be designed for buoyance resistance.
- N. The precast concrete culvert section shall be shipped, handled, and installed in accordance with the manufacturer's recommendations. Unless otherwise directed by the Engineer, all precast concrete culvert sections shall be installed in bedding material in accordance with the details as shown in the plans and in conformance with these specifications. The precast concrete box culverts shall be placed in the dry.

3.02 APPLICATION OF DAMPPROOFING

- A. Application of dampproofing shall be in accordance with the manufacturer's recommendations.
- B. Application shall not be permitted in spaces exposed to inclement weather or when air temperatures are below 40 degrees F, or are expected to go below 40 degrees F within 24 hours after application.
- C. Apply dampproofing at a rate of 4 to 6 gallons per 100 square feet. If applying 2 coats, each coat shall be 2 to 3 gallons per 100 square feet. First coat must be allowed to dry prior to the application of the second coat. Coating must be continuous and free from breaks and pinholes.

3.03 FIELD QUALITY CONTROL

- A. Provide in accordance with Division 01 General Requirements.

3.04 CLOSEOUT ACTIVITIES

- A. Provide in accordance with Division 01 General Requirements.

3.05 CLEANING

- A. A. Upon completion of all construction, and prior to final acceptance, all debris shall be removed from precast structures.

END OF SECTION

SECTION 31 00 00

EARTHWORK

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes

1. Excavating, filling, backfilling, stockpiling, bedding, compacting, grading, hauling, disposal of on-Site soils, processing of on-Site soils for reuse, testing of soils, engaging an independent Geotechnical Testing Agency to perform required quality assurance/quality control inspection and testing, protection and other Work necessary for construction of structures, subsurface structures, foundations, pavements, earthen embankments and appurtenant Work in accordance with this Section and applicable reference standards listed in Article 1.03.

B. Related Requirements

1. Section 01 50 00 – Temporary Facilities and Controls
2. Section 31 25 00 – Erosion and Sedimentation Controls
3. Section 31 32 19 – Geotextiles
4. Section 31 50 00 – Excavation Support and Protection

1.02 PRICE AND PAYMENT PROCEDURES

- A. Measurement and payment requirements:** per Division 01 General Requirements.

1.03 REFERENCES

A. Reference Standards

1. American Association of State Highway and Transportation Officials (AASHTO)
 - a. AASHTO M 85 Standard Specification for Portland Cement
 - b. AASHTO M 295 Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
 - c. AASHTO T 11 Standard Specification for Materials Finer Than 75-Micrometer (No. 200) Sieve in Mineral Aggregates by Washing

- d. AASHTO T 27 Standard Method of Test for Sieve Analysis of Fine and Coarse Aggregates
- e. AASHTO T 96 Standard Method of Test for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
- 2. ASTM International (ASTM)
 - a. ASTM C131 Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
 - b. ASTM D422 Standard Test Method for Particle-Size Analysis of Soils
 - c. ASTM D698 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft³ (600 kN-m/m³))
 - d. ASTM D1556 Density and Unit Weight of Soil in Place by the Sand-Cone Method
 - e. ASTM D1557 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort
 - f. ASTM D2167 Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method
 - g. ASTM D2487 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
 - h. ASTM D2922 Density of Soil and Soil Aggregate in Place by Nuclear Methods (Shallow Depth)
 - i. ASTM D2937 Standard Test Method for Density of Soil in Place by the Drive-Cylinder Method
 - j. ASTM D3017 Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)
 - k. ASTM D3740 Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
 - l. ASTM D6938 Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
 - m. ASTM E329 Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection
 - n. ASTM C131 / AASHTO T-96 (Los Angeles Abrasion Test)
- 3. Maine DOT Standard Specifications

B. Definitions

1. Unsuitable material: soft clay or silt, organic clays or silts, peats, debris, concrete, pavement, stones or boulders over 6 inches in diameter, wet or frozen material, and material deemed unsuitable by Owner or Engineer that will not provide suitable foundation or structural support for pipe and associated drainage structures, buildings, or other structures, and is unsuitable for use in backfill.
2. On-Site material: suitable material from on-Site excavation.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination, Sequencing, and Scheduling: per Division 01 General Requirements.

1. Pre-installation conference: conduct at Project Site at least 30 days prior to start of Work.
 - a. Required attendees: Owner and Engineer, Owner's independent testing firm and geotechnical consultant, Contractor's Superintendent, Support of Excavation (SOE) Installer, Dewatering Installer and Contractor's independent testing firm
 - b. Review methods and procedures related to earthmoving including, but not limited to, the following.
 - 1) Work hours
 - 2) Personnel and equipment needed to maintain proposed construction schedule and avoid delays
 - 3) Work procedures
 - 4) Establishing and maintaining Site access
 - 5) Coordination of Work with utility locator service
 - 6) Stockpiling area and temporary access points
 - 7) Site logistics for hauling and stockpiling
 - 8) Coordination of Work and equipment movement with support of excavation systems installation
 - 9) Construction phasing, anticipated daily and weekly progress and conformance to construction schedule
 - 10) Methodology for field quality control

2. Make provisions for observations and testing of Work by Owner's independent testing and inspection agency and geotechnical consultant.

1.05 SUBMITTALS

- A. Submit in accordance with Division 01 General Requirements.
- B. Product Data
 1. Provide for each on-Site and borrow soil material or aggregate
 - a. Name of each material Supplier, specific type and source of each material
 - b. Bills of Lading documenting materials source, including Supplier name and relationship to source, location where materials were obtained; including street, town, lot and block, country and state. Include present and past usage of source Site.
 - c. Supplier's statement that material is not contaminated and is free of extraneous debris or solid waste, and description of steps taken to confirm
 - d. Product weight shipping tickets certified by Supplier
- C. Certificates
 1. Certification stating materials are virgin materials from a commercial or non-commercial source.
- D. Design Data/Submittals
 1. Materials gradation
- E. Source and Field Quality Control Submittals
 1. Field compaction testing
 2. Material testing reports for each on-Site and borrow soil material proposed for fill and backfill in accordance with ASTM D2487
 3. Laboratory compaction curve in accordance with ASTM D1557
 4. Backfill moisture-density relationships
 5. Submit daily field reports documenting earthwork activity and field-testing for each day. At minimum, reports shall include
 - a. Description of day's activities

- b. Results of in-place density testing including in-place dry density, moisture content, percent compaction, elevation of test and description of soil
 - c. Sketch indicating extent of each day's Work and location of testing
- F. Qualification Statements
 - 1. Contractor's independent testing agency, qualified for testing specified in ASTM E329 and ASTM D3740.
- G. Closeout and Maintenance Material Submittals: per Division 01 General Requirements.

1.06 QUALITY ASSURANCE

- A. Provide in accordance with Division 01 General Requirements.
- B. Qualifications: per Division 01 General Requirements and as follows for geotechnical testing.
 - 1. Geotechnical testing agency to monitor earthwork: qualified per ASTM 329 and ASTM D3740.
- C. Independent Testing
 - 1. Minimum of 50 pounds of material in an airtight container to testing laboratory.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Provide in accordance with Division 01 General Requirements.
- B. Waste Management and Disposal
 - 1. Legally dispose of excess or unsuitable material.

1.08 SITE CONDITIONS

- A. Existing Conditions: per Division 01 General Requirements.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. General
 - 1. Obtain approval of Owner and Engineer for changes in material sources.

2. Off-Site sources of materials and testing of materials to verify compliance with Specifications may be inspected by Owner.
- B. All materials utilized for this Project shall be obtained from a source that has been licensed or permitted for such use by local and state authorities. The Contractor shall be required to submit evidence of such if requested.
1. Suitable materials: Suitable soil materials are defined as those complying with ASTM D2487 soil classification groups GW, SM, SW, and SP.
 2. Unsuitable materials: Materials containing excessive amounts of water, clay, vegetation, organic matter, debris, pavement, stones, or boulders over 6 inches in greatest dimension, frozen material, and material, which, in the opinion of the Engineer, will not provide a suitable foundation or subgrade.
 3. On-site material: Any suitable material from on-site excavation. Material for embankments and general Site fills outside of the building envelope may contain pieces of excavated ledge having a greatest dimension of up to 6 inches, unless otherwise approved by Engineer. All excess suitable on-site material must be used before additional material from off-site is used.
 4. Inspection: The Engineer may inspect off-site sources of materials and order tests of these materials to verify compliance with these Specifications.
 5. Sieve Analysis: Submit sieve analysis in accordance with ASTM D 6913 for all materials prior to start of construction.
- C. Aggregate Base/Base Gravel:
1. For Pavement: gravel base for pavement shall be sand or gravel of hard durable particles free from vegetable matter, lumps or balls of clay and other deleterious substances meeting the requirements of 2014 Maine Dot Standard Specifications 703.06a Aggregate for Base Type B.
 2. Compacted base gravel below sidewalks, should be crushed sand and gravel meeting the requirements of 2014 MaineDOT Standard Specification 703.06a Aggregate for Base - Type B.
- D. Compacted Granular Fill (CGF): Aggregate for Compacted Granular Fill shall be sand or gravel of hard durable particles free from vegetable matter, lumps or balls of clay and other deleterious substances meeting the requirements of 2014 MaineDOT Standard Specification 703.06c Aggregate for Subbase Type D. Use CGF within the Zone of Influence of footings and beneath building slabs.
- E. Crushed stone: 3/4-inch sized, durable, clean angular rock fragments obtained by breaking and crushing rock, free of ice, snow, sand, silt, clay, loam, shale, or other deleterious matter.

Sieve analysis by weight

Sieve Size	Percent Passing by Weight
1-inch	100
3/4-inch	90-100
1/2-inch	10- 50
3/8-inch	0- 20
#4	0-5

- F. Sand: clean inert, hard, durable grains of quartz or other hard durable rock, free from loam or clay, surface coatings and deleterious materials.

Sieve analysis by weight

Sieve Size	Percent Passing by Weight
3/8-inch	100
#4	95-100
#16	50-85
#50	10-30
#100	2-10
#200	0-3

- G. Granular borrow: materials consisting of a mixture of sand, gravel and silt or reclaimed asphalt, concrete, brick, crushed rock that is crushed and blended with sand to create a compactable fill meeting the following gradation:

Sieve analysis by weight

Sieve Size	Percent Passing by Weight
6 inch	100
1/4" inch	25-90
# 40	0-50
# 200	0-20

- H. Refill material: 3/4-inch crushed stone for below grade or rock excavation unless otherwise directed.
- I. Common fill: friable material with no objects greater than 6 inches in diameter, no more than 30 percent by weight finer than No. 200 sieve, free from ice, snow, roots, sod, rubbish and other deleterious or organic matter. Excavated material from on-Site sources meeting these Specifications may be used for common fill.

- J. Compacted structural fill: suitable bank run sand and gravel, free of clay, organic material, snow, ice, or other unsuitable materials, well-graded.

Sieve Designation	Percent Passing by Weight
3 inch	100
#4	30-90
#40	10-50
#200	0-8

- K. Riprap stone: sound, durable rock that will not disintegrate due to exposure to water or weather, angular in shape such as rough, unhewn quarry stone or fragments obtained by blasting, breaking or crushing natural rock. Do not use rounded boulders or cobbles; flat, platy stones; shale or slate rock with its largest length dimension 3 times greater than its shortest dimension.

1. Riprap gradation: stone size corresponding to inch dimension indicated on Drawings. D₅₀ stone size represents 50 percent of stone passing D₅₀ dimension sieve screen. D₂₀ stone size, 20 percent passing: 1/2 D₅₀ dimension. Maximum size limit: D₁₀₀: twice the D₅₀ stone size dimension.

- L. Underdrain Sand: Free draining sand enveloping underdrain pipes should be clean sand meeting the requirements of 2014 MaineDOT Standard Specification 703.22 Underdrain Backfill Material - Type B.

- M. Ballast Stone: Ballast stone shall meet MaineDOT Standard Specification 703.31, and shall be obtained from rock of uniform quality and shall consist of clean, angular fragments of quarried rock, free from soft disintegrated pieces or other objectionable matter. The stone, which shall be similar to railroad ballast, shall meet the following gradation requirements:

Sieve Designation	Percent Passing by Weight
2 ½ inch	100
2 inch	95-100
1 inch	0-30
¾ inch	0-5

2.02 SOURCE QUALITY CONTROL

- A. Provide in accordance with Division 01 General Requirements.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Verification of Conditions
 - 1. Check and verify governing dimensions and elevations before starting Work. Survey condition of adjoining properties with Engineer. Take digital video recording of any prior settlement or cracking of structures, pavements and other improvements. Provide list of damages, verified and signed by Contractor and Engineer.
 - 2. Coordinate survey. Establish exact elevations at fixed points to act as benchmarks. Identify benchmarks and record existing elevations. Locate datum level used to establish benchmark elevations so it will not be affected by excavation operations.

