



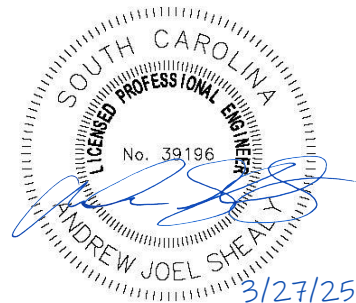
***WATER SYSTEM EXPANSION – SOUTH
SCIIP GRANT – A-23-C081***

*City of Goose Creek
Goose Creek, South Carolina*

PROJECT MANUAL

PROJECT NO. 2023-1180-00

March 2025



***Ardurra Group, Inc.
220 North Main Street, Suite 500
Greenville, South Carolina 29601
Telephone: (864) 226-6111***

THIS PAGE INTENTIONALLY LEFT BLANK

ARDURRA

**WATER SYSTEM EXPANSION - SOUTH
CITY OF GOOSE CREEK
GOOSE CREEK, SOUTH CAROLINA**

**TABLE OF CONTENTS
PROJECT MANUAL**

<u>Section</u>	<u>Description</u>	<u>Page No.</u>
BIDDING REQUIREMENTS, CONTRACT FORMS, AND CONDITIONS OF THE CONTRACT		
C-111	Advertisement for Bids	1 – 2
C-200	Instructions to Bidders	1 – 11
C-410	Bid Form	1 – 7
	Supplement to Bid Form	1 – 1
	Attachment “A” List of Subcontractors	1 – 1
	Attachment “B” List of Suppliers	1 – 1
C-430	Bid Bond	1 – 2
C-510	Notice of Award	1 – 1
C-520	Agreement Between Owner and Contractor	1 – 7
C-550	Notice to Proceed	1 – 1
C-610	Performance Bond	1 – 4
C-615	Payment Bond	1 – 4
	SCIIP Contractor Pay Request Certificate	1 – 1
C-620	Application for Payment	1 – 6
C-700	Standard General Conditions	1 – 70
C-800	Supplementary Conditions	1 – 13
	Contract Requirements for SCIIP Projects	1 – 4
	Debarment Certification	1 – 2
	SAM.GOV Notification	1 – 1
C-941	Change Order Form	1 – 1

THIS PAGE INTENTIONALLY LEFT BLANK

ADVERTISEMENT FOR BIDS
City of Goose Creek
Goose Creek, South Carolina
Water System Expansion - South

General Notice

City of Goose Creek (Owner) is requesting Bids for the construction of the following Project:

Goose Creek Water System Expansion - South
2023-1180-00

Bids for the construction of the Project will be received at the **City of Goose Creek office** located at **200 Button Hall Avenue, Goose Creek, South Carolina**, until **May 15th, 2025, at 2:00 PM (EST)** local time. At that time the Bids received will be **publicly** opened and read.

The Project includes the following Work:

Installation of approximately 2,220 linear feet of 10-inch transmission main, road bores, valves, hydrants, system connections, erosion control, and related appurtenances.

Alternate 1: Installation of approximately 50 linear feet of 6-inch and 1,225 linear feet of 10-inch transmission main, valves, hydrants, erosion control, and related appurtenances.

Alternate 2: Installation of approximately 725 linear feet of 6-inch and 4,375 linear feet of 10-inch transmission main, valves, hydrants, system connections, erosion control, and related appurtenances.

The project is being funded in whole or in part by the South Carolina Infrastructure Investment Program (SCIIP), which is administered by the South Carolina Rural Infrastructure Authority (RIA) and funded by federal State and Local Fiscal Recovery Funds (SLFRF) through the American Rescue Plan Act (ARPA). All federal SLFRF requirements and SCIIP requirements will apply to the contract. All contractors and subcontractors are required to be registered in the federal System for Award Management (SAM) and may not be debarred from doing business with the federal government. Respondents on this work will be required to comply with all applicable federal regulations, including those listed in the supplementary conditions.

Bids are requested for the following Contract: **Goose Creek Water System Expansion - South**

The Project has an expected duration of 180 days.

Obtaining the Bidding Documents

Information and Bidding Documents for the Project can be found at the following designated website:

<https://www.cityofgoosecreek.com/government/vendor-solicitations>

Pre-bid Conference

A non-mandatory pre-bid conference for the Project will be held on **May 1st, 2025, at 2:00 PM (EST)** at **City of Goose Creek, 200 Button Hall Avenue, Goose Creek, South Carolina 29445**. Attendance at the pre-bid conference is encouraged but not required.

Instructions to Bidders.

For all further requirements regarding bid submittal, qualifications, procedures, and contract award, refer to the Instructions to Bidders that are included in the Bidding Documents.

This Advertisement is issued by:

Owner: **City of Goose Creek**

By: **Chuck Denson, PE**

Title: **Director – Department of Public Work**

Date: **April 15th, 2025**

INSTRUCTIONS TO BIDDERS FOR CONSTRUCTION CONTRACT

TABLE OF CONTENTS

	Page
Article 1— Defined Terms.....	1
Article 2— Bidding Documents	1
Article 3— Qualifications of Bidders.....	2
Article 4— Pre-Bid Conference	2
Article 5— Site and Other Areas; Existing Site Conditions; Examination of Site; Owner’s Safety Program; Other Work at the Site.....	2
Article 6— Bidder’s Representations and Certifications.....	4
Article 7— Interpretations and Addenda	4
Article 8— Bid Security	5
Article 9— Contract Times	5
Article 10— Substitute and “Or Equal” Items.....	5
Article 11— Subcontractors, Suppliers, and Others	6
Article 12— Preparation of Bid	6
Article 13— Basis of Bid	7
Article 14— Submittal of Bid.....	8
Article 15— Modification and Withdrawal of Bid.....	8
Article 16— Opening of Bids	9
Article 17— Bids to Remain Subject to Acceptance	9
Article 18— Evaluation of Bids and Award of Contract	9
Article 19— Bonds and Insurance.....	10
Article 20— Signing of Agreement.....	10

ARTICLE 1—DEFINED TERMS

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

ARTICLE 2—BIDDING DOCUMENTS

- 2.01 Bidder shall obtain a complete set of Bidding Requirements and proposed Contract Documents (together, the Bidding Documents). See the Agreement for a list of the Contract Documents. It is Bidder's responsibility to determine that it is using a complete set of documents in the preparation of a Bid. Bidder assumes sole responsibility for errors or misinterpretations resulting from the use of incomplete documents, by Bidder itself or by its prospective Subcontractors and Suppliers.
- 2.02 Bidding Documents are made available for the sole purpose of obtaining Bids for completion of the Project and permission to download or distribution of the Bidding Documents does not confer a license or grant permission or authorization for any other use. Authorization to download documents, or other distribution, includes the right for plan holders to print documents solely for their use, and the use of their prospective Subcontractors and Suppliers, provided the plan holder pays all costs associated with printing or reproduction. Printed documents may not be re-sold under any circumstances.
- 2.03 Owner has established a Bidding Documents Website as indicated in the Advertisement or invitation to bid. Owner recommends that Bidder register as a plan holder with the Issuing Office at such website, and obtain a complete set of the Bidding Documents from such website. Bidders may rely that sets of Bidding Documents obtained from the Bidding Documents Website are complete, unless an omission is blatant. Registered plan holders will receive Addenda issued by Owner.
- 2.04 *Electronic Documents*
- A. When the Bidding Requirements indicate that electronic (digital) copies of the Bidding Documents are available, such documents will be made available to the Bidders as Electronic Documents in the manner specified.
1. Bidding Documents will be provided in Adobe PDF (Portable Document Format) (.pdf) that is readable by Adobe Acrobat Reader Version 22 or later. It is the intent of the Engineer and Owner that such Electronic Documents are to be exactly representative of the paper copies of the documents. However, because the Owner and Engineer cannot totally control the transmission and receipt of Electronic Documents nor the Contractor's means of reproduction of such documents, the Owner and Engineer cannot and do not guarantee that Electronic Documents and reproductions prepared from those versions are identical in every manner to the paper copies.
- B. Unless otherwise stated in the Bidding Documents, the Bidder may use and rely upon complete sets of Electronic Documents of the Bidding Documents, described in Paragraph 2.04.A above. However, Bidder assumes all risks associated with differences arising from transmission/receipt of Electronic Documents versions of Bidding Documents

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

ARTICLE 3—QUALIFICATIONS OF BIDDERS

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

ARTICLE 4—PRE-BID CONFERENCE

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

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

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

5.02 *Existing Site Conditions*

A. *Subsurface and Physical Conditions; Hazardous Environmental Conditions*

1. The Supplementary Conditions identify the following regarding existing conditions at or adjacent to the Site:
 - a. Those reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data.
 - b. Those drawings known to Owner of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data.
 - c. Reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site.
 - d. Technical Data contained in such reports and drawings.
2. Owner will make copies of reports and drawings referenced above available to any Bidder on request. These reports and drawings are not part of the Contract Documents, but the Technical Data contained therein upon whose accuracy Bidder is entitled to rely, as provided in the General Conditions, has been identified and established in the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any Technical Data or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.
3. If the Supplementary Conditions do not identify Technical Data, the default definition of Technical Data set forth in Article 1 of the General Conditions will apply.

- B. *Underground Facilities:* Underground Facilities are shown or indicated on the Drawings, pursuant to Paragraph 5.05 of the General Conditions, and not in the drawings referred to in Paragraph 5.02.A of these Instructions to Bidders. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.

5.03 *Other Site-related Documents*

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

5.04 *Site Visit and Testing by Bidders*

- A. Bidder is required to visit the Site and conduct a thorough visual examination of the Site and adjacent areas. During the visit the Bidder must not disturb any ongoing operations at the Site.
- B. A Site visit is scheduled following the pre-bid conference. Maps to the Site will be available at the pre-Bid conference.
- C. Bidders visiting the Site are required to arrange their own transportation to the Site.
- D. All access to the Site other than during a regularly scheduled Site visit must be coordinated through the following Owner or Engineer contact for visiting the Site: **Andrew Shealy, PE;** ashealy@ardurra.com or (864) 328-1251. Bidder must conduct the required Site visit during normal working hours.

- E. Bidder is not required to conduct any subsurface testing, or exhaustive investigations of Site conditions.
- F. On request, and to the extent Owner has control over the Site, and schedule permitting, the Owner will provide Bidder general access to the Site to conduct such additional examinations, investigations, explorations, tests, and studies as Bidder deems necessary for preparing and submitting a successful Bid. Owner will not have any obligation to grant such access if doing so is not practical because of existing operations, security or safety concerns, or restraints on Owner's authority regarding the Site. Bidder is responsible for establishing access needed to reach specific selected test sites.
- G. Bidder must comply with all applicable Laws and Regulations regarding excavation and location of utilities, obtain all permits, and comply with all terms and conditions established by Owner or by property owners or other entities controlling the Site with respect to schedule, access, existing operations, security, liability insurance, and applicable safety programs.
- H. Bidder must fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies.

5.05 *Owner's Safety Program*

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

ARTICLE 6—BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

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

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

ARTICLE 7—INTERPRETATIONS AND ADDENDA

- 7.01 Owner on its own initiative may issue Addenda to clarify, correct, supplement, or change the Bidding Documents.
- 7.02 Bidder shall submit all questions about the meaning or intent of the Bidding Documents to Engineer in writing. Contact information and submittal procedures for such questions are as follows:
 - A. **Submit questions to Andrew J. Shealy, PE, Ardurra Group, Inc., via email at ashealy@ardurra.com.**

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

ARTICLE 8—BID SECURITY

- 8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of **5** percent of Bidder's maximum Bid price (determined by adding the base bid and all alternates) and in the form of a Bid bond issued by a surety meeting the requirements of Paragraph 6.01 of the General Conditions. Such Bid bond will be issued in the form included in the Bidding Documents.
- 8.02 The Bid security of the apparent Successful Bidder will be retained until Owner awards the contract to such Bidder, and such Bidder has executed the Contract, furnished the required Contract security, and met the other conditions of the Notice of Award, whereupon the Bid security will be released. If the Successful Bidder fails to execute and deliver the Contract and furnish the required Contract security within 15 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited, in whole in the case of a penal sum bid bond, and to the extent of Owner's damages in the case of a damages-form bond. Such forfeiture will be Owner's exclusive remedy if Bidder defaults.
- 8.03 The Bid security of other Bidders that Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of 7 days after the Effective Date of the Contract or 61 days after the Bid opening, whereupon Bid security furnished by such Bidders will be released.
- 8.04 Bid security of other Bidders that Owner believes do not have a reasonable chance of receiving the award will be released within 7 days after the Bid opening.

ARTICLE 9—CONTRACT TIMES

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

ARTICLE 10—SUBSTITUTE AND "OR EQUAL" ITEMS

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

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

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

ARTICLE 11—SUBCONTRACTORS, SUPPLIERS, AND OTHERS

- 11.01 The apparent Successful Bidder, and any other Bidder so requested, must submit to Owner a list of the Subcontractors or Suppliers proposed for the Work within five days after Bid opening.
- 11.02 If requested by Owner, such list must be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor or Supplier. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor or Supplier, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit an acceptable substitute, in which case apparent Successful Bidder will submit a substitute, Bidder’s Bid price will be increased (or decreased) by the difference in cost occasioned by such substitution, and Owner may consider such price adjustment in evaluating Bids and making the Contract award.
- 11.03 If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors and Suppliers. Declining to make requested substitutions will constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor or Supplier, so listed and against which Owner or Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to subsequent revocation of such acceptance as provided in Paragraph 7.07 of the General Conditions.

ARTICLE 12—PREPARATION OF BID

- 12.01 The Bid Form is included with the Bidding Documents.
- A. All blanks on the Bid Form must be completed in ink and the Bid Form signed in ink. Erasures or alterations must be initialed in ink by the person signing the Bid Form. A Bid price must be indicated for each section, Bid item, alternate, adjustment unit price item, and unit price item listed therein.
 - B. If the Bid Form expressly indicates that submitting pricing on a specific alternate item is optional, and Bidder elects to not furnish pricing for such optional alternate item, then Bidder may enter the words “No Bid” or “Not Applicable.”
- 12.02 If Bidder has obtained the Bidding Documents as Electronic Documents, then Bidder shall prepare its Bid on a paper copy of the Bid Form printed from the Electronic Documents version of the Bidding Documents. The printed copy of the Bid Form must be clearly legible, printed on 8½ inch by 11-inch paper and as closely identical in appearance to the Electronic Document version of the Bid Form as may be practical. The Owner reserves the right to accept Bid Forms which nominally vary in appearance from the original paper version of the Bid Form, providing that all required information and submittals are included with the Bid.

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

ARTICLE 13—BASIS OF BID

13.01 *Unit Price*

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

13.02 *Base Bid with Alternates*

- A. Bidders must submit a Bid on a lump sum basis for the base Bid and include a separate price for each alternate described in the Bidding Documents and as provided for in the Bid Form. The price for each alternate will be the amount added to or deleted from the base Bid if Owner selects the alternate.
- B. In the comparison of Bids, alternates will be applied in the same order of priority as listed in the Bid Form.

ARTICLE 14—SUBMITTAL OF BID

- 14.01 The Bidding Documents include one separate unbound copy of the Bid Form, and, if required, the Bid Bond Form. The unbound copy of the Bid Form is to be completed and submitted with the Bid security and the other documents required to be submitted under the terms of Article 2 of the Bid Form.
- 14.02 A Bid must be received no later than the date and time prescribed and at the place indicated in the Advertisement or invitation to bid and must be enclosed in a plainly marked package with the Project title, and, if applicable, the designated portion of the Project for which the Bid is submitted, the name and address of Bidder, and must be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid must be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED." A mailed Bid must be addressed to the location designated in the Advertisement.
- 14.03 Bids received after the date and time prescribed for the opening of bids, or not submitted at the correct location or in the designated manner, will not be accepted and will be returned to the Bidder unopened.

ARTICLE 15—MODIFICATION AND WITHDRAWAL OF BID

- 15.01 An unopened Bid may be withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids. Upon receipt of such notice, the unopened Bid will be returned to the Bidder.
- 15.02 If a Bidder wishes to modify its Bid prior to Bid opening, Bidder must withdraw its initial Bid in the manner specified in Paragraph 15.01 and submit a new Bid prior to the date and time for the opening of Bids.
- 15.03 If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, the Bidder may withdraw its Bid,

and the Bid security will be returned. Thereafter, if the Work is rebid, the Bidder will be disqualified from further bidding on the Work.

ARTICLE 16—OPENING OF BIDS

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

ARTICLE 17—BIDS TO REMAIN SUBJECT TO ACCEPTANCE

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

ARTICLE 18—EVALUATION OF BIDS AND AWARD OF CONTRACT

- 18.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner also reserves the right to waive all minor Bid informalities not involving price, time, or changes in the Work.
- 18.02 Owner will reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible.
- 18.03 If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes of the Bid, whether in the Bid itself or in a separate communication to Owner or Engineer, then Owner will reject the Bid as nonresponsive.
- 18.04 If Owner awards the contract for the Work, such award will be to the responsible Bidder submitting the lowest responsive Bid.
- 18.05 *Evaluation of Bids*
- A. In evaluating Bids, Owner will consider whether the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.
 - B. In the comparison of Bids, alternates will be applied in the same order of priority as listed in the Bid Form. To determine the Bid prices for purposes of comparison, Owner will announce to all bidders a “Base Bid plus alternates” budget after receiving all Bids, but prior to opening them. For comparison purposes alternates will be accepted, following the order of priority established in the Bid Form, until doing so would cause the budget to be exceeded. After determination of the Successful Bidder based on this comparative process and on the responsiveness, responsibility, and other factors set forth in these Instructions, the award may be made to said Successful Bidder on its base Bid and any combination of its additive alternate Bids for which Owner determines funds will be available at the time of award.
 - C. For determination of the apparent low Bidder(s) when sectional bids are submitted, Bids will be compared on the basis of the aggregate of the Bids for separate sections and the Bids for combined sections that result in the lowest total amount for all of the Work.

- D. For the determination of the apparent low Bidder when unit price bids are submitted, Bids will be compared on the basis of the total of the products of the estimated quantity of each item and unit price Bid for that item, together with any lump sum items.
- 18.06 In evaluating whether a Bidder is responsible, Owner will consider the qualifications of the Bidder and may consider the qualifications and experience of Subcontractors and Suppliers proposed for those portions of the Work for which the identity of Subcontractors and Suppliers must be submitted as provided in the Bidding Documents.
- 18.07 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders and any proposed Subcontractors or Suppliers.

ARTICLE 19—BONDS AND INSURANCE

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

ARTICLE 20—SIGNING OF AGREEMENT

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

THIS PAGE INTENTIONALLY LEFT BLANK

BID FORM FOR CONSTRUCTION CONTRACT

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

ARTICLE 1—OWNER AND BIDDER

- 1.01 This Bid is submitted to: **City of Goose Creek, 200 Button Hall Avenue, Goose Creek, South Carolina 29445.**
- 1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2—ATTACHMENTS TO THIS BID

- 2.01 The following documents are submitted with and made a condition of this Bid:
- A. Required Bid security;
 - B. List of Proposed Subcontractors;
 - C. List of Proposed Suppliers;
 - D. Evidence of authority to do business in the state of the Project; or a written covenant to obtain such authority within the time for acceptance of Bids;
 - E. Contractor's license number as evidence of Bidder's State Contractor's License or a covenant by Bidder to obtain said license within the time for acceptance of Bids;
- 2.02 *Unit Price Bids*
- A. Bidder will perform the following Work at the indicated unit prices:

Item No.	Description	Unit	Estimated Quantity	Bid Unit Price	Bid Amount
Goose Creek Water System Expansion – South – Base Bid					
1.	Mobilization (Max. 3%)	LS	1	\$	\$
2.	Clearing & Grubbing	AC	0.2	\$	\$
3.	10-inch Waterline				
a.	PVC	LF	1,755	\$	\$
b.	DIP	LF	465	\$	\$
4.	Fire Hydrant Assembly	EA	2	\$	\$
5.	10-inch Gate Valves	EA	4	\$	\$
6.	System Connections				
a.	10x10 Tee	EA	1	\$	\$
7.	Jack and Bore with Steel Casing				
a.	12-inch Steel Casing	LF	205	\$	\$
b.	18-inch Steel Casing	LF	180	\$	\$
8.	Open Cut Pavement	LF	290	\$	\$
9.	Drive Repair/Overlay				
a.	Asphalt	SY	580	\$	\$

Item No.	Description	Unit	Estimated Quantity	Bid Unit Price	Bid Amount
b.	Concrete	SY	100	\$	\$
10.	Erosion Prevention and Sedimentation Control				
a.	Silt Fence	LF	2,120	\$	\$
b.	Sediment Tubes	EA	15	\$	\$
c.	Temporary Grassing	AC	0.7	\$	\$
d.	Permanent Grassing	AC	0.7	\$	\$
11.	Temporary Traffic Control				
a.	Old State Road	LS	1	\$	\$
12.	Miscellaneous Concrete	CY	10	\$	\$
13.	Rock Excavation & Removal	CY	50	\$	\$
14.	Stone Bedding	CY	20	\$	\$
15.	Select Trench Backfill	CY	40	\$	\$
16.	Flowable Fill	CY	150	\$	\$
Total of Base Bid			\$		

The **TOTAL BASE BID PRICE** for **Goose Creek Water System Expansion - South** (the sum of the items above) is as follows:

_____ (Words)

_____ (Figures)

Item No.	Description	Unit	Estimated Quantity	Bid Unit Price	Bid Amount
Goose Creek Water System Expansion – South – Alternate 1					
1.	Mobilization (Max. 3%)	LS	1	\$	\$
2.	Clearing & Grubbing	AC	0.4	\$	\$
3.	6-inch Waterline				
a.	DIP	LF	50	\$	\$
4.	10-inch Waterline				
a.	PVC	LF	1,225	\$	\$
5.	Fire Hydrant Assembly	EA	2	\$	\$
6.	10-inch Gate Valves	EA	2	\$	\$
7.	Erosion Prevention and Sedimentation Control				
a.	Silt Fence	LF	1,765	\$	\$
b.	Sediment Tubes	EA	2	\$	\$
c.	Temporary Grassing	AC	0.5	\$	\$
d.	Permanent Grassing	AC	0.5	\$	\$
8.	Temporary Traffic Control				
a.	Snake Road	LS	1	\$	\$
9.	Miscellaneous Concrete	CY	5	\$	\$
10.	Rock Excavation & Removal	CY	50	\$	\$
11.	Stone Bedding	CY	20	\$	\$
12.	Select Trench Backfill	CY	40	\$	\$
Total of Alternate 1			\$		

The **ALTERNATE 1 BID PRICE** for **Goose Creek Water System Expansion - South** (the sum of the items above, including the total cost of the base bid price) is as follows:

_____ (Words)
 _____ (Figures)

Item No.	Description	Unit	Estimated Quantity	Bid Unit Price	Bid Amount
Goose Creek Water System Expansion – South – Alternate 2					
1.	Mobilization (Max. 3%)	LS	1	\$	\$
2.	Clearing & Grubbing	AC	1.5	\$	\$
3.	6-inch Waterline				
a.	PVC	LF	570	\$	\$
b.	DIP	LF	155	\$	\$
4.	10-inch Waterline				
a.	PVC	LF	4,330	\$	\$
b.	DIP	LF	45	\$	\$
5.	Fire Hydrant Assembly	EA	9	\$	\$
6.	6-inch Gate Valves	EA	4	\$	\$
7.	System Connections				
a.	6x6 Tee	EA	1	\$	\$
8.	Open Cut Pavement	LF	45	\$	\$
9.	Drive Repair/Overlay				
a.	Asphalt	SY	50	\$	\$
10.	Erosion Prevention and Sedimentation Control				
a.	Silt Fence	LF	6,245	\$	\$
b.	Sediment Tubes	EA	2	\$	\$
c.	Temporary Grassing	AC	1.6	\$	\$
d.	Permanent Grassing	AC	1.6	\$	\$
11.	Temporary Traffic Control				
a.	Red Bank Road	LS	1	\$	\$
b.	Snake Road	LS	1	\$	\$
12.	Miscellaneous Concrete	CY	10	\$	\$
13.	Rock Excavation & Removal	CY	50	\$	\$
14.	Stone Bedding	CY	20	\$	\$
15.	Select Trench Backfill	CY	40	\$	\$
16.	Flowable Fill	CY	50	\$	\$
Total of Alternate 2				\$	

The **ALTERNATE 2 BID PRICE** for **Goose Creek Water System Expansion - South** (the sum of the items above, including the total cost of the base bid price and the total cost of Alternate 1) is as follows:

_____ (Words)
 _____ (Figures)

B. Bidder acknowledges that:

1. each Bid Unit Price includes an amount considered by Bidder to be adequate to cover Contractor's overhead and profit for each separately identified item, and
2. estimated quantities are not guaranteed and are solely for the purpose of comparison of Bids, and final payment for all Unit Price Work will be based on actual quantities, determined as provided in the Contract Documents.

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

2.04 Bidder agrees that the Work will be substantially complete within 180 calendar days after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within 210 calendar days after the date when the Contract Times commence to run.

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

ARTICLE 3—BIDDER'S ACKNOWLEDGEMENTS: ACCEPTANCE PERIOD, INSTRUCTIONS, AND RECEIPT OF ADDENDA

3.01 *Bid Acceptance Period*

- A. This Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

3.02 *Instructions to Bidders*

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

3.03 *Receipt of Addenda*

- A. Bidder hereby acknowledges receipt of the following Addenda:

Addendum Number	Addendum Date

ARTICLE 4—BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

4.01 *Bidder's Representations*

- A. In submitting this Bid, Bidder represents the following:

1. Bidder has examined and carefully studied the Bidding Documents, including Addenda.
2. Bidder has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
3. Bidder is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work.

4. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Technical Data identified in the Supplementary Conditions or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, if selected as Contractor; and (c) Bidder's (Contractor's) safety precautions and programs.
5. Based on the information and observations referred to in the preceding paragraph, Bidder agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.
6. 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.
7. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and of discrepancies between Site conditions and the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
8. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
9. The submission of this Bid constitutes an incontrovertible representation by Bidder that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

4.02 *Bidder's Certifications*

A. The Bidder certifies the following:

1. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation.
2. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid.
3. Bidder has not solicited or induced any individual or entity to refrain from bidding.
4. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 8.02.A:
 - a. Corrupt practice means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process.
 - b. Fraudulent practice means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition.
 - c. Collusive practice means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels.

- d. Coercive practice means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

BIDDER hereby submits this Bid as set forth above:

Bidder:

(typed or printed name of organization)

By:

(individual's signature)

Name:

(typed or printed)

Title:

(typed or printed)

Date:

(typed or printed)

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

Attest:

(individual's signature)

Name:

(typed or printed)

Title:

(typed or printed)

Date:

(typed or printed)

Address for giving notices:

Bidder's Contact:

Name:

(typed or printed)

Title:

(typed or printed)

Phone:

Email:

Address:

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

THIS PAGE INTENTIONALLY LEFT BLANK

SUPPLEMENT TO BID FORM

To: City of Goose Creek
200 Button Hall Avenue
Goose Creek, South Carolina 29445

Project: Water System Expansion – South

Date: _____

Submitted by: _____
(full name)
(full address) _____

In accordance with the Instructions to Bidders, we include the Supplements to Bid Form Attachments listed below. The information provided shall be considered an integral part of the Bid Form.

These Attachments are as follows:

Attachment A - Subcontractors: Include the names of all Subcontractors and the portions of the Work they will perform.

Attachment B – Suppliers: Include the name of all suppliers and the equipment or products they will supply.

SUPPLEMENTS TO BID FORM SIGNATURE(S)

The Corporate Seal of

(Bidder - please print the full name of your Proprietorship, Partnership, or Corporation)

was hereunto affixed in the presence of:

(Authorized signing officer Title)
(Seal)

(Authorized signing officer Title)
(Seal)

THIS PAGE INTENTIONALLY LEFT BLANK

ATTACHMENT "A"
TO BID FORM

LIST OF SUBCONTRACTORS

Herewith is the list of Subcontractors referenced in the bid submitted by:

(Bidder) _____

(Owner) City of Goose Creek _____

Dated _____ and which is an integral part of the Bid Form.

The following work will be performed (or provided) by Subcontractors and coordinated by us:

WORK SUBJECT

NAME

THIS PAGE INTENTIONALLY LEFT BLANK

ATTACHMENT "B"
TO BID FORM

LIST OF SUPPLIERS

Herewith is the list of Suppliers referenced in the bid submitted by:

(Bidder) _____

(Owner) City of Goose Creek

Dated _____ and which is an integral part of the Bid Form.

The following products to be used in the execution of the work described by the Contract Documents will be supplied by the following Suppliers and coordinated by us:

PRODUCT

NAME

[illegible]

THIS PAGE INTENTIONALLY LEFT BLANK

BID BOND (PENAL SUM FORM)

Bidder Name: Address <i>(principal place of business)</i> :	Surety Name: Address <i>(principal place of business)</i> :
Owner Name: City of Goose Creek Address <i>(principal place of business)</i> : 200 Button Hall Avenue Goose Creek, South Carolina 29445	Bid Project <i>(name and location)</i> : Goose Creek Water System Expansion - South Bid Due Date: [Enter date bid is due]
Bond Penal Sum: Date of Bond:	
Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth in this Bid Bond, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.	
Bidder	Surety
_____ <i>(Full formal name of Bidder)</i>	_____ <i>(Full formal name of Surety) (corporate seal)</i>
By: _____ <i>(Signature)</i>	By: _____ <i>(Signature) (Attach Power of Attorney)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
Attest: _____ <i>(Signature)</i>	Attest: _____ <i>(Signature)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
Notes: (1) Note: Addresses are to be used for giving any required notice. (2) Provide execution by any additional parties, such as joint venturers, if necessary.	

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

NOTICE OF AWARD

Date of Issuance:

Owner: City of Goose Creek

Owner's Project No.:

Engineer: Ardurra Group, Inc.

Engineer's Project No.: 2023-1180-00

Project: Goose Creek Water System Expansion - South

Contract Name: Goose Creek Water System Expansion - South

Bidder:

Bidder's Address:

You are notified that Owner has accepted your Bid dated **[date]** for the above Contract, and that you are the Successful Bidder and are awarded a Contract for:

Goose Creek Water System Expansion - South

The Contract Price of the awarded Contract is \$**[Contract Price]**. Contract Price is subject to adjustment based on the provisions of the Contract, including but not limited to those governing changes, Unit Price Work, and Work performed on a cost-plus-fee basis, as applicable.

Four (4) unexecuted counterparts of the Agreement accompany this Notice of Award, and one copy of the Contract Documents accompanies this Notice of Award or has been transmitted or made available to Bidder electronically.

☒ Drawings will be delivered separately from the other Contract Documents.

You must comply with the following conditions precedent within 15 days of the date of receipt of this Notice of Award:

1. Deliver to Owner **four (4)** counterparts of the Agreement, signed by Bidder (as Contractor).
2. Deliver with the signed Agreement(s) the Contract security (such as required performance and payment bonds) and insurance documentation, as specified in the Instructions to Bidders and in the General Conditions, Articles 2 and 6.
3. Other conditions precedent (if any): **Any contract or contracts awarded under this Advertisement for Bids will be funded in part by the South Carolina Infrastructure Investment Program (SCIIP) administered by the South Carolina Rural Infrastructure Authority (RIA). The attention of the bidder is particularly called to the SCIIP Supplemental General Conditions, which is included in Project Manual and the requirements summarized on the Supplement to the Bid Form.**

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

Within 10 days after you comply with the above conditions, Owner will return to you one fully signed counterpart of the Agreement, together with any additional copies of the Contract Documents as indicated in Paragraph 2.02 of the General Conditions.

Owner: **City of Goose Creek**

By (signature): _____

Name (printed): _____

Title: _____

Copy: Engineer

THIS PAGE INTENTIONALLY LEFT BLANK

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

This Agreement is by and between **City of Goose Creek** ("Owner") and **[name of contracting entity]** ("Contractor").

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

Owner and Contractor hereby agree as follows:

ARTICLE 1—WORK

- 1.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows: furnishing and installing all labor, material, and equipment necessary to construct the new waterline and to install other related improvements as shown on the Drawings and as specified.

ARTICLE 2—THE PROJECT

- 2.01 The Project, of which the Work under the Contract Documents is a part, is generally described as follows:

Installation of approximately 2,220 linear feet of 10-inch transmission main with road bores on Howe Hall Road, Red Bank Road, Snake Road, and Old State Road.

Alternate 1: Installation of approximately 50 linear feet of 6-inch and 1,225 linear feet of 10-inch transmission main.

Alternate 2: Installation of approximately 725 linear feet of 6-inch and 4,375 linear feet of 10-inch transmission main.

ARTICLE 3—ENGINEER

- 3.01 The Project has been designed by **Ardurra Group, Inc.**
- 3.02 The Owner has retained **Ardurra Group, Inc.** ("Engineer") to act as Owner's representative, assume all duties and responsibilities of Engineer, and have the rights and authority assigned to Engineer in the Contract.

ARTICLE 4—CONTRACT TIMES

- 4.01 *Time is of the Essence*
- A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.
- 4.02 *Contract Times: Days*
- A. The Work will be substantially complete within **180** days after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within **210** days after the date when the Contract Times commence to run.

4.03 *Liquidated Damages*

- A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial and other losses if the Work is not completed within the Contract Times specified in Paragraph 4.02 above, plus any extensions thereof allowed in accordance with the Contract. The parties also recognize the delays, expense, and difficulties involved in proving, in a legal or arbitration proceeding, the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty):
1. *Substantial Completion*: Contractor shall pay Owner **\$500** for each day that expires after the time (as duly adjusted pursuant to the Contract) specified above for Substantial Completion, until the Work is substantially complete.
 2. *Completion of Remaining Work*: After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Times (as duly adjusted pursuant to the Contract) for completion and readiness for final payment, Contractor shall pay Owner **\$500** for each day that expires after such time until the Work is completed and ready for final payment.
 3. Liquidated damages for failing to timely attain Milestones, Substantial Completion, and final completion are not additive, and will not be imposed concurrently.

4.04 *Special Damages*

- A. Contractor shall reimburse Owner (1) for any fines or penalties imposed on Owner as a direct result of the Contractor's failure to attain Substantial Completion according to the Contract Times, and (2) for the actual costs reasonably incurred by Owner for engineering, construction observation, inspection, and administrative services needed after the time specified in Paragraph 4.02 for Substantial Completion (as duly adjusted pursuant to the Contract), until the Work is substantially complete.
- B. After Contractor achieves Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Times, Contractor shall reimburse Owner for the actual costs reasonably incurred by Owner for engineering, construction observation, inspection, and administrative services needed after the time specified in Paragraph 4.02 for Work to be completed and ready for final payment (as duly adjusted pursuant to the Contract), 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, the amounts that follow, subject to adjustment under the Contract:

- A. For all Unit Price Work, an amount equal to the sum of the extended prices (established for each separately identified item of Unit Price Work by multiplying the unit price times the actual quantity of that item).

The extended prices for Unit Price Work set forth as of the Effective Date of the Contract are based on estimated quantities. As provided in Paragraph 13.03 of the General Conditions, estimated quantities are not guaranteed, and determinations of actual quantities and classifications are to be made by Engineer.

- B. For the contract price of \$_____, as stated in Contractor's Bid, attached hereto as an exhibit.

ARTICLE 6—PAYMENT PROCEDURES

6.01 Submittal and Processing of Payments

- A. Contractor shall submit Applications for Payment in accordance with Article 15 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.

6.02 Progress Payments; Retainage

- A. Owner shall make progress payments on the basis of Contractor's Applications for Payment on or about the **25th** day of each month during performance of the Work as provided in Paragraph 6.02.A.1 below, provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the requirements of the Contract. All such payments will be measured by the Schedule of Values established as provided in the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided elsewhere in the Contract.
1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Owner may withhold, including but not limited to liquidated damages, in accordance with the Contract.
 - a. **90** percent of the value of the Work completed (with the balance being retainage).
 - 1) If 50 percent or more of the Work has been 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 will be no additional retainage; and
 - b. **90** percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).
 - B. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to **95** percent of the Work completed, less such amounts set off by Owner pursuant to Paragraph 15.01.E of the General Conditions, and less **10** percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the punch list of items to be completed or corrected prior to final payment.

6.03 Final Payment

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

6.04 Consent of Surety

- A. Owner will not make final payment or return or release retainage at Substantial Completion or any other time, unless Contractor submits written consent of the surety to such payment, return, or release.

6.05 *Interest*

- A. All amounts not paid when due will bear interest at the rate of 1 1/2 percent per annum.

ARTICLE 7—CONTRACT DOCUMENTS

7.01 *Contents*

- A. The Contract Documents consist of all of the following:
1. This Agreement.
 2. Bonds:
 - a. Bid bond.
 - b. Performance bond (together with power of attorney).
 - c. Payment bond (together with power of attorney).
 3. General Conditions.
 4. Supplementary Conditions.
 5. Contract Requirements for SCIIP Projects.
 6. Specifications as listed in the table of contents of the Project Manual.
 7. Drawings (not attached but incorporated by reference) consisting of 22 sheets with each sheet bearing the following general title: Water System Expansion – South.
 8. Addenda (numbers [number] to [number], inclusive).
 9. Exhibits to this Agreement (enumerated as follows):
 - a. Contractor's Bid.
 10. The following which may be delivered or issued on or after the Effective Date of the Contract and are not attached hereto:
 - a. Notice to Proceed.
 - b. Work Change Directives.
 - c. Change Orders.
 - d. Field Orders.
- B. The Contract Documents listed in Paragraph 7.01.A are attached to this Agreement (except as expressly noted otherwise above).
- C. There are no Contract Documents other than those listed above in this Article 7.
- D. The Contract Documents may only be amended, modified, or supplemented as provided in the Contract.