3.02 PROTECTION

- A. Protect structures, utilities, sidewalks, pavements and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.
- B. Protect and maintain erosion and sedimentation controls during earth moving operations.
- C. Provide protective insulating materials to protect subgrades and foundation soils against freezing temperatures or frost. Remove temporary protection before continuing Work.
- D. Prevent surface water and groundwater from entering excavations, ponding on prepared subgrades, and flooding Project Site and surrounding area.
- E. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
 - 1. Excavation will occur below water level. Complete Work in-the-dry to maintain undisturbed condition of bearing soil.
 - 2. Reroute surface water runoff away from excavated area. Do not allow water to accumulate in excavations to ensure bottoms and sides of excavations remain firm and stable throughout construction operations. Do not use excavated trenches as temporary drainage ditches.
 - 3. Install a dewatering system in accordance with Section 01 50 00 to keep subgrades dry and convey groundwater away from excavations. Maintain until dewatering is no longer required.

4. Recharge water from excavations on-Site avoiding injury to public health, public and private property, existing Work, Work to be completed or in progress, roads, walks and streets, or causing any interference with the public.
5. Do not place concrete or fill in excavations containing free water.

3.03 GENERAL EXCAVATION

- A. Ensure sequence of excavation operations provides efficient use of excavated materials into embankments and minimum use of borrow.
- B. Dispose of excavated materials including unsatisfactory soil materials, cobbles, boulders, and obstructions and replace with suitable backfill materials. Urban fill may be screened to remove unsatisfactory material, and used requirements of suitable backfill are met.
- C. Remove and legally dispose of pavements, curbing and other obstructions visible on ground surface, underground structures and utilities indicated to be demolished and removed, and other materials encountered that are not classified as rock excavation or unauthorized excavation. Legally dispose of surplus materials resulting from excavation not needed for use on Project as determined by Engineer. Obtain necessary permits for legal disposal of surplus material.
- D. Unclassified excavation: excavating to subgrade elevations regardless of surface and subsurface conditions.
- E. Classified excavation: excavating to subgrade elevations. Material excavated: classified as earth and rock. Do not excavate rock until it has been classified and cross sectioned by Engineer.
 1. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; together with soil, boulders, and other materials not classified as rock or unauthorized excavation.
 2. Rock excavation includes removal and disposal of rock. Remove rock to lines and subgrade elevations indicated to permit installation of permanent construction without exceeding the following dimensions.
 - a. 24 inches outside of concrete forms other than at footings
 - b. 12 inches outside of concrete forms at footings
 - c. 6 inches outside of minimum required dimensions of concrete cast against grade
 - d. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments

- 1) 6 inches beneath bottom of concrete slabs-on-grade
 - 2) 6 inches beneath pipe in trenches, and the greater of 24 inches wider than pipe or 42 inches wide
- F. Remove materials encountered to limits shown on Drawings, as specified or required.
- G. Do not perform excavation below normal grade to remove and replace unsuitable materials until approved by Engineer.
- H. Unauthorized excavation: removal of materials beyond indicated subgrade elevations or dimensions without specific direction.
1. Refilling Unauthorized Excavation
 - a. Trenches: use 3/4-inch crushed stone or compacted structural fill and stabilization fabric as separator material as directed.
 - b. Backfill and compact unauthorized excavations as specified for authorized excavations, of same classification, unless otherwise directed.
 - c. Excavation below normal grade
 - 1) Notify Engineer to observe conditions when excavation has reached required subgrade elevations. Carry excavations deeper and replace excavated material with compacted structural fill or crushed stone if unsuitable materials are encountered at required subgrade elevations as directed.
 2. Excavation Above Normal Grade
 - a. Remove from Site and dispose of legally if unsuitable materials are encountered above normal grade. Do not use unsuitable materials as backfill on any portion of Project unless approved.
 - b. Use approved suitable stockpiled material to replace unsuitable material to backfill trenches to dimensions for pipe and structure bedding and backfill as shown on Drawings. Use gravel borrow to complete trench backfills to elevation shown for pipe and structure backfill if suitable stockpile material is not sufficient to backfill trenches to required dimensions.
- I. Material Storage
1. Stockpile and maintain suitable surplus excavated materials for re-use without impacting adjacent properties. Provide adequate stabilization and erosion and sedimentation controls as necessary.

3.04 EXCAVATION IN ASPHALT PAVEMENT AREAS

- A. Saw cut or mill to full depth through existing pavement for pipe or structure placement prior to excavation. Minimize disturbance of remaining pavement.
- B. Use shoring and bracing where sides of excavation will not stand without undermining pavement.
- C. Remove and legally dispose of existing pavements during course of Work. Avoid mixing existing pavement material with excavation material intended for backfill.

3.05 EXCAVATION FOR TRENCHES

- A. Excavate to widths shown on Drawings.
- B. Produce an evenly graded flat trench bottom at subgrade elevation required for installation of pipe and bedding material.
- C. Load excavated material directly into trucks unless otherwise approved.
- D. Place backfill material directly into trench or excavation. Do not stockpile material to be used as backfill in traffic areas.

3.06 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within tolerance of plus or minus 1 inch. Extend excavations sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and inspections.
 - 1. Excavate footings, foundations, and structures to final grade by hand just before concrete reinforcement placement. Do not disturb bottom of excavation. Trim bottoms to required lines and grades to leave solid base to receive other Work.
 - 2. Do not excavate to final subgrade level until geotextile and compacted structural fill or crushed stone layer can be placed immediately to avoid softening or deterioration of formation. Leave a minimum depth of 3 feet overlying the final subgrade level in place where geotextile and compacted structural fill or crushed stone layer are not immediately placed.
 - 3. Do not allow trafficking on final subgrade or upper surface of crushed stone layer without prior placement of approved sacrificial haulage layer.
- B. Approval of Subgrade
 - 1. Notify Engineer when excavations have reached required subgrade. Remove last 6 inches just prior to inspection.

2. Clear subgrade of soft, spongy or other material unsuitable for founding. Continue excavation and replace with compacted structural fill as directed if independent inspection and testing agency or geotechnical consultant determines presence of unsatisfactory soil.
 3. Finished subgrade tolerance: plus or minus 1 inch.
 4. Seal subgrade and protect from degradation.
 5. Re-compact exposed surfaces prior to placing compacted structural fill or constructing foundations in accordance with Article 3.11, with a minimum 4 passes with double-drum vibratory roller compactor following excavation to foundation bearing levels in natural soils, using Bomag BW 60 S or similar. Engineer may waive re-compaction if integrity of subgrade soils is compromised. Do not proof-roll wet or saturated subgrades.
 6. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water or construction activities affecting final subgrade.
 7. Seal formations within 4 hours of inspection with specified geotextile and compacted structural or crushed stone fill.
 8. Install geotextiles in accordance with Section 31 32 19.
 9. Protect formations from loosening by trafficking or resulting from high groundwater table.
- C. Provide monitoring of geotechnical instrumentation against predefined target performance values.

3.07 PROCESSING OF ON-SITE URBAN FILL USED FOR BACKFILL

- A. NOT APPLICABLE

3.08 ROCK REMOVAL

- A. Notify Engineer immediately of change in classification. Expose bedrock surface to allow Engineer to perform an elevation survey and take cross-sectional measurements if bedrock is encountered above trench bottom grade or above subgrade elevation.
- B. Perform rock excavation by mechanical methods only. Do not blast.
- C. Remove or partially remove boulders exposed on sides or bottom of excavations as directed. Remove boulders to
1. minimum 2 feet outside structure walls

2. minimum 12 inches outside footings
 3. minimum 6 inches below under-slab subgrade
 4. minimum lateral trench width line limits indicated
 5. minimum 12 inches below underside of pipes
- D. Refill depressions resulting from removal of boulders and rock with approved compacted bedding.
- E. Refill unauthorized rock excavations, or excavations made beyond or below indicated or directed excavation limits, with compacted bedding.
- F. Remove and legally dispose of unused rock and boulders off-Site.
- G. Remove and legally dispose of residual solids to limits shown on Drawings, as specified, or needed to complete Project in accordance with Laws and Regulations.

3.09 SHORING AND BRACING

- A. Provide in accordance with Section 31 50 00.

3.10 BACKFILL AND FILL

- A. General
1. Suspend operations when weather conditions are unsatisfactory for placing backfill and avoid disturbing placed material and approved excavations.
 2. Remove and replace excavation or material previously placed that have softened or eroded, soft and yielding material, or other unsuitable or damaged areas with compacted backfill as specified.
 3. Do not backfill excavations and trenches until new utilities and structures have been inspected and tested satisfactorily for conformance with Drawings and Specifications unless directed. Place soil material in layers to required elevations as shown on Drawings or specified. Fill, backfill, and compact in accordance with this Section to produce minimum subsequent settlement of material. Provide support for surface treatment or structure to be placed on material. Place material in approximately horizontal layers beginning at lowest area, maintaining drainage. Replace frozen or saturated fill in stockpiles with suitable off-Site fill.
- B. Provide compacted structural fill or backfill for structure, placed beneath the structures' foundations and slabs-on-grade where unsuitable soil has been over excavated below design subgrades, and against below grade walls.

- C. Do not reuse excess excavated on-Site soils as compacted structural fill below foundations.
- D. Ground Surface Preparation
 - 1. Remove asphalt and concrete pavements, granular base course, existing sandy and gravelly fills, existing organic silty clay soils, organic peat, vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface to excavation subgrade prior to placement of fills.
 - 2. When existing ground surface has a density less than specified for a particular area classification, break up ground surface, pulverize, moisture-condition to optimum moisture content, and compact to required depth and percentage of maximum density.
- E. Placement
 - 1. Place backfill and fill materials in layers of maximum 6 inches in loose depth for material compacted by heavy compaction equipment or hand-operated tampers. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
 - 2. Place backfill and fill materials evenly, adjacent to structures, to required elevations. Prevent wedging action of backfill against structures by carrying material uniformly around structure to approximately same elevation in each lift.
 - 3. Do not allow heavy machinery within 5 feet of structure during backfilling and compacting.
- F. Backfilling Excavations
 - 1. Backfill excavations promptly as Work permits and after completion of the following.
 - a. Inspection and recording locations of underground utilities and structures
 - b. Removal of concrete formwork
 - c. Removal of shoring and bracing, and backfilling of voids with satisfactory materials
 - d. Removal of trash and debris
 - 2. Provide that 3/4 inch crushed stone backfill stands at its own angle of repose. Do not haunch or form with common fill.
- G. Backfilling Trenches

1. Place pipe and structure bedding, and gravel bedding to extent and dimensions shown on Drawings so pipes and structures have complete and uniform bearing.
2. Grade, compact, and shape pipe and structure bedding so full length of pipe barrel has complete and uniform bearing. Dig bell holes and depressions for joints after bedding has been graded and compacted, at proper clearance for jointing pipes.
3. Carefully hand place and compact additional approved bedding to limits shown on Drawings following inspection and approval of pipe installation by Engineer. Perform hand or mechanical tamping on sides of pipe.
4. Place 6 inches of suitable backfill with stones a maximum of 3 inches in diameter in trenches above pipe crown; 6 inches above crown of highest pipe around structures and up to underside of pavement. Spread in layers of maximum 6 inches in loose thickness and compact in accordance with Article 3.11, and each layer by minimum 4 passes with approved vibratory compactor. Avoid disturbance of Work and existing structures. Adjust moisture content of backfill for proper compaction.
5. Bed pipe in 3/4-inch crushed stone pipe and structure bedding as shown on Drawings. Remaining trench backfill: as shown on Drawings.
6. Restore surface of trenches in cross-country runs to pre-existing conditions as shown on Drawings, mounding trench 6 inches above existing grade or as directed.

H. Earthen Embankment Fill

1. Strip organic topsoil, trees, shrubs and roots of other vegetation along length and breadth of areas having fill material placed on top. Fill depressions left by grubbing and stripping with same type material and compact to a density at least equal to surrounding foundation material.
2. Replace unsuitable soil with compacted fill material identified by independent inspection and testing agency or Engineer.
3. Proof roll subgrades as directed prior to placement of fill. Excavate soft areas and replace with appropriate compacted fill.
4. Do not place embankment over porous, wet, frozen, or spongy subgrade or previous embankment surfaces. Excavate and remove unsuitable material prior to placing additional fill.
5. Dewater to maintain groundwater levels a minimum of 1 foot below bottom of excavations or subgrades. Place fill in-the-dry.

6. Bench existing slopes prior to placing horizontal fill layers on existing slopes greater than 6H:1V.
7. Place materials in continuous horizontal layers in loose lift thickness of maximum 8 inches.
8. Compact soil materials in accordance with Article 3.11 in accordance with ASTM D1557, with water content of plus or minus 2 percent moisture content. Remove and replace with drier fill if wet fill cannot be compacted as specified.
9. Uniformly water fill that is too dry for proper compaction with sufficient water to allow compaction to required density.
10. Compact impervious and semi pervious materials with more than 15 percent passing the #200 sieve, with a tamping sheep-foot roller or rubber-tired roller. Scarify surface before placement of next lift if compaction results in smooth surface on top of lift.
11. Remove and replace fill that is disturbed after compaction and re-compact to specified degree of compaction.
12. Place and compact soil material on embankment in a direction parallel to embankment top.

3.11 COMPACTION

- A. Use approved methods that produce required degree of compaction throughout entire depth of material placed without damage to new or existing facilities. Adjust moisture content of soil as required. Remove and replace material that is too wet to compact to required density. Compact each layer as Work progresses.
- B. Place compacted structural fill for support of footings and foundations and against below grade walls in loose lift thicknesses not exceeding 10 inches. Compact to minimum 95 percent maximum dry density in accordance with ASTM D1557.
- C. Place backfill in open areas with self-propelled vibratory rollers, and hand-guided equipment in confined areas. Loose lift thickness: maximum 6 inches.
- D. Perform a minimum 4 systematic passes to compact each lift with specified compaction equipment.
- E. Place backfill and fill soil materials evenly on sides of structures to required elevations, and uniformly along full length of each structure.

Compaction Method	Maximum Stone Size	Maximum Loose Lift Thickness		Minimum Number of Passes	
		Below Pavement	Less Critical Areas	Below Pavement	Less Critical Areas
Hand-operated vibratory plate or light roller in confined areas	4 inches	6 inches	8	4	4
Hand-operated vibratory drum rollers weighing at least 1,000 pounds in confined areas	6 inches	10 inches	12 inches	4	4
Light vibratory drum roller minimum weight at drum 5,000 pounds, minimum compaction force 10,000 pounds	8 inches	6 inches	18 inches	4	4
Medium vibratory drum roller min. weight at drum 10,000 pounds, minimum compaction force 20,000 pounds	8 inches	6 inches	24 inches	6	6

F. Degree of Compaction

Fill and Backfill Location	Minimum Density
Top 3 feet under pavement grade	95 percent of maximum
Below slabs and foundations	95 percent of maximum
Below top 3 feet under pavement grade	92 percent of maximum
Pipe Bedding	92 percent of maximum
Beside structure foundation walls	95 percent of maximum
Maximum density	ASTM D698, modified
Field density tests	ASTM D1556 (sand cone) or ASTM D6938 (nuclear methods)

- G. Disc harrow or dry fill material that is too wet for compaction to specified moisture content and to required density. Remove and replace with drier fill that cannot be dried within 48 hours of placement.

3.12 GRADING

- A. Uniformly grade areas, including adjacent transition areas. Smooth finished surface within specified tolerances. Compact with uniform levels or slopes between points

where elevations are shown, or between points where elevations are shown and existing grades.

- B. Grade areas adjacent to structure lines to drain away from structures and prevent ponding.
- C. Finish surfaces: free from irregular surface changes and as follows.
 - 1. Finish lawn or other unpaved areas to receive topsoil to within a maximum 0.10 feet above or below required subgrade elevations.
 - 2. Shape surface of areas under pavement to line, grade and cross-section, with finish surface not more than plus or minus 1 inch above or below required subgrade elevation.

3.13 RIPRAP

- A. Place riprap to full depth of $1.5D_{50}$ in one operation without special handwork, measured perpendicular to face of slope to obtain uniform appearance true to line and grade. Place larger stones at bottom of slope. Place stones in close contact with interlocking of face stones and backing stones. Fill openings between stones with smaller stones. Embed, re-orient or discard loose stones or excessively large stones projecting above surface.

3.14 EROSION CONTROL

- A. Provide erosion control measures in accordance with Section 01 50 00

3.15 PROTECTION

- A. Protect newly graded areas from traffic and erosion. Keep free of trash and debris. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.
- B. Scarify surface, re-shape, and compact to required density prior to further construction where completed compacted areas are disturbed by subsequent construction operations or adverse weather. Immediately repair any subsequent settling and provide maintenance for remainder of Work.
- C. Remove soft or unsuitable material and replace with suitable backfill material prior to paving on sub-grade. Bring low sections, holes, or depressions to required grade with approved material. Shape sub-grade to line, grade, and cross section, and thoroughly compact.
- D. Keep roads free of debris. Use watertight vehicles for hauling wet materials over roads and streets. Promptly clean materials dropped or spread by vehicles or when directed by Engineer.

3.16 FIELD QUALITY CONTROL

- A. Provide in accordance with Division 01 General Requirements.
- B. Owner may engage a qualified special inspector to perform the following special inspections in addition to the Contractor's independent testing.
 - 1. Confirm specified fill and backfill are used.
 - 2. Confirm preparation of Site.
 - 3. Observe removal of existing unsuitable foundation materials from footing and slab areas and confirm character of material encountered at bearing levels.
 - 4. Confirm compliance of fill material and maximum lift thickness.
 - 5. Confirm compliance of in-place density of compacted fill with required frequency.
 - 6. Observe preparation of footing bearing surfaces.
 - 7. Confirm suitability of excavated soils for reuse as fill, including reuse of on-Site soils as common fill.
- C. Perform at least 1 test of each soil stratum at foundation subgrades to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on visual comparison of subgrade with tested subgrade when approved.
- D. Engage an independent testing agency to test compaction of soils in place in accordance with ASTM D1556, ASTM D2167, ASTM D2922, and ASTM D2937.
 - 1. Tests
 - a. Paved and structure areas: at subgrade and each compacted fill and backfill layer, at least 1 test for every 2000 square feet or less of paved area or concrete slab, with minimum 3 tests.
 - b. Foundation walls backfill: at each compacted backfill layer, at least 1 test for every 100 feet or less of wall length, with minimum 2 tests.
 - c. Trench backfill: at each compacted initial and final backfill layer, at least 1 test for every 150 feet less of trench length, with minimum 2 tests.
 - 2. Scarify and moisten or aerate, or remove and replace soil materials to depth required when testing agency reports subgrades, fills, or backfills have not

achieved degree of compaction specified. Re-compact and re-test until specified compaction is obtained.

3. Determine actual in-place densities using field tests as directed.
4. Perform additional Work to obtain proper compaction if in-place densities do not meet specified densities. Retest if directed by Engineer.
5. Tests for Pipe Backfill
 - a. Suitable backfill: compact backfill in maximum loose lifts per table above. Conduct 1 field density test every 50 linear feet for each lift for utility lines.
 - b. Pavement sub-base: minimum 1 field density test of sub base for every 50 linear feet of paved area.

3.17 CLOSEOUT ACTIVITIES

- A. Provide in accordance with Division 01 General Requirements.

END OF SECTION

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SECTION 31 32 19

GEOTEXTILES

PART 1 – GENERAL

1.01 SUMMARY

- A. Section Includes
 - 1. Provide and install permanent geotextile fabrics in accordance with this Section and applicable reference standards listed in Article 1.03.
- B. Related Requirements
 - 1. Section 31 00 00 – Earthwork

1.02 PRICE AND PAYMENT PROCEDURES

- A. Measurement and payment requirements: per Division 01 General Requirements.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Coordination, Sequencing, and Scheduling: per Division 01 General Requirements.

1.04 REFERENCES

- A. Reference Standards
 - 1. ASTM International (ASTM)
 - a. ASTM D4632: Standard Test Method for Grab Breaking Load and Elongation of Geotextiles
 - b. ASTM D4533: Standard Test Method for Trapezoid Tearing Strength of Geotextiles
 - c. ASTM D6241: Standard Test Method for Static Puncture Strength of Geotextiles and Geotextile-Related Products using a 50-mm Probe
 - d. ASTM D4491: Standard Test Method for Water Permeability of Geotextiles by Permittivity
 - e. ASTM D4751: Standard Test Method for Determining Apparent Opening Size of a Geotextile
 - f. ASTM D4355: Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon Arc Type Apparatus

- g. ASTM D4873: Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples
- h. ASTM D4354 Standard Practice for Sampling of Geosynthetics and Rolled Erosion Control Products (RECPs) for Testing

1.05 SUBMITTALS

- A. Product Data: manufacturer's product specifications.
- B. Manufacturer's instructions for storage, handling, and installation of geotextiles
- C. Source and Field Quality Control Submittals: manufacturing quality control certificates for representative rolls for each lot of material delivered.
- D. Closeout and Maintenance Material Submittals: per Division 01 General Requirements.

1.06 QUALITY ASSURANCE

- A. Qualifications: per Division 01 General Requirements and as follows.
 - 1. Geotextile manufacturer: well-established firm with minimum 5 years of experience in manufacture of geotextile fabrics.

1.07 DELIVERY, STORAGE AND HANDLING

- A. Provide in accordance with Division 01 General Requirements.
- B. Deliver and store geotextile materials in protective wrapping to protect materials from ultraviolet (UV) radiation, and other mediums that may reduce physical properties of the material.
- C. Labeling, packaging, and handling: per ASTM D4873.
- D. Submit manufacturing quality control certificates for representative rolls for each lot of material delivered to the Site, signed, and certified by responsible parties employed by manufacturer. Materials delivered without testing certification shall be rejected by the Engineer.
- E. Store geotextiles off ground and out of direct sunlight. Protect from mud, dirt, dust, and moisture. Use unbroken opaque packaging or provide protective cover to prevent exposure of the geotextile to sunlight during storage. Comply with additional storage procedures recommended by the manufacturer at no additional cost to Owner.
- F. Store rolls on a surface that does not cause distortion of roll or wraps or impedes installation.

- G. Do not stack rolls higher than recommended by the manufacturer.
- H. Load, unload, and move rolls with appropriate equipment as recommended by manufacturer.
 - 1. Move rolls using structural steel insert (pipe) placed within core tube of roll. Attach lifting slings or chains to pipe only to support the roll. Prevent damage by slings and chains through use of a spreader bar. If a forklift is used to move rolls, use a single tooth pipe capable of supporting the roll in cantilever and place through roll core tube. Do not lift rolls by sliding the forks under the roll.
- I. Provide a sufficient quantity of geotextile material on Site prior to start of Work to allow efficient and continuous Work without stoppage resulting from lack of materials.

1.08 SITE CONDITIONS

- A. Existing conditions: per Division 01 General Requirements.

PART 2 – PRODUCTS

2.01 GEOTEXTILES

- A. Use woven geotextile stabilization fabric as shown on Drawings and directed by the Engineer or Owner in accordance with this Specification.
- B. Furnish stock materials with Minimum Average Roll Values (MARV) that meet or exceed the criteria specified in below. Strength properties specified are for the weaker principle direction.
- C. Acceptable non-woven geotextile
 - 1. Tencate Mirafi 180N
 - 2. Or equal
- D. Criteria
 - 1. Nonwoven Geotextile

PROPERTY	TEST METHOD	STANDARD	SPECIFIED VALUE
Material	--	--	Polypropylene
AOS	ASTM D4751	maximum	70 mm
Grab Tensile Strength	ASTM D4632	MARV	180 lbs/in
CBR Puncture Strength	ASTM D6241	MARV	450 lbs.
Trapezoidal Tear Strength	ASTM D4533	MARV	75 lbs.
Permittivity	ASTM D4491	MARV	1.4 sec ⁻¹

2.02 SEWING THREAD FOR SEAMING

- A. Type: polyester with chemical and UV light resistance properties, equal to or greater than the fabric itself. Color: contrasting to color of fabric.

2.03 SOURCE QUALITY CONTROL

- A. Provide in accordance with Division 01 General Requirements.
- B. Provide for sampling and testing of geotextile by manufacturer as specified in the table in Article 2.01 above at a minimum of once every 100,000 square feet of production to demonstrate that material conforms to requirements the table.
- C. Obtain quality control certificate that includes roll number identification, sampling procedures used, and results of quality control testing, including descriptions of test methods used per quality control tests specified in the table in Article 2.01 above.
- D. Require manufacturer to perform additional testing at no additional cost to Owner if geotextile sample fails to meet this Specification including the following.
1. Sample and test each roll manufactured in same lot or at the same time as the failing roll.
 2. Continue sampling and testing of rolls until a pattern of acceptable tests results is established.
 3. Additional testing of individual rolls may be performed by manufacturer to more closely identify the non-complying rolls and to qualify individual rolls.
- E. Obtain manufacturer notarized certificates indicating the material meets this Specification.
- F. Require geotextile fabric be supplied in rolls and labeled at a minimum according to ASTM D4873 with the following information.
1. Manufacturer's Name

2. Product Identification (style number)
3. Roll Number
4. Roll Weight
5. Roll Dimensions
6. Geotextile Type

PART 3 – EXECUTION

3.01 PREPARATION

Not applicable.