ARTICLE 8—REPRESENTATIONS, CERTIFICATIONS, AND STIPULATIONS

8.01 *Contractor's Representations*

- A. In order to induce Owner to enter into this Contract, Contractor makes the following representations:
1. Contractor has examined and carefully studied the Contract Documents, including Addenda.
 2. Contractor has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
 3. Contractor is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work.
 4. Contractor has carefully studied the reports of explorations and tests of subsurface conditions at or adjacent to the Site and the drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, with respect to the Technical Data in such reports and drawings.
 5. Contractor has carefully studied the reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, with respect to Technical Data in such reports and drawings.
 6. Contractor has considered the information known to Contractor itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Technical Data identified in the Supplementary Conditions or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor; and (c) Contractor's safety precautions and programs.
 7. Based on the information and observations referred to in the preceding paragraph, Contractor agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.
 8. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.
 9. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and of discrepancies between Site conditions and the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
 10. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

11. Contractor's entry into this Contract constitutes an incontrovertible representation by Contractor that without exception all prices in the Agreement are premised upon performing and furnishing the Work required by the Contract Documents.

8.02 *Contractor's Certifications*

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

8.03 *Standard General Conditions*

- A. Owner stipulates that if the General Conditions that are made a part of this Contract are EJCDC® C-700, Standard General Conditions for the Construction Contract (2018), published by the Engineers Joint Contract Documents Committee, and if Owner is the party that has furnished said General Conditions, then Owner has plainly shown all modifications to the standard wording of such published document to the Contractor, through a process such as highlighting or "track changes" (redline/strikeout), or in the Supplementary Conditions.

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

This Agreement will be effective on **[indicate date on which Contract becomes effective]** (which is the Effective Date of the Contract).

Owner:

City of Goose Creek

Contractor:

(typed or printed name of organization)

By:

(individual's signature)

Date:

(date signed)

Name:

(typed or printed)

Title:

(typed or printed)

Attest:

(individual's signature)

Title:

(typed or printed)

Address for giving notices:

Designated Representative:

Name:

(typed or printed)

Title:

(typed or printed)

Address:

Phone:

Email:

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

(typed or printed name of organization)

By:

(individual's signature)

Date:

(date signed)

Name:

(typed or printed)

Title:

(typed or printed)

(If **[Type of Entity]** is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest:

(individual's signature)

Title:

(typed or printed)

Address for giving notices:

Designated Representative:

Name:

(typed or printed)

Title:

(typed or printed)

Address:

Phone:

Email:

License No.:

(where applicable)

State:

THIS PAGE INTENTIONALLY LEFT BLANK

NOTICE TO PROCEED

Owner: City of Goose Creek Owner's Project No.: _____
Engineer: Ardurra Group, Inc. Engineer's Project No.: 2023-1180-00
Contractor: _____ Contractor's Project No.: _____
Project: Goose Creek Water System Expansion - South
Contract Name: Goose Creek Water System Expansion - South
Effective Date of Contract: _____

Owner hereby notifies Contractor that the Contract Times under the above Contract will commence to run on **[date Contract Times are to start]** pursuant to Paragraph 4.01 of the General Conditions.

On that date, Contractor shall start performing its obligations under the Contract Documents. No Work will be done at the Site prior to such date.

In accordance with the Agreement:

The number of days to achieve Substantial Completion is **180 days** from the date stated above for the commencement of the Contract Times, resulting in a date for Substantial Completion of **[date, calculated from commencement date above]**; and the number of days to achieve readiness for final payment is **210 days** from the commencement date of the Contract Times, resulting in a date for readiness for final payment of **[date, calculated from commencement date above]**.

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

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

Owner: City of Goose Creek
By *(signature)*: _____
Name *(printed)*: _____
Title: _____
Date Issued: _____
Copy: Engineer

THIS PAGE INTENTIONALLY LEFT BLANK

PERFORMANCE BOND

Contractor Name: Address <i>(principal place of business)</i> :	Surety Name: Address <i>(principal place of business)</i> :
Owner Name: City of Goose Creek Mailing address <i>(principal place of business)</i> : 200 Button Hall Avenue Goose Creek, South Carolina 29445	Contract Description <i>(name and location)</i> : Goose Creek Water System Expansion - South Contract Price: Effective Date of Contract:
Bond Bond Amount: Date of Bond: <i>(Date of Bond cannot be earlier than Effective Date of Contract)</i> Modifications to this Bond form: <input type="checkbox"/> None <input type="checkbox"/> See Paragraph 16	
Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth in this Performance Bond, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.	
Contractor as Principal	Surety
<i>(Full formal name of Contractor)</i>	<i>(Full formal name of Surety) (corporate seal)</i>
By: _____ <div style="text-align: center;"><i>(Signature)</i></div>	By: _____ <div style="text-align: center;"><i>(Signature)(Attach Power of Attorney)</i></div>
Name: _____ <div style="text-align: center;"><i>(Printed or typed)</i></div>	Name: _____ <div style="text-align: center;"><i>(Printed or typed)</i></div>
Title: _____	Title: _____
Attest: _____ <div style="text-align: center;"><i>(Signature)</i></div>	Attest: _____ <div style="text-align: center;"><i>(Signature)</i></div>
Name: _____ <div style="text-align: center;"><i>(Printed or typed)</i></div>	Name: _____ <div style="text-align: center;"><i>(Printed or typed)</i></div>
Title: _____	Title: _____
<i>Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party is considered plural where applicable.</i>	

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 will 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 may 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 will 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 does 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 does 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 will not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety will 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 will not be reduced or set off on account of any such unrelated obligations. No right of action will 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 must be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and must 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 will be applicable.
- 12. Notice to the Surety, the Owner, or the Contractor must 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 will be deemed deleted therefrom and provisions conforming to such

statutory or other legal requirement will be deemed incorporated herein. When so furnished, the intent is that this Bond will 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 will be deemed to be Subcontractor and the term Owner will be deemed to be Contractor.
16. Modifications to this Bond are as follows: **[Describe modification or enter “None”]**

PAYMENT BOND

Contractor Name: Address <i>(principal place of business)</i> :	Surety Name: Address <i>(principal place of business)</i> :
Owner Name: City of Goose Creek Mailing address <i>(principal place of business)</i> : 200 Button Hall Avenue Goose Creek, South Carolina 29445	Contract Description <i>(name and location)</i> : Goose Creek Water System Expansion - South Contract Price: Effective Date of Contract:
Bond Bond Amount: Date of Bond: <i>(Date of Bond cannot be earlier than Effective Date of Contract)</i> Modifications to this Bond form: <input type="checkbox"/> None <input type="checkbox"/> See Paragraph 18	
Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth in this Payment Bond, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.	
Contractor as Principal	Surety
<i>(Full formal name of Contractor)</i>	<i>(Full formal name of Surety) (corporate seal)</i>
By: _____ <div style="text-align: center;"><i>(Signature)</i></div>	By: _____ <div style="text-align: center;"><i>(Signature)(Attach Power of Attorney)</i></div>
Name: _____ <div style="text-align: center;"><i>(Printed or typed)</i></div>	Name: _____ <div style="text-align: center;"><i>(Printed or typed)</i></div>
Title: _____	Title: _____
Attest: _____ <div style="text-align: center;"><i>(Signature)</i></div>	Attest: _____ <div style="text-align: center;"><i>(Signature)</i></div>
Name: _____ <div style="text-align: center;"><i>(Printed or typed)</i></div>	Name: _____ <div style="text-align: center;"><i>(Printed or typed)</i></div>
Title: _____	Title: _____
<i>Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party is considered plural where applicable.</i>	

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 will 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 will 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 will 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 will 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 will 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 will 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 satisfying 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 will 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 will be applicable.
13. Notice and Claims to the Surety, the Owner, or the Contractor must be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, will 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 will be deemed deleted here from and provisions conforming to such statutory or other legal requirement will be deemed incorporated herein. When so furnished, the intent is that this Bond will 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:
 - 16.1.1. The name of the Claimant;
 - 16.1.2. The name of the person for whom the labor was done, or materials or equipment furnished;
 - 16.1.3. 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;
 - 16.1.4. A brief description of the labor, materials, or equipment furnished;

- 16.1.5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
 - 16.1.6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;
 - 16.1.7. The total amount of previous payments received by the Claimant; and
 - 16.1.8. 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 is 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 will be deemed to be Subcontractor and the term Owner will be deemed to be Contractor.
18. Modifications to this Bond are as follows: **[Describe modification or enter "None"]**

Contractor Pay Request Certification

SCIIP Grant #: _____ RIA State Grant # (if applicable): _____

Project: _____

Grantee: _____ Contractor: _____

Provisions: *The contractor hereby certifies that work completed on the above-referenced SCIIP Grant and Contract during the period for which payment is requested complies with the following required provisions, as applicable in accordance with the contract terms and conditions:*

1. **Contract Work Hours:** Each contractor is required to compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week. The requirements of the Contract Work Hours and Safety Standards Act, 40 USC 3702 and 3704, as supplemented by Department of Labor regulations at 29 CFR Part 5 are applicable to construction work and provide that no laborer or mechanic must be required to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous. These requirements do not apply to the purchases of supplies or materials or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence.
2. **Safety Standards Act:** Safety Standards and Accident Prevention provisions require contractors to:
 - Comply with the safety standards provisions of applicable laws, building and construction codes, the "Manual of Accident Prevention in Construction" published by the Associated General Contractors of America, the requirements of the Occupational Safety and Health Act of 1970, and the requirements of Title 29, Section 1518.
 - Exercise every precaution at all times for the prevention of accidents and the protection of persons (including employees) and property.
 - Maintain at the construction office or other well-known place on the job site, all articles necessary for giving first aid to the injured and make standing arrangements for the immediate removal to a hospital or to a doctor's care those persons (including employees), who may be injured on the job site. In no case shall employees be permitted to work at a job site before the employer has made a standing arrangement for removal of injured persons to a hospital or doctor's care.
3. **Davis-Bacon Wages:** Projects (construction) in excess of \$10 million funded in whole or in part with federal, non-State and Local Fiscal Recovery Funds (SLFRF) must comply with applicable provisions of the Davis-Bacon Act, 40 USC 3141 – 3144 and 3146 – 3148, as supplemented by Department of Labor regulations located at 29 CFR Part 5. All laborers and mechanics employed by contractors and subcontractors must be paid prevailing wages.
4. **Debarment and Suspension:** In accordance with 2 CFR Part 180 and Treasury's implementing regulations at 31 CFR Part 19, SCIIP funds may not go to individuals or entities that are prohibited from doing business with the federal government. *Debarment status can be checked on the System for Award Management (SAM) website at www.sam.gov.*

CERTIFICATION:

- I certify to the best of my knowledge and belief, that the above referenced project has complied with the applicable provisions of the Contract Work Hours and Safety Standards Act as outlined above during the period for which payment is requested.
- I certify to the best of my knowledge and belief, that the above referenced project has complied with the Davis-Bacon Act as applicable, and that all laborers and mechanics employed by contractors and subcontractors during the period for which payment is requested were paid prevailing wages.
- I certify to the best of my knowledge and belief, that I nor my Company or any of my subcontractors on this project as included in the above-referenced Contract are not presently debarred, suspended, or ineligible from participating in transactions by the federal government or local government department or agency.
- I understand that a false statement on this certification shall be regarded as a material breach of the Agreement. I also acknowledge that RIA, other state agencies or the US Treasury may request any additional information or documentation it deems necessary to demonstrate compliance in the form of an audit or otherwise pursuant to its ability to effectively administer this grant on behalf of the State of South Carolina.

This form must be signed by the contractor and submitted as part of every Contractor's Application for Payment involving federal funds as supporting documentation. This form certifies compliance for the period as stated on the Contractor's Application for Payment.

Contractor Signature: _____ Contractor Printed Name: _____ Date: _____

THIS PAGE INTENTIONALLY LEFT BLANK

Contractor's Application for Payment

Owner: _____ Engineer: _____ Contractor: _____ Project: _____ Contract: _____	Owner's Project No.: _____ Engineer's Project No.: _____ Contractor's Project No.: _____																																				
Application No.: _____ Application Date: _____																																					
Application Period: From _____ to _____																																					
<table border="1" style="width: 100%; border-collapse: collapse;"><tr><td style="width: 70%;">1. Original Contract Price</td><td style="width: 10%; text-align: center;">\$</td><td style="width: 20%; text-align: center;">-</td></tr><tr><td>2. Net change by Change Orders</td><td style="text-align: center;">\$</td><td style="text-align: center;">-</td></tr><tr><td>3. Current Contract Price (Line 1 + Line 2)</td><td style="text-align: center;">\$</td><td style="text-align: center;">-</td></tr><tr><td>4. Total Work completed and materials stored to date (Sum of Column G Lump Sum Total and Column J Unit Price Total)</td><td style="text-align: center;">\$</td><td style="text-align: center;">-</td></tr><tr><td>5. Retainage</td><td></td><td></td></tr><tr><td> a. _____ X \$ - Work Completed</td><td style="text-align: center;">\$</td><td style="text-align: center;">-</td></tr><tr><td> b. _____ X \$ - Stored Materials</td><td style="text-align: center;">\$</td><td style="text-align: center;">-</td></tr><tr><td> c. Total Retainage (Line 5.a + Line 5.b)</td><td style="text-align: center;">\$</td><td style="text-align: center;">-</td></tr><tr><td>6. Amount eligible to date (Line 4 - Line 5.c)</td><td style="text-align: center;">\$</td><td style="text-align: center;">-</td></tr><tr><td>7. Less previous payments (Line 6 from prior application)</td><td></td><td></td></tr><tr><td>8. Amount due this application</td><td style="text-align: center;">\$</td><td style="text-align: center;">-</td></tr><tr><td>9. Balance to finish, including retainage (Line 3 - Line 4)</td><td style="text-align: center;">\$</td><td style="text-align: center;">-</td></tr></table>		1. Original Contract Price	\$	-	2. Net change by Change Orders	\$	-	3. Current Contract Price (Line 1 + Line 2)	\$	-	4. Total Work completed and materials stored to date (Sum of Column G Lump Sum Total and Column J Unit Price Total)	\$	-	5. Retainage			a. _____ X \$ - Work Completed	\$	-	b. _____ X \$ - Stored Materials	\$	-	c. Total Retainage (Line 5.a + Line 5.b)	\$	-	6. Amount eligible to date (Line 4 - Line 5.c)	\$	-	7. Less previous payments (Line 6 from prior application)			8. Amount due this application	\$	-	9. Balance to finish, including retainage (Line 3 - Line 4)	\$	-
1. Original Contract Price	\$	-																																			
2. Net change by Change Orders	\$	-																																			
3. Current Contract Price (Line 1 + Line 2)	\$	-																																			
4. Total Work completed and materials stored to date (Sum of Column G Lump Sum Total and Column J Unit Price Total)	\$	-																																			
5. Retainage																																					
a. _____ X \$ - Work Completed	\$	-																																			
b. _____ X \$ - Stored Materials	\$	-																																			
c. Total Retainage (Line 5.a + Line 5.b)	\$	-																																			
6. Amount eligible to date (Line 4 - Line 5.c)	\$	-																																			
7. Less previous payments (Line 6 from prior application)																																					
8. Amount due this application	\$	-																																			
9. Balance to finish, including retainage (Line 3 - Line 4)	\$	-																																			
Contractor's Certification The undersigned Contractor certifies, to the best of its knowledge, the following: (1) All previous progress payments received from Owner on account of Work done under the Contract have been applied on account to discharge Contractor's legitimate obligations incurred in connection with the Work covered by prior Applications for Payment; (2) Title to all Work, materials and equipment incorporated in said Work, or otherwise listed in or covered by this Application for Payment, will pass to Owner at time of payment free and clear of all liens, security interests, and encumbrances (except such as are covered by a bond acceptable to Owner indemnifying Owner against any such liens, security interest, or encumbrances); and (3) All the Work covered by this Application for Payment is in accordance with the Contract Documents and is not defective.																																					
Contractor: _____																																					
Signature: _____ Date: _____																																					
Recommended by Engineer By: _____ Title: _____ Date: _____	Approved by Owner By: _____ Title: _____ Date: _____																																				
Approved by Funding Agency By: _____ Title: _____ Date: _____	By: _____ Title: _____ Date: _____																																				

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 Performance and Payment Bonds; Evidence of Insurance	7
2.02 Copies of Documents	7
2.03 Before Starting Construction	7
2.04 Preconstruction Conference; Designation of Authorized Representatives	8
2.05 Acceptance of Schedules	8
2.06 Electronic Transmittals	8
Article 3—Contract Documents: Intent, Requirements, Reuse	9
3.01 Intent	9
3.02 Reference Standards	9
3.03 Reporting and Resolving Discrepancies	10
3.04 Requirements of the Contract Documents	10
3.05 Reuse of Documents	11
Article 4—Commencement and Progress of the Work	11
4.01 Commencement of Contract Times; Notice to Proceed	11
4.02 Starting the Work	11
4.03 Reference Points	11
4.04 Progress Schedule	12
4.05 Delays in Contractor’s Progress	12
Article 5—Site; Subsurface and Physical Conditions; Hazardous Environmental Conditions	13
5.01 Availability of Lands	13
5.02 Use of Site and Other Areas	14
5.03 Subsurface and Physical Conditions	15
5.04 Differing Subsurface or Physical Conditions	16

5.05	Underground Facilities.....	17
5.06	Hazardous Environmental Conditions at Site	19
Article 6—Bonds and Insurance		21
6.01	Performance, Payment, and Other Bonds	21
6.02	Insurance—General Provisions.....	22
6.03	Contractor’s Insurance	24
6.04	Builder’s Risk and Other Property Insurance	25
6.05	Property Losses; Subrogation	25
6.06	Receipt and Application of Property Insurance Proceeds	27
Article 7—Contractor’s Responsibilities		27
7.01	Contractor’s Means and Methods of Construction	27
7.02	Supervision and Superintendence	27
7.03	Labor; Working Hours.....	27
7.04	Services, Materials, and Equipment	28
7.05	“Or Equals”	28
7.06	Substitutes	29
7.07	Concerning Subcontractors and Suppliers.....	31
7.08	Patent Fees and Royalties.....	32
7.09	Permits.....	33
7.10	Taxes.....	33
7.11	Laws and Regulations	33
7.12	Record Documents	33
7.13	Safety and Protection	34
7.14	Hazard Communication Programs.....	35
7.15	Emergencies.....	35
7.16	Submittals	35
7.17	Contractor’s General Warranty and Guarantee	38
7.18	Indemnification.....	39
7.19	Delegation of Professional Design Services	39
Article 8—Other Work at the Site		40
8.01	Other Work	40
8.02	Coordination	41
8.03	Legal Relationships	41

Article 9—Owner’s Responsibilities.....	42
9.01 Communications to Contractor	42
9.02 Replacement of Engineer.....	42
9.03 Furnish Data.....	42
9.04 Pay When Due	42
9.05 Lands and Easements; Reports, Tests, and Drawings.....	43
9.06 Insurance	43
9.07 Change Orders	43
9.08 Inspections, Tests, and Approvals.....	43
9.09 Limitations on Owner’s Responsibilities	43
9.10 Undisclosed Hazardous Environmental Condition.....	43
9.11 Evidence of Financial Arrangements	43
9.12 Safety Programs.....	43
Article 10—Engineer’s Status During Construction	44
10.01 Owner’s Representative	44
10.02 Visits to Site	44
10.03 Resident Project Representative	44
10.04 Engineer’s Authority	44
10.05 Determinations for Unit Price Work	45
10.06 Decisions on Requirements of Contract Documents and Acceptability of Work	45
10.07 Limitations on Engineer’s Authority and Responsibilities.....	45
10.08 Compliance with Safety Program	45
Article 11—Changes to the Contract.....	46
11.01 Amending and Supplementing the Contract	46
11.02 Change Orders	46
11.03 Work Change Directives.....	46
11.04 Field Orders	47
11.05 Owner-Authorized Changes in the Work.....	47
11.06 Unauthorized Changes in the Work.....	47
11.07 Change of Contract Price	47
11.08 Change of Contract Times.....	49
11.09 Change Proposals.....	49
11.10 Notification to Surety	50

Article 12—Claims	50
12.01 Claims	50
Article 13—Cost of the Work; Allowances; Unit Price Work	51
13.01 Cost of the Work	51
13.02 Allowances	55
13.03 Unit Price Work	55
Article 14—Tests and Inspections; Correction, Removal, or Acceptance of Defective Work	56
14.01 Access to Work	56
14.02 Tests, Inspections, and Approvals	56
14.03 Defective Work	57
14.04 Acceptance of Defective Work	58
14.05 Uncovering Work	58
14.06 Owner May Stop the Work	58
14.07 Owner May Correct Defective Work	59
Article 15—Payments to Contractor; Set-Offs; Completion; Correction Period	59
15.01 Progress Payments	59
15.02 Contractor’s Warranty of Title	62
15.03 Substantial Completion	62
15.04 Partial Use or Occupancy	63
15.05 Final Inspection	64
15.06 Final Payment	64
15.07 Waiver of Claims	65
15.08 Correction Period	66
Article 16—Suspension of Work and Termination	67
16.01 Owner May Suspend Work	67
16.02 Owner May Terminate for Cause	67
16.03 Owner May Terminate for Convenience	68
16.04 Contractor May Stop Work or Terminate	68
Article 17—Final Resolution of Disputes	69
17.01 Methods and Procedures	69
Article 18—Miscellaneous	69
18.01 Giving Notice	69
18.02 Computation of Times	69

18.03	Cumulative Remedies	70
18.04	Limitation of Damages	70
18.05	No Waiver	70
18.06	Survival of Obligations	70
18.07	Controlling Law	70
18.08	Assignment of Contract	70
18.09	Successors and Assigns	70
18.10	Headings	70

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

ARTICLE 1—DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

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

requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract.

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

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

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

33. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative (RPR) includes any assistants or field staff of Resident Project Representative.
34. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.
35. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer’s review of the submittals.
36. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor’s Applications for Payment.
37. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.
38. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands or areas furnished by Owner which are designated for the use of Contractor.
39. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.
40. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.
41. *Submittal*—A written or graphic document, prepared by or for Contractor, which the Contract Documents require Contractor to submit to Engineer, or that is indicated as a Submittal in the Schedule of Submittals accepted by Engineer. Submittals may include Shop Drawings and Samples; schedules; product data; Owner-delegated designs; sustainable design information; information on special procedures; testing plans; results of tests and evaluations, source quality-control testing and inspections, and field or Site quality-control testing and inspections; warranties and certifications; Suppliers’ instructions and reports; records of delivery of spare parts and tools; operations and maintenance data; Project photographic documentation; record documents; and other such documents required by the Contract Documents. Submittals, whether or not approved or accepted by Engineer, are not Contract Documents. Change Proposals, Change Orders, Claims, notices, Applications for Payment, and requests for interpretation or clarification are not Submittals.
42. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion of such Work.

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

1.02 Terminology

- A. The words and terms discussed in Paragraphs 1.02.B, C, D, and E are not defined terms that require initial capital letters, but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.
- B. *Intent of Certain Terms or Adjectives:* The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.
- C. *Day:* The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.
- D. *Defective:* The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
 - 1. does not conform to the Contract Documents;
 - 2. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
 - 3. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or Paragraph 15.04).
- E. *Furnish, Install, Perform, Provide*
 - 1. The word “furnish,” when used in connection with services, materials, or equipment, means to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
 - 2. The word “install,” when used in connection with services, materials, or equipment, means to put into use or place in final position said services, materials, or equipment complete and ready for intended use.
 - 3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, means to furnish and install said services, materials, or equipment complete and ready for intended use.
 - 4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words “furnish,” “install,” “perform,” or “provide,” then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.

- F. *Contract Price or Contract Times*: References to a change in “Contract Price or Contract Times” or “Contract Times or Contract Price” or similar, indicate that such change applies to (1) Contract Price, (2) Contract Times, or (3) both Contract Price and Contract Times, as warranted, even if the term “or both” is not expressed.
- G. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2—PRELIMINARY MATTERS

2.01 *Delivery of Performance and Payment Bonds; Evidence of Insurance*

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

2.02 *Copies of Documents*

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

2.03 *Before Starting Construction*

- A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise required by the Contract Documents), Contractor shall submit to Engineer for timely review:
 - 1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;
 - 2. a preliminary Schedule of Submittals; and
 - 3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work

into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work, and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other Submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.
- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 *Acceptance of Schedules*

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

2.06 *Electronic Transmittals*

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

ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

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

3.02 *Reference Standards*

- A. *Standards Specifications, Codes, Laws and Regulations*
 - 1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, means the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
 - 2. No provision of any such standard specification, manual, reference standard, or code, and no instruction of a Supplier, will be effective to change the duties or responsibilities of Owner, Contractor, or Engineer from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner or Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility

inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies*

1. *Contractor's Verification of Figures and Field Measurements:* Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict, error, ambiguity, or discrepancy is resolved by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.
2. *Contractor's Review of Contract Documents:* If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.
3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies*

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

3.04 *Requirements of the Contract Documents*

- A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer in writing all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work.

- B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.
- C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly notify Owner and Contractor in writing that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

3.05 *Reuse of Documents*

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

ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times; Notice to Proceed*

- A. The Contract Times will commence to run on the 30th day after the Effective Date of the Contract or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Contract. In no event will the Contract Times commence to run later than the 60th day after the day of Bid opening or the 30th day after the Effective Date of the Contract, whichever date is earlier.

4.02 *Starting the Work*

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

4.03 *Reference Points*

- A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the

established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.04 *Progress Schedule*

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

4.05 *Delays in Contractor's Progress*

- A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times.
- B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.
- C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Such an adjustment will be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:
 - 1. Severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
 - 2. Abnormal weather conditions;
 - 3. Acts or failures to act of third-party utility owners or other third-party entities (other than those third-party utility owners or other third-party entities performing other work at or adjacent to the Site as arranged by or under contract with Owner, as contemplated in Article 8); and
 - 4. Acts of war or terrorism.

- D. Contractor's entitlement to an adjustment of Contract Times or Contract Price is limited as follows:
1. Contractor's entitlement to an adjustment of the Contract Times is conditioned on the delay, disruption, or interference adversely affecting an activity on the critical path to completion of the Work, as of the time of the delay, disruption, or interference.
 2. Contractor shall not be entitled to an adjustment in Contract Price for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor. Such a concurrent delay by Contractor shall not preclude an adjustment of Contract Times to which Contractor is otherwise entitled.
 3. Adjustments of Contract Times or Contract Price are subject to the provisions of Article 11.
- E. Each Contractor request or Change Proposal seeking an increase in Contract Times or Contract Price must be supplemented by supporting data that sets forth in detail the following:
1. The circumstances that form the basis for the requested adjustment;
 2. The date upon which each cause of delay, disruption, or interference began to affect the progress of the Work;
 3. The date upon which each cause of delay, disruption, or interference ceased to affect the progress of the Work;
 4. The number of days' increase in Contract Times claimed as a consequence of each such cause of delay, disruption, or interference; and
 5. The impact on Contract Price, in accordance with the provisions of Paragraph 11.07.
- Contractor shall also furnish such additional supporting documentation as Owner or Engineer may require including, where appropriate, a revised progress schedule indicating all the activities affected by the delay, disruption, or interference, and an explanation of the effect of the delay, disruption, or interference on the critical path to completion of the Work.
- F. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5, together with the provisions of Paragraphs 4.05.D and 4.05.E.
- G. Paragraph 8.03 addresses delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.

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

5.01 *Availability of Lands*

- A. Owner shall furnish the Site. Owner shall notify Contractor in writing of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.

- B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which permanent improvements are to be made and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

5.02 *Use of Site and Other Areas*

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

1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas, or to improvements, structures, utilities, or similar facilities located at such adjacent lands or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.
 2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.13, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or in a court of competent jurisdiction; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.
- B. *Removal of Debris During Performance of the Work:* During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris will conform to applicable Laws and Regulations.
 - C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment

and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

- D. *Loading of Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent structures or land to stresses or pressures that will endanger them.

5.03 *Subsurface and Physical Conditions*

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

1. Those reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data;
2. Those drawings of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data; and
3. Technical Data contained in such reports and drawings.

- B. *Underground Facilities:* Underground Facilities are shown or indicated on the Drawings, pursuant to Paragraph 5.05, and not in the drawings referred to in Paragraph 5.03.A. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.

- C. *Reliance by Contractor on Technical Data:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b.

- D. *Limitations of Other Data and Documents:* Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:
1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto;
 2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings;
 3. the contents of other Site-related documents made available to Contractor, such as record drawings from other projects at or adjacent to the Site, or Owner's archival documents concerning the Site; or
 4. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

5.04 *Differing Subsurface or Physical Conditions*

- A. *Notice by Contractor:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site:
1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate;
 2. is of such a nature as to require a change in the Drawings or Specifications;
 3. differs materially from that shown or indicated in the Contract Documents; or
 4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

- B. *Engineer's Review:* After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine whether it is necessary for Owner to obtain additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.
- C. *Owner's Statement to Contractor Regarding Site Condition:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.
- D. *Early Resumption of Work:* If at any time Engineer determines that Work in connection with the subsurface or physical condition in question may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the condition in question has been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.
- E. *Possible Price and Times Adjustments*
1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in

Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

- a. Such condition must fall within any one or more of the categories described in Paragraph 5.04.A;
 - b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03; and,
 - c. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:
 - a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise;
 - b. The existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or
 - c. Contractor failed to give the written notice required by Paragraph 5.04.A.
 3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.
 4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.
- F. *Underground Facilities; Hazardous Environmental Conditions:* Paragraph 5.05 governs rights and responsibilities regarding the presence or location of Underground Facilities. Paragraph 5.06 governs rights and responsibilities regarding Hazardous Environmental Conditions. The provisions of Paragraphs 5.03 and 5.04 are not applicable to the presence or location of Underground Facilities, or to Hazardous Environmental Conditions.

5.05 *Underground Facilities*

- A. *Contractor's Responsibilities:* Unless it is otherwise expressly provided in the Supplementary Conditions, the cost of all of the following are included in the Contract Price, and Contractor shall have full responsibility for:
1. reviewing and checking all information and data regarding existing Underground Facilities at the Site;
 2. complying with applicable state and local utility damage prevention Laws and Regulations;

3. verifying the actual location of those Underground Facilities shown or indicated in the Contract Documents as being within the area affected by the Work, by exposing such Underground Facilities during the course of construction;
 4. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and
 5. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.
- B. *Notice by Contractor:* If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated on the Drawings, or was not shown or indicated on the Drawings with reasonable accuracy, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing regarding such Underground Facility.
- C. *Engineer's Review:* Engineer will:
1. promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated on the Drawings, or was not shown or indicated with reasonable accuracy;
 2. identify and communicate with the owner of the Underground Facility; prepare recommendations to Owner (and if necessary issue any preliminary instructions to Contractor) regarding the Contractor's resumption of Work in connection with the Underground Facility in question;
 3. obtain any pertinent cost or schedule information from Contractor; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and
 4. advise Owner in writing of Engineer's findings, conclusions, and recommendations.
- During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
- D. *Owner's Statement to Contractor Regarding Underground Facility:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.
- E. *Early Resumption of Work:* If at any time Engineer determines that Work in connection with the Underground Facility may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the Underground Facility in question and conditions affected by its presence have been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.
- F. *Possible Price and Times Adjustments*
1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, to the extent that any existing Underground Facility at the Site that was not shown

or indicated on the Drawings, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

- a. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;
 - b. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E; and
 - c. Contractor gave the notice required in Paragraph 5.05.B.
2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.
 3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.
 4. The information and data shown or indicated on the Drawings with respect to existing Underground Facilities at the Site is based on information and data (a) furnished by the owners of such Underground Facilities, or by others, (b) obtained from available records, or (c) gathered in an investigation conducted in accordance with the current edition of ASCE 38, Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data, by the American Society of Civil Engineers. If such information or data is incorrect or incomplete, Contractor's remedies are limited to those set forth in this Paragraph 5.05.F.

5.06 *Hazardous Environmental Conditions at Site*

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

1. those reports known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site;
2. drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and
3. Technical Data contained in such reports and drawings.

B. *Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures

- of construction to be employed by Contractor, and safety precautions and programs incident thereto;
2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
 3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.
- D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.
- E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.
- F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.
- G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, as a result of such Work stoppage, such special conditions under which Work is agreed to be resumed by Contractor, or any costs or expenses incurred in response to the Hazardous Environmental Condition, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off. Entitlement to any such adjustment is subject to the provisions of Paragraphs 4.05.D, 4.05.E, 11.07, and 11.08.
- H. If, after receipt of such written notice, Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special

conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.

- I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court, arbitration, or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.I obligates Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J obligates Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 6—BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of Contractor's obligations under the Contract. These bonds must remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the terms of a prescribed bond form, the Supplementary Conditions, or other provisions of the Contract.
- B. Contractor shall also furnish such other bonds (if any) as are required by the Supplementary Conditions or other provisions of the Contract.
- C. All bonds must be in the form included in the Bidding Documents or otherwise specified by Owner prior to execution of the Contract, except as provided otherwise by Laws or

Regulations, and must be issued and signed by a surety named in “Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies” as published in Department Circular 570 (as amended and supplemented) by the Bureau of the Fiscal Service, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual’s authority to bind the surety. The evidence of authority must show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.

- D. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue bonds in the required amounts.
- E. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer in writing and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which must comply with the bond and surety requirements above.
- F. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner’s termination rights under Article 16.
- G. Upon request to Owner from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Owner shall provide a copy of the payment bond to such person or entity.
- H. Upon request to Contractor from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Contractor shall provide a copy of the payment bond to such person or entity.

6.02 *Insurance—General Provisions*

- A. Owner and Contractor shall obtain and maintain insurance as required in this article and in the Supplementary Conditions.
- B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized in the state or jurisdiction in which the Project is located to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.
- C. Alternative forms of insurance coverage, including but not limited to self-insurance and “Occupational Accident and Excess Employer’s Indemnity Policies,” are not sufficient to meet the insurance requirements of this Contract, unless expressly allowed in the Supplementary Conditions.
- D. Contractor shall deliver to Owner, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Contractor has obtained and is maintaining the policies and coverages required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, full disclosure of all relevant exclusions, and evidence of insurance required to be purchased and maintained by

Subcontractors or Suppliers. In any documentation furnished under this provision, Contractor, Subcontractors, and Suppliers may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those applicable to this Contract.

- E. Owner shall deliver to Contractor, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Owner has obtained and is maintaining the policies and coverages required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, and full disclosure of all relevant exclusions. In any documentation furnished under this provision, Owner may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those relevant to this Contract.
- F. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, will not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.
- G. In addition to the liability insurance required to be provided by Contractor, the Owner, at Owner's option, may purchase and maintain Owner's own liability insurance. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.
- H. Contractor shall require:
 - 1. Subcontractors to purchase and maintain worker's compensation, commercial general liability, and other insurance that is appropriate for their participation in the Project, and to name as additional insureds Owner and Engineer (and any other individuals or entities identified in the Supplementary Conditions as additional insureds on Contractor's liability policies) on each Subcontractor's commercial general liability insurance policy; and
 - 2. Suppliers to purchase and maintain insurance that is appropriate for their participation in the Project.
- I. If either party does not purchase or maintain the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.
- J. If Contractor has failed to obtain and maintain required insurance, Contractor's entitlement to enter or remain at the Site will end immediately, and Owner may impose an appropriate set-off against payment for any associated costs (including but not limited to the cost of purchasing necessary insurance coverage), and exercise Owner's termination rights under Article 16.
- K. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect (but is in no way obligated) to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price will be adjusted accordingly.

- L. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests. Contractor is responsible for determining whether such coverage and limits are adequate to protect its interests, and for obtaining and maintaining any additional insurance that Contractor deems necessary.
- M. The insurance and insurance limits required herein will not be deemed as a limitation on Contractor's liability, or that of its Subcontractors or Suppliers, under the indemnities granted to Owner and other individuals and entities in the Contract or otherwise.
- N. All the policies of insurance required to be purchased and maintained under this Contract will contain a provision or endorsement that the coverage afforded will not be canceled, or renewal refused, until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured and Engineer.

6.03 *Contractor's Insurance*

- A. *Required Insurance:* Contractor shall purchase and maintain Worker's Compensation, Commercial General Liability, and other insurance pursuant to the specific requirements of the Supplementary Conditions.
- B. *General Provisions:* The policies of insurance required by this Paragraph 6.03 as supplemented must:
 - 1. include at least the specific coverages required;
 - 2. be written for not less than the limits provided, or those required by Laws or Regulations, whichever is greater;
 - 3. remain in effect at least until the Work is complete (as set forth in Paragraph 15.06.D), and longer if expressly required elsewhere in this Contract, and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract;
 - 4. apply with respect to the performance of the Work, whether such performance is by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable; and
 - 5. include all necessary endorsements to support the stated requirements.
- C. *Additional Insureds:* The Contractor's commercial general liability, automobile liability, employer's liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies, if required by this Contract, must:
 - 1. include and list as additional insureds Owner and Engineer, and any individuals or entities identified as additional insureds in the Supplementary Conditions;
 - 2. include coverage for the respective officers, directors, members, partners, employees, and consultants of all such additional insureds;
 - 3. afford primary coverage to these additional insureds for all claims covered thereby (including as applicable those arising from both ongoing and completed operations);

4. not seek contribution from insurance maintained by the additional insured; and
5. as to commercial general liability insurance, apply to additional insureds with respect to liability caused in whole or in part by Contractor's acts or omissions, or the acts and omissions of those working on Contractor's behalf, in the performance of Contractor's operations.

6.04 *Builder's Risk and Other Property Insurance*

- A. *Builder's Risk*: Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the Work's full insurable replacement cost (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). The specific requirements applicable to the builder's risk insurance are set forth in the Supplementary Conditions.
- B. *Property Insurance for Facilities of Owner Where Work Will Occur*: Owner is responsible for obtaining and maintaining property insurance covering each existing structure, building, or facility in which any part of the Work will occur, or to which any part of the Work will attach or be adjoined. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, providing coverage consistent with that required for the builder's risk insurance, and will be maintained until the Work is complete, as set forth in Paragraph 15.06.D.
- C. *Property Insurance for Substantially Complete Facilities*: Promptly after Substantial Completion, and before actual occupancy or use of the substantially completed Work, Owner will obtain property insurance for such substantially completed Work, and maintain such property insurance at least until the Work is complete, as set forth in Paragraph 15.06.D. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, and provide coverage consistent with that required for the builder's risk insurance. The builder's risk insurance may terminate upon written confirmation of Owner's procurement of such property insurance.
- D. *Partial Occupancy or Use by Owner*: If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide advance notice of such occupancy or use to the builder's risk insurer, and obtain an endorsement consenting to the continuation of coverage prior to commencing such partial occupancy or use.
- E. *Insurance of Other Property; Additional Insurance*: If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, then the entity or individual owning such property item will be responsible for insuring it. If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.04, it may do so at Contractor's expense.

6.05 *Property Losses; Subrogation*

- A. The builder's risk insurance policy purchased and maintained in accordance with Paragraph 6.04 (or an installation floater policy if authorized by the Supplementary Conditions), will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against

Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors.

1. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils, risks, or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all individuals or entities identified in the Supplementary Conditions as builder's risk or installation floater insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused.
 2. None of the above waivers extends to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.
- B. Any property insurance policy maintained by Owner covering any loss, damage, or consequential loss to Owner's existing structures, buildings, or facilities in which any part of the Work will occur, or to which any part of the Work will attach or adjoin; to adjacent structures, buildings, or facilities of Owner; or to part or all of the completed or substantially completed Work, during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06, will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them, and that the insured is allowed to waive the insurer's rights of subrogation in a written contract executed prior to the loss, damage, or consequential loss.
1. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from fire or any of the perils, risks, or causes of loss covered by such policies.
- C. The waivers in this Paragraph 6.05 include the waiver of rights due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other insured peril, risk, or cause of loss.
- D. Contractor shall be responsible for assuring that each Subcontract contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from fire or other peril, risk, or cause of loss covered by builder's risk insurance, installation floater, and any other property insurance applicable to the Work.

6.06 *Receipt and Application of Property Insurance Proceeds*

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

ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

7.01 *Contractor's Means and Methods of Construction*

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

7.02 *Supervision and Superintendence*

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

7.03 *Labor; Working Hours*

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall maintain good discipline and order at the Site.

- B. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of Contractor's employees; of Suppliers and Subcontractors, and their employees; and of any other individuals or entities performing or furnishing any of the Work, just as Contractor is responsible for Contractor's own acts and omissions.
- C. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site will be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

7.04 *Services, Materials, and Equipment*

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

7.05 *"Or Equals"*

- A. *Contractor's Request; Governing Criteria:* Whenever an item of equipment or material is specified or described in the Contract Documents by using the names of one or more proprietary items or specific Suppliers, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or equal" item is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material, or items from other proposed Suppliers, under the circumstances described below.
 - 1. If Engineer in its sole discretion determines that an item of equipment or material proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer will deem it an "or equal" item. For the purposes of this paragraph, a proposed item of equipment or material will be considered functionally equal to an item so named if:
 - a. in the exercise of reasonable judgment Engineer determines that the proposed item:
 - 1) is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

- 2) will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;
 - 3) has a proven record of performance and availability of responsive service; and
 - 4) is not objectionable to Owner.
- b. Contractor certifies that, if the proposed item is approved and incorporated into the Work:
 - 1) there will be no increase in cost to the Owner or increase in Contract Times; and
 - 2) the item will conform substantially to the detailed requirements of the item named in the Contract Documents.
- B. *Contractor's Expense*: Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.
- C. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal," which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.
- D. *Effect of Engineer's Determination*: Neither approval nor denial of an "or-equal" request will result in any change in Contract Price. The Engineer's denial of an "or-equal" request will be final and binding, and may not be reversed through an appeal under any provision of the Contract.
- E. *Treatment as a Substitution Request*: If Engineer determines that an item of equipment or material proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer consider the item a proposed substitute pursuant to Paragraph 7.06.

7.06 Substitutes

- A. *Contractor's Request; Governing Criteria*: Unless the specification or description of an item of equipment or material required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material under the circumstances described below. To the extent possible such requests must be made before commencement of related construction at the Site.
1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of equipment or material from anyone other than Contractor.
 2. The requirements for review by Engineer will be as set forth in Paragraph 7.06.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.

3. Contractor shall make written application to Engineer for review of a proposed substitute item of equipment or material that Contractor seeks to furnish or use. The application:
 - a. will certify that the proposed substitute item will:
 - 1) perform adequately the functions and achieve the results called for by the general design;
 - 2) be similar in substance to the item specified; and
 - 3) be suited to the same use as the item specified.
 - b. will state:
 - 1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times;
 - 2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item; and
 - 3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.
 - c. will identify:
 - 1) all variations of the proposed substitute item from the item specified; and
 - 2) available engineering, sales, maintenance, repair, and replacement services.
 - d. will contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.
- B. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.
- C. *Special Guarantee*: Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- D. *Reimbursement of Engineer's Cost*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

- E. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute at Contractor's expense.
- F. *Effect of Engineer's Determination*: If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request will be final and binding, and may not be reversed through an appeal under any provision of the Contract. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.06.D, by timely submittal of a Change Proposal.

7.07 *Concerning Subcontractors and Suppliers*

- A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner. The Contractor's retention of a Subcontractor or Supplier for the performance of parts of the Work will not relieve Contractor's obligation to Owner to perform and complete the Work in accordance with the Contract Documents.
- B. Contractor shall retain specific Subcontractors and Suppliers for the performance of designated parts of the Work if required by the Contract to do so.
- C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor or Supplier to furnish or perform any of the Work against which Contractor has reasonable objection.
- D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within 5 days.
- E. Owner may require the replacement of any Subcontractor or Supplier. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors or Suppliers for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor or Supplier so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor or Supplier.
- F. If Owner requires the replacement of any Subcontractor or Supplier retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.
- G. No acceptance by Owner of any such Subcontractor or Supplier, whether initially or as a replacement, will constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.

- H. On a monthly basis, Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.
- I. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors and Suppliers.
- J. The divisions and sections of the Specifications and the identifications of any Drawings do not control Contractor in dividing the Work among Subcontractors or Suppliers, or in delineating the Work to be performed by any specific trade.
- K. All Work performed for Contractor by a Subcontractor or Supplier must be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract for the benefit of Owner and Engineer.
- L. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor for Work performed for Contractor by the Subcontractor or Supplier.
- M. Contractor shall restrict all Subcontractors and Suppliers from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed in this Contract.

7.08 *Patent Fees and Royalties*

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

7.09 *Permits*

- A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits, licenses, and certificates of occupancy. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

7.10 *Taxes*

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

7.11 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It is not Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this does not relieve Contractor of its obligations under Paragraph 3.03.
- C. Owner or Contractor may give written notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such written notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.12 *Record Documents*

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

7.13 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations.
- B. Contractor shall designate a qualified and experienced safety representative whose duties and responsibilities are the prevention of Work-related accidents and the maintenance and supervision of safety precautions and programs.
- C. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:
 - 1. all persons on the Site or who may be affected by the Work;
 - 2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
 - 3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- D. All damage, injury, or loss to any property referred to in Paragraph 7.13.C.2 or 7.13.C.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).
- E. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection.
- F. Contractor shall notify Owner; the owners of adjacent property; the owners of Underground Facilities and other utilities (if the identity of such owners is known to Contractor); and other contractors and utility owners performing work at or adjacent to the Site, in writing, when Contractor knows that prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.
- G. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. Any Owner's safety programs that are applicable to the Work are identified or included in the Supplementary Conditions or Specifications.
- H. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.

- I. Contractor's duties and responsibilities for safety and protection will continue until all the Work is completed, Engineer has issued a written notice to Owner and Contractor in accordance with Paragraph 15.06.C that the Work is acceptable, and Contractor has left the Site (except as otherwise expressly provided in connection with Substantial Completion).
- J. Contractor's duties and responsibilities for safety and protection will resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.14 *Hazard Communication Programs*

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

7.15 *Emergencies*

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

7.16 *Submittals*

A. *Shop Drawing and Sample Requirements*

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

3. With each Shop Drawing or Sample, Contractor shall give Engineer specific written notice of any variations that the Submittal may have from the requirements of the Contract Documents. This notice must be set forth in a written communication separate from the Submittal; and, in addition, in the case of a Shop Drawing by a specific notation made on the Shop Drawing itself.
- B. *Submittal Procedures for Shop Drawings and Samples:* Contractor shall label and submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals.
1. *Shop Drawings*
 - a. Contractor shall submit the number of copies required in the Specifications.
 - b. Data shown on the Shop Drawings must be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide, and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.C.
 2. *Samples*
 - a. Contractor shall submit the number of Samples required in the Specifications.
 - b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the Submittal for the limited purposes required by Paragraph 7.16.C.
 3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.
- C. *Engineer's Review of Shop Drawings and Samples*
1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the accepted Schedule of Submittals. Engineer's review and approval will be only to determine if the items covered by the Submittals will, after installation or incorporation in the Work, comply with the requirements of the Contract Documents, and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
 2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction, or to safety precautions or programs incident thereto.
 3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
 4. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will

document any such approved variation from the requirements of the Contract Documents in a Field Order or other appropriate Contract modification.

5. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for complying with the requirements of Paragraphs 7.16.A and B.
6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, will not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.
7. Neither Engineer's receipt, review, acceptance, or approval of a Shop Drawing or Sample will result in such item becoming a Contract Document.
8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.C.4.

D. Resubmittal Procedures for Shop Drawings and Samples

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

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

1. The following provisions apply to all Submittals other than Shop Drawings, Samples, and Owner-delegated designs:
 - a. Contractor shall submit all such Submittals to the Engineer in accordance with the Schedule of Submittals and pursuant to the applicable terms of the Contract Documents.
 - b. Engineer will provide timely review of all such Submittals in accordance with the Schedule of Submittals and return such Submittals with a notation of either Accepted or Not Accepted. Any such Submittal that is not returned within the time established in the Schedule of Submittals will be deemed accepted.
 - c. Engineer's review will be only to determine if the Submittal is acceptable under the requirements of the Contract Documents as to general form and content of the Submittal.

- d. If any such Submittal is not accepted, Contractor shall confer with Engineer regarding the reason for the non-acceptance, and resubmit an acceptable document.
- 2. Procedures for the submittal and acceptance of the Progress Schedule, the Schedule of Submittals, and the Schedule of Values are set forth in Paragraphs 2.03, 2.04, and 2.05.
- F. Owner-delegated Designs: Submittals pursuant to Owner-delegated designs are governed by the provisions of Paragraph 7.19.

7.17 Contractor's General Warranty and Guarantee

- A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer is entitled to rely on Contractor's warranty and guarantee.
- B. Owner's rights under this warranty and guarantee are in addition to, and are not limited by, Owner's rights under the correction period provisions of Paragraph 15.08. The time in which Owner may enforce its warranty and guarantee rights under this Paragraph 7.17 is limited only by applicable Laws and Regulations restricting actions to enforce such rights; provided, however, that after the end of the correction period under Paragraph 15.08:
 - 1. Owner shall give Contractor written notice of any defective Work within 60 days of the discovery that such Work is defective; and
 - 2. Such notice will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the notice.
- C. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
 - 1. abuse, or improper modification, maintenance, or operation, by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
 - 2. normal wear and tear under normal usage.
- D. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents is absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents, a release of Contractor's obligation to perform the Work in accordance with the Contract Documents, or a release of Owner's warranty and guarantee rights under this Paragraph 7.17:
 - 1. Observations by Engineer;
 - 2. Recommendation by Engineer or payment by Owner of any progress or final payment;
 - 3. The issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
 - 4. Use or occupancy of the Work or any part thereof by Owner;
 - 5. Any review and approval of a Shop Drawing or Sample submittal;
 - 6. The issuance of a notice of acceptability by Engineer;
 - 7. The end of the correction period established in Paragraph 15.08;
 - 8. Any inspection, test, or approval by others; or

9. Any correction of defective Work by Owner.
- E. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract will govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

7.18 Indemnification

- A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from losses, damages, costs, and judgments (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising from third-party claims or actions relating to or resulting from the performance or furnishing of the Work, provided that any such claim, action, loss, cost, judgment or damage is attributable to bodily injury, sickness, disease, or death, or to damage to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom, but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable.
- B. In any and all claims against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A will not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

7.19 Delegation of Professional Design Services

- A. Owner may require Contractor to provide professional design services for a portion of the Work by express delegation in the Contract Documents. Such delegation will specify the performance and design criteria that such services must satisfy, and the Submittals that Contractor must furnish to Engineer with respect to the Owner-delegated design.
- B. Contractor shall cause such Owner-delegated professional design services to be provided pursuant to the professional standard of care by a properly licensed design professional, whose signature and seal must appear on all drawings, calculations, specifications, certifications, and Submittals prepared by such design professional. Such design professional must issue all certifications of design required by Laws and Regulations.
- C. If a Shop Drawing or other Submittal related to the Owner-delegated design is prepared by Contractor, a Subcontractor, or others for submittal to Engineer, then such Shop Drawing or other Submittal must bear the written approval of Contractor's design professional when submitted by Contractor to Engineer.

- D. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, and approvals performed or provided by the design professionals retained or employed by Contractor under an Owner-delegated design, subject to the professional standard of care and the performance and design criteria stated in the Contract Documents.
- E. Pursuant to this Paragraph 7.19, Engineer's review, approval, and other determinations regarding design drawings, calculations, specifications, certifications, and other Submittals furnished by Contractor pursuant to an Owner-delegated design will be only for the following limited purposes:
 - 1. Checking for conformance with the requirements of this Paragraph 7.19;
 - 2. Confirming that Contractor (through its design professionals) has used the performance and design criteria specified in the Contract Documents; and
 - 3. Establishing that the design furnished by Contractor is consistent with the design concept expressed in the Contract Documents.
- F. Contractor shall not be responsible for the adequacy of performance or design criteria specified by Owner or Engineer.
- G. Contractor is not required to provide professional services in violation of applicable Laws and Regulations.

ARTICLE 8—OTHER WORK AT THE SITE

8.01 *Other Work*

- A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.
- B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any third-party utility work that Owner has arranged to take place at or adjacent to the Site, Owner shall provide such information to Contractor.
- C. Contractor shall afford proper and safe access to the Site to each contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work.
- D. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.

- E. If the proper execution or results of any part of Contractor's Work depends upon work performed by others, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.
- F. The provisions of this article are not applicable to work that is performed by third-party utilities or other third-party entities without a contract with Owner, or that is performed without having been arranged by Owner. If such work occurs, then any related delay, disruption, or interference incurred by Contractor is governed by the provisions of Paragraph 4.05.C.3.

8.02 *Coordination*

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

8.03 *Legal Relationships*

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

- B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site.
 - 1. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this Paragraph 8.03.B.
 - 2. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due Contractor.
- C. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

ARTICLE 9—OWNER'S RESPONSIBILITIES

9.01 *Communications to Contractor*

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

9.02 *Replacement of Engineer*

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

9.03 *Furnish Data*

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

9.04 *Pay When Due*

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

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

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

9.06 *Insurance*

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

9.07 *Change Orders*

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

9.08 *Inspections, Tests, and Approvals*

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

9.09 *Limitations on Owner's Responsibilities*

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

9.10 *Undisclosed Hazardous Environmental Condition*

- A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.

9.11 *Evidence of Financial Arrangements*

- A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract (including obligations under proposed changes in the Work).

9.12 *Safety Programs*

- A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.
- B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

ARTICLE 10—ENGINEER'S STATUS DURING CONSTRUCTION

10.01 *Owner's Representative*

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

10.02 *Visits to Site*

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe, as an experienced and qualified design professional, the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.
- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.07. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

10.03 *Resident Project Representative*

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

10.04 *Engineer's Authority*

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

E. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.05 *Determinations for Unit Price Work*

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

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

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

10.07 *Limitations on Engineer's Authority and Responsibilities*

A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, will create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. Engineer's review of the final Application for Payment and accompanying documentation, and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Contractor under Paragraph 15.06.A, will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals, that the results certified indicate compliance with the Contract Documents.

E. The limitations upon authority and responsibility set forth in this Paragraph 10.07 also apply to the Resident Project Representative, if any.

10.08 *Compliance with Safety Program*

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

ARTICLE 11—CHANGES TO THE CONTRACT

11.01 *Amending and Supplementing the Contract*

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

11.02 *Change Orders*

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

11.03 *Work Change Directives*

- A. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.07 regarding change of Contract Price.

- B. If Owner has issued a Work Change Directive and:
 - 1. Contractor believes that an adjustment in Contract Times or Contract Price is necessary, then Contractor shall submit any Change Proposal seeking such an adjustment no later than 30 days after the completion of the Work set out in the Work Change Directive.
 - 2. Owner believes that an adjustment in Contract Times or Contract Price is necessary, then Owner shall submit any Claim seeking such an adjustment no later than 60 days after issuance of the Work Change Directive.

11.04 *Field Orders*

- A. Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly.
- B. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.05 *Owner-Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Changes involving the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters will be supported by Engineer's recommendation.
- B. Such changes in the Work may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work must be performed under the applicable conditions of the Contract Documents.
- C. Nothing in this Paragraph 11.05 obligates Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

11.06 *Unauthorized Changes in the Work*

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.C.2.

11.07 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment of Contract Price must comply with the provisions of Article 12.
- B. An adjustment in the Contract Price will be determined as follows:

1. Where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03);
 2. Where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.07.C.2); or
 3. Where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.07.C).
- C. *Contractor's Fee:* When applicable, the Contractor's fee for overhead and profit will be determined as follows:
1. A mutually acceptable fixed fee; or
 2. If a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
 - a. For costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee will be 15 percent;
 - b. For costs incurred under Paragraph 13.01.B.3, the Contractor's fee will be 5 percent;
 - c. Where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.07.C.2.a and 11.07.C.2.b is that the Contractor's fee will be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of 5 percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted Work the maximum total fee to be paid by Owner will be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the Work;
 - d. No fee will be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;
 - e. The amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in Cost of the Work will be the amount of the actual net decrease in Cost of the Work and a deduction of an additional amount equal to 5 percent of such actual net decrease in Cost of the Work; and
 - f. When both additions and credits are involved in any one change or Change Proposal, the adjustment in Contractor's fee will be computed by determining the sum of the costs in each of the cost categories in Paragraph 13.01.B (specifically, payroll costs, Paragraph 13.01.B.1; incorporated materials and equipment costs, Paragraph 13.01.B.2; Subcontract costs, Paragraph 13.01.B.3; special consultants costs, Paragraph 13.01.B.4; and other costs, Paragraph 13.01.B.5) and applying to each such cost category sum the appropriate fee from Paragraphs 11.07.C.2.a through 11.07.C.2.e, inclusive.

11.08 *Change of Contract Times*

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

11.09 *Change Proposals*

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

- B. *Change Proposal Procedures*

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

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

- 3. *Engineer's Initial Review:* Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal. If in its discretion Engineer concludes that additional supporting data is needed before conducting a full review and making a decision regarding the Change Proposal, then Engineer may request that Contractor submit such additional supporting data by a date specified by Engineer, prior to Engineer beginning its full review of the Change Proposal.
- 4. *Engineer's Full Review and Action on the Change Proposal:* Upon receipt of Contractor's supporting data (including any additional data requested by Engineer), Engineer will conduct a full review of each Change Proposal and, within 30 days after such receipt of the Contractor's supporting data, either approve the Change Proposal in whole, deny it in whole, or approve it in part and deny it in part. Such actions must be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change

Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.

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

11.10 *Notification to Surety*

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

ARTICLE 12—CLAIMS

12.01 *Claims*

- A. *Claims Process*: The following disputes between Owner and Contractor are subject to the Claims process set forth in this article:
 1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;
 2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents;
 3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters; and
 4. Subject to the waiver provisions of Paragraph 15.07, any dispute arising after Engineer has issued a written recommendation of final payment pursuant to Paragraph 15.06.B.
- B. *Submittal of Claim*: The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim rests with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge

and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.

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

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

13.01 *Cost of the Work*

- A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:
 - 1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or

2. When needed to determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.
- B. *Costs Included:* Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work will be in amounts no higher than those commonly incurred in the locality of the Project, will not include any of the costs itemized in Paragraph 13.01.C, and will include only the following items:
1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor in advance of the subject Work. Such employees include, without limitation, superintendents, foremen, safety managers, safety representatives, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work will be apportioned on the basis of their time spent on the Work. Payroll costs include, but are not limited to, salaries and wages plus the cost of fringe benefits, which include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, sick leave, and vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, will be included in the above to the extent authorized by Owner.
 2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts will accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment will accrue to Owner, and Contractor shall make provisions so that they may be obtained.
 3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, which will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee will be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.
 4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed or retained for services specifically related to the Work.
 5. Other costs consisting of the following:
 - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
 - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, which are

consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

- 1) In establishing included costs for materials such as scaffolding, plating, or sheeting, consideration will be given to the actual or the estimated life of the material for use on other projects; or rental rates may be established on the basis of purchase or salvage value of such items, whichever is less. Contractor will not be eligible for compensation for such items in an amount that exceeds the purchase cost of such item.

c. *Construction Equipment Rental*

- 1) Rentals of all construction equipment and machinery, and the parts thereof, in accordance with rental agreements approved by Owner as to price (including any surcharge or special rates applicable to overtime use of the construction equipment or machinery), and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs will be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts must cease when the use thereof is no longer necessary for the Work.
 - 2) Costs for equipment and machinery owned by Contractor or a Contractor-related entity will be paid at a rate shown for such equipment in the equipment rental rate book specified in the Supplementary Conditions. An hourly rate will be computed by dividing the monthly rates by 176. These computed rates will include all operating costs.
 - 3) With respect to Work that is the result of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price ("changed Work"), included costs will be based on the time the equipment or machinery is in use on the changed Work and the costs of transportation, loading, unloading, assembly, dismantling, and removal when directly attributable to the changed Work. The cost of any such equipment or machinery, or parts thereof, must cease to accrue when the use thereof is no longer necessary for the changed Work.
- d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
- e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
- f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of builder's risk or other property insurance established in accordance with Paragraph 6.04), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses will be included in the Cost of the Work for the purpose of determining Contractor's fee.

- g. The cost of utilities, fuel, and sanitary facilities at the Site.
 - h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.
 - i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.
- C. *Costs Excluded:* The term Cost of the Work does not include any of the following items:
 - 1. Payroll costs and other compensation of Contractor's officers, executives, principals, general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.
 - 2. The cost of purchasing, renting, or furnishing small tools and hand tools.
 - 3. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
 - 4. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
 - 5. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
 - 6. Expenses incurred in preparing and advancing Claims.
 - 7. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.
- D. *Contractor's Fee*
 - 1. When the Work as a whole is performed on the basis of cost-plus-a-fee, then:
 - a. Contractor's fee for the Work set forth in the Contract Documents as of the Effective Date of the Contract will be determined as set forth in the Agreement.
 - b. for any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work, Contractor's fee will be determined as follows:
 - 1) When the fee for the Work as a whole is a percentage of the Cost of the Work, the fee will automatically adjust as the Cost of the Work changes.
 - 2) When the fee for the Work as a whole is a fixed fee, the fee for any additions or deletions will be determined in accordance with Paragraph 11.07.C.2.
 - 2. When the Work as a whole is performed on the basis of a stipulated sum, or any other basis other than cost-plus-a-fee, then Contractor's fee for any Work covered by a Change

Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work will be determined in accordance with Paragraph 11.07.C.2.

- E. *Documentation and Audit*: Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor and pertinent Subcontractors will establish and maintain records of the costs in accordance with generally accepted accounting practices. Subject to prior written notice, Owner will be afforded reasonable access, during normal business hours, to all Contractor's accounts, records, books, correspondence, instructions, drawings, receipts, vouchers, memoranda, and similar data relating to the Cost of the Work and Contractor's fee. Contractor shall preserve all such documents for a period of three years after the final payment by Owner. Pertinent Subcontractors will afford such access to Owner, and preserve such documents, to the same extent required of Contractor.

13.02 Allowances

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.
- B. *Cash Allowances*: Contractor agrees that:
1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
 2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment for any of the foregoing will be valid.
- C. *Owner's Contingency Allowance*: Contractor agrees that an Owner's contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor for Work covered by allowances, and the Contract Price will be correspondingly adjusted.

13.03 Unit Price Work

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision

thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, and the final adjustment of Contract Price will be set forth in a Change Order, subject to the provisions of the following paragraph.

E. *Adjustments in Unit Price*

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

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

14.01 *Access to Work*

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

14.02 *Tests, Inspections, and Approvals*

- A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.
- B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work will be governed by the provisions of Paragraph 14.05.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

- D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:
1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;
 2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;
 3. by manufacturers of equipment furnished under the Contract Documents;
 4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and
 5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

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

- E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.
- F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering will be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 *Defective Work*

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

losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 *Acceptance of Defective Work*

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

14.05 *Uncovering Work*

- A. Engineer has the authority to require additional inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.
- B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.
- C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.
 - 1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.
 - 2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 *Owner May Stop the Work*

- A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work,

or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work will not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

14.07 Owner May Correct Defective Work

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace defective Work as required by Engineer, then Owner may, after 7 days' written notice to Contractor, correct or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.
- C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.
- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

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

15.01 Progress Payments

- A. *Basis for Progress Payments:* The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments for Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.
- B. *Applications for Payments*
 - 1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents.
 - 2. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment must also be accompanied by: (a) a bill of sale, invoice, copies of subcontract or purchase order payments, or other documentation

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

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

C. Review of Applications

1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:
 - a. the Work has progressed to the point indicated;
 - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and
 - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
 - a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or
 - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
 - a. to supervise, direct, or control the Work;
 - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto;
 - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work;
 - d. to make any examination to ascertain how or for what purposes Contractor has used the money paid by Owner; or
 - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.
6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:
 - a. the Work is defective, requiring correction or replacement;
 - b. the Contract Price has been reduced by Change Orders;
 - c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or
 - e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due*

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

E. *Reductions in Payment by Owner*

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

- b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;
 - c. Contractor has failed to provide and maintain required bonds or insurance;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;
 - e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;
 - f. The Work is defective, requiring correction or replacement;
 - g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - h. The Contract Price has been reduced by Change Orders;
 - i. An event has occurred that would constitute a default by Contractor and therefore justify a termination for cause;
 - j. Liquidated or other damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;
 - k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens; or
 - l. Other items entitle Owner to a set-off against the amount recommended.
2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed will be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.
 3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld will be treated as an amount due as determined by Paragraph 15.01.D.1 and subject to interest as provided in the Agreement.

15.02 *Contractor's Warranty of Title*

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than 7 days after the time of payment by Owner.

15.03 *Substantial Completion*

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time

submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.

- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which will fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have 7 days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.
- E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.
- F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

15.04 *Partial Use or Occupancy*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without

significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:

1. At any time, Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through 15.03.E for that part of the Work.
2. At any time, Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.04 regarding builder's risk or other property insurance.

15.05 *Final Inspection*

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

15.06 *Final Payment*

A. *Application for Payment*

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, annotated record documents (as provided in Paragraph 7.12), and other documents, Contractor may make application for final payment.
2. The final Application for Payment must be accompanied (except as previously delivered) by:
 - a. all documentation called for in the Contract Documents;
 - b. consent of the surety, if any, to final payment;
 - c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.

- d. a list of all duly pending Change Proposals and Claims; and
 - e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.
- 3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.
- B. *Engineer's Review of Final Application and Recommendation of Payment:* If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within 10 days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the final Application for Payment to Owner for payment. Such recommendation will account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.
- C. *Notice of Acceptability:* In support of its recommendation of payment of the final Application for Payment, Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to stated limitations in the notice and to the provisions of Paragraph 15.07.
- D. *Completion of Work:* The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment and issuance of notice of the acceptability of the Work.
- E. *Final Payment Becomes Due:* Upon receipt from Engineer of the final Application for Payment and accompanying documentation, Owner shall set off against the amount recommended by Engineer for final payment any further sum to which Owner is entitled, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions of this Contract with respect to progress payments. Owner shall pay the resulting balance due to Contractor within 30 days of Owner's receipt of the final Application for Payment from Engineer.

15.07 *Waiver of Claims*

- A. By making final payment, Owner waives its claim or right to liquidated damages or other damages for late completion by Contractor, except as set forth in an outstanding Claim,

appeal under the provisions of Article 17, set-off, or express reservation of rights by Owner. Owner reserves all other claims or rights after final payment.

- B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted as a Claim, or appealed under the provisions of Article 17.

15.08 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the Supplementary Conditions or the terms of any applicable special guarantee required by the Contract Documents), Owner gives Contractor written notice that any Work has been found to be defective, or that Contractor's repair of any damages to the Site or adjacent areas has been found to be defective, then after receipt of such notice of defect Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
 - 1. correct the defective repairs to the Site or such adjacent areas;
 - 2. correct such defective Work;
 - 3. remove the defective Work from the Project and replace it with Work that is not defective, if the defective Work has been rejected by Owner, and
 - 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting from the corrective measures.
- B. Owner shall give any such notice of defect within 60 days of the discovery that such Work or repairs is defective. If such notice is given within such 60 days but after the end of the correction period, the notice will be deemed a notice of defective Work under Paragraph 7.17.B.
- C. If, after receipt of a notice of defect within 60 days and within the correction period, Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others). Contractor's failure to pay such costs, losses, and damages within 10 days of invoice from Owner will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the failure to pay.
- D. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- E. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

- F. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph are not to be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 16—SUSPENSION OF WORK AND TERMINATION

16.01 *Owner May Suspend Work*

- A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times directly attributable to any such suspension. Any Change Proposal seeking such adjustments must be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 *Owner May Terminate for Cause*

- A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:
 - 1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment, or failure to adhere to the Progress Schedule);
 - 2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;
 - 3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or
 - 4. Contractor's repeated disregard of the authority of Owner or Engineer.
- B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) 10 days' written notice that Owner is considering a declaration that Contractor is in default and termination of the Contract, Owner may proceed to:
 - 1. declare Contractor to be in default, and give Contractor (and any surety) written notice that the Contract is terminated; and
 - 2. enforce the rights available to Owner under any applicable performance bond.
- C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.
- D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within 7 days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.
- E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects,

attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses, and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

- F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.
- G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond will govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *Owner May Terminate for Convenience*

- A. Upon 7 days' written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
 - 1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
 - 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and
 - 3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.
- B. Contractor shall not be paid for any loss of anticipated profits or revenue, post-termination overhead costs, or other economic loss arising out of or resulting from such termination.

16.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon 7 days' written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.
- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, 7 days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The

provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

ARTICLE 17—FINAL RESOLUTION OF DISPUTES

17.01 *Methods and Procedures*

- A. *Disputes Subject to Final Resolution:* The following disputed matters are subject to final resolution under the provisions of this article:
 - 1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full, pursuant to Article 12; and
 - 2. Disputes between Owner and Contractor concerning the Work, or obligations under the Contract Documents, that arise after final payment has been made.
- B. *Final Resolution of Disputes:* For any dispute subject to resolution under this article, Owner or Contractor may:
 - 1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions;
 - 2. agree with the other party to submit the dispute to another dispute resolution process; or
 - 3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

ARTICLE 18—MISCELLANEOUS

18.01 *Giving Notice*

- A. Whenever any provision of the Contract requires the giving of written notice to Owner, Engineer, or Contractor, it will be deemed to have been validly given only if delivered:
 - 1. in person, by a commercial courier service or otherwise, to the recipient's place of business;
 - 2. by registered or certified mail, postage prepaid, to the recipient's place of business; or
 - 3. by e-mail to the recipient, with the words "Formal Notice" or similar in the e-mail's subject line.

18.02 *Computation of Times*

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

18.03 *Cumulative Remedies*

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

18.04 *Limitation of Damages*

- A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

- A. A party's non-enforcement of any provision will not constitute a waiver of that provision, nor will it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

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

18.07 *Controlling Law*

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

18.08 *Assignment of Contract*

- A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party to this Contract of any rights under or interests in the Contract will be binding on the other party without the written consent of the party sought to be bound; and, specifically but without limitation, money that may become due and money that is due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract.

18.09 *Successors and Assigns*

- A. Owner and Contractor each binds itself, its successors, assigns, and legal representatives to the other party hereto, its successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

18.10 *Headings*

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

THIS PAGE INTENTIONALLY LEFT BLANK

SUPPLEMENTARY CONDITIONS OF THE CONSTRUCTION CONTRACT

TABLE OF CONTENTS

	Page
Article 1— Definitions and Terminology.....	2
Article 2— Preliminary Matters	2
Article 3— Contract Documents: Intent, Requirements, Reuse	6
Article 4— Commencement and Progress of the Work	4
Article 5— Site, Subsurface and Physical Conditions, Hazardous Environmental Conditions	6
Article 6— Bonds and Insurance	6
Article 7— Contractor’s Responsibilities	8
Article 8— Other Work at the Site	8
Article 9— Owner’s Responsibilities	8
Article 10— Engineer’s Status During Construction	8
Article 11— Changes to the Contract	10
Article 12— Claims	10
Article 13— Cost of Work; Allowances, Unit Price Work.....	10
Article 14— Tests and Inspections; Correction, Removal, or Acceptance of Defective Work.....	10
Article 15— Payments to Contractor, Set Offs; Completions; Correction Period	11
Article 16— Suspension of Work and Termination	11
Article 17— Final Resolutions of Disputes	11
Article 18— Miscellaneous	11
Exhibit A— Software Requirements for Electronic Document Exchange.....	12
Contract Requirements for SCIIP Projects	
Debarment Certification	
SAM.GOV Notification	

**CITY OF GOOSE CREEK
GOOSE CREEK, SOUTH CAROLINA**

GOOSE CREEK WATER SYSTEM EXPANSION - SOUTH

(THESE SUPPLEMENTARY CONDITIONS MODIFY THE STANDARD GENERAL CONDITIONS)

SUPPLEMENTARY CONDITIONS OF THE CONSTRUCTION CONTRACT

These Supplementary Conditions amend or supplement EJCDC® C-700, Standard General Conditions of the Construction Contract (2018). The General Conditions remain in full force and effect except as amended.

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

The address system used in these Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix "SC" added—for example, "Paragraph SC-4.05."

ARTICLE 1—DEFINITIONS AND TERMINOLOGY

No Supplementary Conditions in this Article.

ARTICLE 2—PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

SC-2.01 Delete Paragraphs 2.01.B. and C. in their entirety and insert the following in their place:

- B. *Evidence of Contractor's Insurance:* When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner copies of the policies (including all endorsements, and identification of applicable self-insured retentions and deductibles) of insurance required to be provided by Contractor in this Contract. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.
- C. *Evidence of Owner's Insurance:* After receipt from Contractor of the signed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor copies of the policies of insurance to be provided by Owner in this Contract (if any). Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

2.02 *Copies of Documents*

SC-2.02 Amend the first sentence of Paragraph 2.02.A. to read as follows:

Owner shall furnish to Contractor **three** printed copies of the Contract Documents (including one fully signed counterpart of the Agreement), and **one copy** in electronic portable document format (PDF).

2.06 *Electronic Transmittals*

SC-2.06 Delete Paragraphs 2.06.B and 2.06.C in their entirety and insert the following in their place:

B. *Electronic Documents Protocol*: The parties shall conform to the following provisions in Paragraphs 2.06.B and 2.06.C, together referred to as the Electronic Documents Protocol (“EDP” or “Protocol”) for exchange of electronic transmittals.

1. *Basic Requirements*

- a. To the fullest extent practical, the parties agree to and will transmit and accept Electronic Documents in an electronic or digital format using the procedures described in this Protocol. Use of the Electronic Documents and any information contained therein is subject to the requirements of this Protocol and other provisions of the Contract.
- b. The contents of the information in any Electronic Document will be the responsibility of the transmitting party.
- c. Electronic Documents as exchanged by this Protocol may be used in the same manner as the printed versions of the same documents that are exchanged using non-electronic format and methods, subject to the same governing requirements, limitations, and restrictions, set forth in the Contract Documents.
- d. Except as otherwise explicitly stated herein, the terms of this Protocol will be incorporated into any other agreement or subcontract between a party and any third party for any portion of the Work on the Project, or any Project-related services, where that third party is, either directly or indirectly, required to exchange Electronic Documents with a party or with Engineer. Nothing herein will modify the requirements of the Contract regarding communications between and among the parties and their subcontractors and consultants.
- e. When transmitting Electronic Documents, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the receiving party’s use of software application packages, operating systems, or computer hardware differing from those established in this Protocol.
- f. Nothing herein negates any obligation 1) in the Contract to create, provide, or maintain an original printed record version of Drawings and Specifications, signed and sealed according to applicable Laws and Regulations; 2) to comply with any applicable Law or Regulation governing the signing and sealing of design documents or the signing and electronic transmission of any other documents; or 3) to comply with the notice requirements of Paragraph 18.01 of the General Conditions.

2. *System Infrastructure for Electronic Document Exchange*

- a. Each party will provide hardware, operating system(s) software, internet, e-mail, and large file transfer functions (“System Infrastructure”) at its own cost and sufficient for complying with the EDP requirements. With the exception of minimum standards set forth in this EDP, and any explicit system requirements specified by attachment to this EDP, it is the obligation of each party to determine, for itself, its own System Infrastructure.
 - 1) The maximum size of an email attachment for exchange of Electronic Documents under this EDP is **10 MB**. Attachments larger than that may be exchanged using large file transfer functions or physical media.
 - 2) Each Party assumes full and complete responsibility for any and all of its own costs, delays, deficiencies, and errors associated with converting, translating, updating, verifying, licensing, or otherwise enabling its System Infrastructure, including operating systems and software, for use with respect to this EDP.
- b. Each party is responsible for its own system operations, security, back-up, archiving, audits, printing resources, and other Information Technology (“IT”) for maintaining operations of its System Infrastructure during the Project, including coordination with the party’s individual(s) or entity responsible for managing its System Infrastructure and capable of addressing routine communications and other IT issues affecting the exchange of Electronic Documents.
- c. Each party will operate and maintain industry-standard, industry-accepted, ISO-standard, commercial-grade security software and systems that are intended to protect the other party from: software viruses and other malicious software like worms, trojans, adware; data breaches; loss of confidentiality; and other threats in the transmission to or storage of information from the other parties, including transmission of Electronic Documents by physical media such as CD/DVD/flash drive/hard drive. To the extent that a party maintains and operates such security software and systems, it shall not be liable to the other party for any breach of system security.
- d. In the case of disputes, conflicts, or modifications to the EDP required to address issues affecting System Infrastructure, the parties shall cooperatively resolve the issues; but, failing resolution, the Owner is authorized to make and require reasonable and necessary changes to the EDP to effectuate its original intent. If the changes cause additional cost or time to Contractor, not reasonably anticipated under the original EDP, Contractor may seek an adjustment in price or time under the appropriate process in the Contract.
- e. Each party is responsible for its own back-up and archive of documents sent and received during the term of the contract under this EDP, unless this EDP establishes a Project document archive, either as part of a mandatory Project website or other communications protocol, upon which the parties may rely for document archiving during the specified term of operation of such Project document archive. Further, each party remains solely responsible for its own post-Project back-up and archive of Project documents after the term of the Contract, or after termination of the Project document archive, if one is established, for as long as required by the Contract and as each party deems necessary for its own purposes.