3.02 INSTALLATION

- A. Install where shown on Drawings in accordance with manufacturer's instructions.
- B. Provide smooth graded surface, free of large stones, tree roots and limbs, or other debris prior to placement of geotextiles. Notify Engineer when areas are ready for placement of geotextile.
- C. Deployment and Covering
 1. Unroll fabric in area to be used, in down-slope direction.
 2. Minimize wrinkles and folds in the geotextile. Straighten to smooth out creases or irregularities in the sections. Place geotextile in close contact with adjacent materials. Overlap adjacent fabric sides and ends minimum of 12 inches. Do not allow gaps and tears. Place overlaps so uphill panel is shingled over the downhill panel. Replace damaged geotextile.
 3. Begin placement at base of slope and proceed up-slope for overlying stone. Work in direction of fabric overlap for overlying stone placement on flat areas. Ensure fabric overlap remains intact. Install in a relaxed condition and free of tension or stress upon completion. Do not stretch geotextile to fit.
- D. Protection
 1. Secure geotextile from wind damage during and after construction.
 2. Do not allow construction equipment to travel directly over any in-place geotextiles. Maintain 1-foot minimum cover above fabrics for low ground pressure tracked vehicles (contact pressure 8-psi or less) and 3-foot

minimum cover for wheeled vehicles or heavy tracked vehicles (contact pressure above 8-psi).

3. Do not allow more than 14 days to elapse between the day when reinforcing geotextile is unrolled and when a subsequent layer is placed to cover it. do not allow more than 30 days to elapse between the day when the cushioning geotextile is unrolled and when a subsequent layer is placed to cover it. Replace material exposed to sunlight or weather for longer duration.

E. Patching

1. Patch rips and tears with a minimum 3-foot overlap in each direction from perimeter of damaged area. Heat bond repair patch to underlying geotextile.
2. For damaged areas greater than half the width of fabric roll, cut out entire roll-width of damaged area and place a new section laced over the area with minimum 3-foot overlap at each end. Place up-slope end of patch under existing up-slop fabric and place down-slope end of patch over down-slope fabric.

3.03 FIELD QUALITY CONTROL

- A. Provide in accordance with Division 01 General Requirements.

3.04 CLOSEOUT ACTIVITIES

- A. Provide in accordance with Division 01 General Requirements.

END OF SECTION

SECTION 31 50 00

EXCAVATION SUPPORT AND PROTECTION

PART 1 – GENERAL

1.01 SUMMARY

- A. Section Includes
 - 1. Provide excavation support and protection in accordance with this Section and applicable reference standards listed in Article 1.03.
- B. Related Requirements
 - 1. Section 31 00 00 - Earthwork

1.02 PRICE AND PAYMENT PROCEDURES

- A. Measurement and payment requirements: per Division 01 General Requirements.

1.03 REFERENCES

- A. Reference Standards
 - 1. American Institute of Steel Construction (AISC)
 - a. Steel Construction Manual
 - 2. ASTM International (ASTM)
 - a. ASTM A36 Standard Specification for Carbon Structural Steel
 - b. ASTM A307 Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60000 PSI Tensile Strength
 - c. ASTM A328 Standard Specification for Steel Sheet Piling
 - d. ASTM A572 Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel
 - e. ASTM A615 Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
 - f. ASTM A690 Standard Specification for High-Strength Low-Alloy Nickel, Copper, Phosphorus Steel H-Piles and Sheet Piling with Atmospheric Corrosion Resistance for Use in Marine Environments
 - g. ASTM A992 Standard Specification for Structural Steel Shapes
 - 3. American Welding Society (AWS)

a. D1.1 - Structural Welding Code, Steel

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination, Sequencing, and Scheduling: per Division 01 General Requirements.
- B. Pre-installation Conference
 - 1. Review geotechnical report, existing utilities and subsurface conditions.
 - 2. Review coordination for interruption, shutoff, capping, and continuation of utility services.
 - 3. Review instrumentation and monitoring program, and dewatering program. Confirm coordination with instrumentation and monitoring, and dewatering activities.
 - 4. Review proposed excavations and equipment, monitoring of excavation support and protection system and abandonment or removal of excavation support and protection system.

1.05 SUBMITTALS

- A. Submit in accordance with Division 01 General Requirements.
 - 1. Do not begin excavation requiring support until submittals are approved.
- B. Product Data
 - 1. Include construction details, material descriptions, performance properties, dimensions of individual components and profiles, and calculations for excavation support and protection system for each type of product.
- C. Shop Drawings
 - 1. Plans, elevations, sections, and details for excavation support and protection system, by professional engineer licensed in the state where Project is located
 - 2. Arrangement, locations, and details of soldier piles, sheet piling, lagging, tiebacks, bracing, and other components of excavation support and protection system
 - 3. Written plan for excavation support and protection, including sequence of construction of support and protection coordinated with progress of excavation

- D. Calculations and analysis data for excavation support and protection system by professional engineer licensed in the state where Project is located
- E. Closeout and Maintenance Material Submittals: per Division 01 General Requirements.
 - 1. Identify locations and depths of capped utilities, abandoned-in-place support and protection systems, and other subsurface structural, electrical, or mechanical conditions on record documents.

1.06 QUALITY ASSURANCE

- A. Provide in accordance with Division 01 General Requirements.
- B. Qualifications: per Division 01 General Requirements for Installer and professional engineer.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Provide in accordance with Division 01 General Requirements.

1.08 SITE CONDITIONS

- A. Existing Conditions: per Division 01 General Requirements.
- B. Review geotechnical report and determine need to perform additional test borings and conduct other exploratory operations necessary for excavation support and protection.
- C. Verify dimensions and elevations before starting Work. Survey condition of adjoining properties with Engineer. Take photographs, recording any prior settlement or cracking of structures, pavements, and other improvements. Prepare list of existing damages, verified by dated photographs, signed by Contractor, Engineer and others conducting the investigation.
- D. Survey adjacent structures and improvements, establishing exact elevations at fixed points to act as benchmarks. Identify benchmarks and record existing elevations. Locate datum level where it will not be affected by excavation operations.
- E. Interruption of Existing Utilities
 - 1. Do not interrupt any utility serving facilities without Owner's written permission. Provide temporary utility if required.
 - 2. Provide minimum 5 days' advance notice of proposed interruption of utility.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Provide shoring and bracing materials, in serviceable condition and adequate for intended purpose.
- B. Steel sheet piling and shapes: continuous interlocking type; section modulus, type of section specified, in accordance with ASTM A328, ASTM A572, and ASTM A690, with continuous interlocks.
- C. Provide movable box where shoring system is required, and where sheet piling is not specified.
- D. Bracing members: wood timbers or steel members in accordance with ASTM A36.
- E. Provide bolts in accordance with ASTM A307.
- F. Provide structural steel in accordance with ASTM A36, ASTM A690, and ASTM A992.
- G. Wood lagging: lumber, mixed hardwood, pressure-treated.
- H. Provide reinforcing bars in accordance with ASTM A 615, Grade 60, deformed.

2.02 DESIGN CRITERIA

- A. Provide services by professional engineer licensed in the state where Project is located, including preparation of Shop Drawings.
- B. Design excavation support system in accordance with earth pressures and other criteria indicated, for construction of permanent structures without excessive movement or settlement of adjacent buildings, roadways, structures, or utilities, as shown on Drawings and as specified. Include analysis by professional engineer licensed in the state where Project is located.
- C. Earth support design: coordinated dewatering design incorporating lowest anticipated excavation depths and full differential water head during dewatering.
- D. Consult official records of both surface and subsurface existing utilities and connections to verify existing conditions and limitations as they apply to this Work and its relation to other construction work. Proceed with caution in areas of utility facilities. Excavate by hand, or other methods acceptable to utility owner. Protect existing utilities to remain within and adjacent to Work area in accordance with requirements of authorities having jurisdiction.

2.03 SOURCE QUALITY CONTROL

- A. Provide in accordance with Division 01 General Requirements.

PART 3 – EXECUTION

3.01 GENERAL

- A. Anchor and brace system to resist earth and hydrostatic pressures, including surcharges from surface loads. Support excavation to prevent undermining or disturbance to foundations of existing structures and utilities, or of ongoing or previously completed Work. Shore, support, and protect utilities encountered.
- B. Install excavation support and protection systems to ensure minimum interference with roads, streets, walks, and adjacent occupied and used facilities.
 - 1. Do not close or obstruct streets, walks, or adjacent occupied or used facilities without approval. Provide alternate routes around closed or obstructed traffic ways if required.
- C. Maintain shoring and bracing while excavation is open.
- D. Check base stability.
- E. Prevent surface water from entering excavations.
- F. Monitor vibrations, settlements, and movements to ensure stability of excavations and constructed slopes to prevent damage to permanent structures in accordance with Section 31 09 00.

3.02 STEEL SHEET PILING

- A. Install 1-piece sheet piling lengths and interlock vertical edges to form a continuous barrier before starting excavation.
- B. Place piling using templates and guide frame unless otherwise specified by sheet piling manufacturer. Limit vertical offset of adjacent sheet piling to 60 inches. Align exposed faces of sheet piling to vary not more than 2 inches from a horizontal line, and not more than 1:120 out of vertical alignment.
- C. Cut off sheet piling to be left in place at least 5 feet below finish grade. Indicate location of sheet piling cut off and left in place on record documents.
- D. Remove steel sheet piling following completion of Work where shown on Drawings or directed by Engineer. Obtain approval for steel sheet piling to be left in place.

3.03 BRACING

- A. Locate bracing to clear columns, floor framing construction, and other permanent Work. Install new bracing before removing original brace if moved. Do not place bracing where it will be cast into permanent concrete Work unless approved by Engineer.
- B. Install internal bracing if required to prevent spreading or distortion of braced frames.
- C. Maintain bracing until structural elements are supported by other bracing, or until permanent construction is able to withstand lateral earth and hydrostatic pressures.

3.04 REPAIR/RESTORATION

- A. Remove excavation support and protection systems in stages to avoid disturbing underlying soils and rock, or damaging structures, pavements, facilities, and utilities.
- B. Fill voids immediately with approved backfill compacted to density specified in accordance with Section 31 00 00.
- C. Repair or replace adjacent Work damaged or displaced by removing excavation support and protection systems.

3.05 FIELD QUALITY CONTROL

- A. Provide in accordance with Division 01 General Requirements.
- B. Promptly correct detected bulges, breakage, or other evidence of movement to ensure that excavation support and protection system remains stable.
- C. Promptly repair damages to adjacent facilities caused by installation or faulty performance of excavation support and protection systems.

3.06 CLOSEOUT ACTIVITIES

- A. Provide in accordance with Division 01 General Requirements.

END OF SECTION

SECTION 31 66 15

HELICAL FOUNDATION PILES

PART 1 – GENERAL

1.01 SUMMARY

A. Description

1. Provide helical pile foundation for the precast concrete box culvert as indicated in the Drawings including all materials, tools, equipment and labor required for the design, preparation, shop fabrication, shipping, supervision, installation and load testing in accordance with this Specification, the Drawings and applicable reference standards listed in Article 1.03.

B. Related Requirements

1. 03 41 01 Precast Concrete Culvert

1.02 PRICE AND PAYMENT PROCEDURES

- A. Measurement and payment requirements: per Division 01 General Requirements.

1.03 REFERENCES

A. Reference Standards

1. American Concrete Association (ACI)
 - a. ACI 318 Building Code Requirements for Structural Concrete
2. American Institute of Steel Construction (AISC)
 - a. AISC 360 Specification for Structural Steel Buildings
3. American Society for Testing and Materials (ASTM)
 - a. ASTM A29 Steel Bars, Carbon and Alloy, Hot-Wrought and Cold Finished
 - b. ASTM A36 Structural Steel
 - c. ASTM A53 Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless
 - d. ASTM A153 Zinc Coating (Hot Dip) on Iron and Steel Hardware
 - e. ASTM A193 Alloy-Steel and Stainless Steel Bolting Materials for High Temperature Service

- f. ASTM A252 Welded and Seamless Steel Pipe Piles
- g. ASTM A325 Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
- h. ASTM A500 Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
- i. ASTM A513 Standard Specification for Electric Resistance Welded Carbon and Alloy Steel Mechanical Tubing
- j. ASTM A572 HSLA Columbium-Vanadium Steels of Structural Quality
- k. ASTM A618 Hot-Formed Welded and Seamless High-Strength Low-Alloy Structural Tubing
- l. ASTM A656 Hot-Rolled Structural Steel, High-Strength Low-Alloy Plate with Improved Formability
- m. ASTM A775 Electrostatic Epoxy Coating
- n. ASTM A1018 Steel, Sheet and Strip, Heavy Thickness Coils, Hot Rolled, Carbon, Structural, High-Strength Low-Alloy, Columbium or Vanadium, and High-Strength Low-Alloy with Improved Formability.
- o. ASTM D1143 Method of Testing Piles Under Static Axial Compressive Load
- p. ASTM D3689 Method of Testing Individual Piles Under Static Axial Tensile Load
- 4. American Welding Society (AWS)
 - a. AWS D1.1 Structural Welding Code - Steel
- 5. Society of Automotive Engineers (SAE)
 - a. SAE J429 Mechanical and Material Requirements for Externally Threaded Fasteners

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination, Sequencing, and Scheduling: per Division 01 General Requirements.
- B. A preconstruction meeting shall be held at least 5 working days prior to Contractor beginning helical pile construction at the site to review construction procedures, schedule and required testing. At a minimum the Contractor, Engineer and Geotechnical Engineer shall attend preconstruction meeting.