- f. If a receiving party receives an obviously corrupted, damaged, or unreadable Electronic Document, the receiving party will advise the sending party of the incomplete transmission.
- g. The parties will bring any non-conforming Electronic Documents into compliance with the EDP. The parties will attempt to complete a successful transmission of the Electronic Document or use an alternative delivery method to complete the communication.
- h. The Owner will operate a Project information management system (also referred to in this EDP as “Project Website”) for use of Owner, Engineer and Contractor during the Project for exchange and storage of Project-related communications and information. Except as otherwise provided in this EDP or the General Conditions, use of the Project Website by the parties as described in this Paragraph will be mandatory for exchange of Project documents, communications, submittals, and other Project-related information. The following conditions and standards will govern use of the Project Website:
 - 1) Describe the period of time during which the Project Website will be operated and be available for reliance by the parties;
 - 2) Provide any minimum system infrastructure, software licensing and security standards for access to and use of the Project Website;
 - 3) Describe the types and extent of services to be provided at the Project Website (such as large file transfer, email, communication and document archives, etc.); and
 - 4) Include any other Project Website attributes that may be pertinent to Contractor’s use of the facility and pricing of such use.

C. Software Requirements for Electronic Document Exchange; Limitations

- 1. Each party will acquire the software and software licenses necessary to create and transmit Electronic Documents and to read and to use any Electronic Documents received from the other party (and if relevant from third parties), using the software formats required in this section of the EDP.
 - a. Prior to using any updated version of the software required in this section for sending Electronic Documents to the other party, the originating party will first notify and receive concurrence from the other party for use of the updated version or adjust its transmission to comply with this EDP.
- 2. The parties agree not to intentionally edit, reverse engineer, decrypt, remove security or encryption features, or convert to another format for modification purposes any Electronic Document or information contained therein that was transmitted in a software data format, including Portable Document Format (PDF), intended by sender not to be modified, unless the receiving party obtains the permission of the sending party or is citing or quoting excerpts of the Electronic Document for Project purposes.
- 3. Software and data formats for exchange of Electronic Documents will conform to the requirements set forth in Exhibit A to this EDP, including software versions, if listed.

ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

SC-3.01 Delete Paragraph 3.01.C in its entirety.

ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK

SC-4.01.A – Delete the last sentence of paragraph.

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

SC-5.03 Add the following new paragraphs immediately after Paragraph 5.03.D:

 E. There was no Geotechnical Report prepared for this project.

5.06 *Hazardous Environmental Conditions*

SC-5.06 Add the following new paragraphs immediately after Paragraph 5.06.A.3:

4. There are no available reports known to the Owner relating to Hazardous Environmental Conditions at or adjacent to the Site.
5. There are no available drawings known to Owner relating to Hazardous Environmental Conditions at or adjacent to the Site.

ARTICLE 6—BONDS AND INSURANCE

SC-6.03 Add the following new paragraph immediately after Paragraph 6.03.C:

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

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

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

Employer's Liability:

Bodily injury, each accident	\$ <u>500,000</u>
Bodily injury by disease, each employee	\$ <u>500,000</u>
Bodily injury/disease aggregate	\$ <u>500,000</u>

Foreign voluntary worker compensation	<u>Statutory</u>
---------------------------------------	------------------

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

General Aggregate	\$ <u>5,000,000</u>
Products - Completed Operations Aggregate	\$ <u>5,000,000</u>
Personal and Advertising Injury	\$ <u>1,000,000</u>
Each Occurrence (Bodily Injury and Property Damage)	\$ <u>1,000,000</u>

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

Bodily Injury:

Each person	\$ <u>1,000,000</u>
Each accident	\$ <u>1,000,000</u>

Property Damage:

Each accident	\$ <u>1,000,000</u>
---------------	---------------------

4. Excess or Umbrella Liability:

Per Occurrence	\$ <u>5,000,000</u>
General Aggregate	\$ <u>5,000,000</u>

5. Contractor's Pollution Liability:

Each Occurrence	\$ <u>Not applicable</u>
General Aggregate	\$ <u>Not applicable</u>

☒ If box is checked, Contractor is not required to provide Contractor's Pollution Liability insurance under this Contract

6. Additional Insureds: In addition to Owner and Engineer, include as additional insureds the following:

7. Contractor's Professional Liability:

Each Claim	\$ <u>Not applicable</u>
Annual Aggregate	\$ <u>Not applicable</u>

SC-6.04 Supplement Paragraph 6.04 of the General Conditions with the following provisions:

F. *Builder's Risk Requirements:* The builder's risk insurance must:

1. be written on a builder's risk "all risk" policy form that at a minimum includes insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment stored and in transit, and must not exclude the coverage of the following risks: fire; windstorm; hail; flood; earthquake, volcanic activity, and other earth movement; lightning; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; and water damage (other than that caused by flood).
 - a. Such policy will include an exception that results in coverage for ensuing losses from physical damage or loss with respect to any defective workmanship, methods, design, or materials exclusions.
 - b. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake, volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance will be provided through other insurance policies acceptable to Owner and Contractor.
2. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for

the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.

3. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of contractors, engineers, and architects).
4. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier).
5. extend to cover damage or loss to insured property while in transit.
6. allow for the waiver of the insurer's subrogation rights, as set forth in this Contract.
7. allow for partial occupancy or use by Owner by endorsement, and without cancellation or lapse of coverage.
8. include performance/hot testing and start-up, if applicable.
9. be maintained in effect until the Work is complete, as set forth in Paragraph 15.06.D of the General Conditions, or until written confirmation of Owner's procurement of property insurance following Substantial Completion, whichever occurs first.
10. include as named insureds the Owner, Contractor, Subcontractors (of every tier), and any other individuals or entities required by this Contract to be insured under such builder's risk policy. For purposes of Paragraphs 6.04, 6.05, and 6.06 of the General Conditions, and this and all other corresponding Supplementary Conditions, the parties required to be insured will be referred to collectively as "insureds." In addition to Owner, Contractor, and Subcontractors of every tier, include as insureds the following:
 - a. None.
11. include, in addition to the Contract Price amount, the value of the following equipment and materials to be installed by the Contractor but furnished by the Owner or third parties:
 - a. None.
12. If debris removal in connection with repair or replacement of insured property is subject to a coverage sublimit, such sublimit will be a minimum of \$[Non-applicable].

ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

No Supplementary Conditions in this Article.

ARTICLE 8—OTHER WORK AT THE SITE

No Supplementary Conditions in this Article.

ARTICLE 9—OWNER’S RESPONSIBILITIES

9.13 *Owner’s Site Representative*

SC-9.13 Add the following new paragraph immediately after Paragraph 9.12 of the General Conditions:

9.13 *Owner’s Site Representative*

- A. Owner will furnish an “Owner’s Site Representative” to represent Owner at the Site and assist Owner in observing the progress and quality of the Work. The Inspector is designated to perform duties and responsibilities within the limitations of authority of Engineer as Owner’s representative during construction as set forth in the Contract.

ARTICLE 10—ENGINEER’S STATUS DURING CONSTRUCTION

10.03 *Resident Project Representative*

SC-10.03 Replace Paragraph A with the following:

- A. Engineer may be Owner’s representative.

SC-10.03 Add the following new paragraphs immediately after Paragraph 10.03.B:

- C. The Resident Project Representative (RPR) will be Engineer's representative at the Site. RPR's dealings in matters pertaining to the Work in general will be with Engineer and Contractor. RPR's dealings with Subcontractors will only be through or with the full knowledge or approval of Contractor. The RPR will:
 - 1. *Conferences and Meetings:* Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences, and other Project-related meetings (but not including Contractor’s safety meetings), and as appropriate prepare and circulate copies of minutes thereof.
 - 2. *Safety Compliance:* Comply with Site safety programs, as they apply to RPR, and if required to do so by such safety programs, receive safety training specifically related to RPR’s own personal safety while at the Site.
 - 3. *Liaison*
 - a. Serve as Engineer’s liaison with Contractor. Working principally through Contractor’s authorized representative or designee, assist in providing information regarding the provisions and intent of the Contract Documents.
 - b. Assist Engineer in serving as Owner’s liaison with Contractor when Contractor’s operations affect Owner’s on-Site operations.
 - c. Assist in obtaining from Owner additional details or information, when required for Contractor’s proper execution of the Work.
 - 4. *Review of Work; Defective Work*
 - a. Conduct on-Site observations of the Work to assist Engineer in determining, to the extent set forth in Paragraph 10.02, if the Work is in general proceeding in accordance with the Contract Documents.

- b. Observe whether any Work in place appears to be defective.
 - c. Observe whether any Work in place should be uncovered for observation, or requires special testing, inspection or approval.
- 5. *Inspections and Tests*
 - a. Observe Contractor-arranged inspections required by Laws and Regulations, including but not limited to those performed by public or other agencies having jurisdiction over the Work.
 - b. Accompany visiting inspectors representing public or other agencies having jurisdiction over the Work.
- 6. *Payment Requests: Review Applications for Payment with Contractor.*
- 7. *Completion*
 - a. Participate in Engineer's visits regarding Substantial Completion.
 - b. Assist in the preparation of a punch list of items to be completed or corrected.
 - c. Participate in Engineer's visit to the Site in the company of Owner and Contractor regarding completion of the Work, and prepare a final punch list of items to be completed or corrected by Contractor.
 - d. Observe whether items on the final punch list have been completed or corrected.
- D. The RPR will not:
 - 1. Authorize any deviation from the Contract Documents or substitution of materials or equipment (including "or-equal" items).
 - 2. Exceed limitations of Engineer's authority as set forth in the Contract Documents.
 - 3. Undertake any of the responsibilities of Contractor, Subcontractors, or Suppliers.
 - 4. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of construction.
 - 5. Advise on, issue directions regarding, or assume control over security or safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor.
 - 6. Participate in specialized field or laboratory tests or inspections conducted off-site by others except as specifically authorized by Engineer.
 - 7. Authorize Owner to occupy the Project in whole or in part.

ARTICLE 11—CHANGES TO THE CONTRACT

SC-11.02.C – Add new paragraph immediately after Paragraph 11.02.B:

C. The Engineer or Owner shall contact the Funding Agency for concurrence on each Change Order prior to issuance. All Contract Change Orders must be concurred on (signed) by the Funding Agency before they are effective.

ARTICLE 12—CLAIMS

No Supplementary Conditions in this Article.

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

No Supplementary Conditions in this Article.

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

SC-14.02 – Delete Paragraph 14.02.B in its entirety and insert the following in its place:

- B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work will be governed by the provisions of Paragraph 14.05, and except that costs incurred in connection with tests or inspections which indicate that materials fail to meet project requirements.

ARTICLE 15—PAYMENTS TO CONTRACTOR, SET OFFS; COMPLETIONS; CORRECTION PERIOD

15.01 Progress Payments

SC-15.01.B.5 – Add new paragraph immediately after Paragraph 15.01.B.4:

5. The recommended Application for Payment form to be used on this Project is EJCDC® C-620 in conjunction with Agency's Contractor Pay Request Certification Form. The Agency must approve all Applications for Payment before payment is made.

SC-15.01.D.1 – Delete Paragraph 15.01.D.1 in its entirety and insert the following in its place:

1. After presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor. Payments will then be submitted by Owner to the RIA for approval and payment, which may require 30 days for processing payment.

ARTICLE 16—SUSPENSION OF WORK AND TERMINATION

No Supplementary Conditions in this Article.

ARTICLE 17—FINAL RESOLUTIONS OF DISPUTES

No Supplementary Conditions in this Article.

ARTICLE 18—MISCELLANEOUS

No Supplementary Conditions in this Article.

EXHIBIT A—SOFTWARE REQUIREMENTS FOR ELECTRONIC DOCUMENT EXCHANGE

Item	Electronic Documents	Transmittal Means	Data Format	Note (1)
a.1	General communications, transmittal covers, meeting notices and responses to general information requests for which there is no specific prescribed form.	Email	Email	
a.2	Meeting agendas, meeting minutes, RFI's and responses to RFI's, and Contract forms.	Email w/ Attachment	PDF	(2)
a.3	Contactors Submittals (Shop Drawings, "or equal" requests, substitution requests, documentation accompanying Sample submittals and other submittals) to Owner and Engineer, and Owner's and Engineer's responses to Contractor's Submittals, Shop Drawings, correspondence, and Applications for Payment.	Email w/ Attachment	PDF	
a.4	Correspondence; milestone and final version Submittals of reports, layouts, Drawings, maps, calculations and spreadsheets, Specifications, Drawings and other Submittals from Contractor to Owner or Engineer and for responses from Engineer and Owner to Contractor regarding Submittals.	Email w/ Attachment or LFE	PDF	
a.5	Layouts and drawings to be submitted to Owner for future use and modification.	Email w/ Attachment or LFE	DWG	
a.6	Correspondence, reports and Specifications to be submitted to Owner for future word processing use and modification.	Email w/ Attachment or LFE	DOC	
a.7	Spreadsheets and data to be submitted to Owner for future data processing use and modification.	Email w/ Attachment or LFE	EXC	
a.8	Database files and data to be submitted to Owner for future data processing use and modification.	Email w/ Attachment or LFE	DB	
Notes				
(1)	All exchanges and uses of transmitted data are subject to the appropriate provisions of Contract Documents.			
(2)	Transmittal of written notices is governed by Paragraph 18.01 of the General Conditions.			
Key				
Email	Standard Email formats (.htm, .rtf, or .txt). Do not use stationery formatting or other features that impair legibility of content on screen or in printed copies			
LFE	Agreed upon Large File Exchange method (FTP, CD, DVD, hard drive)			
PDF	Portable Document Format readable by Adobe® Acrobat Reader Version 23 or later.			
DWG	Autodesk® AutoCAD .dwg format Version 2020.			
DOC	Microsoft® Word .docx format Version 2016 or higher.			
EXC	Microsoft® Excel .xls or .xml format Version 2016 or higher.			
DB	Microsoft® Access .mdb format Version 2016 or higher.			

THIS PAGE INTENTIONALLY LEFT BLANK

Contract Requirements for SCIIP Projects

Clean Air Act and Federal Water Pollution Control Act

- i. The Grantee and its **contractors** agree to comply with all applicable standards, orders, and regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. 7401 et seq. Grantee and its contractors agree to report each violation to assure notification to Treasury and the appropriate Environmental Protection Agency Regional Office. Grantees and its contractors agree to include these requirements in each subcontract exceeding \$150,000 financed, in whole or in part, with SCIIP funds.
- ii. The Grantee and its **contractors** agree to comply with all applicable standards, orders, and regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et seq. Grantee and its contractors agree to report each violation to assure notification to Treasury and the appropriate Environmental Protection Agency Regional Office. Grantee and its contractors agree to include these requirements in each subcontract exceeding \$150,000 financed, in whole or in part, with SCIIP funds.

Procurement of Recovered Materials

The Grantee and its **contractors** shall make maximum use of products containing recovered materials that are EPA-designated items, unless the product cannot (1) be acquired competitively within a timeframe providing for compliance with the project performance schedule, (2) meet project performance requirements, or (3) be acquired at a reasonable price. Information about this requirement, along with the list of EPA-designated items, is available on EPA's website. The Grantee and its contractors also agree to comply with all other applicable requirements of Section 6002 of the Solid Waste Disposal Act.

Terms and Conditions for Federal Contracts

Termination for Cause and Convenience

The contract may be terminated in whole or in part as follows:

- i. By the Grantee, if a contractor fails to comply with the terms and conditions of the SCIIP award;
- ii. By the Grantee, to the greatest extent authorized by law, if an award no longer effectuates the program goals or agency priorities;
- iii. By the Grantee with the consent of the contractor, in which case the two parties must agree upon the termination conditions, including the effective date and, in the case of partial termination, the portion to be terminated;
- iv. By the Grantee upon written notification setting forth the reasons for such termination, the effective date, and, in the case of partial termination, the portion to be terminated. However, if the Grantee determines in the case of partial termination that the reduced or modified portion of the contract will not accomplish the purposes for which the contract was made, the Grantee may terminate the contract in its entirety; or
- v. By the Grantee pursuant to termination provisions included in the SCIIP award.

Administrative, Contractual, and Legal Remedies

In addition to any of the remedies described elsewhere in the contract, if the contractor materially fails to comply with the terms and conditions of this contract, including any federal or state statutes, rules or regulations, applicable to this contract, RIA or the Grantee may take one or more of the following actions:

- i. Temporarily withhold payments pending correction of the deficiency by the contractor.

- ii. Disallow (that is, deny both use of funds and any applicable matching credit for) all or part of the cost of the activity or action not in compliance;
- iii. Wholly or partly suspend or terminate this Contract; and
- iv. Take other remedies that may be legally available.

The remedies identified above, do not preclude the contractor from being subject to debarment and suspension under Presidential Executive Orders 12549 and 12689. The Grantee shall have the right to demand a refund, either in whole or part, of the funds provided to the contractor for noncompliance with the terms of this Contract.

Equal Opportunity Clause

During the performance of this contract, the contractor agrees as follows:

- i. The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following:
 - a. Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause. The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.
- ii. The contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information.
- iii. The contractor will send to each labor union or representative of workers with which he has a collective bargaining contract or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- iv. The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
- v. The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

- vi. In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

Debarment and Suspension (Executive Orders 12549 and 12689)

The Contractor certifies that it is not listed on the government-wide exclusions in SAM, in accordance with the OMB guidelines at 2 CFR 180 and 2 CF 1200 that implement Executive Orders 12549 (3 CFR part 1986 Comp., p. 189) and 12689 (3 CFR part 1989 Comp., p. 235), "Debarment and Suspension."

Contract Work Hours and Safety Standards Act

The Contractor must comply with 40 U.S.C. 3702 and 3704, as supplemented by Department of Labor regulations (29 CFR Part 5). Under 40 U.S.C. 3702 of the Act, each Contractor must be required to compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week. Requirements of 40 U.S.C. 3704 are applicable to construction work and provide that no laborer or mechanic must be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous. These requirements do not apply to the purchases of supplies or materials or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence.

THIS PAGE INTENTIONALLY LEFT BLANK

Grantee Debarment Certification Form

SCIIP Grant #: _____ RIA State Grant # (if applicable): _____

Grantee: _____ Grant Period: _____

Project: _____

Subrecipient, Contractor, or Consultant Name: _____

Subrecipient, Contractor, or Consultant SAM Unique Entity ID (UEI) #: _____

In accordance with the regulations implementing Executive Orders 12549 and 12689 regarding Debarment and Suspension, Uniform Guidance regulations at 2 CFR Part 200 for Grantee responsibilities, 2 CFR Part 180, and Treasury's regulation at 31 CFR Part 19, SCIIP funds may not go to individuals or entities that are prohibited from doing business with the federal government. Debarment status should be checked on the System for Award Management (SAM) website at www.sam.gov.

The Grantee certifies to the best of its knowledge and belief that:

- Neither the Grantee nor any of its subrecipients or contractors under the Grant is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any federal department, the Rural Infrastructure Authority (RIA) or any local government department or agency.
- The Grantee further agrees that it will immediately notify the RIA if during the term of this Grant it or any of its subrecipients or contractors under the Grant become subject to debarment, suspension, or ineligibility from participating in transactions by the federal government or local government department or agency.
- The Grantee further agrees by submitting this Certification that it has included the clause titled "Debarment and Suspension (Executive Orders 12549 and 12689)" as written in the SCIIP Grant Project Management Procedures, without modification, in all SCIIP-funded contracts and solicitations for SCIIP-funded contracts.
- The Grantee will provide immediate written notice to the RIA if at any time the Grantee learns that its certification or that of its subrecipient or contractor was erroneous when submitted or has become erroneous by reason of changed circumstances.

This signed form certifies compliance with the above-referenced requirements regarding debarment and suspension.

Chief Executive Official

Title

Date

Note: This form must be signed by the Grantee and submitted with all SCIIP-funded agreements and contracts for review and approval by RIA prior to executing the agreement or contract. The form can be accepted electronically with a scanned signature.

THIS PAGE INTENTIONALLY LEFT BLANK

Sam.gov Notification

All contractors and subcontractors must be registered at <http://sam.gov> before a contract can be awarded. A search of sam.gov records must be conducted regarding debarment from being awarded a contract using federal funds. There is no cost for this. The legal name and address of the contractor or subcontractor and the DUNS number must match. When registering or updating the sam.gov registration, the applicant must opt in for **public view**. If confirmation of debarment can not be obtained, the contractor or subcontractor will not be allowed to work on the project.

Please sign stating you understand that this must be completed immediately.

Contractor's Signature

Date

THIS PAGE INTENTIONALLY LEFT BLANK

CHANGE ORDER NO.: [Number of Change Order]

Owner: _____ Owner's Project No.: _____
Engineer: _____ Engineer's Project No.: _____
Contractor: _____ Contractor's Project No.: _____
Project: _____
Contract Name: _____
Date Issued: _____ Effective Date of Change Order: _____

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

Description:

[Description of the change]

Attachments:

[List documents related to the change]

Change in Contract Price	Change in Contract Times [State Contract Times as either a specific date or a number of days]
Original Contract Price: \$ _____	Original Contract Times: Substantial Completion: _____ Ready for final payment: _____
[Increase] [Decrease] from previously approved Change Orders No. 1 to No. [Number of previous Change Order] : \$ _____	[Increase] [Decrease] from previously approved Change Orders No.1 to No. [Number of previous Change Order] : Substantial Completion: _____ Ready for final payment: _____
Contract Price prior to this Change Order: \$ _____	Contract Times prior to this Change Order: Substantial Completion: _____ Ready for final payment: _____
[Increase] [Decrease] this Change Order: \$ _____	[Increase] [Decrease] this Change Order: Substantial Completion: _____ Ready for final payment: _____
Contract Price incorporating this Change Order: \$ _____	Contract Times with all approved Change Orders: Substantial Completion: _____ Ready for final payment: _____

Recommended by Engineer (if required)

Accepted by Contractor

By: _____

Title: _____

Date: _____

Authorized by Owner _____ Approved by Funding Agency (if applicable) _____

By: _____

Title: _____

Date: _____

THIS PAGE INTENTIONALLY LEFT BLANK



***WATER SYSTEM EXPANSION – SOUTH
SCIIP GRANT – A-23-C081***

*City of Goose Creek
Goose Creek, South Carolina*

TECHNICAL SPECIFICATIONS

PROJECT NO. 2023-1180-00

March 2025



***Ardurra Group, Inc.
220 North Main Street, Suite 500
Greenville, South Carolina 29601
Telephone: (864) 226-6111***

THIS PAGE INTENTIONALLY LEFT BLANK

ARDURRA

**WATER SYSTEM EXPANSION - SOUTH
CITY OF GOOSE CREEK
GOOSE CREEK, SOUTH CAROLINA**

TABLE OF CONTENTS

TECHNICAL SPECIFICATIONS

<u>Section</u>	<u>Description</u>	<u>Page No.</u>
DIVISION 1 – GENERAL REQUIREMENTS		
01 10 10	Schedule of Drawings	1 – 2
01 11 00	Summary of Work	1 – 2
01 12 16	Work Sequence	1 – 2
01 14 00	Work Restrictions	1 – 1
01 20 00	Measurement and Payment	1 – 15
01 22 00	Unit Prices	1 – 2
01 23 00	Alternates ..	1 – 2
01 29 00	Payment Procedures	1 – 4
01 31 00	Project Management and Coordination	1 – 4
01 32 33	Photographic Documentation	1 – 2
01 33 00	Submittal Procedures	1 – 9
01 40 00	Quality Requirements	1 – 6
01 41 00	Regulatory Requirements	1 – 2
01 50 00	Temporary Facilities and Controls	1 – 6
01 60 00	Product Requirements	1 – 6
01 71 23	Field Engineering	1 – 3
01 73 31	Disinfection of Potable Water Mains	1 – 4
01 73 32	Testing Piping Systems	1 – 6
01 77 00	Closeout Procedures	1 – 4
01 78 39	Project Record Documents	1 – 3
01 79 10	System Demonstrations	1 – 3
DIVISION 3 – CONCRETE		
03 30 00	Cast-in-Place Concrete	1 - 11
DIVISION 31 – EARTHWORK		
31 10 00	Site Clearing	1 - 4
31 20 01	Trenching, Backfilling, and Compacting	1 - 13
31 23 19	Dewatering	1 - 4
31 25 00	Erosion and Sediment Controls	1 - 38
31 37 00	Riprap	1 - 1
31 50 00	Excavation Support and Protection	1 - 4

ARDURRA

Table of Contents
(continued)

<u>Section</u>	<u>Description</u>	<u>Page No.</u>
DIVISION 32 – EXTERIOR IMPROVEMENTS		
32 11 23	Aggregate Base Courses	1 - 3
32 12 16	Asphalt Paving	1 - 4
32 13 13	Concrete Paving.....	1 - 8
32 92 19	Seeding	1 - 6
DIVISION 33 – UTILITIES		
33 05 23.16	Steel Pipe Sleeves	1 - 2
33 11 00	Pressure Piping – General	1 - 7
33 11 13.13	Ductile Iron Pipe – Waterlines.....	1 - 6
33 11.13.23	Polyvinyl Chloride (PVC) Pipe – (Potable Water)	1 - 5
33 12 16	Water Utility Distribution Valves and Accessories	1 - 4
33 12 19	Fire Hydrant Assemblies	1 - 4

ARDURRA

SECTION 01 10 10

SCHEDULE OF DRAWINGS

PART 1 - GENERAL

1.1 DRAWINGS ACCOMPANING SPECIFICATIONS

- A. The following Drawings, prepared by Ardurra and dated November 2024, accompany this Specification and are a part of the Contract Documents. Drawings are the property of the Owner and shall not be used for any purpose other than as intended by the Contract Documents.

1.2 SCHEDULE OF DRAWINGS

SCHEDULE OF DRAWINGS	
<i>Drawing Number</i>	<i>Description</i>
G0.00	COVER
G0.01	GENERAL NOTES AND ABBREVIATIONS SHEET 1 OF 2
G0.02	GENERAL NOTES AND ABBREVIATIONS SHEET 2 OF 2
C1.00	OVERALL SHEET LAYOUT
C1.01	WATERLINE PLAN & PROFILE SHEET 1 OF 7
C1.02	WATERLINE PLAN & PROFILE SHEET 2 OF 7
C1.03	WATERLINE PLAN & PROFILE SHEET 3 OF 7
C1.04	WATERLINE PLAN & PROFILE SHEET 4 OF 7
C1.05	WATERLINE PLAN & PROFILE SHEET 5 OF 7
C1.06	WATERLINE PLAN & PROFILE SHEET 6 OF 7
C1.07	WATERLINE PLAN & PROFILE SHEET 7 OF 7
CD1.00	CIVIL DETAILS SHEET 1 OF 3
CD1.01	CIVIL DETAILS SHEET 2 OF 3
CD1.02	CIVIL DETAILS SHEET 3 OF 3
EC1.01	SEDIMENT & EROSION CONTROL PLAN SHEET 1 OF 4
EC1.02	SEDIMENT & EROSION CONTROL PLAN SHEET 2 OF 4
EC1.03	SEDIMENT & EROSION CONTROL PLAN SHEET 3 OF 4
EC1.04	SEDIMENT & EROSION CONTROL PLAN SHEET 4 OF 4

ARDURRA

SCHEDULE OF DRAWINGS	
<i>Drawing Number</i>	<i>Description</i>
EC1.05	SEDIMENT & EROSION CONTROL DETAILS SHEET 1 OF 4
EC1.06	SEDIMENT & EROSION CONTROL DETAILS SHEET 2 OF 4
EC1.07	SEDIMENT & EROSION CONTROL DETAILS SHEET 3 OF 4
EC1.08	SEDIMENT & EROSION CONTROL DETAILS SHEET 4 OF 4

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION

ARDURRA

SECTION 01 11 00

SUMMARY OF WORK

PART 1 - GENERAL

1.1 SUMMARY

- A. Project Identification: Goose Creek Water System Expansion - South
- B. Project Location: Goose Creek, South Carolina
- C. Owner: City of Goose Creek
Department of Public Works
200 Button Hall Avenue
Goose Creek, SC 29445

1.2 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Project consists of furnishing all labor, materials, equipment, and incidentals required to complete work in its entirety as shown on the Drawings and specified herein.
- B. Perform work complete, in place, and ready for continuous service. Work includes permits, testing, cleanup, repairs, replacements, and restoration required as a result of damages caused during construction.
- C. Comply with all applicable municipal, county, state, federal, and other codes.
- D. Work includes, but is not necessarily limited to the following:
 - 1. Base Bid: Installation of approximately 2,220 linear feet of 10-inch transmission main from Station 63+15± to Station 85+32± and the road bores on Howe Hall Road, Red Bank Road, Snake Road, and Old State Road. The work includes all related valves and appurtenances, connections to existing transmission mains and facilities, disinfection and testing, traffic control, clearing and grubbing, erosion control, grassing, road repair, and all other activities incidental to the completion of the work.
 - 2. Alternate 1: Installation of approximately 50 linear feet of 6-inch and 1,225 linear feet of 10-inch transmission main from Station 50+90± to Station 63+15±. The work includes all related valves and appurtenances, connections to existing transmission mains and facilities, disinfection and testing, traffic control, clearing and grubbing, erosion control, grassing, road repair, and all other activities incidental to the completion of the work.
 - 3. Alternate 2: Installation of approximately 725 linear feet of 6-inch and 4,375 linear feet of 10-inch transmission main from Station 0+00 to Station 50+90±. The work includes all related valves and appurtenances, connections to existing transmission mains and facilities, disinfection and testing, traffic control, clearing and grubbing, erosion control, grassing, road repair, and all other activities incidental to the completion of the work.

ARDURRA

1.3 CONTRACT

- A. Project will be constructed under a general construction contract.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION

ARDURRA

SECTION 01 12 16

WORK SEQUENCE

PART 1 - GENERAL

1.1 SUMMARY

- A. Perform work in an orderly manner to cause the least disruption to Owner's activities and the operation of the Owner's water distribution and transmission system.
- B. Where necessary to prevent or minimize interruptions of existing facility operations, schedule work for system tie-ins or service transfers during low demand periods.
- C. No time extension or increased cost claims will be considered for overtime work as a result of completing work in accordance with the requirements established herein.

1.2 SUBMITTALS

- A. Submit to Engineer overall plan of construction.
- B. Submit to Engineer schedule for system connections, including wet taps, and temporary shutdowns.

1.3 PROJECT SITE CONDITIONS

- A. Project site is generally within existing rights-of-way along streets, state roads and highways, and county roads and highways. Several portions of the Project are within private easements. Easements have been obtained from the individual property owner by Owner and include permanent easement and construction easement areas.

1.4 SEQUENCING AND SCHEDULING

- A. The existing facilities comprise a fully functioning water transmission and distribution system. Conduct all work in a manner which will not interrupt or jeopardize operations, cause permit violations, or jeopardize public health.
- B. Coordinate all required shut downs and system connections with Owner and provide a minimum of 72 hours' notice.
- C. Comply with the following in developing overall plan of construction.
 - 1. Sequencing for Pipe Installation:
 - a. Locate and excavate existing piping and other utilities to field verify locations and elevations prior to proceeding with pipe installation.

ARDURRA

- b. Install new piping and appurtenances. Clean up road shoulders as piping is installed.
 - c. Install a plug in the pipe at the end of each day's construction.
 - d. Inspect and clean the pipe interior at the end of each week for the section of pipe that was installed that week.
 - e. Make piping tie-ins.
 - f. Pressure test piping systems.
 - g. Flush piping system.
 - h. Conduct bacteriological sampling.
2. Sequencing for System Connections, including Wet Taps:
- a. Excavate existing piping and other utilities to field verify locations and elevations for connections prior to proceeding with the portion of work affected by these conditions.
 - b. Install new piping and appurtenances. Adjust piping alignment and materials as necessary, based on existing conditions.
 - c. Make piping connections as required.
3. Sequencing for major road bores:
- a. Provide a minimum of 72 hours' notice to all jurisdictions as indicated on the encroachment permits.
 - b. Conduct an on-site Pre-Construction Meeting with Owner, Engineer and other jurisdictions prior to conducting work.
 - c. Coordinate construction activities as required in the encroachment permits.
 - d. Excavate and install facilities in a manner that will not disrupt the transportation corridor at all times.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION

ARDURRA

SECTION 01 14 00

WORK RESTRICTIONS

PART 1 - GENERAL

1.1 USE OF PREMISES

- A. Refer to construction restraints as outlined in Section 01 11 00 – *Summary of Work*.
- B. Contractor will coordinate access to project sites with Owner and Engineer.
- C. Areas available for construction staging are shown on the Drawings.
- D. Contractor will move at his/her expense any items that interfere with operations of Owner.
- E. Provide security for all material and equipment stored on site during construction.
- F. Do not disturb portions of site beyond areas in which the Work is indicated.
 - 1. Owner Occupancy: Allow for Owner occupancy of site and use by the public.
 - 2. Driveways and Entrances: Keep driveways and entrances serving public and private properties clear, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - 3. Schedule deliveries to minimize use of driveways and entrances.
 - 4. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

ARDURRA

SECTION 01 20 00

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDE

- A. This section is the basis for payment for work to be completed under the contract as listed in the bid. The price for each item listed in the bid will be either a unit price or a lump sum amount.
- B. The Bid Proposal for this Contract covers all Work shown on the Drawings and specified herein.
- C. All costs for providing labor, materials, equipment, tools, machinery, supplies, supervision, management, coordination and other services to fully complete the Work as shown on the Drawings and specified herein shall be included in the lump sum prices listed in the Bid Form.
- D. All work not specifically listed as a pay item in the Bid Form shall be considered to be included in the unit price or lump sum bid amount for each bid item.
- E. Contractor's overhead and profit shall be included in the unit price or lump sum amount for each bid item.
- F. No additional compensation will be considered, except for an extension of the unit price quantities, beyond those shown on the bid, and eligible for "Extra Cost" as specified in the General Conditions.
- G. The Owner or his duly authorized representative will perform measurement for payment. Payment will not be made for work considered by the Owner to be incomplete or otherwise not installed in accordance with the contract documents.

1.2 BID ITEMS:

A. BASE BID

- 1. Item No. 1 – Mobilization (3 percent Maximum):
 - a. Mobilization is measured as a unit completed and accepted.
 - b. Payment shall be made at the Contract lump sum price; the cost of mobilization shall not exceed three (3) percent of the Total Bid.
 - c. This payment is full compensation for preparatory work and operations necessary for the movement of personnel, equipment, supplies, and incidentals to the project site; and for other work, operations or cost that are of necessity incurred prior to the beginning of construction. Bond costs, license fees, lump sum insurance premiums, and other such items of expense may be included, but any

ARDURRA

item that will be subsequently paid for as project work or material on hand shall be excluded.

2. Item No. 2 – Clearing and Grubbing:
 - a. The area of completed and accepted clearing and grubbing is measured in acres. Only the area cleared and grubbed as shown on the Plans or as designated by the Engineer is measured.
 - b. Payment shall be made for Clearing and Grubbing at the Contract Unit Price per acre.
 - c. This payment is full compensation for furnishing and installing all labor, materials, and equipment required to clear and grub the areas designated on the Drawings and in accordance with the Specifications.
3. Item No. 3 – 10-inch Waterline:
 - a. Item No. 3.a – PVC
 - 1) The overall length of pipe installed is measured in linear feet, along the central axis of the diameter of the pipe. Tees, bends, and other fittings are included in this measurement. Excavation and normal backfill are not measured for payment.
 - 2) Payment for furnishing and installing the 10-inch PVC waterlines shall be made at the contract unit price per linear foot, as listed in the bid, for the pipe in place and accepted.
 - 3) This payment is full compensation for furnishing and installing all labor, materials, and equipment required for the installation of the new waterline pipe, fittings, and appurtenances as shown on the Drawings and as called for in the Specifications.
 - b. Item No. 3.b – DIP
 - 1) The overall length of pipe installed is measured in linear feet, along the central axis of the diameter of the pipe. Tees, bends, and other fittings are included in this measurement. Excavation and normal backfill are not measured for payment.
 - 2) Payment for furnishing and installing the 10-inch DIP waterlines shall be made at the contract unit price per linear foot, as listed in the bid, for the pipe in place and accepted.
 - 3) This payment is full compensation for furnishing and installing all labor, materials, and equipment required for the installation of the new waterline pipe, fittings, and appurtenances as shown on the Drawings and as called for in the Specifications.
4. Item No. 4 – Fire Hydrant Assembly:
 - a. Fire hydrant assembly is measured as a unit installed and accepted. Excavation and normal backfill are not measured for payment.
 - b. Payment shall be made at the Contract unit price for each fire hydrant assembly installed.

ARDURRA

- c. This payment is full compensation for furnishing and installing all labor, materials, and equipment as required for the proper installation of each fire hydrant assembly as shown on the Drawings and in accordance with the Specifications.
- 5. Item No. 5 – 10-inch Gate Valves:
 - a. 10-inch gate valves are measured as a unit installed and accepted. Excavation and normal backfill are not measured for payment.
 - b. Payment shall be made at the Contract unit price for each gate valve installed.
 - c. This payment is full compensation for furnishing and installing all labor, materials, and equipment necessary for the proper installation of the gate valve as shown on the Drawings and as called for in the Specifications.
- 6. Item No. 6 – System Connections:
 - a. Item No. 6.a – 10x10 Tee
 - 1) System Connections are measured as each unit installed and accepted. Excavation and normal backfill are not measured for payment.
 - 2) Payment shall be made at the Contract unit price for the proper installation of the system connection.
 - 3) This payment will be full compensation for furnishing and installing all labor, materials, and equipment required for the installation of the system connections to the existing distribution system as shown on the Drawings and as stipulated in the Specifications. Payment includes, but is not limited to, tees, miscellaneous fittings and appurtenances required to complete the system connection.
- 7. Item No. 7 – Jack and Bore with Steel Casing:
 - a. Item No. 7.a – 12-inch Steel Casing
 - 1) Payment for encased bores under highways, roads, railroads, and at other locations shown on the Drawings shall be paid for at the unit price per linear foot and shall include the following under a single pay item:
 - a) Bore pit and set-up shall include bore mobilization, bore pit excavation, establishing control points, stone placement, bore machine set-up, removing machinery and equipment upon bore completion, bore pit backfill, compaction, area restoration, grassing, and cleanup.
 - b) Encasement pipe boring shall include furnishing all labor and materials required to bore the encasement pipe to the limits as shown on the Drawings. Price shall include steel encasement pipe and vents where required. Payment shall be from the limits of encasement.
 - c) Pipe supports, “spiders,” casing seals, and all other work necessary to install the carrier pipe into the encasement pipe.
 - 2) Payment shall be at the contract unit price per linear foot as stated in the bid documents for the size and length required to cross highways as indicated on the Drawings. All stone, dewatering, accessories, traffic safe-

ARDURRA

ty and control devices, worker safety devices, supervision, monitoring and insurance as required, roadway repair, and other miscellaneous operations shall be included in the unit price.

b. Item No. 7.b – 18-inch Steel Casing

- 1) Payment for encased bores under highways, roads, railroads, and at other locations shown on the Drawings shall be paid for at the unit price per linear foot and shall include the following under a single pay item:
 - a) Bore pit and set-up shall include bore mobilization, bore pit excavation, establishing control points, stone placement, bore machine set-up, removing machinery and equipment upon bore completion, bore pit backfill, compaction, area restoration, grassing, and cleanup.
 - b) Encasement pipe boring shall include furnishing all labor and materials required to bore the encasement pipe to the limits as shown on the Drawings. Price shall include steel encasement pipe and vents where required. Payment shall be from the limits of encasement.
 - c) Pipe supports, "spiders," casing seals, and all other work necessary to install the carrier pipe into the encasement pipe.
- 2) Payment shall be at the contract unit price per linear foot as stated in the bid documents for the size and length required to cross highways as indicated on the Drawings. All stone, dewatering, accessories, traffic safety and control devices, worker safety devices, supervision, monitoring and insurance as required, roadway repair, and other miscellaneous operations shall be included in the unit price.

8. Item No. 8 – Open Cut Pavement:

- a. Payment for open cut trenching shall be at the contract unit price per linear foot as shown on the Drawings. Payment shall include compensation for traffic control, cutting, removal, and disposal of existing pavement, compaction of backfill and the furnishing/placement of base materials to the satisfaction of the roadway jurisdiction authorities and the Engineer according to the details. The Contractor shall be responsible for all associated operations or tests required at no additional expense to the Owner.

9. Item No. 9 – Drive Repair/Overlay:

a. Item No. 9.a – Asphalt

- 1) Asphalt drive repair/overlay is measured as a unit installed and accepted. Excavation and backfill are not measured for payment. Incidental damage to driveway is not measured for payment.
- 2) Payment for asphalt drive repair/overlay shall be at the contract unit price per square yard as shown on the Drawings. Payment shall include compensation for the furnishing/placement of asphalt materials. The Contractor shall be responsible for all associated operations or tests required at no additional expense to the Owner.

ARDURRA

b. Item No. 9.b – Concrete

- 1) Concrete drive repair/overlay is measured as a unit installed and accepted. Excavation and backfill are not measured for payment. Incidental damage to driveway is not measured for payment.
- 2) Payment for concrete drive repair/overlay shall be at the contract unit price per square yard as shown on the Drawings. Payment shall include compensation for the furnishing/placement of concrete materials. The Contractor shall be responsible for all associated operations or tests required at no additional expense to the Owner.

10. Item No. 10 – Erosion Prevention and Sedimentation Control:

a. Item No. 10.a – Silt Fence

- 1) The overall length of silt fence, installed and accepted, is measured in linear feet.
- 2) Payment shall be made at the Contract unit price per linear foot for silt fence installed and as follows:
 - a) 75-percent of the Contract Price per linear foot is paid when each silt fence is complete in-place.
 - b) 25-percent is paid at removal or acceptance.
- 3) This payment is full compensation for furnishing and installing all labor, materials, and equipment required for the proper installation of silt fence as shown on the Drawings and as stipulated in the Specifications.

b. Item No. 10.b – Sediment Tubes

- 1) Sediment tubes are measured as a unit completed and accepted.
- 2) Payment shall be made at the Contract unit price per each sediment tube installed and as follows:
 - a) 75-percent of the Contract Price per unit is paid when each sediment tube is complete in-place.
 - b) 25-percent is paid at removal or acceptance.
- 3) This payment is full compensation for furnishing and installing all labor, materials, and equipment required for the proper installation of sediment tubes as shown on the Drawings and as stipulated in the Specifications.

c. Item No. 10.c – Temporary Grassing

- 1) The area of completed and accepted temporary grassing is measured in acres. Only the limits of disturbance as defined on the Drawings or as designated by the Engineer will be measured.
- 2) Payment will be made at the Contract unit price per acre of temporary grassing properly installed.
- 3) This payment is full compensation for furnishing and installing all labor, materials, and equipment required to properly seed and to establish

ARDURRA

temporary stands of grass over the limits of disturbance as shown on the Drawings and as called for in the Specifications.

d. Item No. 10.d – Permanent Grassing

- 1) The area of completed and accepted permanent grassing is measured in acres. Only the limits of disturbance as defined on the Drawings or as designated by the Engineer will be measured.
- 2) Payment will be made at the Contract unit price per acre of permanent grassing properly installed.
- 3) This payment is full compensation for furnishing and installing all labor, materials, and equipment required to properly seed and to establish permanent stands of grass over the limits of disturbance as shown on the Drawings and as called for in the Specifications.

11. Item No. 11 – Temporary Traffic Control:

a. Item No. 11.a – State Road – Old State Road

- 1) Temporary traffic control for Old State Road is measured as a unit complete and accepted.
- 2) Payment shall be made at the Contract lump sum price for temporary traffic control.
- 3) This payment is full compensation for furnishing and installing all labor, materials, and equipment required to install and maintain temporary traffic control measures on Old State Road for the duration of work within the State Road right-of-way.

12. Item No. 12 – Miscellaneous Concrete:

- a. The volume of completed and accepted miscellaneous concrete is measured in cubic yards. Only the volume of miscellaneous concrete as designated by the Engineer will be measured.
- b. Payment shall be made at the Contract unit price per cubic yard (CY) for miscellaneous concrete.
- c. This payment is full compensation for furnishing and installing all labor, materials, and equipment required for placing miscellaneous concrete as directed by the Engineer and as stipulated by the Specifications.
- d. Miscellaneous concrete shall only be placed at locations determined and approved by the Engineer.

13. Item No. 13 – Rock Excavation and Removal:

- a. The volume of completed and accepted rock excavation and removal is measured in cubic yards (CY). Only the volume of rock excavation and removal approved by the Engineer will be measured.
- b. Payment shall be at the Contract unit price per cubic yard for rock excavation and removal.
- c. This payment is full compensation for furnishing and installing all labor, materials, and equipment required to excavate and remove rock, approved by the Engineer, and in accordance with the Specifications.

ARDURRA

- d. Notify the Engineer at least 24-hours in advance of starting excavation and removal of rock so that elevations and measurements can be made. No payment will be made for any rock excavated or removed before these measurements are taken.

14. Item No. 14 – Stone Bedding:

- a. The volume of completed and accepted stone bedding is measured in cubic yards (CY). Only the volume of stone bedding approved by the Engineer will be measured. Furnish dray tickets to the Engineer to determine the volume of stone bedding placed.
- b. Payment shall be made at the Contract unit price per cubic yard for the placement of stone bedding.
- c. This payment is full compensation for furnishing and installing all labor, materials, and equipment necessary for the placement and acceptance of stone bedding as directed by the Engineer, as shown on the Drawings, and as called for in the Specifications.
- d. Stone bedding shall only be placed at the direction of the Engineer.

15. Item No. 15 – Select Trench Backfill:

- a. The volume of completed and accepted select trench backfill is measured in cubic yards (CY). Only the volume of select trench backfill approved by the Engineer will be measured. Furnish dray tickets to the Engineer to determine the volume of select trench backfill placed.
- b. Payment shall be made at the Contract unit price per cubic yard for the placement of select trench backfill.
- c. This payment is full compensation for furnishing and installing all labor, materials, and equipment necessary for the placement and acceptance of select backfill as approved by the Engineer, as shown on the Drawings, and as called for in the Specifications.
- d. Select trench backfill shall only be placed at the direction of the Engineer.

16. Item No. 16 – Flowable Fill:

- a. The volume of completed and accepted flowable fill is measured in cubic yards. Only the volume of flowable fill as designated by the Engineer will be measured.
- b. Payment shall be made at the Contract unit price per cubic yard (CY) for flowable fill.
- c. This payment is full compensation for furnishing and installing all labor, materials, and equipment required for placing flowable fill as directed by the Engineer and as stipulated by the Specifications.
- d. Flowable fill shall only be placed at locations determined and approved by the Engineer.

B. ALTERNATE 1

1. Item No. 1 – Mobilization (3 percent Maximum):

- a. Mobilization is measured as a unit completed and accepted.

ARDURRA

- b. Payment shall be made at the Contract lump sum price; the cost of mobilization shall not exceed three (3) percent of the Total Bid.
 - c. This payment is full compensation for preparatory work and operations necessary for the movement of personnel, equipment, supplies, and incidentals to the project site; and for other work, operations or cost that are of necessity incurred prior to the beginning of construction. Bond costs, license fees, lump sum insurance premiums, and other such items of expense may be included, but any item that will be subsequently paid for as project work or material on hand shall be excluded.
- 2. Item No. 2 – Clearing and Grubbing:
 - a. The area of completed and accepted clearing and grubbing is measured in acres. Only the area cleared and grubbed as shown on the Plans or as designated by the Engineer is measured.
 - b. Payment shall be made for Clearing and Grubbing at the Contract Unit Price per acre.
 - c. This payment is full compensation for furnishing and installing all labor, materials, and equipment required to clear and grub the areas designated on the Drawings and in accordance with the Specifications.
- 3. Item No. 3 – 6-inch Waterline:
 - a. Item No. 3.b – DIP
 - 1) The overall length of pipe installed is measured in linear feet, along the central axis of the diameter of the pipe. Tees, bends, and other fittings are included in this measurement. Excavation and normal backfill are not measured for payment.
 - 2) Payment for furnishing and installing the 6-inch DIP waterlines shall be made at the contract unit price per linear foot, as listed in the bid, for the pipe in place and accepted.
 - 3) This payment is full compensation for furnishing and installing all labor, materials, and equipment required for the installation of the new waterline pipe, fittings, and appurtenances as shown on the Drawings and as called for in the Specifications.
- 4. Item No. 4 – 10-inch Waterline:
 - a. Item No. 4.a – PVC
 - 1) The overall length of pipe installed is measured in linear feet, along the central axis of the diameter of the pipe. Tees, bends, and other fittings are included in this measurement. Excavation and normal backfill are not measured for payment.
 - 2) Payment for furnishing and installing the 10-inch PVC waterlines shall be made at the contract unit price per linear foot, as listed in the bid, for the pipe in place and accepted.
 - 3) This payment is full compensation for furnishing and installing all labor, materials, and equipment required for the installation of the new waterline pipe, fittings, and appurtenances as shown on the Drawings and as called for in the Specifications.

ARDURRA

5. Item No. 5 – Fire Hydrant Assembly:

- a. Fire hydrant assembly is measured as a unit installed and accepted. Excavation and normal backfill are not measured for payment.
- b. Payment shall be made at the Contract unit price for each fire hydrant assembly installed.
- c. This payment is full compensation for furnishing and installing all labor, materials, and equipment as required for the proper installation of each fire hydrant assembly as shown on the Drawings and in accordance with the Specifications.

6. Item No. 6 – 10-inch Gate Valves:

- a. 10-inch gate valves are measured as a unit installed and accepted. Excavation and normal backfill are not measured for payment.
- b. Payment shall be made at the Contract unit price for each gate valve installed.
- c. This payment is full compensation for furnishing and installing all labor, materials, and equipment necessary for the proper installation of the gate valve as shown on the Drawings and as called for in the Specifications.

7. Item No. 7 – Erosion Prevention and Sedimentation Control:

a. Item No. 7.a – Silt Fence

- 1) The overall length of silt fence, installed and accepted, is measured in linear feet.
- 2) Payment shall be made at the Contract unit price per linear foot for silt fence installed and as follows:
 - a) 75-percent of the Contract Price per linear foot is paid when each silt fence is complete in-place.
 - b) 25-percent is paid at removal or acceptance.
- 3) This payment is full compensation for furnishing and installing all labor, materials, and equipment required for the proper installation of silt fence as shown on the Drawings and as stipulated in the Specifications.

b. Item No. 7.b – Sediment Tubes

- 1) Sediment tubes are measured as a unit completed and accepted.
- 2) Payment shall be made at the Contract unit price per each sediment tube installed and as follows:
 - a) 75-percent of the Contract Price per unit is paid when each sediment tube is complete in-place.
 - b) 25-percent is paid at removal or acceptance.
- 3) This payment is full compensation for furnishing and installing all labor, materials, and equipment required for the proper installation of sediment tubes as shown on the Drawings and as stipulated in the Specifications.

ARDURRA

c. Item No. 7.c – Temporary Grassing

- 1) The area of completed and accepted temporary grassing is measured in acres. Only the limits of disturbance as defined on the Drawings or as designated by the Engineer will be measured.
- 2) Payment will be made at the Contract unit price per acre of temporary grassing properly installed.
- 3) This payment is full compensation for furnishing and installing all labor, materials, and equipment required to properly seed and to establish temporary stands of grass over the limits of disturbance as shown on the Drawings and as called for in the Specifications.

d. Item No. 7.d – Permanent Grassing

- 1) The area of completed and accepted permanent grassing is measured in acres. Only the limits of disturbance as defined on the Drawings or as designated by the Engineer will be measured.
- 2) Payment will be made at the Contract unit price per acre of permanent grassing properly installed.
- 3) This payment is full compensation for furnishing and installing all labor, materials, and equipment required to properly seed and to establish permanent stands of grass over the limits of disturbance as shown on the Drawings and as called for in the Specifications.

8. Item No. 8 – Temporary Traffic Control:

a. Item No. 8.a – State Road – Snake Road

- 1) Temporary traffic control for Snake Road is measured as a unit complete and accepted.
- 2) Payment shall be made at the Contract lump sum price for temporary traffic control as shown in the Bid Form.
- 3) This payment is full compensation for furnishing and installing all labor, materials, and equipment required to install and maintain temporary traffic control measures on Snake Road for the duration of work within the State Road right-of-way.

C. ALTERNATE 2

1. Item No. 1 – Mobilization (3 percent Maximum):

- a. Mobilization is measured as a unit completed and accepted.
- b. Payment shall be made at the Contract lump sum price; the cost of mobilization shall not exceed three (3) percent of the Total Bid.
- c. This payment is full compensation for preparatory work and operations necessary for the movement of personnel, equipment, supplies, and incidentals to the project site; and for other work, operations or cost that are of necessity incurred prior to the beginning of construction. Bond costs, license fees, lump sum insurance premiums, and other such items of expense may be included, but any item that will be subsequently paid for as project work or material on hand shall be excluded.

ARDURRA

2. Item No. 2 – Clearing and Grubbing:
 - a. The area of completed and accepted clearing and grubbing is measured in acres. Only the area cleared and grubbed as shown on the Plans or as designated by the Engineer is measured.
 - b. Payment shall be made for Clearing and Grubbing at the Contract Unit Price per acre.
 - c. This payment is full compensation for furnishing and installing all labor, materials, and equipment required to clear and grub the areas designated on the Drawings and in accordance with the Specifications.
3. Item No. 3 – 6-inch Waterline:
 - a. Item No. 3.a – PVC
 - 1) The overall length of pipe installed is measured in linear feet, along the central axis of the diameter of the pipe. Tees, bends, and other fittings are included in this measurement. Excavation and normal backfill are not measured for payment.
 - 2) Payment for furnishing and installing the 6-inch PVC waterlines shall be made at the contract unit price per linear foot, as listed in the bid, for the pipe in place and accepted.
 - 3) This payment is full compensation for furnishing and installing all labor, materials, and equipment required for the installation of the new waterline pipe, fittings, and appurtenances as shown on the Drawings and as called for in the Specifications.
 - b. Item No. 3.b – DIP
 - 1) The overall length of pipe installed is measured in linear feet, along the central axis of the diameter of the pipe. Tees, bends, and other fittings are included in this measurement. Excavation and normal backfill are not measured for payment.
 - 2) Payment for furnishing and installing the 6-inch DIP waterlines shall be made at the contract unit price per linear foot, as listed in the bid, for the pipe in place and accepted.
 - 3) This payment is full compensation for furnishing and installing all labor, materials, and equipment required for the installation of the new waterline pipe, fittings, and appurtenances as shown on the Drawings and as called for in the Specifications.
4. Item No. 4 – 10-inch Waterline:
 - a. Item No. 4.a – PVC
 - 1) The overall length of pipe installed is measured in linear feet, along the central axis of the diameter of the pipe. Tees, bends, and other fittings are included in this measurement. Excavation and normal backfill are not measured for payment.
 - 2) Payment for furnishing and installing the 10-inch PVC waterlines shall be made at the contract unit price per linear foot, as listed in the bid, for the pipe in place and accepted.

ARDURRA

- 3) This payment is full compensation for furnishing and installing all labor, materials, and equipment required for the installation of the new water-line pipe, fittings, and appurtenances as shown on the Drawings and as called for in the Specifications.
- b. Item No. 4.b – DIP
 - 1) The overall length of pipe installed is measured in linear feet, along the central axis of the diameter of the pipe. Tees, bends, and other fittings are included in this measurement. Excavation and normal backfill are not measured for payment.
 - 2) Payment for furnishing and installing the 10-inch DIP waterlines shall be made at the contract unit price per linear foot, as listed in the bid, for the pipe in place and accepted.
 - 3) This payment is full compensation for furnishing and installing all labor, materials, and equipment required for the installation of the new water-line pipe, fittings, and appurtenances as shown on the Drawings and as called for in the Specifications.
5. Item No. 5 – Fire Hydrant Assembly:
 - a. Fire hydrant assembly is measured as a unit installed and accepted. Excavation and normal backfill are not measured for payment.
 - b. Payment shall be made at the Contract unit price for each fire hydrant assembly installed.
 - c. This payment is full compensation for furnishing and installing all labor, materials, and equipment as required for the proper installation of each fire hydrant assembly as shown on the Drawings and in accordance with the Specifications.
6. Item No. 6 – 6-inch Gate Valves:
 - a. 6-inch gate valves are measured as a unit installed and accepted. Excavation and normal backfill are not measured for payment.
 - b. Payment shall be made at the Contract unit price for each gate valve installed.
 - c. This payment is full compensation for furnishing and installing all labor, materials, and equipment necessary for the proper installation of the gate valve as shown on the Drawings and as called for in the Specifications.
7. Item No. 7 – System Connections:
 - a. Item No. 8.a – 6x6 Tee
 - 1) System Connections are measured as each unit installed and accepted. Excavation and normal backfill are not measured for payment.
 - 2) Payment shall be made at the Contract unit price for the proper installation of the system connection.
 - 3) This payment will be full compensation for furnishing and installing all labor, materials, and equipment required for the installation of the system connections to the existing distribution system as shown on the Drawings and as stipulated in the Specifications. Payment includes, but is not limited to, tees, miscellaneous fittings and appurtenances required to complete the system connection.

ARDURRA

8. Item No. 8 – Open Cut Pavement:

- a. Payment for open cut trenching shall be at the contract unit price per linear feet as shown on the Drawings. Payment shall include compensation for traffic control, cutting, removal, and disposal of existing pavement, compaction of backfill and the furnishing/placement of base materials to the satisfaction of the roadway jurisdiction authorities and the Engineer according to the details. The Contractor shall be responsible for all associated operations or tests required at no additional expense to the Owner.

9. Item No. 9 – Drive Repair/Overlay:

a. Item No. 9.a – Asphalt

- 1) Asphalt drive repair/overlay is measured as a unit installed and accepted. Excavation and backfill are not measured for payment. Incidental damage to driveway is not measured for payment.
- 2) Payment for asphalt drive repair/overlay shall be at the contract unit price per square yard as shown on the Drawings. Payment shall include compensation for the furnishing/placement of asphalt materials. The Contractor shall be responsible for all associated operations or tests required at no additional expense to the Owner.

10. Item No. 10 – Erosion Prevention and Sedimentation Control:

a. Item No. 10.a – Silt Fence

- 1) The overall length of silt fence, installed and accepted, is measured in linear feet.
- 2) Payment shall be made at the Contract unit price per linear foot for silt fence installed and as follows:
 - a) 75-percent of the Contract Price per linear foot is paid when each silt fence is complete in-place.
 - b) 25-percent is paid at removal or acceptance.
- 3) This payment is full compensation for furnishing and installing all labor, materials, and equipment required for the proper installation of silt fence as shown on the Drawings and as stipulated in the Specifications.

b. Item No. 10.b – Sediment Tubes

- 1) Sediment tubes are measured as a unit completed and accepted.
- 2) Payment shall be made at the Contract unit price per each sediment tube installed and as follows:
 - a) 75-percent of the Contract Price per unit is paid when each sediment tube is complete in-place.
 - b) 25-percent is paid at removal or acceptance.

ARDURRA

- 3) This payment is full compensation for furnishing and installing all labor, materials, and equipment required for the proper installation of sediment tubes as shown on the Drawings and as stipulated in the Specifications.
- c. Item No. 10.c – Temporary Grassing
- 1) The area of completed and accepted temporary grassing is measured in acres. Only the limits of disturbance as defined on the Drawings or as designated by the Engineer will be measured.
 - 2) Payment will be made at the Contract unit price per acre of temporary grassing properly installed.
 - 3) This payment is full compensation for furnishing and installing all labor, materials, and equipment required to properly seed and to establish temporary stands of grass over the limits of disturbance as shown on the Drawings and as called for in the Specifications.
- d. Item No. 10.d – Permanent Grassing
- 1) The area of completed and accepted permanent grassing is measured in acres. Only the limits of disturbance as defined on the Drawings or as designated by the Engineer will be measured.
 - 2) Payment will be made at the Contract unit price per acre of permanent grassing properly installed.
 - 3) This payment is full compensation for furnishing and installing all labor, materials, and equipment required to properly seed and to establish permanent stands of grass over the limits of disturbance as shown on the Drawings and as called for in the Specifications.
11. Item No. 11 – Temporary Traffic Control:
- a. Item No. 11.a – State Road – Red Bank Road
- 1) Temporary traffic control for Red Bank Road is measured as a unit complete and accepted.
 - 2) Payment shall be made at the Contract lump sum price for temporary traffic control.
 - 3) This payment is full compensation for furnishing and installing all labor, materials, and equipment required to install and maintain temporary traffic control measures on Red Bank Road for the duration of work within the State Road right-of-way.
- b. Item No. 11.b – State Road – Snake Road
- 1) Temporary traffic control for Snake Road is measured as a unit complete and accepted.
 - 2) Payment shall be made at the Contract lump sum price for temporary traffic control as shown in the Bid Form.
 - 3) This payment is full compensation for furnishing and installing all labor, materials, and equipment required to install and maintain temporary traffic control measures on Snake Road for the duration of work within the State Road right-of-way.

ARDURRA

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

ARDURRA

SECTION 01 23 00

ALTERNATES

PART 1 - GENERAL

1.1 SUMMARY

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

1.2 DEFINITIONS

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain Work defined in the Bidding Requirements that may be added to or deducted from the Base Bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

- 1. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.3 PROCEDURES

- A. Coordination: Modify or adjust affected adjacent Work as necessary to completely integrate Work of the alternate into Project.
 - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
- B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.
- C. Schedule: A Schedule of Alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the Work described under each alternate.

PART 2 - PRODUCTS

Not Used.

ARDURRA

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

- A. **Alternate No. 1** – Installation of approximately 50 feet of 6-inch DIP and 1,225 feet of 10-inch PVC transmission main from Station 50+90± to Station 63+15±. The work includes all related valves and appurtenances, connections to existing transmission mains and facilities, disinfection and testing, traffic control, clearing and grubbing, erosion control, grassing, road repair, and all other activities incidental to the completion of the work.
- B. **Alternate No. 2** – Installation of approximately 725 feet of 6-inch and 4,375 feet of 10-inch PVC and DIP transmission main from Station 0+00 to Station 50+90±. The work includes all related valves and appurtenances, connections to existing transmission mains and facilities, disinfection and testing, traffic control, clearing and grubbing, erosion control, grassing, road repair, and all other activities incidental to the completion of the work.

END OF SECTION

ARDURRA

SECTION 01 27 00

UNIT PRICES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for unit prices.
- B. Related Requirements:
 - 1. Section 01 20 00 – *Measurement and Payment*.
 - 2. Section 01 29 00 – *Payment Procedures*.

1.2 DEFINITIONS

- A. Unit price is an amount incorporated in the Agreement, applicable during the duration of the Work as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

1.3 PROCEDURES

- A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.
- B. Measurement and Payment: See Section 01 20 00 – *Measurement and Payment*.
- C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.
- D. List of Unit Prices: See *Bid Form for Construction Contract* found in the Contract Documents, EJCDC No. C-410 (2018).

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

ARDURRA

END OF SECTION

ARDURRA

SECTION 01 29 00

PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section specifies administrative and procedural requirements governing the Contractor's Applications for Payment.

1.2 SCHEDULE OF VALUES

- A. Coordinate preparation of a Schedule of Values for Lump Sum Bid Items with preparation of the Contractor's Construction Schedule.

- 1. Correlate line items in the Schedule of Values with other required administrative schedules and forms, including:

- a. Contractor's Construction Schedule.
 - b. Application for Payment forms, including Continuation Sheets.
 - c. List of subcontractors.
 - d. Schedule of allowances.
 - e. Schedule of alternates.
 - f. List of products.
 - g. List of principal suppliers and fabricators.
 - h. Schedule of submittals.

- 2. Submit the Schedule of Values to the Engineer at the earliest possible date but no later than 7 days before the date scheduled for submittal of the initial Application for Payment.

- B. Format and Content: Use the Project Manual table of contents as a guide to establish the format for the Schedule of Values.

- 1. Identification: Include the following Project identification on the Schedule of Values:

- a. Project name and location.
 - b. Name of the Engineer.
 - c. Project number.
 - d. Contractor's name and address.
 - e. Date of submittal.

- 2. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:

- a. Related Specification Section or Division.
 - b. Description of Work.
 - c. Name of subcontractor.

ARDURRA

- d. Name of manufacturer or fabricator.
 - e. Name of supplier.
 - f. Change Orders (numbers) that affect value.
 - g. Dollar value.
- 1) Percentage of Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
- 3. Provide a breakdown of the Contract Sum in sufficient detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual Table of Contents. Break principal subcontract amounts down into several line items.
 - 4. Round amounts to nearest whole dollar. The total shall equal the Contract Sum.
 - 5. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment, purchased or fabricated and stored, but not yet installed.
 - a. Differentiate between items stored on-site and items stored off-site. Include requirements for insurance and bonded warehousing.
 - 6. Provide separate line items on the Schedule of Values for initial cost of the materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
 - 7. Each item in the Schedule of Values and Applications for Payment shall be complete. Include the total cost and proportionate share of overhead and profit margin for each item.
 - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at the Contractor's option.
 - 8. Schedule Updating: Update and resubmit the Schedule of Values prior to the next Application for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.3 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment shall be consistent with previous applications and payments as certified by the Engineer and paid by the Owner. The initial Application for Payment, the Application for Payment at time of Substantial Completion, and the final Application for Payment involve additional requirements.
- B. Payment-Application Times: Progress payments will be made once a month. The period covered by each Application for Payment starts on the day following the end of the preceding period and ends on the 25th of each month. All applications for payment are due by the 25th of each month.
- C. Payment-Application Forms: Use Application for Payment form found in the Contract Documents, EJCDC No. C-620 (2018).

ARDURRA

- D. Application Preparation: Complete every entry on the form. Include notarization and execution by a person authorized to sign legal documents on behalf of the Contractor. The Engineer will return incomplete applications without action.
1. Entries shall match data on the Schedule of Values and the Contractor's Construction Schedule. Use updated schedules if revisions were made.
 2. Include amounts of Change Orders and Construction Change Directives issued prior to the last day of the construction period covered by the application.
- E. Transmittal: Submit four (4) signed and notarized original copies of each Application for Payment to the Engineer by a method ensuring receipt within 24 hours. One copy shall be complete, including waivers of lien and similar attachments, when required.
1. Transmit each copy with a transmittal form listing attachments and recording appropriate information related to the application, in a manner acceptable to the Engineer.
- F. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of the first Application for Payment include the following:
1. List of subcontractors.
 2. List of principal suppliers and fabricators.
 3. Schedule of Values.
 4. Contractor's Construction Schedule (preliminary if not final).
 5. Schedule of principal products.
 6. Schedule of unit prices.
 7. Submittal Schedule (preliminary if not final).
 8. List of Contractor's staff assignments.
 9. Copies of authorizations and licenses from governing authorities for performance of the Work.
 10. Initial progress report.
 11. Report of preconstruction meeting.
- G. Application for Payment at Substantial Completion: Following issuance of the Certificate of Substantial Completion, submit an Application for Payment.
1. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
 2. Administrative actions and submittals that shall precede or coincide with this application include:
 - a. Permit to place in service and similar approvals.
 - b. Warranties (guarantees) and maintenance agreements.
 - c. Testing records.
 - d. Maintenance instructions.
 - e. Meter readings.
 - f. Startup performance reports.
 - g. Changeover information related to Owner's occupancy, use, operation, and maintenance.
 - h. Final cleaning.
 - i. Application for reduction of retainage and consent of surety.
 - j. Advice on shifting insurance coverages.

ARDURRA

- k. Final progress photographs.
 - l. List of incomplete Work, recognized as exceptions to Engineer's Certificate of Substantial Completion.
- H. Final Payment Application: Administrative actions and submittals that must precede or coincide with submittal of the final Application for Payment include the following:
 - 1. Completion of Project closeout requirements.
 - 2. Completion of items specified for completion after Substantial Completion.
 - 3. Ensure that unsettled claims will be settled.
 - 4. Ensure that incomplete Work is not accepted and will be completed without undue delay.
 - 5. Transmittal of required Project construction records to the Owner.
 - 6. Proof that taxes, fees, and similar obligations were paid.
 - 7. Removal of temporary facilities and services.
 - 8. Removal of surplus materials, rubbish, and similar elements.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION

ARDURRA

SECTION 01 31 00

PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative provisions for coordinating construction operations on the Project including, but not limited to, the following:
 - 1. General project coordination procedures.
 - 2. Administrative and supervisory personnel.
 - 3. Project meetings.

1.2 COORDINATION

- A. Coordination: Coordinate construction operations included in various Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections that depend on each other for proper installation, connection and operation.
 - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 - 2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. If necessary, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
 - 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 - 1. Preparation of Contractor's Construction Schedule.
 - 2. Preparation of the Schedule of Values.
 - 3. Installation and removal of temporary facilities and controls.
 - 4. Delivery and processing of submittals.
 - 5. Progress meetings.
 - 6. Preinstallation conferences.
 - 7. Project closeout activities.

ARDURRA

1.3 SUBMITTALS

- A. Staff Names: Prior to starting construction operations, submit a list of principal staff assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to the Project. Distribute copies of staff list to Owner and Engineer.

1. Provide copies of the list to the Owner and the Engineer.

1.4 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

- A. General: In addition to the Project superintendent, provide other administrative and supervisory personnel as required for proper performance of the Work.

1. Ensure that a supervisory person employed directly by the Contractor is present on site any time Work is being performed.

1.5 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at the Project site, unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Engineer of scheduled meeting dates and times.
2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
3. Minutes: Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Engineer, within five (5) working days of the meeting.

- B. Preconstruction Conference: Schedule a preconstruction conference before starting construction, at a time convenient to Owner and Engineer, but no later than 15 days after execution of the Agreement. Hold the conference at Project site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.

1. Attendees: Authorized representatives of Owner, Engineer, and their consultants; Contractor and its superintendent; major subcontractors; manufacturers; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Tentative construction schedule.
 - b. Phasing.
 - c. Critical work sequencing.
 - d. Designation of responsible personnel.
 - e. Procedures for processing field decisions and Change Orders.

ARDURRA

- f. Procedures for processing Applications for Payment.
 - g. Distribution of the Contract Documents.
 - h. Submittal procedures.
 - i. Preparation of Record Documents.
 - j. Use of the premises.
 - k. Responsibility for temporary facilities and controls.
 - l. Parking availability.
 - m. Office, work, and storage areas.
 - n. Equipment deliveries and priorities.
 - o. First aid.
 - p. Security.
 - q. Progress cleaning.
 - r. Working hours.
 - s. Stormwater Pollution Prevention Plan (SWPPP).
- C. Progress Meetings: Conduct progress meetings at monthly intervals. Coordinate dates of meetings with preparation of payment requests.
- 1. Attendees: In addition to representatives of Owner and Engineer, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site utilization.
 - 8) Temporary facilities and controls.
 - 9) Work hours.
 - 10) Hazards and risks.
 - 11) Progress cleaning.
 - 12) Quality and work standards.
 - 13) Change Orders.
 - 14) Documentation of information for payment requests.

ARDURRA

3. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.
 - a. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION

ARDURRA

SECTION 01 32 33

PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Preconstruction photographs.
 - 2. Concealed Work Photographs.
 - 3. Periodic construction photographs.
 - 4. Final completion construction photographs.

1.2 INFORMATIONAL SUBMITTALS

- A. Submit in accordance with 01 33 00 – *Submittal Procedures*.
- B. Digital Photographs: Submit image files within seven days of taking photographs.
 - 1. Submit photos on a thumb drive or via email.
 - 2. Identification: Provide the following information with each image description in file metadata tag:
 - a. Name of Project.
 - b. Name and contact information for photographer.
 - c. Name of Engineer.
 - d. Name of Contractor.
 - e. Date photograph was taken.
 - f. Description of location, vantage point, and direction.
 - g. Unique sequential identifier keyed to accompanying key plan.

1.3 FORMATS AND MEDIA

- A. Digital Photographs: Provide color images in JPG format, produced by a digital camera with minimum sensor size of 8 megapixels, and at an image resolution of not less than 3200 by 2400 pixels and with vibration-reduction technology. Use flash in low light levels or backlit conditions.
- B. Digital Images: Submit digital media as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.
- C. Metadata: Record accurate date and time and GPS location data from camera.
- D. File Names: Name media files with date, Project area and sequential numbering suffix.

ARDURRA

1.4 CONSTRUCTION PHOTOGRAPHS

- A. Photographer: Engage a qualified photographer to take construction photographs.
- B. General: Take photographs with maximum depth of field and in focus.
 - 1. Maintain key plan with each set of construction photographs that identifies each photographic location.
- C. Preconstruction Photographs: Before commencement of the Work, take photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points, as directed by Engineer.
 - 1. Flag construction limits before taking construction photographs.
 - 2. Take photographs to show existing conditions adjacent to property before starting the Work.
 - 3. Take photographs of existing buildings either on or adjoining property to accurately record physical conditions at start of construction.
 - 4. Take additional photographs as required to record settlement or cracking of adjacent structures, pavements, and improvements.
- D. Concealed Work Photographs: Before proceeding with installing work that will conceal other work, take photographs sufficient in number, with annotated descriptions, to record nature and location of concealed Work, including, but not limited to, the following:
 - 1. Underground utilities.
 - 2. Underslab services.
 - 3. Piping.
 - 4. Electrical conduit.
 - 5. Waterproofing and weather-resistant barriers.
- E. Periodic Construction Photographs: Take to record progress of the Work. Select vantage points to show status of construction and progress since last photographs were taken.
- F. Final Completion Construction Photographs: Take photographs after date of Substantial Completion for submission as Project Record Documents. Engineer will inform photographer of desired vantage points.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION

ARDURRA

SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for submitting shop drawings, Product Data, Samples, and other miscellaneous submittals.

1.2 DEFINITIONS

- A. Action Submittals: Written and graphic information that requires Engineer's responsive action.
- B. Informational Submittals: Written information that does not require Engineer's approval. Submittals may be rejected for not complying with requirements.

1.3 SUBMITTAL PROCEDURES

- A. Incomplete Submittals: Submittals not containing all information required by this Section and the equipment and materials specification sections will be returned without review.
- B. General: Electronic copies of CAD Drawings or the Contract Drawings will not be provided by Engineer for Contractor's use in preparing submittals.
- C. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that requires sequential activity.
 - 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- D. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Engineer's receipt of submittal.
 - 1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. Engineer will advise Contractor when a submittal being processed must be delayed for coordination.
 - 2. If intermediate submittal is necessary, process it in same manner as initial submittal.
 - 3. Allow 15 days for processing each resubmittal.

ARDURRA

4. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing.
- E. Identification: Place a permanent label or title block on each submittal for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
 2. Provide a space approximately 4 inches by 5 inches on label or beside title block to record Contractor's review and approval markings and action taken by Engineer.
 3. Include the following information on label for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name and address of Engineer.
 - d. Name and address of Contractor.
 - e. Name and address of subcontractor.
 - f. Name and address of supplier.
 - g. Name of manufacturer.
 - h. Unique identifier, including revision number.
 - i. Number and title of appropriate Specification Section.
 - j. Drawing number and detail references, as appropriate.
 - k. Other necessary identification.
- F. Deviations: Provide copy of the corresponding specification (or applicable Sections) from Project Manual. Beside each requirement, indicate whether submitted product meets requirement. Where deviations exist, provide an additional sheet explaining all deviations. Highlight, encircle, or otherwise identify deviations from the Contract Documents on submittals.
- G. Additional Copies: Unless additional copies are required for final submittal, and unless Engineer observes noncompliance with provisions of the Contract Documents, initial submittal may serve as final submittal.
1. Submit one (1) copy of submittal to concurrent reviewer in addition to specified number of copies to Engineer.
 2. Additional copies submitted for maintenance manuals will not be marked with action taken and will be returned.
- H. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Engineer will return submittals, without review, received from sources other than Contractor.
1. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Engineer on previous submittals, and deviations from requirements of the Contract Documents, including minor variations and limitations. Include the same label information as the related submittal.
 2. Include Contractor's certification stating that information submitted complies with requirements of the Contract Documents.
 3. Transmittal Form: Provide locations on form for the following information:
 - a. Project name.
 - b. Date.