1.05 SUBMITTALS

- A. Submit in accordance with Division 01 General Requirements.

- B. At least four weeks prior to the start of helical pile construction, the Contractor shall submit a project reference list to the Engineer for approval. The reference list shall be used to verify the successful completion by the Contractor of at least three separate foundation projects within the last five years with helical piles and similar subsurface conditions. A brief description of each project and the owner's contact person's name and current phone number shall be included for each project listed.
- C. At least 14 calendar days prior to the start of foundation construction, the Contractor shall prepare and submit to the Engineer, working drawings and design calculations for the helical piles intended for use based on the subsurface conditions encountered at the site, the applicable Building Code, the structural loads provided in the Drawings, the requirements of this Specification, and the recommendations included in the Geotechnical Engineering Report. Design criteria include the following:
1. Compression: Allowable working load shall not exceed $0.6 \cdot F_y \cdot A$ where F_y is yield strength of central shaft and A is area of central shaft
 2. Tension: Allowable working load shall not exceed $S_{ut}/2$. S_{ut} is minimum ultimate tensile strength of central shaft (at coupling joint).
 3. Except where noted otherwise on the project plans, all helical piles shall be designed and installed to provide a minimum safety factor for ultimate applied load of $FS = 2.0$ and a maximum axial displacement at working load of 1 inch.
 4. The overall length and installed torque of a helical pile shall be specified such that the required in-soil capacity is developed by end-bearing on the helix plate(s) in an appropriate strata(s). Required soil parameters are available in the geotechnical report.
 5. Lateral load and bending: Helical piles are subjected to lateral loads as indicated on the plans, the bending moment from said loads shall be determined using lateral load analysis program such as LPILE or equal commercially available software. The required soil parameters for use with LPILE or equal are available in the geotechnical report. Allowable deflection due to lateral working load is 1 inch. The combined bending and axial load factor of safety of the helical pile shall be $FS = 2.0$.
 6. Down-Drag/Negative Skin Friction: For helical shafts > 4 inches in diameter used in compressible soils or where expansive or frozen soils can cause pile jacking, helical pile shafts should be provided with a no-bond zone along a specified length to prevent load transfer that may adversely affect pile capacity. Alternately, helical piles can be provided with sufficient axial load capacity to resist down-drag/negative skin friction forces.

7. The helical pile structure attachment (pile cap) shall distribute the design load to the concrete foundation such that the concrete bearing stress does not exceed those in ACI 318 (specified in 03 30 00) and the stresses in the steel plates/welds does not exceed AISC allowable stresses.
 8. Corrosion Protection: Galvanized full length. See Section 2.07.
- D. The working drawings shall include the following:
1. Helical pile number, location and pattern by assigned identification number
 2. Helical pile design load and required safety factor
 3. Type and minimum size of central steel shaft
 4. Minimum number of helix plates
 5. Minimum overall depth
 6. Inclination angle of helical pile
 7. Cut-off elevation
 8. Helical pile attachment to pile caps, grade beams, etc
 9. Detailed description of construction procedures and major equipment
- E. At least 14 days prior to the start of drilled pier construction, the Contractor shall submit a list identifying the on-site supervisor(s) and operator(s) assigned to the project for review by the Engineer. A detailed summary of each individual's experience in helical pile construction should be included.
- F. At least 14 days prior to the start of drilled pier construction, the Contractor shall submit shop drawings for all helical pile components, including corrosion protection and pile top attachment to the Engineer for review and approval. This includes helical pile lead/starter and extension section identification (manufacturer's catalog numbers). Shop drawings shall include certified mill test reports, ultimate strength, yield strength, % elongation and chemistry composition.
- G. The Contractor shall submit plans for production testing of the helical piles to the Engineer for review and acceptance prior to beginning load tests. The purpose of the test is to determine the load versus displacement response of the helical pile and provide an estimation of ultimate capacity.
- H. The Contractor shall submit to the Engineer copies of calibration reports for each torque indicator or torque motor and all load test equipment to be used on the project. The calibration tests shall have been performed within 6 months of the date submitted. Helical pile installation and testing shall not proceed until the

Engineer has received the calibration reports. These calibration reports shall include but are not limited to, the following information:

1. Name of project and Contractor
 2. Name of testing agency
 3. Identification (serial number) of device calibrated
 4. Description of calibrated testing equipment
 5. Date of calibration
 6. Calibration data
- I. All submittals shall be signed and sealed by a Registered Professional Engineer licensed in the State of Massachusetts and have a minimum of four years of experience as an engineer knowledgeable in helical pile foundation analysis and design.
- J. The Contractor shall provide the Engineer copies of helical pile installation records. These records shall include, but are not limited to, the following information:
1. Name of project and Contractor
 2. Name of Contractor's supervisor during installation
 3. Date and time of installation
 4. Name and model of installation equipment
 5. Type of torque indicator used
 6. Location of helical pile by assigned identification number
 7. Actual helical pile type and configuration – including lead section (number and size of helix plates), number and type of extension sections (manufacturer's SKU numbers)
 8. Helical pile installation duration and observations
 9. Total length of installed helical pile
 10. Cut-off elevation
 11. Inclination of helical pile
 12. Installation torque at one-foot intervals for the final 10 ft

13. Comments pertaining to interruptions, obstructions or other relevant information
 14. Rated load capacities
- K. The Contractor shall submit to the Owner copies of field test reports within 24 hours after completion of the load tests. These test reports shall include, but are not limited to, the following information:
1. Name of project and Contractor
 2. Name of Contractor's supervisor during installation
 3. Name of third party test agency
 4. Date, time and duration of test
 5. Location of helical pile by assigned identification number
 6. Type of test (ie tension or compression)
 7. Description of calibrated testing equipment and test set-up
 8. Actual helical pile type and configuration – including lead section, number and type of extension sections (manufacturer's SKU numbers)
 9. Steps and duration of each load increment
 10. Cumulative pile-head movement at each load step
 11. Comments pertaining to test procedure, equipment adjustments, or other relevant information
 12. Signed by third party test agency rep., registered professional engineer, or as required by local jurisdiction
- L. Approvals: Work shall not begin until all the required submittals have been accepted in writing by the Engineer. All procedural acceptances given by the Engineer shall not relieve the Contractor of the responsibility to satisfactorily complete the work.
- M. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights the Owner may have under Contract Documents.

1.06 QUALITY ASSURANCE

- A. Provide in accordance with Division 01 General Requirements.

- B. Installer Qualifications: Installation shall be performed by an installation contractor authorized by helical pile manufacturer.
- C. All helical piles shall be installed in the presence of a designated representative of the Owner unless said representative informs the Contractor otherwise. The designated representative shall have the right of access to any and all field installation records and test reports.
- D. Welding: Meet requirements of AWS D1.1, latest edition. All welders shall be AWS certified.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Provide in accordance with Division 01 General Requirements.

1.08 SITE CONDITIONS

- A. Existing Conditions: per Division 01 General Requirements.

1.09 WARRANTY

- A. Manufacturer's 30-year warranty on materials and workmanship.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. AB Chance
- B. Pier Tech
- C. Heli Pile
- D. Or equal

2.02 CENTRAL STEEL SHAFT

- A. The central steel shaft, consisting of lead sections, helical extensions, and plain extensions, shall be square shaft, round shaft or a combination of the two.
 - 1. Approved materials
 - a. ASTM A29 hot-rolled round-corner solid steel bar, modified medium carbon steel (similar to AISI 1044), Minimum yield strength = 70 ksi (AB Chance SS5)
 - b. ASTM A29 hot-rolled round-corner solid steel bar, High Strength Low Alloy (HSLA), low to medium carbon steel, Minimum yield strength = 90 ksi (AB Chance SS125, SS150, SS175, SS200, SS225)

- c. ASTM A500 or A513 structural steel tube or pipe, welded or seamless, minimum wall thickness = 0.203", Minimum yield strength = 50 ksi (AB Chance RS2875)
- d. ASTM A53, A252, A500 or A618 structural steel tube or pipe, seamless or straight-seam welded, minimum wall thickness = 0.300" (schedule 80), Minimum yield strength = 50 ksi (AB Chance RS3500)
- e. ASTM A500 or A513 structural steel tube or pipe, seamless or straight-seam welded, minimum wall thickness = 0.337" (schedule 80), Minimum yield strength = 50 ksi (AB Chance RS4500)
- f. For combination square/round shafts, approved materials above may be used with a welded adapter for the transition.

2.03 HELIX BEARING PLATE

- A. Shall be hot-rolled carbon steel sheet, strip or plate formed on matching metal dies to true helical shape and uniform pitch. Bearing plate material shall conform to the following ASTM specifications.
 - 1. Approved materials
 - a. ASTM A572, A1018 or A656, Minimum yield strength = 50 ksi, Minimum thickness = 3/8" (AB Chance SS5)
 - b. ASTM A572, Minimum yield strength = 50 ksi, Minimum thickness = 3/8" (AB Chance SS125, SS1375)
 - c. ASTM A656 or A1018, Minimum yield strength = 80 ksi, Minimum thickness = 3/8" (AB Chance SS150, SS175)
 - d. ASTM A656 or A1018, Minimum yield strength = 80 ksi, Minimum thickness = 1/2" (AB Chance SS200, SS225)
 - e. ASTM A36 or A572, Minimum yield strength = 36 ksi, Minimum thickness = 3/8" (AB Chance RS2875)
 - f. ASTM A36, A572, A1018 or A656, Minimum yield strength = per requirements cited above, Minimum thickness = 3/8" (AB Chance RS2875)
 - g. ASTM A572, Minimum yield strength = 50 ksi, Minimum thickness = 1/2" (AB Chance RS4500)

2.04 BOLTS

- A. The size and type of bolts used to connect the central steel shaft sections together shall conform to the following ASTM specifications.
 - 1. Approved bolts

- a. For square shaft: 5/8" minimum diameter, ASTM A325 or A193 Grade B7
- b. For round shaft: 3/4" minimum diameter, SAE J429 Grades 5 or 8

2.05 COUPLINGS

- A. For square shaft material, the coupling shall be formed as an integral part of the plain and helical extension material as hot upset forged sockets.
- B. For round shaft material, the couplings shall either be formed as an integral part of the plain and helical extension material as hot forge expanded sockets, or as internal sleeve wrought steel connectors. The steel connectors can be either tubing or solid steel bar with holes for connecting shaft sections together.

2.06 PILE CAP

- A. Depending on the application, the pile cap shall be a welded assembly consisting of structural steel plates and shapes designed to fit the pile and transfer the applied load. Structural steel plates and shapes for helical pile top attachments shall conform to ASTM A36 or A572 Grade 50.

2.07 CORROSION PROTECTION

- A. Epoxy coating (if required): the thickness of coating applied electrostatically to the central steel shaft shall be 7-12 mils. Epoxy coating shall be in accordance with ASTM A775. Bend test requirements are not required. Coupling bolts and nuts are not required to be epoxy coated.
- B. Galvanization (if required):
 1. Square shafts: Hot-dipped or electrodeposited in accordance with ASTM A153 or B633 after fabrication
 2. Round shafts: Hot-dipped or electrodeposited in accordance with ASTM A153 or A123 or B633 after fabrication

2.08 SOURCE QUALITY CONTROL

- A. Provide in accordance with Division 01 General Requirements.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Prior to commencing helical pile installation, the Contractor shall inspect the work of all other trades and verify that all said work is completed to the point where helical piles may commence without restriction.

- B. The Contractor shall verify that all helical piles may be installed in accordance with all pertinent codes and regulations regarding such items as underground obstructions, right-of-way limitations, utilities, etc.
- C. In the event of a discrepancy, the Contractor shall notify the Owner. The Contractor shall not proceed with helical pile installation in areas of discrepancies until said discrepancies have been resolved. All costs associated with unresolved discrepancies shall be the responsibility of the Owner.

3.02 INSTALLATION EQUIPMENT

- A. Shall be rotary type, hydraulic power-driven torque motor with clockwise and counter-clockwise rotation capabilities. The torque motor shall be capable of continuous adjustment to revolutions per minute (RPM's) during installation. Percussion drilling equipment shall not be permitted. The torque motor shall have torque capacity 15% greater than the torsional strength rating of the central steel shaft to be installed.
- B. Equipment shall be capable of applying adequate down pressure (crowd) and torque simultaneously to suit project soil conditions and load requirements. The equipment shall be capable of continuous position adjustment to maintain proper helical pile alignment.