ARDURRA

- c. Destination (To:).
 - d. Source (From:).
 - e. Names of subcontractor, manufacturer and supplier.
 - f. Category and type of submittal.
 - g. Submittal purpose and description.
 - h. Submittal and transmittal distribution record.
 - i. Remarks.
 - j. Signature of transmitter.
- I. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- J. Use for Construction: Use only final submittals with mark indicating action taken by Engineer in connection with construction.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

- A. General: Prepare and submit Action Submittals required by individual Specification Sections.
- 1. Number of Copies: Submit five (5) copies of each submittal, unless otherwise indicated. Engineer will return three (3) copies. Mark up and retain one (1) returned copy as a Project Record Document.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
- 1. If information must be specially prepared for submittal because standard printed data is not suitable for use, submit as shop drawings, not as Product Data.
 - 2. Mark each copy of each submittal to show which products and options are applicable.
 - 3. Include the following information, as applicable:
 - a. Manufacturer's written recommendations.
 - b. Manufacturer's product specifications.
 - c. Manufacturer's installation instructions.
 - d. Standard color charts.
 - e. Manufacturer's catalog cuts.
 - f. Wiring diagrams showing factory-installed wiring.
 - g. Printed performance curves.
 - h. Operational range diagrams.
 - i. Mill reports.
 - j. Standard product operating and maintenance manuals.
 - k. Compliance with recognized trade association standards.
 - l. Compliance with recognized testing agency standards.
 - m. Application of testing agency labels and seals.
 - n. Notation of coordination requirements.

ARDURRA

- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base shop drawings on reproductions of the Contract Documents or standard printed data.

1. Preparation: Include the following information, as applicable:
 - a. Dimensions.
 - b. Identification of products.
 - c. Fabrication and installation drawings.
 - d. Roughing-in and setting diagrams.
 - e. Shopwork manufacturing instructions.
 - f. Templates and patterns.
 - g. Schedules.
 - h. Design calculations.
 - i. Compliance with specified standards.
 - j. Notation of coordination requirements.
 - k. Notation of dimensions established by field measurement.
2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit shop drawings on sheets at least 8-1/2 inches by 11 inches but no larger than 30 inches by 40 inches.

- D. Samples: Prepare physical units of materials or products, including the following:

1. Comply with requirements in Section 01 40 00 - *Quality Requirements* for mockups.
2. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
3. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from the same material to be used for the Work, cured and finished in manner specified, and physically identical with the product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
4. Preparation: Mount, display, or package Samples in manner specified to facilitate review of qualities indicated. Prepare Samples to match Engineer's sample where so indicated. Attach label on unexposed side that includes the following:
 - a. Generic description of Sample.
 - b. Product name or name of manufacturer.
 - c. Sample source.
5. Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, provide the following:
 - a. Size limitations.
 - b. Compliance with recognized standards.
 - c. Availability.
 - d. Delivery time.
6. Submit Samples for review of kind, color, pattern, and texture for a final check of these characteristics with other elements and for a comparison of these

ARDURRA

characteristics between final submittal and actual component as delivered and installed.

- a. If variation in color, pattern, texture, or other characteristic is inherent in the product represented by a Sample, submit at least three sets of paired units that show approximate limits of the variations.
 - b. Refer to individual Specification Sections for requirements for Samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation, and similar construction characteristics.
7. Number of Samples for Initial Selection: Submit one (1) full set of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Engineer will return submittal with options selected.
8. Number of Samples for Verification: Submit three (3) sets of Samples. Engineer will retain one (1) Sample set; remainder will be returned. Mark up and retain one (1) returned Sample set as a Project Record Sample.
 - a. Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
9. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
 - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
- E. Product Schedule or List: Prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
 1. Type of product: Include unique identifier for each product.
 2. Number and name of room or space.
 3. Location within room or space.
- F. Delegated-Design Submittal: Comply with requirements in Section 01 40 00 - *Quality Requirements*.
- G. Submittals Schedule: Comply with requirements in Section 01 33 00 - *Submittal Procedures*.
- H. Application for Payment: Comply with requirements in Section 01 29 00 - *Payment Procedures*.
- I. Schedule of Values: Comply with requirements in Section 01 29 00 - *Payment Procedures*.
- J. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

ARDURRA

1. Name, address, and telephone number of entity performing subcontract or supplying products.
2. Number and title of related Specification Section(s) covered by subcontract.
3. Drawing number and detail references, as appropriate, covered by subcontract.

2.2 INFORMATIONAL SUBMITTALS

- A. General: Prepare and submit Informational Submittals required by other Specification Sections.
 1. Number of Copies: Submit two (2) copies of each submittal, unless otherwise indicated. Engineer will not return copies.
 2. Certificates and Certifications: Provide a notarized statement that includes signature of Contractor, testing agency or design professional responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of the company.
 3. Test and Inspection Reports: Comply with requirements in Section 01 40 00 - *Quality Requirements*.
- B. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of Engineers and Owners, and other information specified.
- C. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements.
- D. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.
- E. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements and, where required, is authorized for this specific Project.
- F. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements. Include evidence of manufacturing experience where required.
- G. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements.
- H. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.
- I. Preconstruction Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements.

ARDURRA

- J. Compatibility Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- K. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements.
- L. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- M. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements in Section 01 77 00 - *Closeout Procedures*.
- N. Design Data: Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.
- O. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:
 - 1. Preparation of substrates.
 - 2. Required substrate tolerances.
 - 3. Sequence of installation or erection.
 - 4. Required installation tolerances.
 - 5. Required adjustments.
 - 6. Recommendations for cleaning and protection.
- P. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:
 - 1. Name, address, and telephone number of factory-authorized service representative making report.
 - 2. Statement on condition of substrates and their acceptability for installation of product.
 - 3. Statement that products at Project site comply with requirements.
 - 4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 - 5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 - 6. Statement whether conditions, products, and installation will affect warranty.
 - 7. Other required items indicated in individual Specification Sections.

ARDURRA

- Q. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.
- R. Material Safety Data Sheets: Submit information directly to Owner. If submitted to Engineer, Engineer will not review this information but will return it with no action taken.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Review each submittal and check for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Engineer.
- B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked and approved for compliance with the Contract Documents.

3.2 ACTION ON SUBMITTALS

- A. Engineer's Action:
 - 1. General:
 - a. Except for submittals for record and similar purposes, where action and return on submittals is required or requested, Engineer will review each submittal, mark with appropriate action, and return. Where submittal must be held for coordination, Engineer will so advise Contractor without delay.
 - b. Engineer will stamp each submittal with uniform, self-explanatory action stamp, appropriately marked with submittal action.
 - 2. Notification of Insufficient Information:
 - a. If information submitted is not sufficient to complete review of submittal, Engineer will send transmittal to Contractor notifying Contractor that additional information is required.
 - b. Submittal will be placed in an "on hold" status and not returned until Contractor provides additional information.
- B. Action Stamp:
 - 1. Marking: "No Exceptions Taken"
 - a. Final Unrestricted Release: When submittals are marked as "No Exceptions Taken," Work covered by submittal may proceed provided it complies with Contract Documents. Acceptance of Work depends on that compliance.

ARDURRA

2. Marking: "Note Markings"
 - a. Final-But-Restricted Release: When submittals are marked as "Note Markings," Work covered by submittal may proceed provided it complies with Engineer's notations or corrections on submittal and with Contract Documents. Acceptance of Work depends on that compliance. Resubmittal is not required.
 3. Marking: "Rejected"
 - a. Submittal Not Accepted: When submittals are marked as "Rejected," do not proceed with Work covered by submittal. Work covered by submittal does not comply with Contract Documents.
 4. Marking: "Resubmit"
 - a. Returned for Resubmittal: When submittals are marked as "Resubmit," do not proceed with Work covered by submittal. Do not permit Work covered by submittals to be used at Project Site or elsewhere where Work is in progress.
 - b. Revise submittal or prepare new submittal in accordance with Engineer's notations in accordance with resubmittal requirements of this section. Resubmit without delay. Repeat if required to obtain different action marking.
 5. Marking: "Confirm"
 - a. When submittals are marked "Confirm," submit confirmation that submittals have been received and that all marks are understood.
- C. The submittal will not be accepted for review unless it contains complete information and complies with the specifications. Submittals that are not accepted will be returned with attached notations of requirements necessary for acceptance. Resubmit after the material has been amended to comply with the comments.
 - D. Informational Submittals: Engineer will review each submittal and will not return it, or will reject and return it if it does not comply with requirements. Engineer will forward each submittal to appropriate party.
 - E. Submittals not required by the Contract Documents will not be reviewed and may be discarded.
 - F. Cost associated with reviewing third and subsequent resubmittals will be charged to the Contractor.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

ARDURRA

SECTION 01 40 00

QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specific quality-control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's quality-control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-control services required by Engineer, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

1.2 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and ensure that proposed construction complies with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that completed construction complies with requirements. Services do not include contract enforcement activities performed by Engineer.
- C. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

1.3 DELEGATED DESIGN

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Engineer.

ARDURRA

1.4 SUBMITTALS

- A. Qualification Data: For testing agencies specified in Section 01 40 00 - *Quality Requirements* to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.
- C. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
 - 1. Specification Section number and title.
 - 2. Description of test and inspection.
 - 3. Identification of applicable standards.
 - 4. Identification of test and inspection methods.
 - 5. Number of tests and inspections required.
 - 6. Time schedule or time span for tests and inspections.
 - 7. Entity responsible for performing tests and inspections.
 - 8. Requirements for obtaining samples.
 - 9. Unique characteristics of each quality-control service.
- D. Reports: Prepare and submit certified written reports that include the following:
 - 1. Date of issue.
 - 2. Project title and number.
 - 3. Name, address, and telephone number of testing agency.
 - 4. Dates and locations of samples and tests or inspections.
 - 5. Names of individuals making tests and inspections.
 - 6. Description of the Work and test and inspection method.
 - 7. Identification of product and Specification Section.
 - 8. Complete test or inspection data.
 - 9. Test and inspection results and an interpretation of test results.
 - 10. Ambient conditions at time of sample taking and testing and inspecting.
 - 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 - 12. Name and signature of laboratory inspector.
 - 13. Recommendations on retesting and reinspecting.
- E. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.
- F. All submittals shall meet the requirements of Section 01 33 00 – *Submittal Procedures*.

ARDURRA

1.5 QUALITY ASSURANCE

- A. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- B. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- C. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- D. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.
- F. Specialists: Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
 - 1. Requirement for specialists shall not supersede building codes and similar regulations governing the Work, nor interfere with local trade-union jurisdictional settlements and similar conventions.
- G. Testing Agency Qualifications: An agency with the experience and capability to conduct testing and inspecting indicated, as documented by ASTM E548, and that specializes in types of tests and inspections to be performed.
- H. Preconstruction Testing: Testing agency shall perform preconstruction testing for compliance with specified requirements for performance and test methods.
 - 1. Contractor responsibilities include the following:
 - a. Provide test specimens and assemblies representative of proposed materials and construction. Provide sizes and configurations of assemblies to adequately demonstrate capability of product to comply with performance requirements.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - c. Fabricate and install test assemblies using installers who will perform the same tasks for Project.
 - d. When testing is complete, remove assemblies; do not reuse materials on Project.

ARDURRA

2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Engineer, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

1.6 QUALITY CONTROL

- A. Contractor Responsibilities: Unless otherwise indicated, provide quality-control services specified and required by authorities having jurisdiction.
 1. Contractor will employ and pay for the services of an independent testing laboratory.
 2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
 3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
 6. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.
- B. Special Tests and Inspections: Contractor will engage a testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Contractor.
 1. Testing agency will notify Engineer and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
 2. Testing agency will submit a certified written report of each test, inspection, and similar quality-control service to Engineer with copy to Contractor and to authorities having jurisdiction.
 3. Testing agency will submit a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
 4. Testing agency will interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
 5. Testing agency will retest and reinspect corrected work.
- C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing.
- D. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that revised or replaced Work that failed to comply with requirements established by the Contract Documents.
- E. Testing Agency Responsibilities: Cooperate with Engineer and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
 1. Notify Engineer and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.

ARDURRA

2. Interpret tests and inspections and state in each report whether tested and inspected Work complies with or deviates from requirements.
 3. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 4. Do not release, revoke, alter, or increase requirements of the Contract Documents or approve or accept any portion of the Work.
 5. Do not perform any duties of Contractor.
- F. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
 4. Facilities for storage and field-curing of test samples.
 5. Delivery of samples to testing agencies.
 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 7. Security and protection for samples and for testing and inspecting equipment at Project site.
- G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
1. Provide materials and comply with installation requirements specified in other Sections of these Specifications. Restore patched areas and extend restoration into adjoining areas in a manner that eliminates evidence of patching.
 2. Comply with the Contract Document requirements for Section 32 12 16 - *Asphalt Paving*.
- B. Protect construction exposed by or for quality-control service activities.

ARDURRA

- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

ARDURRA

SECTION 01 41 00

REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Provide all labor, materials and equipment required to comply with the regulatory requirements associated with this project as shown on the Drawings and specified herein.

1.2 PERMITS

- A. Owner has obtained or applied for the following permits; copies will be provided to Contractor by Engineer.
 - 1. South Carolina Department of Health and Environmental Control Construction Permit.
 - 2. Berkeley County Stormwater Permit.
 - 3. South Carolina Department of Transportation Highway Encroachment Permit.
 - 4. U.S. Army Corps of Engineers Permit.
- B. Comply with requirements of permits obtained by Owner. In order to fulfill the requirements for the SCDOT Encroachment Permit, the Contractor shall prepare and submit a traffic control plan to meet the requirements of the agencies.
- C. Obtain other permits required for construction of Work, including, but not limited to the following:
 - 1. Business License(s) from the City of Goose Creek as applicable.
 - 2. Grading Permit as required by municipal jurisdictions.

1.3 NOTICES

- A. Provide notices in accordance with requirements of General Conditions to following agencies or individuals and to others as required elsewhere in Contract Documents.
 - 1. Engineer:
 - a. Notice: 3 working days prior to start of construction.
 - b. Notice: 3 days prior to start of pipe laying.
 - c. Notice: 3 days prior to start of additional crews.
 - 2. Fire and Police:
 - a. Notice: 24 hours minimum, or as required by local agencies, prior to closing streets or performing operations affecting vehicular traffic.

ARDURRA

3. Utilities:

- a. Notice: 72 hours minimum.
- b. Notice: Call 811 for locates in accordance with permit or approved letters.

4. Others as required in Contract Documents.

1.4 REGULATIONS

- A. Comply with local, state, and federal laws, rules, ordinances, and regulations. Give Engineer notice of variations in accordance with General Conditions.

1.5 MEASUREMENT AND PAYMENT

- A. Consider Work specified in this section incidental and include cost as part of appropriate prices in Bid Form.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION

ARDURRA

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes requirements for temporary facilities and controls, including temporary utilities, support facilities, and security and protection facilities.
- B. Temporary utilities include, but are not limited to, the following:
 - 1. Water service and distribution.
 - 2. Sanitary facilities, including toilets, wash facilities, and drinking-water facilities.
 - 3. Heating and cooling facilities.
 - 4. Ventilation.
 - 5. Electric power service.
 - 6. Lighting.
 - 7. Telephone service.
- C. Support facilities include, but are not limited to, the following:
 - 1. Temporary roads and paving.
 - 2. Dewatering facilities and drains.
 - 3. Project identification and temporary signs.
 - 4. Waste disposal facilities.
 - 5. Field offices.
 - 6. Storage and fabrication sheds.
 - 7. Lifts and hoists.
 - 8. Temporary stairs.
 - 9. Construction aids and miscellaneous services and facilities.
- D. Security and protection facilities include, but are not limited to, the following:
 - 1. Environmental protection.
 - 2. Stormwater control.
 - 3. Tree and plant protection.
 - 4. Pest control.
 - 5. Site enclosure fence.
 - 6. Security enclosure and lockup.
 - 7. Barricades, warning signs, and lights.
 - 8. Temporary enclosures.
 - 9. Temporary partitions.
 - 10. Fire protection.

ARDURRA

1.2 DEFINITIONS

- A. Permanent Enclosure: As determined by Engineer, permanent or temporary roofing is complete, insulated, and weathertight; exterior walls are insulated and weathertight; and all openings are closed with permanent construction or substantial temporary closures.

1.3 USE CHARGES

- A. General: Cost or use charges for temporary facilities are not chargeable to Owner or Engineer and shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, the following:
 - 1. Owner's construction forces.
 - 2. Occupants of Project.
 - 3. Engineer.
 - 4. Testing agencies.
 - 5. Personnel of authorities having jurisdiction.
- B. Water Service: Use water from Owner's existing water system without metering and without payment of use charges. Notify Owner at least 48 hours in advance of the need for water to flush and test water mains.
- C. Electric Power Service: Use and pay for electrical service.

1.4 SUBMITTALS

- A. Temporary Utility Reports: Submit reports of tests, inspections, meter readings, and similar procedures performed on temporary utilities.
- B. Implementation and Termination Schedule: Within 15 days of date established for submittal of Contractor's Construction Schedule, submit a schedule indicating implementation and termination of each temporary utility.

1.5 QUALITY ASSURANCE

- A. Standards: Comply with ANSI A10.6, NECA's "Temporary Electrical Facilities," and NFPA 241.
 - 1. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.6 PROJECT CONDITIONS

- A. Temporary Utilities: At earliest feasible time, when acceptable to Owner, change over from use of temporary service to use of permanent service.

ARDURRA

- B. Conditions of Use: The following conditions apply to use of temporary services and facilities by all parties engaged in the Work:
 - 1. Keep temporary services and facilities clean and neat.
 - 2. Relocate temporary services and facilities as required by progress of the Work.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Provide new materials. Undamaged, previously used materials in serviceable condition may be used if approved by Engineer. Provide materials suitable for use intended.
- B. Tarpaulins: Fire-resistive labeled with flame-spread rating of 15 or less.
- C. Water: Potable.

2.2 EQUIPMENT

- A. General: Provide equipment suitable for use intended.
- B. Self-Contained Toilet Units: Single-occupant units of chemical, aerated recirculation, or combustion type; vented; fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.
- B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Engage appropriate local utility company to install temporary service or connect to existing service. Where utility company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with utility company recommendations.
 - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

ARDURRA

2. Provide adequate capacity at each stage of construction. Before temporary utility is available, provide trucked-in services.
 3. Obtain easements to bring temporary utilities to Project site where Owner's easements cannot be used for that purpose.
- B. Sanitary Facilities: Provide temporary toilets. Comply with regulations and health codes for type, number, location, operation, and maintenance of fixtures and facilities.
1. Disposable Supplies: Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Maintain adequate supply. Provide covered waste containers for disposal of used material.
 2. Toilets: Install self-contained toilet units. Shield toilets to ensure privacy.
- C. Telephone Service: Provide cell phones for Contractor's supervisory personnel and provide the telephone numbers for each cell phone to the Engineer and Owner.

3.3 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
1. Locate field offices, storage sheds, sanitary facilities, and other temporary construction and support facilities for easy access.
 2. Maintain support facilities until near Substantial Completion. Remove before Substantial Completion.
- B. Traffic Controls: Comply with all requirements related to performing utility work on state and county roads. Provide warning signs, flags, diversionary cones as required by state and county authorities having jurisdiction.
- C. Project Identification and Temporary Signs: Prepare Project identification and other signs in sizes indicated. Install signs where indicated to inform public and persons seeking entrance to Project. Do not permit installation of unauthorized signs.
1. Engage an experienced sign painter to apply graphics for Project identification signs. Comply with details indicated.
 2. Prepare temporary signs to provide directional information to construction personnel and visitors.
 3. Construct signs of exterior-type Grade B-B high-density concrete form overlay plywood in sizes and thicknesses indicated. Support on posts or framing of preservative-treated wood or steel.
 4. Paint sign panel and applied graphics with exterior-grade alkyd gloss enamel over exterior primer.
- D. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Containerize and clearly label hazardous, dangerous, or unsanitary waste materials separately from other waste. Comply with Section 01 40 00 - *Quality Requirements* for progress cleaning requirements.
1. If required by authorities having jurisdiction, provide separate containers, clearly labeled, for each type of waste material to be deposited.

ARDURRA

- E. Engineer's Field Office: An Engineer's Field Office is not required for this project.
- F. Common-Use Field Office: If required by contractor, provide an insulated, weathertight, air-conditioned field office for use as a common facility by all personnel engaged in construction activities; of sufficient size to accommodate required office personnel and meetings of eight (8) persons at Project site. Keep office clean and orderly.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects. Avoid using tools and equipment that produce harmful noise. Restrict use of noisemaking tools and equipment to hours that will minimize complaints from persons or firms near Project site.
- B. Stormwater Control: Provide earthen embankments and similar barriers in and around excavations and subgrade construction, sufficient to prevent flooding by runoff of stormwater from heavy rains.
- C. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from construction damage. Protect tree root systems from damage, flooding, and erosion.
- D. Barricades, Warning Signs, and Lights: Comply with standards and code requirements for erecting structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and public of possible hazard. Where appropriate and needed, provide lighting, including flashing red or amber lights.
 - 1. For safety barriers, sidewalk bridges, and similar uses, provide minimum 5/8-inch-thick exterior plywood.

3.5 OPERATION, TERMINATION AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage caused by freezing temperatures and similar elements.
- C. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
 - 1. Materials and facilities that constitute temporary facilities are the property of Contractor. Owner reserves right to take possession of Project identification signs.

ARDURRA

2. At Substantial Completion, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements in Section 01 77 00 - *Closeout Procedures*.

END OF SECTION

ARDURRA

SECTION 01 60 00

PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following administrative and procedural requirements:

1. Selection of products for use in Project.
2. Product delivery, storage and handling.
3. Manufacturer's standard warranties on products.
4. Special warranties.
5. Product substitutions and comparable products.

1.2 DEFINITIONS

A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation, shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility, except that products consisting of recycled-content materials are allowed, unless explicitly stated otherwise. Products salvaged or recycled from other projects are not considered new products.
3. Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

C. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.

D. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

ARDURRA

1.3 SUBMITTALS

- A. Product List: Submit a list, in tabular form, showing specified products. Include generic names of products required. Include manufacturer's name and proprietary product names for each product.
1. Coordinate product list with Contractor's Construction Schedule and the Submittals Schedule.
 2. Form: Tabulate information for each product under the following column headings:
 - a. Specification Section number and title.
 - b. Generic name used in the Contract Documents.
 - c. Proprietary name, model number and similar designations.
 - d. Manufacturer's name and address.
 - e. Supplier's name and address.
 - f. Installer's name and address.
 - g. Projected delivery date or time span of delivery period.
 - h. Identification of items that require early submittal approval for scheduled delivery date.
 3. Initial Submittal: Within 15 days after date of commencement of the Work, submit three (3) copies of initial product list. Include a written explanation for omissions of data and for variations from Contract requirements.
 - a. At Contractor's option, initial submittal may be limited to product selections and designations that must be established early in Contract period.
 4. Completed List: Within 60 days after date of commencement of the Work, submit three (3) copies of completed product list. Include a written explanation for omissions of data and for variations from Contract requirements.
 5. Engineer's Action: Engineer will respond in writing to Contractor within 15 days of receipt of completed product list. Engineer's response will include a list of unacceptable product selections and a brief explanation of reasons for this action. Engineer's response, or lack of response, does not constitute a waiver of requirement that products comply with the Contract Documents.
- B. Substitution Requests: Submit three (3) copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
1. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified material or product cannot be provided.
 - b. Coordination Information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.

ARDURRA

- d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. List of similar installations for completed projects with project names and addresses and names and addresses of Engineers and Owners.
 - g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - h. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
 - i. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
 - j. Cost information, including a proposal of change, if any, in the Contract Sum.
 - k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
 - l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
2. Engineer's Action: If necessary, Engineer will request additional information or documentation for evaluation within one week of receipt of a request for substitution. Engineer will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.
- a. Form of Acceptance: Change Order.
 - b. Use product specified if Engineer cannot make a decision on use of a proposed substitution within time allocated.

1.4 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Transport and handle Products in accordance with manufacturer's instructions.
- B. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
- C. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.

ARDURRA

- D. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
- E. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
- F. Store products to allow for inspection and measurement of quantity or counting of units.
- G. Store materials in a manner that will not endanger Project structure.
- H. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
- I. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
- J. Protect stored products from damage.

1.6 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.
 - 1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 - 2. Specified Form: Forms are included with the Specifications. Prepare a written document using appropriate form properly executed.
 - 3. Refer to Divisions 2 through 46 Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Section 01 77 00 – *Closeout Procedures*.

PART 2 - PRODUCTS

2.1 PRODUCT OPTIONS

- A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged, and unless otherwise indicated, that are new at time of installation.
 - 1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.

ARDURRA

2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
 4. Where products are accompanied by the term "as selected," Engineer will make selection.
 5. Where products are accompanied by the term "match sample," sample to be matched is Engineer's.
 6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.
 7. Or Equal: Where products are specified by name and accompanied by the term "or equal" or "or approved equal" or "or approved," comply with provisions in "Comparable Products" Article to obtain approval for use of an unnamed product.
- B. Product Selection Procedures: Procedures for product selection include the following:
1. Product: Where Specification paragraphs or subparagraphs titled "Product" name a single product and manufacturer, provide the product named.
 2. Manufacturer/Source: Where Specification paragraphs or subparagraphs titled "Manufacturer" or "Source" name single manufacturers or sources, provide a product by the manufacturer or from the source named that complies with requirements.
 3. Products: Where Specification paragraphs or subparagraphs titled "Products" introduce a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.
 4. Manufacturers: Where Specification paragraphs or subparagraphs titled "Manufacturers" introduce a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.
 5. Visual Matching Specification: Where Specifications require matching an established Sample, select a product (and manufacturer) that complies with requirements and matches Engineer's sample. Engineer's decision will be final on whether a proposed product matches satisfactorily.
 - a. If no product available within specified category matches satisfactorily and complies with other specified requirements, comply with provisions of the Contract Documents on "substitutions" for selection of a matching product.
 6. Visual Selection Specification: Where Specifications include the phrase "as selected from manufacturer's colors, patterns, textures" or a similar phrase, select a product (and manufacturer) that complies with other specified requirements.
 - a. Standard Range: Where Specifications include the phrase "standard range of colors, patterns, textures" or similar phrase, Engineer will select color, pattern, or texture from manufacturer's product line that does not include premium items.
 - b. Full Range: Where Specifications include the phrase "full range of colors, patterns, textures" or similar phrase, Engineer will select color, pattern, or texture from manufacturer's product line that includes both standard and premium items.

ARDURRA

2.2 SUBSTITUTIONS

- A. Timing: Engineer will consider requests for substitution if received within 30 days after the beginning date established in the Notice to Proceed. Requests received after that time may be considered or rejected at discretion of Engineer.
- B. Conditions: Engineer will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Engineer will return requests without action, except to record noncompliance with these requirements:
 - 1. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Engineer for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
 - 2. Requested substitution does not require extensive revisions to the Contract Documents.
 - 3. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - 4. Substitution request is fully documented and properly submitted.
 - 5. Requested substitution will not adversely affect Contractor's Construction Schedule.
 - 6. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - 7. Requested substitution is compatible with other portions of the Work.
 - 8. Requested substitution has been coordinated with other portions of the Work.
 - 9. Requested substitution provides specified warranty.
 - 10. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
- C. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.

PART 3 - EXECUTION

Not Used.

END OF SECTION

ARDURRA

SECTION 01 71 23

FIELD ENGINEERING

PART 1 - GENERAL

1.1 SUMMARY

- A. General: This Section specifies administrative and procedural requirements for field engineering services.
- B. Provide and pay for field engineering services required for proper completion of the Construction Project.
- C. Once identified, the Contractor shall protect the various vertical and horizontal control points as shown on the Drawings and shall pay all costs to reestablish control during the course of the work.

1.2 SUBMITTALS

- A. Certificates: Submit a certificate signed by the Land Surveyor or Professional Engineer certifying the location and elevation of improvements.
- B. Project Record Documents: Submit a record of Work performed and record survey data as required under provisions of Section 01 33 00 - *Submittal Procedures* and Section 01 77 00 - *Closeout Procedures*. Include the following:
 - 1. Site Survey at same scale as Drawings indicating corners of buildings, structures, tank centerlines, sidewalks, paved areas, and location of all above ground structures.
 - 2. Drawing showing location, lines and grades of all buried piping and duct banks exterior to buildings, and other buried facilities installed, as a result of the Work. Provide drawing at same scale as Engineer's Site Piping Plan.

1.3 QUALITY ASSURANCE

- A. Surveyor Qualifications: Engage a Land Surveyor registered in the state where the Project is located, to perform required land surveying services.
- B. Engineer Qualifications: Engage an Engineer of the discipline required, licensed in the state where the Project is located, to perform required engineering services.

PART 2 - PRODUCTS

Not Used.

ARDURRA

PART 3 - EXECUTION

3.1 EXECUTION

- A. Identification: The Owner will identify existing control points and property line corner stakes.
- B. Verify layout information shown on the Drawings, in relation to the property survey and existing benchmarks, before proceeding to lay out the Work. Locate and protect existing benchmarks and control points. Preserve permanent reference points during construction.
 - 1. Do not change or relocate benchmarks or control points without prior written approval. Promptly report in writing lost or destroyed reference points or requirements to relocate reference points because of necessary changes in grades or locations.
 - 2. Promptly replace lost or destroyed Project control points. Base replacements on the original survey control points.
- C. Establish and maintain a minimum of two (2) permanent benchmarks along the route, referenced to data established by survey control points.
 - 1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
- D. Existing Utilities and Equipment: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities and other construction.
 - 1. Prior to construction, verify the location and invert elevation at points of connection of sanitary sewer, gas piping, underground electric, underground telephone, storm sewer, and water-service piping.

3.2 PERFORMANCE

- A. Establish lines and levels, locate and lay out, by instrumentation and similar appropriate means:
 - 1. Site improvements.
 - 2. Fire hydrant or vault locations and elevations.
- B. Surveyor's Log: Maintain a surveyor's log of control and other survey work. Make this log available for reference.
 - 1. Record deviations from required lines and locations, and advise the Engineer when deviations that exceed indicated or recognized tolerances are detected. On Project Record Drawings, record locations of key elements of the work by station and offset from road centerline, or by measurements to permanent identifiable features.
 - 2. On completing site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.

ARDURRA

- C. Site Improvements: Locate and lay out site improvements, including pavements, stakes for grading, fill and topsoil placement, utility slopes, and invert elevations.
- D. Building Lines and Levels: Locate and lay out batter boards for structures.
- E. Existing Utilities: Furnish information necessary to adjust, move, or relocate existing structures, utility poles, lines, services, or other appurtenances located in or affected by construction. Coordinate with local authorities having jurisdiction.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

ARDURRA

SECTION 01 73 31

DISINFECTION OF POTABLE WATER MAINS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide all labor, materials, equipment, tools, testing, and incidentals required to disinfect all new potable water mains and any existing potable water mains that are contaminated during construction activities.
- B. Section includes:
 - 1. Requirements for disinfection of new water mains.
 - 2. Requirements for disinfection of existing water mains, which have been relocated or contaminated by construction operations.
 - 3. Requirements for materials used during disinfection.
 - 4. Requirements for flushing and testing potable water lines that have been disinfected.
- C. Owner-Furnished Material: Potable water for disinfection purposes.

1.2 SUBMITTALS

- A. Quality Control Submittals:
 - 1. Design Data: Fourteen (14) days prior to disinfection of potable water lines, submit detailed outline of proposed sequence of disinfection, manner of filling and flushing, source and quality of water to be used, sampling locations, and disposal of wasted water.
 - 2. Test Reports: Submit for each test performed. Include location of sample point, volume of sample, date and time of sample, signature of sampler, and lab certification.

1.3 QUALITY ASSURANCE

- A. Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, with the experience and capability to conduct the testing indicated.
- B. Regulatory Requirements: Perform disinfection activities in accordance with South Carolina Department of Environmental Services (SCDES). If the requirements of this Section are in conflict with requirements of regulatory agencies, the latter shall govern.
- C. Comply with AWWA C651 – Disinfecting Water Mains.

1.4 SEQUENCE & SCHEDULING

- A. Coordinate disinfection sampling and testing with the Owner.

ARDURRA

- B. Perform preliminary flushing and pressure testing before disinfection.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Chlorine:
 - 1. Chlorine gas-water solution, or a continuous direct chlorine feed is preferred.
 - 2. Use high-test calcium hypochlorite or tablet method of disinfection only when approved by Engineer and performed in accordance with applicable AWWA standards.
 - 3. Do not use tablet form calcium hypochlorite for disinfecting mains greater than 12 inches in diameter or greater than 2,500 feet in length.

PART 3 - EXECUTION

3.1 GENERAL

- A. Disinfect water mains and appurtenances in accordance with AWWA C651.
- B. Provide SCDES approved testing agency to collect and test disinfected water samples.
- C. The Contractor shall be liable for damages arising from direct contact of granular calcium hypochlorite with solvent welding materials used to join PVC pipe.
- D. Water from the existing distribution system or other supply shall be controlled so as to flow slowly into the newly laid pipeline during the application of chlorine.

3.2 PREPARATION

- A. Chlorine:
 - 1. Liquid Chlorine:
 - a. Apply chlorine gas-water solution by means of solution feed chlorinating device or, if approved by Engineer, feed dry gas directly through proper devices for regulating rate of flow and providing effective diffusion of gas into water within the main being treated.
 - b. Provide chlorinating devices for feeding solutions of chlorine gas that prevent backflow of water into chlorine cylinder.
 - 2. Calcium Hypochlorite:
 - a. Prepare granular calcium hypochlorite as water mixture prior to introduction into main. Make dry powder into paste and thin to approximately one (1) percent chlorine solution.

ARDURRA

- b. To prepare chlorine solution, add one (1) pound of calcium hypochlorite (65 percent – 70 percent available Chlorine) to 7.5 gallons of water.

B. Pipeline Preparation:

1. Provide a step-by-step plan that describes the proposed method to flush the transmission main and protect the surrounding area.
2. Provide bulkheads, flanges, valves, bracing, blocking, blowoffs or other temporary materials that may be required for flushing and venting piping.
3. Flush units thoroughly to remove any foreign material. Flushing flow rate must produce a minimum velocity of 2.5 feet per second in the pipeline being flushed. Flushing must continue until a minimum of three (3) turnovers of water occur in the section of pipeline being flushed. Do not connect any flushing device directly to any sewer.
4. After flushing has been satisfactorily completed, perform pressure and leakage tests in accordance with Section 01 73 32 – *Testing Piping Systems*.
5. Release entrapped air at high points and fill units with disinfecting agent and water to allow disinfecting agent to come in contact with interior surfaces.
6. If complete venting cannot be accomplished through available outlets, provide necessary corporation cocks and vent piping.
7. Remove temporary materials after disinfection is complete.

3.3 FIELD QUALITY CONTROL

A. Disinfection:

1. Disinfect by introducing disinfecting agent into the water, which is being pumped into the system not more than ten (10) feet from the supply source, in such manner that the entire system will be filled with water containing a minimum chlorine concentration of 25 mg/L at any location.
2. Retain solution in main for not less than twenty-four (24) hours, and no more than forty-eight (48) hours, with a minimum residual concentration of 10 mg/L sustained before the system is flushed out. Flush out the line thoroughly with potable water of satisfactory bacteriological quality before beginning the sampling program.
3. Disinfecting Valves:
 - a. Operate valves and appurtenances while main is being disinfected to ensure surfaces of valves are disinfected.
4. Swabbing:
 - a. Flush and swab pipe, fittings, or valves that must be placed in service immediately with five (5) percent solution of calcium hypochlorite immediately prior to assembly.
 - b. Secure approval from the Engineer before using this method of disinfection.

B. Sampling:

1. Collect a minimum of two (2) samples from each sampling site for total coliform analysis. The number of sites depends on the amount of new construction but must include all dead-end lines, tie-in locations of new and existing water lines, be

ARDURRA

representative of the water in the newly constructed mains, and shall be collected a minimum of every 1,200 linear feet.

2. Prior to sampling, reduce chlorine residual to normal system residual levels. Reduce residual levels to non-detectable in those systems normally not chlorinated.
3. Collect each of the two (2) samples at least twenty-four (24) hours apart. The samples must show the water line to be absent of total coliform bacteria.
4. Measure and report the chlorine residual.
5. If the membrane filter method of analysis is used for the coliform analysis, report non-coliform growth.
6. Repeat sampling and testing if the non-coliform growth is greater than eighty (80) colonies per one-hundred (100) milliliters.
7. All samples must be analyzed by a State certified laboratory.
8. If required by SCDES, perform turbidity, pH and/or heterotrophic plate count tests.
9. Submit test certifications to Engineer within forty-eight (48) hours after satisfactory test results are received from testing laboratory.

3.4 FINAL FLUSHING AND TESTING

- A. Following chlorination, flush the system until replacement water in system is proven to be comparable in quality to water that will enter system. Dechlorinate all water used for flushing prior to discharge into the environment.
- B. Above acceptable condition of water delivered by each system shall continue for at least two (2) days, as demonstrated by laboratory examination of samples. Laboratory tests shall show chlorine residual, after final flushing, of less than 1 mg/l (ppm).
- C. Repetition of Flushing and Testing:
 1. If initial treatment results in unsatisfactory bacterial tests, repeat disinfection until satisfactory results are obtained.
- D. Prevent entry of contaminated water into previously disinfected units or systems.
- E. Do not directly connect flushing devices to any sewer.

END OF SECTION

ARDURRA

SECTION 01 73 32

TESTING PIPING SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide all labor, materials, equipment, tools and incidentals required to perform pressure and leakage testing of all new piping systems and existing piping systems that have been relocated or disturbed during construction activities.
- B. Section includes:
 - 1. Requirements for performing pressure and leakage testing of new piping systems.
 - 2. Requirements for performing pressure and leakage testing of existing piping systems that have been relocated or disturbed during construction.
- C. Owner-Furnished Material: Potable water for hydrostatic testing.
- D. Select appropriate testing method for the piping system being tested.