3.03 INSTALLATION TOOLING

- A. Shall consist of a Kelly Bar Adapter and drive tools for square or round shaft used in accordance with manufacturer's written installation instructions.
- B. A torque indicator shall be used during helical pile installation. The torque indicator can be an integral part of the installation equipment or externally mounted in-line with the installation tooling.
 - 1. Shall be capable of providing continuous measurement of applied torque throughout installation.
 - 2. Shall be capable of torque measurements in increments of at least 500 ft-lb
 - 3. Shall be calibrated prior to pre-production testing or start of work. Torque indicators which are an integral part of the installation equipment, shall be calibrated on-site. Torque indicators which are mounted in-line with the installation tooling, shall be calibrated either on-site or at an appropriately equipped test facility. Indicators that measure torque as a function of hydraulic pressure shall be calibrated at normal operating temperatures.
 - 4. Shall be re-calibrated, if in the opinion of the Owner and/or Contractor reasonable doubt exists as to the accuracy of the torque measurements.

3.04 INSTALLATION PROCEDURES

- A. The helical pile installation technique shall be such that it is consistent with the geotechnical, logistical, environmental and load carrying conditions of the project.
- B. The lead section shall be positioned at the location as shown on the working drawings. The helical pile sections shall be engaged and advanced into the soil in a smooth, continuous manner at a rate of rotation of 5 to 20 RPM's. Extension sections shall be provided to obtain the required minimum overall length and installation torque as shown on the working drawings. Connect sections together using coupling bolt(s) and nut torqued to 40 ft-lb.
- C. Sufficient down pressure shall be applied to uniformly advance the helical pile sections approximately 3 inches per revolution. The rate of rotation and magnitude of down pressure shall be adjusted for different soil conditions and depths.

3.05 TERMINATION CRITERIA

- A. The torque as measured during the installation shall not exceed the torsional strength rating of the central steel shaft.
- B. The minimum installation torque and minimum overall depth criteria as shown on the working drawings shall be satisfied prior to terminating the helical pile installation.
- C. If the torsional strength rating of the central steel shaft and/or installation equipment has been reached prior to achieving the minimum overall length required, the Contractor shall have the following options:
 - 1. Terminate the installation at the depth obtained subject to the review and acceptance of the Owner, or,
 - 2. Remove the existing helical pile and install a new one with fewer and/or smaller diameter helix plates. The new helix configuration shall be subject to review and acceptance of the Owner. If re-installing in the same location, the top-most helix of the new helical pile shall be terminated at least (3) three feet beyond the terminating depth of the original helical pile.
 - 3. If the minimum installation torque as shown on the working drawings is not achieved at the minimum overall length, and there is no maximum length constraint, the Contractor shall have the following options:
 - a. Install the helical pile deeper using additional extension sections, or,
 - b. Remove the existing helical pile and install a new one with additional and/or larger diameter helix plates. The new helix configuration shall be subject to review and acceptance of the Owner. If re-installing in the same location, the top-most helix of the new helical pile shall be terminated at least (3) three feet beyond the terminating depth of the original helical pile.

- c. De-rate the load capacity of the helical pile and install additional helical pile(s). The de-rated capacity and additional helical pile location shall be subject to the review and acceptance of the Owner.
4. If the helical pile is refused or deflected by a subsurface obstruction, the installation shall be terminated and the pile removed. The obstruction shall be removed, if feasible, and the helical pile re-installed. If the obstruction can't be removed, the helical pile shall be installed at an adjacent location, subject to review and acceptance of the Owner.
5. If the torsional strength rating of the central steel shaft and/or installation equipment has been reached prior to proper positioning of the last plain extension section relative to the final elevation, the Contractor may remove the last plain extension and replace it with a shorter length extension. If it is not feasible to remove the last plain extension, the Contractor may cut said extension shaft to the correct elevation. The Contractor shall not reverse (back-out) the helical pile to facilitate extension removal.
6. The average torque for the last two feet of penetration shall be used as the basis of comparison with the minimum installation torque as shown on the working drawings. The average torque shall be defined as the average of the last three readings recorded at one-foot intervals.

3.06 TOLERANCES

- A. Allowable Tolerances:
 1. Centerline of helical piles shall not be more than 2 inches from indicated plan location
 2. Plumbness shall be within 2 degrees of design alignment
 3. Top elevation of helical pile shall be within +/- 1 inch of the design vertical elevation.

3.07 FIELD QUALITY CONTROL

- A. Provide in accordance with Division 01 General Requirements.
- B. Pre-production load tests: Not required.
- C. Production load tests – Axial: Required.
 1. The Contractor shall perform proof tests on a minimum of 10% of the total production helical piles. The helical piles to be tested will be selected by the Owner. At the Contractor's suggestion, but with the Owner's permission, tension tests may be performed in lieu of compression tests up to 100% of the design load for helical piles with sufficient structural tension capacity.

2. The Contractor shall determine a test sequence and acceptance criteria including load steps, hold times and the maximum test load. Maximum test load shall be selected so as to ensure that the production pile is not permanently damaged. The production test plan shall be submitted to the Owner for review and acceptance.
3. If a production pile that is tested fails to meet the acceptance criteria, the Contractor shall be directed to proof test another helical pile in the vicinity. For failed helical piles and further construction of other foundations, the Contractor shall modify the design, construction procedure or both. These modifications include but are not limited to, installing replacement helical piles, modifying the installation methods and equipment, increasing the minimum effective installation torque, changing the helix configuration, or changing the helical pile material (ie central steel shaft). Modifications that require changes to the structure shall have prior review and acceptance of the Owner and Engineer. Any modifications of design or construction procedures shall be at the Contractor's expense.

D. Production load tests - Lateral: Not required

3.08 CLOSEOUT ACTIVITIES

A. Provide in accordance with Division 01 General Requirements.

END OF SECTION

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SECTION 32 12 16

ASPHALT PAVING

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes

1. Furnish and install tack prime coat, hot mix asphalt pavement base and surface courses, pavement reclaim, structure protection and adjustments, and miscellaneous patching in accordance with this Section and applicable reference standards listed in Article 1.03.

1.02 PRICE AND PAYMENT PROCEDURES

- A. Measurement and payment requirements: per Division 01 General Requirements.

1.03 REFERENCES

A. Reference Standards

1. American Association of State Highway and Transportation Officials (AASHTO)
 - a. AASHTO T166 Standard Method of Test for Bulk Specific Gravity (Gmb) of Compacted Hot Mix Asphalt (HMA) Using Saturated Surface-Dry Specimens
 - b. AASHTO T209 Standard Method of Test for Theoretical Maximum Specific Gravity (Gmm) and Density of Hot Mix Asphalt (HMA)
 - c. AASHTO TP 68 Standard Method of Test for Density of In-Place Hot-Mix Asphalt (HMA) Pavement by Electronic Surface Contact Devices
 - d. AASHTO M320- Standard Specifications for Performance-Graded Asphalt Binder
2. MaineDOT Standard Specifications

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination, Sequencing, and Scheduling: per Division 01 General Requirements.

1.05 SUBMITTALS

- A. Submit in accordance with the Division 01 General Requirements.
- B. Material Certificates: Certificates signed by material producer and Contractor stating that each material complies with specified requirements
- C. Mix Design: Provide mix design for each grade of pavement to be used at least 20 days prior to start of paving
- D. Certified Weigh Slips: If required by the Owner, provide for each truck load of bituminous material.
- E. Closeout and Maintenance Material Submittals: per Division 01 General Requirements.

1.06 QUALITY ASSURANCE

- A. Provide in accordance with Division 01 General Requirements.
- B. Comply with any road opening permits issued for the Work
- C. Establish and control the pavement (aggregate or asphalt base course and asphalt surface course) alignments, grades, elevations, and cross sections as shown on the Drawings.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Provide in accordance with Division 01 General Requirements.

1.08 SITE CONDITIONS

- A. Existing Conditions: per Division 01 General Requirements.

PART 2 – PRODUCTS

2.01 BITUMEN FOR TACK PRIME COAT

- A. Provide in accordance with MaineDOT Division 400 & Division 700 Section 703.

2.02 HOT POURED RUBBERIZED ASPHALT SEALANT

- A. Provide in accordance with MaineDOT Division 400 & Division 700 Section 703.

2.03 HOT MIX ASPHALT SURFACE COURSE STANDARD TOP

- A. Provide in accordance with MaineDOT Division 400 & Division 700 Section 703.

2.04 HOT MIX ASPHALT BASE COURSE

- A. Provide in accordance with MaineDOT Division 400 & Division 700 Section 703.

2.05 BITUMINOUS CONCRETE BERM

- A. Provide in accordance with MaineDOT Division 400 & Division 700 Section 703.

2.06 HOT MIX ASPHALT FOR MISCELLANEOUS WORK

- A. Provide in accordance with MaineDOT Division 400 & Division 700 Section 703.

2.07 SOURCE QUALITY CONTROL

- A. Provide in accordance with Division 01 General Requirements.

PART 3 – EXECUTION

3.01 GENERAL

- A. Minimize area of pavement removed to suitable width for installation of Work. Legally dispose of existing pavements.
- B. Placement of hot mix asphalt
 1. Hot mix asphalt may be placed for use other than traveled wearing course between the dates of October 1 and November 15, provided that the air temperature as determined by an approved thermometer (placed in the shade at the paving location) is 40 degrees F or higher
 2. Hot mix asphalt may be placed with an accepted WMA technology for any base, intermediate base, or shim course between October 1 and November 15, provided that the air temperature as determined by an approved thermometer (placed in the shade at the paving location) is 35 degrees F or higher.
 3. Hot mix asphalt pavement for use as traveled way wearing course may be placed between October 1 and November 15 provided that the air temperature as determined by an approved thermometer is 50 degrees F or higher.
 4. All sections of overlay with wearing course less than 1 inch thick, the wearing course for the travelway and adjacent shoulders shall be placed between the dates of May 15 and the Saturday following September 15.
- C. Place hot mix asphalt mixture within the mixing and compaction temperature range of 275 degrees F and 325 degrees F.

- D. Do not place mix on wet or damp surfaces.
- E. Use straightedge to check compacted surfaces and obtain approval of Engineer.
- F. Utilize an approved dial type thermometer, and infrared piston thermometer for each paving machine. Retain thermometer upon completion of Project.
 - 1. Fahrenheit or Celsius selectable
 - 2. Portable and battery operated
 - 3. Repeatability of plus or minus 5 degrees F
 - 4. LCD display to nearest 1 degrees
 - 5. Accuracy of plus or minus 2 percent
 - 6. Emissivity present at 0.95
 - 7. Temperature operation range: 0 degrees F to 750 degrees F.

3.02 INSTALLATION

- A. Place hot mix asphalt base and top courses on roadways, sidewalks and other areas to maintain traffic access and egress to properties abutting Work, and for safe passage of pedestrian and vehicular traffic in accordance with Maine DOT Division 400 and Construction Standard Details.
 - 1. Provide minimum compacted thickness depth of hot mix asphalt base course indicated on Drawings or as directed by Engineer to achieve necessary base course grade in support of finish grade pavement elevations.
 - 2. Apply bitumen tack coat prior to placing any new HMA course. Clean surface of sand and foreign matter, and dry before applying prime coat.
 - 3. Provide minimum compacted thickness depth of hot mix asphalt surface course indicated on Drawings or as directed by Engineer to achieve finish grades.
 - 4. Apply hot poured rubberized asphalt sealant to longitudinal and transverse joints.
 - 5. Remove and replace defective mix not conforming to specified mix formula within stipulated tolerances on basis of testing. Samples of mixture in use will be taken as many times daily as necessary, and mixtures maintained uniform as specified. Owner may suspend further approval of plant mixtures in related Work if mixtures are not uniformly furnished as

specified, until necessary changes have been made so mixtures conform to specified requirements.

6. Irregularities which may develop before completion of rolling, and while material is still workable, may be remedied by loosening surface mixture and removing or adding material as necessary. Should any irregularities or surface defects remain after final compaction, defective Work will be corrected by minor surface projections, joints, and minor honeycombed surfaces ironed out smoothly to grade, and as directed.
 7. If any soft, imperfect places or spots develop on surface before final acceptance of Work, remove and replace with new materials and compact until edges of new Work seamlessly connect with old Work.
- B. Install hot poured rubberized asphalt sealer on roadway cracks less than or equal to 1-inch in width. Prior to placing sealer, thoroughly clean and dry crack to be sealed to a minimum depth of twice the crack width with a high pressure air blast. Apply sealer per manufacturer's recommendations.
 - C. On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing impracticable, spread, rake, and lute the HMA with hand tools to provide the required compacted thickness. Solvent based agents developed to strip asphalts from aggregates will not be allowed as release agents.
 - D. Set manhole covers and water gate boxes flush with finish grade of top course of resurfaced streets.
 - E. Vehicular traffic or loads will not be permitted on newly completed pavement until adequate stability has been attained and material has cooled sufficiently to prevent distortion or loss of fines. If climatic or other conditions warrant it, the period of time before opening to traffic may be extended at discretion of Owner.

3.03 BITUMINOUS CONCRETE BERM

- A. Provide foundation for bituminous concrete berms as shown on Drawings or as directed, conforming to requirements for the particular type of berm.
- B. Place mixture and compact with machine approved by Owner for type of berm required.

3.04 FIELD QUALITY CONTROL

- A. Provide in accordance with Division 01 General Requirements.
- B. Perform testing of in-place density of applicable hot mix asphalt pavement courses using 6-inch diameter cores in accordance with AASHTO T166 or AASHTO TP 68. Do not obtain cores from bridge protective course or bridge surface course.

Determine degree of compaction from each core by comparing bulk density of core pavement layer to average maximum theoretical density of same day's production.

- C. Test plane of finished surfaces of base and binder courses and top course of compacted mixtures with a 16-foot straightedge. A 10-foot straight edge may be used on vertical curves. Apply straightedge immediately after first compaction by rolling, and from then on, as necessary until and after final compaction of material in place. Hold straightedge in successive positions parallel to road centerline and in contact with road surface, and check entire area from one side of pavement to the other. Correct irregularities which vary 1/4 inch from true surface in base or binder course.

3.05 CLOSEOUT ACTIVITIES

- A. Provide in accordance with Division 01 General Requirements.

END OF SECTION

SECTION 32 17 23

PAVEMENT MARKINGS

PART 1 – GENERAL

1.01 SUMMARY

- A. Section Includes
 - 1. Provide pavement markings in accordance with this Section and applicable reference standards listed in Article 1.03.

1.02 PRICE AND PAYMENT PROCEDURES

- A. Measurement and payment requirements: per Division 01 General Requirements.

1.03 REFERENCES

- A. Reference Standards
 - 1. Maine Department of Transportation Standard Specifications (MaineDOT)
 - 2. Federal Highway Administration (FHWA)
 - a. Manual on Uniform Traffic Control Devices (MUTCD)

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination, Sequencing, and Scheduling: per Division 01 General Requirements.

1.05 SUBMITTALS

- A. Submit in accordance with the Division 01 General Requirements.
 - 1. Product Data
 - 2. Manufacturer Instructions
- B. Closeout and Maintenance Material Submittals: per Division 01 General Requirements.

1.06 QUALITY ASSURANCE

- A. Provide in accordance with Division 01 General Requirements.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Provide in accordance with Division 01 General Requirements.

1.08 SITE CONDITIONS

- A. Existing Conditions: per Division 01 General Requirements.

PART 2 – PRODUCTS

2.01 PAVEMENT MARKINGS

- A. Provide in accordance with MaineDOT Section 627.

2.02 SOURCE QUALITY CONTROL

- A. Provide in accordance with Division 01 General Requirements.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Apply and install pavement markings in accordance with FHWA MUTCD, and MaineDOT Section 627.

3.02 FIELD QUALITY CONTROL

- A. Provide in accordance with Division 01 General Requirements.

3.03 CLOSEOUT ACTIVITIES

- A. Provide in accordance with Division 01 General Requirements.

END OF SECTION

SECTION 32 32 53

STONE RETAINING WALLS

PART 1 – GENERAL

1.01 SUMMARY

- A. Work shall consist of furnishing materials, labor, equipment and supervision to install a segmental retaining wall system consisting of existing native granite blocks in accordance with plans and specifications and in reasonably close conformity with the lines, grades, design and dimensions shown on plans or established by the Engineer.

1.02 PRICE AND PAYMENT PROCEDURES

- A. Measurement and Payment requirements: per Division 01 General Requirements.

1.03 REFERENCES

- A. Reference Standards
 - 1. ASTM International (ASTM)
 - a. ASTM D422 Standard Test Method for Particle-Size Analysis of Soils
 - b. ASTM D698 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort
 - c. ASTM D2487 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
 - d. ASTM D4318 Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils
 - e. ASTM D4595 Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method
 - f. ASTM D5262 Standard Test Method for Evaluating the Unconfined Tension Creep and Creep Rupture Behavior of Geosynthetics
 - g. ASTM D5321 Standard Test Method for Determining the Shear Strength of Soil-Geosynthetic and Geosynthetic-Geosynthetic Interfaces by Direct Shear
 - h. ASTM D5818 Standard Practice for Exposure and Retrieval of Samples to Evaluate Installation Damage of Geosynthetics
 - i. ASTM D6706 Standard Test Method for Measuring Geosynthetic Pullout Resistance in Soil

- j. ASTM F405 Standard Specification for Corrugated Polyethylene (PE) Pipe and Fittings
- k. ASTM F758 Standard Specification for Smooth-Wall Polyvinyl Chloride (PVC) Plastic Underdrain Systems for Highway, Airport and Similar Drainage
- l. ASTM G51 Standard Test Method for Measuring pH of Soil for Use in Corrosion Testing
- 2. National Concrete Masonry Association (NCMA)
 - a. “NCMA Design Manual for Segmental Retaining Walls,” 3rd Edition, 2009.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination, Sequencing, and Scheduling: per Division 01 General Requirements.

1.05 SUBMITTALS

- A. Submit in accordance with Division 01 General Requirements.
- B. Product Data
 - 1. Geosynthetic Reinforcement
 - 2. Adhesive
- C. Design Submittal: The Contractor shall submit detailed design calculations, final retaining wall plans, and typical wall sections for approval prior to the beginning of wall construction. All calculations and drawings shall be prepared and sealed by a professional engineer (P.E.) – (Wall Design Engineer) experienced in SRW design and licensed in the state where the wall is to be built.
- D. Closeout and Maintenance Material Submittals: per Division 01 General Requirements.

1.06 QUALITY ASSURANCE

- A. Provide in accordance with Division 01 General Requirements.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Provide in accordance with Division 01 General Requirements.
- B. Contractor shall check materials upon delivery to ensure that the specified type and grade of materials have been received.
- C. Contractor shall store and handle materials in accordance with manufacturer’s recommendations and in a manner to prevent deterioration or damage due to

moisture, temperature changes, contaminants, corrosion, breaking, chipping or other causes.

- D. Contractor shall prevent excessive mud, wet concrete, epoxies and similar materials that may affix themselves from coming in contact with materials.
- E. Contractor shall protect materials from damage; no damaged material shall be incorporated into the segmental wall.
- F. Geosynthetic shall be protected from UV exposure and the protective covering on geosynthetic shall remain until immediately before installation and shall be stored at temperatures above -10 degrees F.

1.08 SITE CONDITIONS

- A. Existing Conditions: per Division 01 General Requirements.

PART 2 – PRODUCTS

2.01 SEGMENTAL RETAINING WALL UNITS

- A. SRW units shall be existing native granite blocks on site.
- B. SRW units shall be sound and free of cracks, large voids, irregularities, or other defects that would interfere with the proper placing of the unit or significantly impair the strength or permanence of the structure.

2.02 GEOSYNTHETIC REINFORCEMENT

- A. If required as part of the granite wall design, the type, strength and placement of the reinforcing geosynthetic shall be as determined by the Wall Design engineer and as shown on the final P.E.-sealed retaining wall plans.
- B. Unless otherwise recommended by Wall Design engineer, geosynthetic reinforcement shall consist of high-tenacity PET geogrids, HDPE geogrids, or geotextiles manufactured for soil reinforcement applications. The type, strength and placement of the geosynthetic reinforcement shall be determined by procedures outlined in this specification and the “NCMA Design Manual for Segmental Retaining Walls” (3rd Edition, 2009), and materials shall be specified by Wall Design engineer in their final wall plans and specifications. The manufacturers/suppliers of the geosynthetic reinforcement shall have demonstrated construction of similar size and types of segmental retaining walls on previous projects.

2.03 LEVELING PAD

- A. If required by Wall Design engineer, leveling pads shall be constructed using compacted 3/4" crushed stone. The leveling pad should extend laterally at least a distance of 6 inches from the toe and heel of the lowermost SRW unit.

2.04 DRAINAGE AGGREGATE

- A. Drainage aggregate shall be angular clean 3/4-inch crushed stone in accordance with Specification 31 00 00 EARTHWORK.

2.05 DRAINAGE PIPE

- A. The drainage collection pipe shall be a perforated or slotted PVC, or corrugated HDPE pipe. The drainage pipe shall be wrapped with a geotextile around a minimum 6" of 3/4" crushed stone bedding to function as a filter.

2.06 BACKFILL SOIL

- A. Backfill shall consist of On-Site Material as specified in Section 31 00 00 EARTHWORK.

2.07 GEOTEXTILE FILTER

- A. Drainage geotextile shall consist of geosynthetic specifically manufactured for use as a preamable soil filter that retains soil while still allowing water to pass throughout the life of the structure. The type and placement of the geotextile filter material shall be as required by the Wall Design engineer in their final wall plans and specifications.

2.08 SOURCE QUALITY CONTROL

- A. Provide in accordance with Division 01 General Requirements.

PART 3 – EXECUTION

3.01 DESIGN

- A. The design analysis for the final P.E.-sealed retaining wall plans prepared by the Wall Design engineer shall consider the external stability against sliding and overturning, internal stability and facial stability of the reinforced soil mass, and shall be in accordance with acceptable engineering practice and these specifications. The internal and external stability analysis shall be performed in accordance with the "NCMA Design Manual for Segmental Retaining Walls," (3rd Edition, 2009), using the recommended minimum factors of safety in this manual.

- B. While vertical spacing between geogrid layers may vary, it shall not exceed 2.0 feet maximum in the wall design, unless otherwise recommended by the Wall Design engineer.
- C. The geosynthetic placement in the wall design shall have 100% continuous coverage parallel to the wall face. Gapping between horizontally adjacent layers of geosynthetic (partial coverage) will not be allowed.

3.02 INSPECTION

- A. The Owner or Owner's Engineer is responsible for verifying that the materials supplied by the Contractor meet all the requirements of the specification. This includes all submittals for materials and design, qualifications and proper installation of wall system.
- B. Contractor's field construction supervisor shall have demonstrated experience with granite retaining wall system installations and be qualified to direct all work at the site.

3.03 EXCAVATION

- A. Contractor shall excavate to the lines and grades shown on the project grading plans. Contractor shall take precautions to minimize over-excavation. Over-excavation shall be filled with compacted infill material, or as directed by the Wall Design engineer, at the Contractor's expense.
- B. Contractor shall verify location of existing structures and utilities prior to excavation. Contractor shall ensure all surrounding structures are protected from the effects of wall excavation. Excavation support, if required, is the responsibility of the Contractor.

3.04 FOUNDATION PREPARATION

- A. Following the excavation, the foundation soil shall be examined by the Owner's Engineer to assure actual foundation soil strength meets or exceeds the assumed design bearing strength. Soils not meeting the required strength shall be removed and replaced with infill soils, as directed by the Engineer and Wall Design engineer.
- B. Foundation soil shall be proof-rolled and compacted to 95% standard Proctor density and inspected by the Engineer prior to placement of leveling pad materials.

3.05 LEVELING PAD CONSTRUCTION

- A. Leveling pad, if required, shall be placed as shown on the final P.E.-sealed retaining wall plans with a minimum thickness as indicated on submitted shop drawings. The leveling pad should extend laterally at least a distance of 6 inches from the toe and heel of the lowermost SRW unit.

3.06 GEOSYNTHETIC REINFORCEMENT PLACEMENT

- A. All geosynthetic reinforcement shall be installed at the proper elevation and orientation as shown on the final P.E.-sealed retaining wall plan profiles and details, or as directed by the Wall Design engineer.
- B. At the elevations shown on the final plans, (after the units, drainage material and backfill have been placed to this elevation) the geosynthetic reinforcement shall be laid horizontally on compacted infill and on top of the SRW units, to within 1 inch of the front face of the unit below. Correct orientation of the geosynthetic reinforcement shall be verified by the Contractor to be in accordance with the geosynthetic manufacturer's recommendations. The highest-strength direction of the geosynthetic must be perpendicular to the wall face.
- C. Geosynthetic reinforcement layers shall be one continuous piece for their entire embedment length. Splicing of the geosynthetic in the design-strength direction (perpendicular to the wall face) shall not be permitted. Along the length of the wall, horizontally adjacent sections of geosynthetic reinforcement shall be butted in a manner to assure 100% coverage parallel to the wall face.
- D. Tracked construction equipment shall not be operated directly on the geosynthetic reinforcement. A minimum of 6 inches of backfill is required prior to operation of tracked vehicles over the geosynthetic. Turning should be kept to a minimum. Rubber-tired equipment may pass over the geosynthetic reinforcement at slow speeds (less than 5 mph).
- E. The geosynthetic reinforcement shall be free of wrinkles prior to placement of soil fill. The nominal tension shall be applied to the reinforcement and secured in place with staples, stakes or by hand tensioning until reinforcement is covered by 6 inches of fill.