1.2 SUBMITTALS

- A. Quality Control Submittals
 - 1. Design Data: Fourteen (14) days prior to pressure and leakage testing, submit detailed outline of proposed sequence of testing piping systems. For hydrostatic testing, include source of water, location of test, and test pressure.
 - 2. Test Report: Submit for each piping system tested. Include location of test point, portion of line to be tested, required test pressure, and date and time of test.

1.3 SEQUENCE AND SCHEDULING

- A. Coordinate testing of piping systems with Owner and Engineer. Engineer or Engineer's representative will witness tests.
- B. Provide a minimum of 48 hours notice to Owner and Engineer prior to testing.

PART 2 - PRODUCTS

Not Used.

ARDURRA

PART 3 - EXECUTION

3.1 PREPARATION

- A. Provide appropriate protection of personnel and equipment while tests are in progress. Provide safety equipment, barricades and warning signs where necessary.
- B. Test in the presence of the Engineer or Engineer's representative.
- C. Provide all necessary equipment, piping connections, meters, pressure gauges, tools, materials, and facilities necessary to complete specified tests. Ensure that meters, gauges, and other measuring devices have ranges, accuracies and ratings appropriate for the application.
- D. All testing equipment is required to be furnished with a meter gauge (measuring 1/10 gallon) attached to the inlet side of the testing equipment to accurately measure the amount of water used to fill the line back to the required test pressure (if necessary) once test time period (2 hours) has ended.
- E. Maintain a calibration program for meters, gauges and other measuring devices. Submit calibration reports which show the date of calibration, indicate deviations from the standard, and identify the calibration standard along with pressure test reports.
- F. Provide bulkheads, flanges, valves, bracing, blocking, blowoffs or other temporary materials that may be required.
- G. Remove temporary materials after tests are complete.
- H. Perform tests on piping after piping is completely installed, including supports, hangers and anchors.
- I. Perform tests on piping before insulation is installed, and before it is permanently covered.
- J. Perform tests on piping that is clean and free of soil, sand or other foreign material.
- K. Plug pipe outlets with test plugs. Brace each plug securely to prevent blowouts.
- L. Add test fluid slowly.
- M. Include regulator set to avoid over-pressurizing and damaging piping.
- N. Isolate and test separately portions of the system which require different test pressures.
- O. Do not operate valves in either direction if the differential pressure exceeds the rated working pressure of that valve.
- P. Perform testing in accordance with local, state and federal requirements.

ARDURRA

3.2 FIELD QUALITY CONTROL

A. Tests:

1. Hydrostatic Testing:

- a. Perform hydrostatic testing for potable water piping systems and wastewater forcemains identified in other sections to be hydrostatically tested. Test pressure shall be calculated from paragraph c.1 below.
 - 1) Potable water piping systems shall be pressure leakage tested in accordance with AWWA C600.
- b. Open vents at high points to purge air pockets while piping system is filling.
- c. Test Pressure:
 - 1) Test piping system to 1.5 times the system working pressure or 150 psi, whichever is greater, unless specified otherwise in piping material specifications.
- d. Test Restrictions:
 - 1) Maintain test pressure at the highest point in the section of pipe being tested to at least 1.25 times the working pressure at the lowest point in that section.
 - 2) Do not exceed pressure ratings of pipe, valve, appurtenances, or thrust restraint design pressures.
- e. Testing:
 - 1) Flush line to be tested thoroughly before testing to remove soil and other foreign material and to expel air from the line.
 - 2) After section of piping to be tested has been flushed and filled with water, apply test pressure by means of force pump of such design and capacity that required pressure can be applied and maintained without interruption for duration of test.
 - 3) The line shall be slowly filled with water and all air expelled through the air valves or other means.
 - 4) Measure test pressure by means of tested and properly calibrated pressure gauge acceptable to the Engineer.
 - 5) Maintain test pressure within 5.0 psi for a sufficient length of time to permit the Engineer to observe piping under test, but not less than two (2) hours. A test in which the pressure drops more than 5.0 psi during the test period will be considered a failed test, and that section of line will not be accepted.
- f. Determining Leakage:
 - 1) Pump make-up water into the test section in order to maintain the test pressure within 5.0 psi. Measure the amount of make-up water added during the test period by using a metering system, approved by the Engineer, to determine actual leakage in that section of line. Metering system shall measure in gallons.

ARDURRA

- 2) At the end of the test period, if no make-up water has been added because the pressure has been maintained within 5.0 psi of the test pressure, add make-up water to return the system to the test pressure. The amount of make-up water added is considered actual leakage for that section of line.
 - g. Testing Allowance:
 - 1) Maximum allowable leakage for buried piping with mechanical joints or push-on joints shall be determined by the following method:

Length of pipe:

$$L = \frac{SDP^{1/2}}{148,000}$$

Where:
L = Leakage (gallons per hour)
S = Length of pipe tested (feet)
D = Diameter of pipe (inches)
P = Average test pressure (psig)
 - h. If actual leakage during test period exceeds testing allowance, the pressure test is considered a failure and the section of line being tested will not be accepted.
 - i. If repairs are required, repeat pressure test until pipe installation conforms to specified requirements and is acceptable to the Engineer.
 - j. Regardless of pressure and leakage test results, repair all piping systems showing visual evidence of weeping or leaking at no additional cost to the Owner.
2. Low Pressure Air Testing:
- a. General:
 - 1) Perform low pressure air testing for gravity sewer and drainage systems identified in other sections to be low-pressure air tested.
 - 2) Test pipe sections between adjacent manholes.
 - 3) Record time for air pressure to drop 1 psig.
 - 4) For pipe diameters of 4 inches through 36 inches, comply with Schedule 1, at the end of this Section.
 - 5) Pipe diameters above 36 inches will not be accepted by means of low-pressure air test.
 - 6) Ignore length of laterals.
 - b. Preparation:
 - 1) Isolate pipe section to be tested by plugging each end with airtight plug. Plug ends of branches, laterals, and wyes, which are included in test section.
 - 2) Brace plugs to prevent slippage and blowout due to internal pressure.
 - 3) Provide one plug having inlet tap or other provision for connecting supply air hose.

ARDURRA

- 4) Connect one end of air hose to plug used for air inlet, and other end to portable air control equipment.
 - 5) Provide air control equipment consisting of valves and pressure gauges to control rate at which air flows into test section and gauges to monitor air pressure inside pipe.
 - 6) Connect air hose between source of compressed air and control equipment.
- c. Testing:
- 1) If pipe to be tested is submerged in groundwater, determine height of groundwater above spring line of pipe at each end of test section and compute average. For every foot of groundwater above pipe's spring line, increase test pressures by 0.43 psig.
 - 2) Add air slowly to test section until pressure inside pipe is raised to 4.0 psig greater than average backpressure of groundwater that may be over pipe.
 - 3) After pressure of 4.0 psig is obtained, control supply of air so internal pressure maintained between 3.5 and 4.0 psig (above average groundwater back pressure) for minimum of two (2) minutes to allow temperature of air to come into equilibrium with temperature of pipe walls.
 - 4) Determine rate of air loss by time/pressure drop method.
 - a) After temperature has stabilized for two (2) minute period, disconnect air supply. Allow pressure to decrease to 3.5 psig. At this pressure, start stopwatch to determine time required for pressure to drop 1.0 psig. Compare time required for loss of 1.0 psig with Schedule 1. If time is equal to or greater than time indicated in schedule, or if pressure does not drop 1.0 psi within the indicated time, test is considered acceptable.
3. High Pressure Air Testing:
- a. Perform high-pressure air testing of piping systems as specified in other sections. Test pressure shall be as specified in other sections.
 - b. Perform preliminary test at pressures not greater than 25 psig. Examine for leakage at joints with soap solution and visual detection of soap bubbles. Correct visible leaks.
 - c. Perform final test at test pressure.
 - 1) Gradually increase pressure in system in small increments until test pressure is reached.
 - 2) Maintain test pressure for a minimum of ten (10) minutes, with additional time if necessary to conduct soap bubble leakage examination at each joint.
 - d. Ensure that piping system shows no evidence of leakage. If evidence of leakage is observed, repair the leak and repeat the test.

ARDURRA

4. Test Report:

- a. Prepare and submit test report for each piping system tested. Include the following information in test report.
 - 1) Date of test.
 - 2) Description and identification of piping system tested. Include pipe diameter and material and length of system.
 - 3) Type of test performed.
 - 4) Test fluid.
 - 5) Test pressure.
 - 6) Type and location of leaks detected.
 - 7) Corrective action taken to repair leaks.
 - 8) Results of retesting.
 - 9) Section of line tested.
 - 10) Copy of calibration certification for measuring devices used in the test.

SCHEDULE 1 Minimum Specified Time Required for a 1.0 psig Pressure Drop for Size and Length of Pipe Indicated for Q = 0.0015												
Pipe Dia (in.)	Minimum Time (min:sec)	Length for Minimum Time (ft)	Time for Longer Length (sec)	Specification Time for Length (L) Show n (min:sec)								
				100 ft	150 ft	200 ft	250 ft	300 ft	350 ft	400 ft	450 ft	
4	3:46	597	.380 L	3:46	3:46	3:46	3:46	3:46	3:46	3:46	3:46	
6	5:40	398	.854 L	5:40	5:40	5:40	5:40	5:40	5:40	5:42	6:24	
8	7:34	298	1.520 L	7:34	7:34	7:34	7:34	7:36	8:52	10:08	11:24	
10	9:26	239	2.374 L	9:26	9:26	9:26	9:53	11:52	13:51	15:49	17:48	
12	11:20	199	3.418 L	11:20	11:20	11:24	14:15	17:05	19:56	22:47	25:38	
15	14:10	159	5.342 L	14:10	14:10	17:48	22:15	26:42	31:09	35:36	40:04	
18	17:00	133	7.692 L	17:00	19:13	25:38	32:03	38:27	44:52	51:16	57:41	
21	19:50	114	10.470 L	19:50	26:10	34:54	43:37	52:21	61:00	69:48	78:31	
24	22:40	99	13.674 L	22:47	34:11	45:34	56:58	68:22	79:46	91:10	102:33	
27	25:30	88	17.306 L	28:51	43:16	57:41	72:07	86:32	100:57	115:22	129:48	
30	28:20	80	21.366 L	35:37	53:25	71:13	89:02	106:50	124:38	142:26	160:15	
33	31:10	72	25.852 L	43:05	64:38	86:10	107:43	129:16	150:43	172:21	193:53	
36	34:00	66	30.768 L	51:17	76:55	102:34	128:12	153:50	179:29	205:07	230:46	
42	39:48	57	41.883 L	69:48	104:42	139:37	174:30	209:24	244:19	279:13	314:07	
48	45:34	50	54.705 L	91:10	136:45	182:21	227:55	273:31	319:06	364:42	410:17	
54	51:02	44	69.236 L	115:24	173:05	230:47	288:29	346:11	403:53	461:34	519:16	
60	56:40	40	85.476 L	142:28	213:41	284:55	356:09	427:23	498:37	569:50	641:04	

Note: If there has been no leakage (zero psig drop) after one hour of testing, the test section shall be accepted and the test complete.

END OF SECTION

ARDURRA

SECTION 01 77 00

CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for Contract closeout, including, but not limited to, the following:

1. Inspection procedures.
2. Project Record Documents.
3. Operation and maintenance manuals.
4. Warranties.
5. Instruction of Owner's personnel.
6. Final cleaning.

1.2 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following items:

1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete. Submit three (3) copies of list to the Engineer. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
 - a. Organize list of spaces in sequential order.
 - b. Include the following information at the top of each page:
 - 1) Project name.
 - 2) Date.
 - 3) Name of Engineer.
 - 4) Name of Contractor.
 - 5) Page number.
2. Advise Owner of pending insurance changeover requirements.
3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates and similar releases.
5. Prepare and submit Project Record Documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
7. Complete startup testing of systems.

ARDURRA

8. Submit test/adjust/balance records.
9. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
10. Complete final cleaning requirements, including touchup painting.
11. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Engineer that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.

1.3 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:

1. Submit a final Application for Payment according to Section 01 29 00 – *Payment Procedures*.
2. Submit certified copy of Engineer's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Engineer. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Instruct Owner's personnel in operation, adjustment and maintenance of products, equipment and systems.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.4 WARRANTIES

A. Submittal Time: Submit written warranties on request of Engineer for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

ARDURRA

- B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
 - 1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2 by 11-inch paper.
 - 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of installer.
 - 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
- C. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Comply with manufacturer's written instructions.
- C. Cleaning: Employ experienced workers for final cleaning. Comply with manufacturers written instructions.
 - 1. Complete the following cleaning operations before requesting inspection for final Completion for entire Project or for a portion of Project:
 - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - d. Terminate and remove temporary facilities, mock-ups, construction tools, equipment, machinery, and surplus material from the Project Site.

ARDURRA

- e. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - f. Remove debris and surface dust from limited access spaces, including vaults, manholes, and similar spaces.
 - g. Remove labels that are not permanent.
 - h. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
 - 1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
 - i. Replace parts subject to unusual operating conditions.
 - j. Leave Project clean and ready for occupancy.
- D. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION

ARDURRA

SECTION 01 78 39

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for Project Record Documents, including the following:
 - 1. Record Drawings.
 - 2. Record Specifications.
 - 3. Record Product Data.

1.2 SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit one (1) set of marked-up Record Prints.
- B. Record Specifications: Submit one (1) copy of Project's Specifications, including addenda and Contract modifications.
- C. Record Product Data: Submit one (1) copy of each Product Data submittal.
 - 1. Where Record Product Data is required as part of operation and maintenance manuals, submit marked-up Product Data as an insert in the manual instead of submittal as Record Product Data.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one (1) set of blue- or black-line white prints of the Contract Drawings and shop drawings.
 - 1. Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity that obtained record data, whether individual or entity is installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an understandable drawing technique.
 - c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.

ARDURRA

2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Locations and depths of underground utilities.
 - d. Revisions to routing of piping and conduits.
 - e. Actual equipment locations.
 - f. Locations of concealed internal utilities.
 - g. Changes made by Change Order or Work Change Directive.
 - h. Changes made following Engineer's written orders.
 - i. Details not on the original Contract Drawings.
 - j. Field records for variable and concealed conditions.
 - k. Record information on the Work that is shown only schematically.
 3. Mark the Contract Drawings or shop drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If shop drawings are marked, show cross-reference on the Contract Drawings.
 4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize Record Prints and newly prepared Record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 2. Identification: As follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Engineer.
 - e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and Contract modifications.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 3. Record the name of the manufacturer, supplier, installer, and other information necessary to provide a record of selections made.

ARDURRA

4. For each principal product, indicate whether Record Product Data has been submitted in operation and maintenance manuals instead of submitted as Record Product Data.
5. Note related Change Orders, Record Drawings, and Product Data where applicable.

2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 3. Note related Change Orders, Record Drawings, and Product Data where applicable.

2.4 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.
- B. Maintenance of Record Documents and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Engineer's reference during normal working hours.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

ARDURRA

SECTION 01 79 10

SYSTEMS DEMONSTRATIONS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Before Substantial Completion is considered for entire Work, Contractor shall test and demonstrate specific items of equipment and systems in operation.
- B. Preliminary:
 - 1. Before Contractor begins testing and system operation demonstrations, Installation Services specified for each system or equipment shall be completed.
- C. Coordination:
 - 1. Designate representative of Contractor to be responsible for testing and operation demonstration of systems.
 - 2. Contractor shall submit schedule of systems testing and operation demonstrations for review by Engineer and Owner 20 days prior to system tests and demonstrations.
 - 3. Notify Engineer at least 5 days before tests and system operation demonstrations are to begin so Engineer can make arrangements with Owner to witness testing and demonstration.
 - 4. Reschedule cancelled tests and operation demonstrations 5 days in advance.

1.2 SUBMITTALS

- A. Operation and Maintenance (O&M) Data:
 - 1. Submit in accordance with Section 01 78 23 – *Operation and Maintenance Data*, before conducting Instructional Services specified.
- B. Reports:
 - 1. Testing of Components and Systems:
 - a. Prepare report for each system on results and activities encompassing testing as required by this section. Submit report within two (2) days of completion of tests.
 - b. As minimum, report shall describe findings of inspections; revisions, modifications or replacement of equipment; calibrations; test results; dates and names of persons involved and observing inspections, testing, and other activities pertaining to components and systems; and statement regarding operational condition of components and systems.
 - 2. System Operation Demonstration.

ARDURRA

- a. Prepare report for each system on results of activities encompassing operation demonstration as required by this section. Submit report within two (2) days of completion of demonstration.
- b. Report shall describe operational conditions; daily results of systems operation; dates and names of persons involved and observing operation; and statement regarding system ability to meet operational criteria.

C. Submit in accordance with Section 01 33 00 – *Submittal Procedures*.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.1 TESTING OF SYSTEM COMPONENTS

- A. Subject each system, process, mechanical, instrumentation, and electrical equipment components, including related piping and control systems, to individual inspection and testing by Contractor and certified by Contractor to be ready for operations before beginning system operation demonstration.
- B. Inspection and tests shall be made to determine if equipment is properly assembled, aligned, adjusted, calibrated, wired or connected. Changes, adjustments or replacements of equipment due to errors or omissions on part of Contractor, or otherwise necessary to comply with requirements of Contract Documents shall be done without additional cost to Owner.
- C. Complete training required as specified in individual Specification Sections.

3.2 SYSTEM OPERATION DEMONSTRATION

- A. Upon completion of inspection and testing of individual components in each system, demonstrate operation and performance of each system in accordance with requirements of Contract Documents.
 - 1. Where no specific performance requirements are stated in Specifications, demonstrate to show equipment operates in accordance with acceptable industry standards for application of equipment.
 - 2. System operation demonstration shall show equipment operates within manufacturer's tolerances for noise and vibration, equipment is responsive to manual and automatic controls, control and protective devices are properly set, and equipment runs on controlled or intermittent basis when such operation is intended.
 - 3. System operation demonstration shall include checkout from each remote control point. Demonstrate alarm and safety lockout systems for proper function and process instrumentation and control.

ARDURRA

- B. During testing and system operation demonstration, Contractor shall arrange for presence of qualified representatives of Suppliers of each piece of equipment and instrumentation included in system necessary to conduct test and demonstration.
- C. Temporary facilities and services are Contractor's responsibility. Electrical power for equipment inside existing buildings will be supplied by Owner. Contractor shall provide temporary connections if necessary.
- D. Successful completion of system demonstration for each system will be when performance requirements established in Contract Documents are met while running for four (4) consecutive hours.
- E. If during demonstration system is not meeting performance requirements established in Contract Documents, Contractor shall stop demonstration, adjust, calibrate or replace equipment or instrumentation and re-start and run demonstration until four (4) consecutive hours have been completed.

3.3 DETERMINATION OF SUBSTANTIAL COMPLETION

A. Systems described in Section:

- 1. Upon successful completion of testing of system components, system operation demonstrations, and delivery of submittals specified in this section, Contractor shall notify Owner and Engineer in writing that components and system are substantially complete.
- 2. Provisions of paragraphs 14.04 and 14.05 of General Conditions will apply with respect to procedure for determining substantial completion of that part of Work, certification of Substantial Completion, and division of responsibility in respect to substantially completed work.
- 3. Retainage will not be reduced at substantial completion of components and system.
- 4. Substantial completion of system will not entitle Contractor reduction or elimination of liquidated damages.

B. Other Systems:

- 1. Other identified systems will be considered for substantial completion when Contractor considers Work ready for its intended use.
- 2. Components and systems will be substantially complete after successful completion of testing of components and systems, system operation demonstration, and delivery of submittals.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

ARDURRA

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes cast-in-place concrete, formwork, reinforcement, concrete materials, mix design, placement procedures, and finishes for thrust blocks, pipe encasement, concrete fill, and lean concrete.

1.2 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash and other pozzolans, and silica fume.
- B. Terms used in these specifications are defined in ACI 116R.

1.3 SUBMITTALS

- A. Product Data: For each type of manufactured material and product indicated.
- B. Concrete materials and concrete mix designs proposed for use. Include results of all testing performed to qualify materials and to establish mix designs. Place no concrete until approval of mix designs has been received in writing. Submittal for each concrete mix design to include:
 - 1. Sieve analysis and source of fine and coarse aggregates.
 - 2. Test for aggregate organic impurities.
 - 3. Proportioning of all materials.
 - 4. Type of cement with mill certificate for the cement.
 - 5. Brand, quantity and class of fly ash proposed for use along with other submittal data as required for fly ash by this specification.
 - 6. Slump.
 - 7. Brand, type and quantity of air entrainment and any other proposed admixtures.
 - 8. Total chloride ion content per cubic yard of concrete determined in accordance with AASHTO T260.
 - 9. Compression test results (28-day) and any other data required by ACI 318 and this specification to establish concrete mix design.
- C. Steel Reinforcement Shop Drawings: Details of fabrication, bending and placement, prepared according to ACI 315 and CRSI "Manual of Standard Practice." Include material, grade, bar schedules, stirrup spacing, bent bar diagrams, arrangement, and supports of concrete reinforcement. Include special reinforcement required for openings through concrete structures.

ARDURRA

- D. Design and engineering of formwork are Contractor's responsibility. If requested, submit structural analysis and concrete strength data used in planning and implementing form placement, removal and shoring.
- E. Material Certificates: Signed by manufacturers certifying each of the following items complies with requirements:
 - 1. Cementitious materials and aggregates.
 - 2. Form materials and form-release agents.
 - 3. Steel reinforcement and reinforcement accessories.
 - 4. Fiber reinforcement.
 - 5. Admixtures.
- F. If requested by Engineer, provide material test reports from a qualified testing agency for aggregates. Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed concrete Work similar in material, design and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products complying with ASTM C94 requirements for production facilities and equipment.
 - 1. Manufacturer must be certified according to the National Ready Mixed Concrete Association's Certification of Ready Mixed Concrete Production Facilities.
- C. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C1077 and ASTM E329 to conduct the testing indicated, as documented according to ASTM E548.
 - 1. Personnel conducting field tests must be qualified as ACI Concrete Field Testing Technician, Grade 1.
- D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, each aggregate from one source, and each admixture from the same manufacturer.
- E. ACI Publications: Comply with ACI 301 and ACI 117, unless more stringent provisions are indicated.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Reinforcement:
 - 1. Deliver reinforcement to jobsite with attached metal or plastic tags with permanent mark numbers that match the shop drawing mark numbers.
 - 2. Deliver, store and handle reinforcement to prevent bending and damage.

ARDURRA

3. Support and store reinforcement above ground.

B. Concrete truck washout:

1. Do not dispose of truck washout water by dumping into a sanitary sewer, storm drain or onto soil that carries storm water runoff.
2. Washout from concrete trucks should be disposed into one of the following:
 - a. A designated area that will later be backfilled: a slurry pit.
 - b. An area where the concrete can harden, be broken up, and then disposed of as solid waste.
 - c. A location which is not subject to surface water runoff, and more than 50-feet away from a storm drain, open ditch, or receiving water.
3. When utilizing a concrete pump and pump bin, pump excess concrete back into mixer truck.
4. Concrete washout from concrete pumper bins can be washed into concrete pumper trucks and discharged into designated washout area or properly disposed offsite.

PART 2 - PRODUCTS

2.1 FORMWORK

- A. Formwork will comply with ACI 347.

2.2 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A615, Grade 60, deformed.
- B. Plain-Steel Welded Wire Fabric: ASTM A185, fabricated from as-drawn steel wire into flat sheets.

2.3 REINFORCEMENT ACCESSORIES

- A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting and fastening reinforcing bars and welded wire fabric in place. Manufacture bar supports according to CRSI "Manual of Standard Practice" from steel wire, plastic or precast concrete of greater compressive strength than concrete.

2.4 CONCRETE MATERIALS

- A. Portland Cement: ASTM C150, Type I, Type I/II, Type II or Type V.
 1. Type I Cement not allowed for structures intended to contain liquid.

ARDURRA

B. Fly Ash:

1. ASTM C618, Class C or F, including requirements of Table 1A.
2. Non-staining.
3. Suited to provide hardened concrete of uniform light gray color.
4. Maximum loss on ignition: 3 percent.
5. Maximum water requirement: 100 percent (as percent of control).
6. Fineness (maximum retained on No. 325 sieve): 25 percent.
7. R-Factor, $(\text{CaO (\%)} - 5)/(\text{Fe}_2\text{O}_3 (\%))$: 3.2 maximum.
8. Compatible with other concrete ingredients and having no deleterious effects on the hardened concrete.
9. Produced by source approved by the South Carolina State Department of Transportation (SCDOT).
10. Fly ash and cement type used will correspond to that upon which selection of concrete proportions was based in the submitted mix design.

C. Normal-Weight Aggregate: ASTM C33, modified as follows:

1. Fine Aggregate: Natural sand.
2. Coarse Aggregate Sieve Analysis:
 - a. Not more than 1/5 of narrowest dimension between sides of forms, 1/3 of depth of slabs, nor 3/4 of minimum clear spacing between reinforcing bars. The minimum sieve size used for coarse aggregate for the ASTM number noted is No. 4 sieve in order to accommodate nationwide conditions.
 - b. For lean concrete, concrete topping, and integral wearing course: ASTM C33, size number 8 (maximum 3/8 inch).
 - c. For footings, mat foundation slabs and grade beams: ASTM C33 size number 467 (maximum 1-1/2 inches) may be used.
 - d. For all other concrete: ASTM C33 size number 57 or 67 (maximum 1 inch or 3/4 inch).
3. Potential reactivity of aggregates will be determined in accordance with Appendix XI of ASTM C33.

D. Water: Potable and complying with ASTM C94.

2.5 ADMIXTURES

- A. General: Admixtures certified by manufacturer to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material and to be compatible with other admixtures and cementitious materials. Do not use admixtures containing calcium chloride.
- B. Air-Entraining Admixture: ASTM C260.
- C. Water-Reducing Admixture: ASTM C494, Type A.
- D. High-Range, Water-Reducing Admixture: ASTM C494, Type F.
- E. Water-Reducing and Accelerating Admixture: ASTM C494, Type E.

ARDURRA

- F. Water-Reducing and Retarding Admixture: ASTM C494, Type D.
- G. High-Range, Water-Reducing and Retarding Admixtures: ASTM C494, Type G.

2.6 FIBER REINFORCEMENT

- A. Synthetic Fiber: Fibrillated polypropylene fibers engineered and designed for use in concrete, complying with ASTM C1116, Type III, 1/2 to 1-1/2 inches long.

- 1. Available Products:
 - a. Fibermesh; Fibermesh, Div. of Synthetic Industries.
 - b. Grace Fibers; W. R. Grace & Co., Construction Products Division.
 - c. Or approved equal.

2.7 CONCRETE MIXES

- A. Prepare design mixes for each type and strength of concrete determined by either laboratory trial mix or field test data bases, as follows:
 - 1. Proportion normal-weight concrete according to ACI 211.1 and ACI 301.
- B. Use a qualified independent testing agency for preparing and reporting proposed mix designs for the laboratory trial mix basis.
- C. All concrete to be normal weight concrete.
- D. Minimum 28-day compressive strengths:
 - 1. Sidewalks, concrete fill, lean concrete, and thrust blocking: 3,000 psi
 - 2. Mud slab and concrete for backfill: 2,000 psi.
 - 3. All other concrete: 4,000 psi
 - 4. Slump: 4 inches maximum, 1 inch minimum. Mud slab will have no maximum slump.
 - 5. Provide additional water at ready mix plant for concrete that is to be pumped to allow for slump loss due to pumping. Provide only enough additional water so that slump of concrete at discharge end of pump hose does not exceed maximum slump and maximum water/cement ratio specified.
 - 6. Maximum slump for concrete containing high-range water-reducing admixture: eight (8) inches after admixture is added to concrete with 2- to 4-inch slump.
- E. Normal weight concrete minimum cement contents and maximum water cement ratios:

<u>Specified Strength</u> (psi)	<u>Minimum Cement</u> (Lbs/CY)	<u>Maximum Water/Cement Ra-</u> <u>tio by Weight</u>
2,000	235*	-
3,000	517*	0.50
4,000	611*	0.45

* If fly ash is proposed for use, the weight of fly ash plus weight of Portland cement will equal these values.

ARDURRA

- F. Cementitious Materials: Limit percentage by weight of cementitious materials other than Portland cement in concrete as follows:
 - 1. Fly Ash:
 - a. For cast-in-place concrete only, a maximum of 25 percent by weight of Portland cement content per cubic yard may be replaced with fly ash at a rate of one (1) pound fly ash for one (1) pound cement.
 - b. If fly ash is used, the water to fly ash plus cement ratio not to exceed the maximum water cement ratio specified in this Section.
 - G. Air Content: Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content as follows within a tolerance of plus one (1) or minus 1.5 percent, unless otherwise indicated:
 - 1. 5.5 percent for 1-1/2-inch nominal maximum aggregate size.
 - 2. 6 percent for 1-inch nominal maximum aggregate size.
 - 3. 0 percent for mud slabs.
 - H. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.
 - I. Synthetic Fiber: Uniformly disperse in concrete mix at manufacturer's recommended rate, but not less than 1.5 pounds per cubic yard.
 - 1. Fibers to be used in concrete fill and where indicated on Drawings.
 - J. Admixtures: Use admixtures according to manufacturer's written instructions.
 - 1. Use water-reducing admixture or high-range water-reducing admixture (superplasticizer) in concrete, as required, for placement and workability.
 - 2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
- 2.8 FABRICATING REINFORCEMENT
- A. Fabricate steel reinforcement according to CRSI "Manual of Standard Practice."
- 2.9 CONCRETE MIXING
- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C94 and ASTM C1116, and furnish batch ticket information.
 - 1. When air temperature is between 85 and 90 degrees F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 degrees F, reduce mixing and delivery time to 60 minutes.

ARDURRA

PART 3 - EXECUTION

3.1 FORMWORK

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until concrete structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:
 - 1. Class B, 1/4 inch.
- D. Construct forms to prevent loss of concrete mortar.
- E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical. Kerf wood inserts for forming keyways, reglets, recesses, and the like, for easy removal.
 - 1. Do not use rust-stained steel form-facing material.
- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
- G. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, soil, and other debris just before placing concrete.
- H. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- I. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

3.3 STEEL REINFORCEMENT

- A. General: Comply with CRSI "Manual of Standard Practice" for placing reinforcement.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials.

ARDURRA

- C. Accurately position, support and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- E. Install welded wire fabric in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one (1) mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.4 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement and embedded items is complete and that required inspections have been performed.
- B. Do not add water to concrete during delivery at Project site or during placement, unless approved by Engineer.
 - 1. Do not add water to concrete after adding high-range water-reducing admixtures to mix.
- C. Deposit concrete continuously or in layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as specified. Deposit concrete to avoid segregation.
- D. Deposit concrete in forms in horizontal layers no deeper than 24 inches and in a manner to avoid inclined construction joints. Place each layer while preceding layer is still plastic, to avoid cold joints.
 - 1. Consolidate placed concrete with mechanical vibrating equipment. Use equipment and procedures for consolidating concrete recommended by ACI 309R.
 - 2. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations no farther than the visible effectiveness of the vibrator. Place vibrators to rapidly penetrate placed layer and at least six (6) inches into proceeding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mix constituents to segregate.
- E. Deposit concrete as nearly as practicable in its final position to avoid segregation.
 - 1. Maximum free fall: five (5) feet.
 - 2. Free fall exceeding five (5) feet:
 - a. Place concrete by means of hopper, elephant trunk or tremie pipe extending down to within five (5) feet of surface placed upon.

ARDURRA

- F. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
 - 1. When air temperature has fallen to or is expected to fall below 40 degrees F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 degrees F and not more than 80 degrees F at point of placement.
 - 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 - 3. Do not use calcium chloride, salt or other materials containing antifreeze agents or chemical accelerators, unless otherwise specified and approved in mix designs.
- G. Hot-Weather Placement: Place concrete according to recommendations in ACI 305R and as follows, when hot-weather conditions exist:
 - 1. Cool ingredients before mixing to maintain concrete temperature below 90 degrees F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 - 2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
 - 3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots or dry areas.

3.5 FINISHING FORMED SURFACES

- A. Ordinary Finish: Finish resulting directly from formwork for surfaces that will be hidden from view by earth.
- B. Related Unformed Surfaces: At tops of walls, horizontal offsets and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.6 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and with recommendations in ACI 305R for hot-weather protection during curing.
- B. Unformed Surfaces: Begin curing immediately after finishing concrete.
- C. Perform structural repairs of concrete, subject to Engineer's approval, using epoxy adhesive and patching mortar.
- D. Repair materials and installation not specified may be used, subject to Engineer's approval.

ARDURRA

3.7 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to sample materials, perform tests and submit test reports during concrete placement. Sampling and testing for quality control may include those specified in this Article.
- B. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C172 will be performed according to the following requirements:
 - 1. Testing Frequency: Obtain one (1) composite sample for each day's pour of each concrete mix exceeding five (5) cubic yards, but less than 25 cubic yards, plus one (1) set for each additional 50 cubic yards or fraction thereof.
 - 2. Slump: ASTM C143; one (1) test at point of placement for each composite sample, but not less than one (1) test for each day's pour of each concrete mix. Perform additional tests when concrete consistency appears to change.
 - 3. Air Content: ASTM C231, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one (1) test for each day's pour of each concrete mix.
 - 4. Concrete Temperature: ASTM C1064; one (1) test hourly when air temperature is 40 degrees F and below and when 80 degrees F and above, and one (1) test for each composite sample.
 - 5. Compression Test Specimens: ASTM C31.
 - a. Cast and laboratory cure one (1) set of four (4) standard cylinder specimens for each composite sample.
 - 6. Compressive-Strength Tests: ASTM C39.
 - a. Test one (1) specimen at seven (7) days and two (2) at 28 days with one (1) spare.
 - b. A compressive-strength test will be the average compressive strength from two (2) specimens obtained from same composite sample and tested at age indicated.
 - c. Spare specimen may be destroyed three (3) months after acceptance of test results.
- C. Strength of each concrete mix will be satisfactory if every average of any three (3) consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
- D. Test results will be reported in writing to Engineer, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests will contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in work, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
- E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Engineer but will not be used as sole basis for approval or rejection of concrete.

ARDURRA

- F. Additional Tests: Testing and inspecting agency will make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Engineer. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42 or by other methods as directed by Engineer.
- G. Concrete truck washout disposal area:
 - 1. Monitor employees throughout the duration of the construction project to ensure appropriate practices are being implemented.
 - 2. Inspect designated onsite washout area regularly and remove liquids and sediment as needed.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

ARDURRA

SECTION 31 10 00

SITE CLEARING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Removing trees and other vegetation.
 - 2. Clearing and grubbing.
 - 3. Topsoil stripping.

1.3 DEFINITIONS

- A. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than two (2) inches in diameter; and free of weeds, roots, and other deleterious materials.
- B. Tree Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction, and defined by the drip line of individual trees or the perimeter drip line of groups of trees, unless otherwise indicated.

1.4 MATERIALS OWNERSHIP

- A. Except for materials indicated to be stockpiled or to remain Owner's property, cleared materials shall become Contractor's property and shall be removed from the site.

1.5 SUBMITTALS

- A. Photographs sufficiently detailed, of existing conditions of trees and plantings, adjoining construction, and site improvements that might be misconstrued as damage caused by site clearing.
- B. Identify and accurately locate capped utilities and other subsurface structural, electrical, and mechanical conditions.
- C. Submit in accordance with Section 01 33 00 – *Submittal Procedures*.

ARDURRA

1.6 QUALITY ASSURANCE

- A. Preinstallation Conference: Conduct conference at Project site prior to start of construction.

1.7 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
 - 2. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
- B. Improvements on Adjoining Property: Authority for performing indicated removal and alteration work on property adjoining Owner's property will be obtained by the Owner before award of the contract.
- C. Salvable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises where indicated.
- D. Notify utility locator service for area where Project is located before site clearing.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.
- B. Provide erosion-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
- C. Locate and clearly flag trees and vegetation to remain or to be relocated.
- D. During construction, protect from damage any existing site improvements to remain.
 - 1. Restore damaged improvements to their original condition, as acceptable to Owner.

ARDURRA

3.2 TREE PROTECTION

- A. Erect and maintain a temporary fence around drip line of individual trees or around perimeter drip line of groups of trees to remain. Remove fence when construction is complete.
 - 1. Do not store construction materials, debris, or excavated material within drip line of remaining trees.
 - 2. Do not permit vehicles, equipment, or foot traffic within drip line of remaining trees.
- B. Do not excavate within drip line of trees, unless otherwise indicated.
- C. Where excavation for new construction is required within drip line of trees, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks, comb soil to expose roots, and cleanly cut roots as close to excavation as possible.
 - 1. Cover exposed roots with burlap and water regularly.
 - 2. Temporarily support and protect roots from damage until they are permanently relocated and covered with soil.
 - 3. Coat cut faces of roots more than 1-1/2 inches in diameter with an emulsified asphalt or other approved coating formulated for use on damaged plant tissues.
 - 4. Cover exposed roots with wet burlap to prevent roots from drying out. Backfill with soil as soon as possible.
- D. Repair or replace trees and vegetation indicated to remain that are damaged by construction operations, in a manner approved by Engineer.
 - 1. Employ a qualified arborist, licensed in jurisdiction where Project is located, to submit details of proposed repairs and to repair damage to trees and shrubs.
 - 2. Replace trees that cannot be repaired and restored to full-growth status, as determined by the qualified arborist.

3.3 CLEARING AND GRUBBING

- A. Remove obstructions, trees, shrubs, grass, and other vegetation to permit installation of new construction. Removal includes digging out stumps and obstructions and grubbing roots.
 - 1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
 - 2. Cut minor roots and branches of trees indicated to remain in a clean and careful manner where such roots and branches obstruct installation of new construction.
 - 3. Completely remove stumps, roots, obstructions, and debris extending to a depth of 18 inches below exposed subgrade.
 - 4. Use only hand methods for grubbing within drip line of remaining trees.
- B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated.
 - 1. Place fill material in horizontal layers not exceeding 8-inch loose depth, and compact each layer to a density equal to adjacent original ground.

ARDURRA

3.4 TOPSOIL STRIPPING

- A. Remove sod and grass before stripping topsoil and store in location designated by Owner.
- B. Strip topsoil to whatever depths are encountered in a manner to prevent intermingling with underlying subsoil or other waste materials.
 - 1. Strip surface soil of unsuitable topsoil, including trash, debris, weeds, roots, and other waste materials.
- C. Stockpile topsoil materials away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 1. Limit height of topsoil stockpiles to 72 inches.
 - 2. Do not stockpile topsoil within drip line of remaining trees.
 - 3. Dispose of excess topsoil as specified for waste material disposal.
 - 4. Stockpile surplus topsoil and allow for respreading deeper topsoil.