3.07 DRAINAGE AGGREGATE AND DRAINAGE MATERIAL PLACEMENT

- A. Drainage aggregate shall be installed to the line, grades and sections shown on the final P.E.-sealed retaining wall plans. Drainage aggregate shall be placed to the minimum thickness shown on the construction plans between and behind units (a minimum of 1 cubic foot for each exposed square foot of wall face unless otherwise noted on the final wall plans).
- B. Drainage collection pipes shall be installed to maintain gravity flow of water outside the reinforced-soil zone. The drainage collection pipe shall be installed at the locations shown on the final construction drawings. The drainage collection pipe shall daylight into a storm sewer or along a slope, at an elevation below the lowest point of the pipe within the aggregate drain. Drainage laterals shall be spaced at a maximum 50-foot spacing along the wall face.

3.08 BACKFILL PLACEMENT

- A. Backfill shall be placed as shown in the final wall plans in the maximum compacted lift thickness of 8 inches and shall be compacted to a minimum of 95% of standard Proctor density (ASTM D698) at a moisture content within -1% point to +3% points of optimum. The backfill shall be placed and spread in such a manner as to eliminate wrinkles or movement of the geosynthetic reinforcement and the SRW units.
- B. Only hand-operated compaction equipment shall be allowed within 3 feet of the back of the wall units. Compaction within the 3 feet behind the wall units shall be achieved by at least three passes of a lightweight mechanical tamper, plate, or roller.
- C. At the end of each day's operation, the Contractor shall slope the last level of backfill away from the wall facing and backfill to direct water runoff away from the wall face.
- D. At completion of wall construction, backfill shall be placed level with final top of wall elevation. If final grading, paving, landscaping and/or storm drainage installation adjacent to the wall is not placed immediately after wall completion, temporary grading and drainage shall be provided to ensure water runoff is not directed at the wall nor allowed to collect or pond behind the wall until final construction adjacent to the wall is completed.

3.09 CONSTRUCTION ADJACENT TO COMPLETED WALL

- A. The Owner or Owner's Representative is responsible for ensuring that construction by others adjacent to the wall does not disturb the wall or place temporary construction loads on the wall that exceed design loads, including loads such as water pressure, temporary grades, or equipment loading. Heavy paving or grading equipment shall be kept a minimum of 3 feet behind the back of the wall face. Equipment with wheel loads in excess of 150 psf live load shall not be operated within 10 feet of the face of the retaining wall during construction adjacent to the wall. Care should be taken by the General Contractor to ensure water runoff is directed away from the wall structure until final grading and surface drainage collection systems are completed.

3.10 FIELD QUALITY CONTROL

- A. Provide in accordance with Division 01 General Requirements.

3.11 CLOSEOUT ACTIVITIES

- A. Provide in accordance with Division 01 General Requirements.
- B. Power wash if necessary exposed face of retaining wall to ensure it is be free of dirt and staining.

END OF SECTION

SECTION 32 92 19

SEEDING

PART 1 – GENERAL

1.01 SUMMARY

- A. Section Includes
 - 1. Provide landscape development Work as required, including
 - a. Preparation of subgrade to receive topsoil
 - b. Spreading topsoil
 - c. Seeding
 - d. Maintaining seeded areas until acceptance
 - 2. Repair all grassed areas disturbed during performance of the Work. Where existing topsoil remains, provide seed to re-establish grass. Where necessary, provide additional topsoil.

1.02 PRICE AND PAYMENT PROCEDURES

- A. Measurement and payment requirements: per Division 01 General Requirements.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Coordination, Sequencing, and Scheduling: per Division 01 General Requirements.

1.04 SUBMITTALS

- A. Submit in accordance with Division 01 General Requirements.
- B. Certificates
 - 1. Submit manufacturers or vendors certified analysis for soil amendments and fertilizer materials. Submit other data substantiating that materials comply with specified requirements.
 - 2. Submit seed vendor's certified statement for each grass seed mixture required, stating botanical and common name, percentage by weight, and percentages of purity germination, and weed seed for each grass seed species.
- C. Samples
 - 1. Submit proposed planting schedule indicating dates for each type of landscape work during normal seasons for such Work in area of Site.

Correlate with specified maintenance periods to provide maintenance from date of substantial completion. Once accepted, revise dates only as approved in writing, after documentation of reasons for delays.

- D. Closeout and Maintenance Material Submittals: per Division 01 General Requirements.

1.05 QUALITY ASSURANCE

- A. Analysis and Standards: Package standard products with manufacturers certified analysis. For other materials, provide analysis by recognized laboratory made in accordance with methods established by the Association of Official Agriculture Chemists, wherever applicable.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Provide in accordance with Division 01 General Requirements.
 - 1. Deliver grass seed in original containers showing analysis of seed mixture, percentage of pure seed, year of production, net weight, date of packaging, and location of packaging. Damaged packages are not acceptable.
 - 2. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

1.07 SITE CONDITIONS

- A. Proceed with, and complete landscape work as rapidly as portions of Site become available, working within seasonal limitations for each kind of landscape work required. When conditions detrimental to plant growth are encountered, notify Engineer before planting.
- B. Locate underground utilities. Perform Work in a manner that will avoid damage.
- C. Plant or install materials during normal planting seasons for each type of landscape work required.
- D. Beginning Work means acceptance of existing conditions.

PART 2 – PRODUCTS

2.01 TOPSOIL

- A. Use topsoil stockpiled for re-use in landscape work. If quantity of stockpiled topsoil is insufficient, provide additional topsoil as required to complete landscape work.
- B. Provide new topsoil which is fertile, friable, natural loam surface soil found at a depth of not less than 4-inches from the original ground surface, reasonably free of

subsoil, clay lumps, brush, weeds and other litter, and free of roots, stumps, stones larger than 2-inches in any dimension, and debris.

- C. Obtain topsoil from local sources or from areas having similar soil characteristics to that found at Project Site. Obtain topsoil only from naturally, well-drained sites where topsoil occurs in a depth of not less than 4-inches; do not obtain from bogs or marshes.

2.02 SOIL AMENDMENTS

- A. Lime: Natural limestone containing not less than 90 percent total carbonates, ground, so that not less than 98 percent passes a 20-mesh sieve and not less than 40 percent passes a 100-mesh sieve.

2.03 GRASS MATERIALS

- A. Grass Seed: Provide fresh, clean, new-crop seed complying with tolerance for purity and germination established by Official Seed Analyst of North America. Do not use seed that has become wet, moldy, or damaged. All seed mixtures listed are proportions by weight.
 - 1. Germination: not less than 80 percent
 - 2. Purity: not less than 85 percent
 - 3. Weed content: not more than 1 percent
- B. Seed mixture for lawn areas shall be MaineDOT Method #1, and proportioned by weight as follows:
 - 1. 45% Creeping Red Fescue
 - 2. 25% Kentucky Bluegrass
 - 3. 15% Chewings Fescue
 - 4. 10% Perennial Ryegrass
 - 5. 5% Annual Ryegrass

2.04 MISCELLANEOUS LANDSCAPE MATERIALS

- A. Erosion control mesh: Uniform, open weave jute matting or flexible vinyl mat equal to Mira Mat erosion control, and revegetation mat as manufactured by TenCate Mirafi.

2.05 SOURCE QUALITY CONTROL

- A. Provide in accordance with Division 01 General Requirements.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Protect existing underground improvements from damage.
- B. Remove foreign materials, plants, roots, stones, and debris from Site. Do not bury foreign material.
- C. Remove contaminated subsoil.
- D. Preparation for Planting Grass
 - 1. Loosen subgrade of grass areas to a minimum of 3-inches. Remove stones over 1-1/2 inches in any dimension, sticks, roots, rubbish and other extraneous matter. Limit preparation to areas that will be planted promptly after preparation.
 - 2. Spread top soil to minimum depth of 4-inches after light rolling and natural settlement. Add specified soil amendments and mix thoroughly into upper 4-inches of topsoil.
- E. Where grass is to be planted in areas that have not been altered or disturbed by excavating, grading, or stripping operations, prepare soil for planting as follows: Till to a depth of not less than 6-inches; apply soil amendments and initial fertilizers as specified; remove high areas and fill in depressions; till soil to a homogenous mixture of fine texture, free of lumps, clods, stones, roots and other extraneous matter.
- F. Fine Grade areas to be smooth, even surface with loose, uniformly fine texture. Roll, rake and remove ridges, and fill depressions as required to meet finish grades. Limit fine grading to areas that can be planted immediately after grading. Assure positive drainage away from buildings.
- G. Moisten prepared areas before planting if soil is dry. Water thoroughly and allow surface moisture to dry before planting lawns. Do not create a muddy soil condition.
- H. Restore grassed areas to specified condition if eroded or otherwise disturbed after fine grading and prior to planting.

3.02 SEEDING NEW AREAS

- A. Sow seed using a spreader or seeding machine. Do not seed when wind velocity exceeds 5 miles per hour. Distribute seed evenly over entire area by sowing equal quantity in 2 directions at right angles to each other. Do not sow immediately following rain or when ground is too dry.
- B. Seed application rate

1. New England Conservation Seed Mix: 1 pound per 1,750 square feet.
 2. All others: 1 pound per 1,000 square feet.
- C. Rake seed lightly into top 1/8-inch of soil, roll lightly, and water with a fine spray.

3.03 HYDROSEEDING NEW AREAS

- A. Mix specified seed and pulverized mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogenous slurry suitable for hydraulic application.
- B. Apply slurry using an approved machine. Seed and suitable corn fiber mulch may be applied in one operation. Mix materials with water in machine and agitate to keep mixture uniformly suspended. Use spraying equipment that will distribute slurry uniformly at required rates.
- C. Immediately following hydroseeding, mulch areas by means of mulch blower at rate of 1,200 pounds per acre on level grades, 2,000 pounds on slopes if mulch is not part of slurry. Do not seed area in excess of that which can be mulched on same day.

3.04 PROTECTION OF SEEDED SLOPES

- A. Protect seeded slopes against erosion with erosion netting or other methods acceptable to the Engineer.
- B. Spread specified lawn mulch after completion of seeding operations to form a continuous blanket not less than 1-1/2-inches loose measurement over seeded areas.
- C. Anchor mulch by spraying with asphalt emulsion at the rate of 10 to 13 gallons per 1000 square feet. Take precautions to prevent damage or staining of construction or other plantings adjacent to mulched areas.
- D. Cover seeded slopes where grade is 3:1 or greater, unless otherwise noted, with jute matting. Roll matting down over slopes without stretching or pulling.
- E. Lay matting smoothly on soil surface, burying top end of each section in narrow 6-inch trench. Leave 12-inch overlap from top roll over bottom roll. Leave 4-inch overlap over adjacent section.
- F. Staple outside edges and overlaps at 36-inch intervals.
- G. Lightly dress slopes with topsoil to ensure close contact between matting and soil.
- H. In ditches, unroll matting in direction of flow. Overlap ends of strips 6 inches with upstream section on top.

3.05 RECONDITIONING EXISTING GRASSED AREAS

- A. Recondition existing lawn areas damaged by Contractor's operations and existing lawn areas where minor re-grading is required.
- B. Provide fertilizer, seed, or sod, and soil amendments as specified for new lawns and as required to provide a satisfactorily reconditioned lawn. Provide new topsoil as required to fill low spots and meet new finish grades.
- C. Cultivate bare and compacted areas thoroughly to provide a satisfactory planting bed.
- D. Remove diseased and unsatisfactory lawn areas. Do not bury into soil. Remove topsoil containing foreign materials resulting from Contractor's operations.
- E. Water newly planted areas and keep moist until new grass is established.

3.06 MAINTENANCE

- A. Begin maintenance immediately after planting.
- B. Maintain grassed areas for not less than 60 days after substantial completion, and longer as required to establish an acceptable lawn.
- C. If seeded in fall, and not given full 60 days of maintenance, or if not considered acceptable at that time, continue maintenance during the following spring until acceptable lawn is established.
- D. Maintain grass by watering, fertilizing, weeding, mowing, trimming, and other operations such as rolling, re-grading, and replanting as required to establish a smooth, acceptable lawn, free of eroded or bare areas.

3.07 CLEANUP AND PROTECTION

- A. Keep pavements clean. Maintain protection during installation and maintenance periods.
- B. Restore pavement, grassed areas and planted areas damaged during execution of Work of this section.

3.08 INSPECTION AND ACCEPTANCE

- A. Landscape work may be inspected for acceptance in parts agreeable to Engineer, provided Work offered for inspection is complete, including maintenance.
- B. Replace rejected Work and continue specified maintenance until re-inspected by Engineer and found to be acceptable.

3.09 FIELD QUALITY CONTROL

- A. Provide in accordance with Division 01 General Requirements.

3.10 CLOSEOUT ACTIVITIES

- A. Provide in accordance with Division 01 General Requirements.

END OF SECTION



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