3.5 DISPOSAL

- A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials, including trash and debris, and legally dispose of them.

END OF SECTION

ARDURRA

SECTION 31 20 01

TRENCHING, BACKFILLING AND COMPACTING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Excavating, backfilling and compacting trenches for waterlines.

1.2 DEFINITIONS

A. Backfill: Soil materials used to fill an excavation.

1. Initial Trench Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. Final Trench Backfill: Backfill placed over initial trench backfill to fill a trench.

B. Bedding Course: Layer placed over the excavated subgrade in a trench before laying pipe.

C. Borrow: Satisfactory tested and approved soil imported from off-site for use as fill or backfill.

D. Excavation: Removal of material encountered above subgrade elevations.

1. Additional Excavation: Excavation below subgrade elevations as directed by Engineer. Additional excavation and replacement material will be compensated according to Contract provisions for changes in the Work.
2. Bulk Excavation: Excavations more than 10 feet in width and pits more than 30 feet in either length or width.
3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated dimensions without direction by Engineer. Unauthorized excavation, as well as remedial work directed by Engineer, will be without additional compensation.

E. Fill: Soil materials used to raise existing grades.

F. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

G. Subbase Course: Layer that is placed and compacted between the subgrade and base course for asphalt paving, or between the subgrade and a concrete pavement or walk.

H. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.

I. Utilities: On-site and offsite underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

ARDURRA

1.3 SUBMITTALS

- A. Product Data: For the following:
 - 1. Each type of plastic warning tape.
 - 2. Drainage fabric.
 - 3. Separation fabric.
- B. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:
 - 1. Classification according to ASTM D2487 of each on-site or borrow soil material proposed for fill and backfill.
 - 2. Laboratory compaction curve according to ASTM D698 for each on-site or borrow soil material proposed for fill and backfill.

1.4 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt existing utilities serving facilities occupied and used by Owner or others unless permitted in writing by Engineer, and then only after arranging to provide temporary utility services according to requirements indicated:
 - 1. Notify Engineer not less than 48 hours in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without Engineer's written permission.
 - 3. Contact utility-locator service for area where Project is located before excavating.
 - 4. Locate existing underground and above ground utilities in the areas of work before starting earthwork operations. Where utilities are to remain in place, provide adequate means of protection during earthwork operations.
 - 5. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult Engineer immediately for directions. Cooperate with the Owner, and public and private utility companies, in keeping their respective services and facilities in operation. Repair damaged utilities to the satisfaction of the utility owner at Contractor's expense.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. General: Provide borrow soil materials that have been sampled, tested and certified when sufficient satisfactory soil materials are not available from excavations.
- B. Satisfactory Soils: ASTM D2487 soil classification groups GW, GP, GM, SW, SP, and SM, or a combination of these group symbols; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
- C. Unsatisfactory Soils: ASTM D2487 soil classification groups GC, SC, ML, MH, CL, CH, OL, OH, and PT, or a combination of these group symbols.

ARDURRA

1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
- D. Backfill and Fill:
1. Trench Backfill above the pipe zone is classified as follows:
 - a. Class I Backfill: Flowable fill that conforms to ASTM C94, Alternate 3. Proportion to obtain a 28-day compressive strength of 150 pounds per square inch maximum.
 - b. Class II Backfill: Material suitable for backfill in a properly dewatered trench shall consist of any of the following: Well graded coarse granular materials free of roots, branches, stumps, or other material not so suited, with maximum particle size not exceeding 1 inch; sands, silty sands or clayey sands. Soils having more than 25 percent of its weight passing a No. 200 sieve shall not be used for backfill. Soils shall be compacted to 95% dry density (modified proctor). Class II backfill may be supplanted by use of flowable fill per SCDOT Specifications.
 - c. Class III Backfill: Material that will be generally used throughout the project and be generally excavated trench material free of roots, branches, stumps, or other organic or unsuitable materials.
- E. Subbase: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.
- F. Base: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940; with at least 95 percent passing a 1-1/2-inch sieve and not more than 8 percent passing a No. 200 sieve.
- G. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.
- H. Bedding:
1. Class II Bedding Material:
 - a. Material suitable for bedding in a properly dewatered trench shall consist of any of the following: Well graded coarse granular materials free of roots, branches, stumps, or other material not so suited, with maximum particle size not exceeding 1 inch; sands, silty-sands or clayey sands. Soils having more than 5 percent of its weight passing a No. 200 sieve shall not be used for bedding. Soils shall be compacted to 95% dry density (modified proctor). Class II backfill may be supplanted by use of flowable fill per SCDOT Specifications.
 2. Class III Bedding Material:
 - a. Class III bedding will be used throughout the project and will generally be excavated trench material free of roots, branches, stumps, or other organic or unsuitable materials.

ARDURRA

- I. Drainage Fill: Washed, narrowly graded mixture of crushed stone, or crushed or uncrushed gravel; ASTM D448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2- inch sieve and 0 to 5 percent passing a No. 8 sieve.
- J. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D448; coarse-aggregate grading Size 67; with 100 percent passing a 1- inch sieve and 0 to 5 percent passing a No. 4 sieve.
- K. Sand: ASTM C33; fine aggregate, natural, or manufactured sand; with 100 percent passing a No. 4 sieve and 0 to 5 percent passing a No. 200 sieve.
- L. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

2.2 ACCESSORIES

- A. Detectable Warning Tape: Provide acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, minimum 6 inches wide and 5 mils thick, continuously inscribed with a description of utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep, foil to be visible from both sides; colored as follows:
 - 1. Red: Electric.
 - 2. Yellow: Gas, oil, steam, and dangerous materials.
 - 3. Orange: Telephone and other communications.
 - 4. Safety Precaution Blue: Water systems (wording on tape to indicate "Potable Water").
 - 5. Green: Sewer systems.
- B. Drainage Fabric: Nonwoven geotextile, specifically manufactured as a drainage geotextile; made from polyolefins, polyesters, or polyamides; and with the following minimum properties determined according to ASTM D4759 and referenced standard test methods:
 - 1. Grab Tensile Strength: 110 lbf; ASTM D4632.
 - 2. Tear Strength: 40 lbf; ASTM D4533.
 - 3. Puncture Resistance: 50 lbf; ASTM D4833.
 - 4. Water Flow Rate: 150 gpm per sq. ft.; ASTM D4491.
 - 5. Apparent Opening Size: No. 50; ASTM D4751.
- C. Separation Fabric: Woven geotextile, specifically manufactured for use as a separation geotextile; made from polyolefins, polyesters, or polyamides; and with the following minimum properties determined according to ASTM D4759 and referenced standard test methods:
 - 1. Grab Tensile Strength: 200 lbf; ASTM D4632.
 - 2. Tear Strength: 75 lbf; ASTM D4533.
 - 3. Puncture Resistance: 90 lbf; ASTM D4833.
 - 4. Water Flow Rate: 4 gpm per square foot; ASTM D4491.
 - 5. Apparent Opening Size: No. 30; ASTM D4751.

ARDURRA

PART 3 - EXECUTION

3.1 INSPECTION

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

3.2 PREPARATION

- A. Protect structures, utilities, walks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
- B. Protect subgrades and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary.
- C. Notify engineer in writing upon encountering rock and before blasting operations begin.
- D. Provide temporary and/or permanent erosion-control measures as necessary to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties, walkways, roads, streams, lakes, etc.

3.3 DEWATERING

- A. See specification Section 31 23 19 – *Dewatering*.

3.4 EXCAVATION, GENERAL

- A. Classified Excavation: Excavation to subgrade elevations classified as earth.
 - 1. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; and soil, and other materials not classified as unauthorized excavation.

3.5 EXCAVATION FOR WALKS AND PAVEMENTS

- A. Excavate surfaces under walks and pavements to indicated cross sections, elevations, and grades to within plus or minus 0.10 feet.

3.6 EXCAVATION FOR UTILITY TRENCHES

- A. Excavate trenches to indicated gradients, lines, depths, and elevations shown on plans.

ARDURRA

1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.
 2. As the excavation approaches pipes, conduits, and other underground structures, discontinue digging by machinery and excavate using hand tools.
 3. Excavate test pits where necessary to determine the exact location of pipes or other underground structures prior to proceeding with general excavation.
- B. Minimum width of un-sheeted trenches in which pipe is to be laid shall be 18-inches greater than the inside diameter of the pipe, but not less than that required for proper compaction around the pipe. Sheet piling requirements shall be independent of trench widths. The maximum trench width at the top of the pipe zone is limited to 1.33 times the pipe outside diameter plus 18-inches. Excavate trench walls vertically from trench bottom to an elevation 12 inches higher than top of pipe or conduit, unless otherwise indicated.
- C. Where unsuitable material is encountered, excavate to a minimum depth of 6 inches below the required elevation. Backfill and compact to proper subgrade with washed stone (#57) or sand and compact to 90 percent of maximum density as determined by ASTM D698.
- D. Backfill trenches with concrete where excavations pass within 18 inches of column or wall footings, where excavations extend below the bottom of such footings, or where excavations pass under wall footings. Place concrete to the elevation of the bottom of adjacent footings.
- E. Do not backfill trenches until tests and inspections have been completed and backfilling authorized by the Engineer. Use care in backfilling to avoid damage or displacement of pipe systems.
- F. Trench Bottoms (for pipes and conduits not requiring bedding course): Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.
1. For pipes and conduit less than 6 inches in nominal diameter and flat-bottomed, multiple-duct conduit units, hand-excavate trench bottoms and support pipe and conduit on an undisturbed subgrade.
 2. For pipes and conduit 6 inches or larger in nominal diameter, shape bottom of trench to support bottom 90 degrees of pipe circumference. Fill depressions with tamped sand backfill.
 3. Excavate trenches 6 inches deeper than specified elevation when rock or other unyielding and/or unsuitable bearing material is encountered to allow for bedding course.
 4. If the trench is over excavated below the required grade, correct any part of the trench excavated below the grade with crushed stone or Class II backfill as specified herein. Unauthorized over excavation shall be backfilled at no additional cost to the owner.
- G. Trench Bottoms (for pipes and conduits requiring a bedding course): Excavate trenches 4 inches deeper than specified bottom of pipe elevation to allow for bedding course. Hand excavate for bell of pipe.
1. Excavate trenches 6 inches deeper than specified elevation when rock or other unyielding and/or unsuitable bearing material is encountered to allow for bedding

ARDURRA

course. Place the pipe bedding material over the full width of trench in compacted layers not exceeding 6-inches deep to the established grade.

2. If the trench is over excavated below the required grade, correct any part of the trench excavated below the grade with crushed stone or Class II backfill as specified herein. Unauthorized over excavation shall be backfilled at no additional cost to the owner.

H. Trench Within Paved Areas:

1. When trenching across roadways, open only one-half of the road width in order to maintain traffic. When trenching parallel with the roadways, maintain vehicular accessibility for local traffic. Do not leave trench made in the traveled portion of the roadway open overnight.
 2. Exercise utmost care to minimize the width of pavement removed. Avoid indiscriminate removal. Do not permit the pavement to slough off into the excavation. Saw-cut pavement to provide uniform edge. For pipes and conduit less than 6 inches in nominal diameter and flat-bottomed, multiple-duct conduit units, hand-excavate trench bottoms and support pipe and conduit on an undisturbed subgrade.
- I. If pipe is to be placed in embankments or other recently filled material, first place fill to the finished grade or to a height of at least 3 feet above the top of the pipe. Obtain required compaction of fill material prior to trench excavation.

3.7 APPROVAL OF SUBGRADE

- A. Notify Engineer when excavations have reached required subgrade.
- B. If Engineer determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
1. Payment for additional excavation and replacement material will be in accordance with the unit price for Stone Bedding as listed in the Bid Form.
- C. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Engineer.

3.8 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow materials and satisfactory excavated soil materials. Stockpile soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.9 TRENCH BACKFILL

- A. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

ARDURRA

- B. Use Class I (Flowable Fill) backfill where there is less than 24-inch of cover over the pipe for proper protection. Class I is also required when a water main and a sewer cross with less than 18-inches clearance. In this case, encase the sewer line according to the requirements of SCDHEC and The City of Goose Creek.
- C. Class II backfill can be limited to paved streets, driveways and parking lots where final surface replacement will be made shortly after backfilling and subsequent settlement must be held to a minimum. Class II backfill shall also be used under all culverts, water, gas, irrigation, and sewer lines, buried telephone, power and television cable, and any other buried pipelines or cables that cross or parallel the excavated trench.
- D. It is intended that all surfaces for which Class III backfill is specified shall be returned to equal or better condition than that existing prior to construction. Surfaces shall not settle due to normal weathering and settling that can be expected for each area.
- E. Backfill trenches excavated under footings and within 18 inches of bottom of footings; fill with concrete to elevation of bottom of footings.
- F. Provide 4-inch thick, concrete-base slab support for piping or conduit less than 30 inches below surface of roadways. After installing and testing, completely encase piping or conduit in a minimum of 4 inches of concrete before backfilling or placing roadway subbase.
- G. Place and compact initial backfill of subbase material, free of particles larger than 1 inch, to a height of 12 inches over the utility pipe or conduit.
 - 1. Carefully compact material under pipe haunches and bring backfill evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of utility system.
- H. Coordinate backfilling with utilities testing.
- I. Fill voids with approved backfill materials while shoring and bracing, and as sheeting is removed.
- J. Place and compact final backfill of satisfactory soil material to final subgrade.
- K. Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.
- L. In unpaved areas, deposit and compact the remainder of the backfill with mechanical tampers. Deposit layers having a maximum uncompacted thickness of 12 inches in unpaved areas. In areas to be paved or repaved, deposit the entire depth of backfill in layers having a maximum uncompacted thickness of 6 inches, and compact by hand or mechanical tampers to 98 percent maximum density as determined by the Standard Proctor Method ASTM D698.
- M. In areas to be paved, density tests will be performed by a testing laboratory for the purpose of verifying the specified compaction. Frequency of tests will be one for every 100 feet of trench cut, with a minimum of two tests. It is the intent of this specification to secure a condition in which no further settlement of trenches will occur. When backfilling is completed, the roadway base for the pavement replacement may be placed immediately. It will be the responsibility of the Contractor to restore the surface to the original grade wherever settlement occurs.

ARDURRA

- N. Perform trenching, backfilling and compaction within State Highways rights-of-way in accordance with the requirements of the State of South Carolina Department of Transportation Encroachment Permit issued for this project in addition to the requirements of these specifications.
- 3.10 MOISTURE CONTROL
- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within 2 percent of optimum moisture content.
 - 1. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
 - 2. Remove and replace, or scarify and air-dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent or more and is too wet to compact to specified dry unit weight.
- 3.11 COMPACTION OF BACKFILLS AND FILLS
- A. Place backfill and fill materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
 - B. Place backfill and fill materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.
 - C. Compact soil to not less than the following percentages of maximum dry density according to ASTM D698:
 - 1. Under roadway pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill material at 100 percent.
 - 2. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill material at 95 percent.
 - 3. Under lawn or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill material at 90 percent.
 - 4. Under driveway pavements, scarify and recompact top 12 inches of existing subgrade and each layer or backfill or fill material to 98 percent.
 - D. Impact type compactors are suitable. Rubber tired rollers and track type equipment is not suitable and is not allowed for Class II or III backfill. No mechanical equipment is allowed in pipe zone.
 - E. Any subsequent settlement of the finished surfacing during the 1 year warranty period shall be considered to be a result of improper or insufficient compaction and shall be promptly repaired at no cost to The City of Goose Creek.
 - F. The City of Goose Creek, or other agencies having jurisdiction over the work, reserves the right to require the contractor to provide, at his expense, all testing necessary to determine the in-place density and moisture content of the sub-grade and compacted fill according to ASTM D1556. Test results and a certified statement by the soil testing company that the

ARDURRA

actual soil compaction found meets these specifications shall be submitted to The City of Goose Creek as soon as it is available to the Contractor.

3.12 GRADING

- A. General: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
 - 1. Provide a smooth transition between adjacent existing grades and new grades.
 - 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
- B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
 - 1. Lawn or Unpaved Areas: Plus or minus 0.10 feet.
 - 2. Walks: Plus or minus 0.05 feet.
 - 3. Pavements: Plus or minus 0.05 feet.

3.13 SUBBASE AND BASE COURSES

- A. Under pavements and walks, place subbase course on prepared subgrade and as follows:
 - 1. Place base course material over subbase.
 - 2. Compact subbase and base courses at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D698.
 - 3. Shape subbase and base to required crown elevations and cross-slope grades.
 - 4. When thickness of compacted subbase or base course is 6 inches or less, place materials in a single layer.
 - 5. When thickness of compacted subbase or base course exceeds 6 inches, place materials in equal layers, with no layer more than 6 inches thick or less than 3 inches thick when compacted.
- B. Pavement Shoulders: Place shoulders along edges of subbase and base course to prevent lateral movement. Construct shoulders, at least 12 inches wide, of satisfactory soil materials and compact simultaneously with each subbase and base layer to not less than 98 percent of maximum dry density weight according to ASTM D698.

3.14 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent geotechnical engineering testing agency to perform field quality-control testing. Notify testing agency at least 24 hours in advance of requiring testing.
- B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.

ARDURRA

- C. Testing agency will test compaction of soils in place according to ASTM D1556, ASTM D2937, and ASTM D3017, as applicable. Tests will be performed at the following locations and frequencies:
 - 1. Trench Backfill: At each compacted initial and final backfill layer, at least one test for each 150 feet or less of trench length, with a minimum of two tests.
- D. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained.

3.15 PROTECTION

- A. Provide temporary erosion and sediment control measures to prevent the silting of streams and existing drainage facilities.
- B. Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- C. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
 - 1. Scarify or remove and replace soil material to depth as directed by Engineer, reshape and recompact.
- D. Where settling occurs before Project correction warranty period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
 - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible. Saw cut edges of area to be patched, where applicable.

3.16 RESTORATION OF SURFACE IMPROVEMENTS

- A. Restore roadways, including shoulders, alleys and driveways of stabilized soil or gravel, grass plots, sod, shrubbery, ornamental trees, signs, fences, mailboxes, or other surface improvements on public or private property which have been damaged or removed in excavating, to conditions equal or better than the conditions existing prior to beginning work. Seed and mulch shoulders as specified in Section 32 92 19 - *Seeding*.
- B. Compact materials for unpaved roadways, road shoulders, alleys, or driveways, to a minimum of 95 percent of the maximum density as determined by ASTM D698. Include the cost of this work and furnishing new materials in the cost of the applicable items of work as no separate payment will be made, unless a separate bid item is provided.

ARDURRA

3.17 EXCAVATION NEAR EXISTING UTILITIES AND STRUCTURES

- A. Attention is directed to the fact that there may be existing pipe, drains and other utilities in locations along the proposed work.
- B. Where information is available as to the location of existing pipes, drains and other utilities, the approximate locations have been indicated on the drawings; however, the completeness or accuracy of the information given is not guaranteed.
- C. As the excavation approaches pipes, conduits, or other underground structures, discontinue digging by machinery and excavate by means of hand tools. Such manual excavation when incidental to normal excavation is included in the work to be done under items involving normal excavation.
- D. Excavate test pits where necessary to determine the exact location of pipes or other underground structures prior to proceeding with trench excavation. Such test pits are considered as incidental to other excavation.

3.18 PAVEMENT REMOVAL AND REPLACEMENT

- A. Cut all bituminous and concrete pavements, regardless of thickness, and all curbs and sidewalks, prior to excavation of the trenches as specified in the South Carolina Department of Transportation. Width of the pavement cut shall be at least equal to the required width of the trench at ground surface. Pavement cut lines shall be even and parallel. Any ragged or uneven cuts shall be cut smooth before patching. Pavement and concrete materials removed shall be hauled from the site and not used for trench backfill.
- B. Remove asphalt pavement by cutting on a straight line with edges as nearly vertical as possible. Remove concrete pavement or asphaltic concrete pavement by cutting with a concrete saw in as straight line and as nearly vertical as possible. Provide materials to replace State Highway paving that conform to the specifications required by the State of South Carolina Department of Transportation. Provide other asphalt pavement replacement that conforms to the requirements of the applicable Department of Transportation Specifications for Type I asphaltic concrete surface course.
- C. Prior to replacing concrete or asphalt pavement, provide a stabilized gravel or concrete base. The base for concrete or asphalt pavements on state primary roads consists of 10 inches of 3,000 psi concrete (see Standard Details for Type A Pavement Replacement). The base course for concrete or asphalt pavements on state or county secondary roads consists of 6 inches of Type 1 binder (see Standard Details for Type B Pavement Replacement). The base course for concrete or asphalt pavements on private driveways consists of 8 inches of crushed aggregate. (See Standard Details for Type C Pavement Replacement.) Compact stabilized aggregate base courses to a minimum of 100 percent of the maximum density as determined by ASTM D698.
- D. Replace non-asphalt pavement of like material and thickness. Replace asphalt or built-up asphalt pavement with like material or concrete as directed by the Engineer. Where asphalt or built-up asphalt pavement is replaced by concrete, provide a minimum of 6 inches concrete thickness and 6 by 6 No. 6 gauge welded wire fabric reinforcement. Provide 3,000 psi design strength concrete for pavement replacement.

ARDURRA

- E. Install pavement replacement to the thicknesses and dimensions as shown on the drawings or otherwise specified.
- F. Unless base is sealed or other temporary paving applied over areas to be repaved, replace pavement not later than three weeks after completion of backfill.

3.19 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus satisfactory soil and waste material, including unsatisfactory soil, rock, trash, and debris, and legally dispose of it off Owner's property at a NPDES permitted site.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

ARDURRA

SECTION 31 23 19

DEWATERING

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide all labor, materials, equipment, tools, and incidentals required for dewatering activities as specified herein.
- B. This Section includes construction dewatering.
- C. Filter bags may be used during filtering of water for trench dewatering in lieu of sediment traps.

1.2 PERFORMANCE REQUIREMENTS

- A. Dewatering Performance: Design, furnish, install, test, operate, monitor, and maintain dewatering system of sufficient scope, size, and capacity to control ground-water flow into excavations and permit construction to proceed on dry, stable subgrades.
 - 1. Maintain dewatering operations to ensure erosion control, stability of excavations and constructed slopes that excavation does not flood, and that damage to subgrades and permanent structures is prevented.
 - 2. When dewatering open excavations, dewater from outside the structural limits and from a point below the bottom of the excavator.
 - 3. Prevent surface water from entering excavations by grading, dikes, or other means.
 - 4. Accomplish dewatering without damaging existing buildings adjacent to excavation.
 - 5. Provide erosion control devices and temporary sediment basins to detain pumped sediment-laden water and to trap and retain sediment on the construction site.
 - 6. Remove all water during period when concrete is being deposited, when pipe is being laid, during tunneling or jack and bore operations, during the placing of backfill, and at such other times as required for efficient and safe execution of the work.
 - 7. Remove dewatering system if no longer needed.

1.3 SUBMITTALS

- A. Shop Drawings for Information: For dewatering system: show arrangement, locations, and details of wells and well points; locations of headers and discharge lines; and means of discharge and disposal of water.
 - 1. Include layouts of piezometers and flow-measuring devices for monitoring performance of dewatering system.
 - 2. Include a written report outlining control procedures to be adopted if dewatering problems arise.
 - 3. Include shop drawings signed and sealed by the qualified professional engineer responsible for their preparation.

ARDURRA

- B. Photographs or videotape, sufficiently detailed, of existing conditions of adjoining construction and site improvements that might be misconstrued as damage caused by dewatering operations.
- C. Product submittal data when using filter bags.
- D. Record Drawings at Project closeout identifying and locating capped utilities and other subsurface structural, electrical, or mechanical conditions performed during dewatering.
 - 1. Note locations and capping depth of wells and well points.
- E. Submit in accordance with Section 01 33 00 – *Submittal Procedures*.

1.4 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with water disposal requirements of authorities having jurisdiction.
- B. Discuss dewatering in Preconstruction Conference prior to start of construction. See Section 01 31 00 – *Project Management and Coordination* for preconstruction conference requirements.
- C. Professional Engineer Qualifications: Comply with Section 01 40 00 – *Quality Requirements*.

1.5 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Engineer and then only after arranging to provide temporary utility services according to requirements indicated.
- B. Survey adjacent structures and improvements, employing a qualified professional engineer or land surveyor, establishing exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations.
 - 1. During dewatering, regularly resurvey benchmarks, maintaining an accurate log of surveyed elevations for comparison with original elevations. Promptly notify Engineer if changes in elevations occur or if cracks, sags, or other damage is evident in adjacent construction.

PART 2 - PRODUCTS

2.1 FILTER BAGS

- A. The dewatering bag is a non-woven geotextile fabric needle punched to allow clean water to flow out of the bag.

ARDURRA

B. Manufacturer

1. Granite Environmental.
2. US Fabrics.
3. Or approved equal.
4. Use only filter bags appearing on SCDOT approval sheet no. 80.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by dewatering operations.
1. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding site and surrounding area.
 2. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.
- B. Install dewatering system to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

3.2 INSTALLATION

- A. Install dewatering system utilizing wells, well points, or similar methods complete with pump equipment, standby power and pumps, filter material gradation, valves, appurtenances, water disposal, and surface-water controls.
- B. Before excavating below ground-water level, place system into operation to lower water to specified levels. Operate system continuously until drains, sewers, and structures have been constructed and fill materials have been placed, or until dewatering is no longer required.
- C. Provide an adequate system to lower and control ground water to permit excavation, construction of structures, and placement of fill materials on dry subgrades. Install sufficient dewatering equipment to drain water-bearing strata above and below bottom of foundations, drains, sewers, and other excavations.
1. Do not permit open-sump pumping that leads to loss of fines, soil piping, subgrade softening, and slope instability.
- D. Reduce hydrostatic head in water-bearing strata below subgrade elevations of foundations, drains, sewers, and other excavations.

ARDURRA

1. Maintain piezometric water level a minimum of 24 inches below bottom of excavation.
- E. Dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Dispose of water in a manner that avoids inconvenience to others. Provide sumps, sedimentation tanks, and other flow-control devices as required by authorities having jurisdiction.
- F. Provide standby equipment on-site, installed and available for immediate operation, to maintain dewatering on continuous basis if any part of system becomes inadequate or fails. If dewatering requirements are not satisfied due to inadequacy or failure of dewatering system, restore damaged structures and foundation soils at no additional expense to Owner.
 1. Remove dewatering system from Project site on completion of dewatering. Plug or fill well holes with sand or cut off and cap wells a minimum of 36 inches below overlying construction.
- G. Damages: Promptly repair damages to adjacent facilities caused by dewatering operations.

3.3 OBSERVATION WELLS

- A. Provide, take measurements, and maintain at least the minimum number of observation wells or piezometers required to verify that dewatering activities are controlling groundwater below excavations.
- B. Observe and record daily elevation of ground water and piezometric water levels in observation wells.
- C. Repair or replace, within 24 hours, observation wells that become inactive, damaged, or destroyed. Suspend construction activities in areas where observation wells are not functioning properly until reliable observations can be made. Add or remove water from observation-well risers to demonstrate that observation wells are functioning properly.
 1. Fill observation wells, remove piezometers, and fill holes when dewatering is completed.

END OF SECTION

ARDURRA

SECTION 31 25 00

EROSION AND SEDIMENTATION CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide all labor, materials, equipment, tools, and incidentals required to install, maintain, remove and cleanup sediment and erosion control facilities shown on the Drawings, as specified herein, as required by the City of Goose Creek and the South Carolina Department of Environmental Services (SCDES), and as required by the job site conditions.
- B. A Comprehensive Stormwater Pollution Prevention Plan (C-SWPPP) has been prepared by the Engineer for this project. The C-SWPPP will become the basis for the requirements of the On-Site Stormwater Pollution Prevention Plan (OS-SWPPP) that will govern this project. The C-SWPPP is available for review at the Engineer's office.
- C. Section includes:
 - 1. Installation of temporary Best Management Practices (BMPs) to control erosion and stormwater runoff.
 - 2. Installation of permanent BMPs to control erosion and stormwater runoff.
 - 3. Scheduling or staging of various earthwork activities to minimize erosion.
 - 4. Inspections, report preparation and recordkeeping as required by SCDES or local governing agency.

1.2 REFERENCES

- A. "NPDES General Permit for Storm Water Discharges from Construction Activities," South Carolina Department of Health and Environmental Control, January 2021.
- B. "South Carolina DHEC Storm Water Best Management BMP Handbook," South Carolina Department of Health and Environmental Control, August 2005.
- C. "2007 Standard Specifications for Highway Construction," South Carolina Department of Transportation, 2007.

1.3 SUBMITTALS

- A. For land disturbing activities 10 acres or greater, submit contractor certifications in accordance with the requirements of the NPDES General Permit.
- B. Submit an inspection report of all erosion and sediment control BMPs at least once every calendar week in accordance with the requirements of the NPDES General Permit and the approved OS-SWPPP.

ARDURRA

- C. Submit samples and product literature for all materials used for BMPs. Examples of BMP materials may include, but not limited to, silt fence, geotextile fabrics, erosion control blankets, etc.
- D. Submit qualifications and resume for personnel proposed as Certified Erosion Prevention and Sediment Control Inspector (CEPSCI) for the project.

1.4 QUALITY ASSURANCE

- A. Discuss details of erosion and sediment control plan during onsite Preconstruction Conference. See Section 01 31 00 – *Project Management and Coordination* for preconstruction conference requirements.
- B. Comply with “NPDES General Permit for Storm Water Discharges from Construction Activities,” issued by SCDES, January 2013 and/or Qualified Local Program.

1.5 MAINTENANCE

- A. Inspect erosion control Best Management Practices (BMPs) at least once every seven days (every calendar week), or as shown on Drawings, in accordance with the requirements of the NPDES General Permit. The inspections must be conducted by a certified Erosion Prevention and Sediment Control Inspector (CEPSCI) until Notice of Termination (NOT) has been accepted. File the inspection reports in the OS-SWPPP and provide copies of the weekly reports to the Engineer.
- B. Repair and/or replace damaged or ineffective BMPs that are discovered during the weekly inspections within 48 hours.
- C. Remove, and incorporate on the site, or properly dispose of, sediment deposited in BMPs in accordance with the requirements of the NPDES General Permit and as noted on Drawings.

1.6 PROJECT CONDITIONS

- A. OS-SWPPP Storage – The Contractor will maintain a copy of the approved OS-SWPPP on the construction site at all times in an all-weather permit box. Update the OS-SWPPP and modify as appropriate, including placement of additional BMPs if it is determined during the weekly inspections that the OS-SWPPP is ineffective. Modify the OS-SWPPP in consultation with the Engineer and in accordance with the approved NPDES permit.
- B. Rain Gauge – The Contractor will maintain an on-site rain gauge at the construction site to record rainfall records from any significant rainfall event, 0.5 inches or greater. These recorded rainfall amounts must be maintained in the Rain Log located in the OS-SWPPP. Rainfall records for the day of an inspection and any significant rainfall events since the last inspection must be reported on each weekly inspection report.
- C. Inspector Qualifications – The Contractor is to provide for weekly inspections. The inspector must possess certification through a Construction Site Inspector Certification Course that has been approved by DHEC. Inspections may also be conducted by a person with professional registration equivalent to the registration of the preparer of the OS-SWPPP (Licensed PE). The qualified inspector may NOT be a direct employee of the Contractor responsible for the activity covered by the inspection.

ARDURRA

- D. Record Keeping - A record of each inspection and of any actions taken in accordance with the inspections must be retained as part of the OS-SWPPP for at least three years from the date that permit coverage expires or is terminated. The inspection report must be signed by the qualified inspector. Copies of required inspection and logs are included at the end of this Section.

PART 2 - PRODUCTS

2.1 SILT FENCING

- A. Comprised of a geotextile fabric supported on a steel wire mesh barrier supported by steel posts.
- B. Filter Fabric:
 - 1. Manufacturer:
 - a. Geotex 2130.
 - b. TerraTex SF-90.
 - c. Or approved equal.
 - 2. Only use filter fabric appearing on SCDOT approval sheet number 34.
 - 3. Pervious sheet of synthetic polymer filaments forming a stable network of fibers retaining their relative position.
 - 4. Use only filter fabric of the type recommended by its manufacturer for the application of silt fences.
- C. Posts:
 - 1. Steel posts: Standard "T" section post, at least 4 feet in length; approximately 1-3/8 inches wide measured parallel to the fence and having a minimum weight of 1.25 pounds per foot of length. Equip with an anchor plate having a minimum area of 17.0 square inches and having a means of retaining wire and fabric in the desired position without displacement.
 - 2. Larger posts or reduced post spacing may be required to provide an adequate fence to handle the stress from sediment loading.
- D. Woven Wire Fence:
 - 1. Conform to the requirements of ASTM A116, Class 1 zinc coating for wire.
 - 2. Minimum wire height of 32 inches.
 - 3. 6-inch by 6-inch wire mesh.
 - 4. Top and bottom wires minimum of 10 gauge.
 - 5. All other wires minimum of 12 gauge.
- E. Plastic Ties: Use heavy duty plastic ties that are evenly spaced and installed in a manner to prevent sagging or tearing of the fabric. In all cases, ties should be affixed in no less than four (4) places.

ARDURRA

2.2 SEDIMENT TUBES

A. Non-Weighted Sediment Tubes:

1. Manufacturer:
 - a. SlopeGard 1 SC-FR2010.
 - b. Aspen Excelsior.
 - c. Curlex.
 - d. Or approved equal.
2. Only use non-weighted sediment tubes appearing on SCDOT approval sheet number 57.
3. Elongated tubes of compacted geotextiles, curled excelsior wood, natural coconut fiber or hardwood mulch. Straw, pine needle, and leaf mulch-filled tubes are not permitted.
4. Consult with manufacturer for specific application.

B. Weighted Sediment Tubes:

1. Manufacturer:
 - a. SlopeGard 3.
 - b. Or approved equal.
2. Only use weighted sediment tubes appearing on SCDOT approval sheet number 58.
3. Weighted, elongated tubes of compacted geotextiles, curled excelsior wood, natural coconut fiber or hardwood mulch. Straw, pine needle, and leaf mulch-filled tubes are not permitted.
4. Consult with manufacturer for specific application.

2.3 GEOTEXTILE FILTER FABRIC

A. Geotextile Filter Fabric:

1. For subsurface drainage or material separation:
 - a. Manufacturer:
 - 1) Mirafi 140NC.
 - 2) Or approved equal.
 - b. Only use filter fabric appearing on SCDOT approval sheet number 44.
 - c. Consult with manufacturer for specific application.
2. For soil stabilization on Paved and Unpaved Roadways:
 - a. Manufacturer:
 - 1) Propex GEOTEX.
 - 2) Or approved equal.
 - b. Only use filter fabric appearing on SCDOT approval sheet number 44.

ARDURRA

- c. Consult with manufacturer for specific application.

B. Staples:

1. Biodegradable staples.
2. Bio-Stake.
3. E-Staple.
4. Or approved equal.
5. Provide size and style recommended by manufacturer for intended application.

2.4 EROSION CONTROL BLANKETS AND TURF REINFORCEMENT MATTING

A. Erosion Control Blankets: (ECBs)

1. For temporary stabilization of ditches:
 - a. Manufacturer:
 - 1) Curlex II.
 - 2) North American Green-C125.
 - 3) Propex-LANDLOK or Pyramat.
 - 4) Or approved equal.
 - b. Only use ECBs appearing on SCDOT approval sheet number 55.
 - c. Consult with manufacturer for specific application.
2. For temporary slope and embankment stabilization:
 - a. Manufacturer:
 - 1) Curlex II.
 - 2) Propex-LANDLOK.
 - 3) Or approved equal.
 - b. Only use ECBs appearing on SCDOT approval sheet number 55.
 - c. Consult with manufacturer for specific application.
3. Installation:
 - a. Install blankets in parallel with the slope.
 - b. Overlap blankets 6 inches on the sides.
 - c. If a break must be used on the slope, blankets should overlap 1 foot.
 - d. The slope must not exceed a slope of 2H:1V.

B. Turf Reinforcement Matting: (TRMs)

1. For moderate slopes < 2H:1V:
 - a. Manufacturer:
 - 1) North American Green SC 250.

ARDURRA

- 2) North American Green P300.
 - 3) Propex-LANDLOK TRM 435.
 - 4) Or approved equal.
 - b. Only use TRMs appearing on SCDOT approval sheet number 56.
 - c. Consult with manufacturer for specific application.
 2. For steep slopes > 2H:1V:
 - a. Manufacturer:
 - 1) Propex-LANDLOK TRM 450.
 - 2) Propex-LANDLOK TRM 1060.
 - 3) Or approved equal.
 - b. Only use TRM's appearing on SCDOT approval sheet number 56.
 - c. Consult with manufacturer for specific application.
- C. Staples:
1. Biodegradable staples.
 2. Bio-Stake.
 3. E-Staple.
 4. Or approved equal.
 5. Provide size and style recommended by manufacturer for intended application.
- ### 2.5 INLET PROTECTION
- A. Low flow, Filter Fabric: Type A
1. Use steel "T" post at least 42 inches in length.
 2. Bury posts to a depth of 2 feet around inlet.
 3. Wrap the post with 3 feet of filter fabric and bury minimum one foot to avoid undermining.
 4. Avoid any seams in the filter fabric.
 5. See Geotextile Filter Fabric section for approved manufacturers.
- B. Low flow, Weighted Sediment Tube: Type A
1. Use weighted sediment tubes to completely surround inlet.
 2. Overlap ends of sediment tubes 1 foot to avoid having seams accessible to sediment.
 3. If used in asphalt, steel posts are not required.
 4. See Section 2.2.B for approved manufacturers.
- C. High flow, High Velocity: Type D
1. Type D1 for above ground applications:
 - a. Manufacturer:
 - 1) Silt-Saver, Inc.
 - 2) Or approved equal.

ARDURRA

- b. Only use inlet protection appearing on SCDOT approval sheet number 58.
 - c. Consult with manufacturer for specific application.
 - 2. Type D2 for sump applications:
 - a. Manufacturer:
 - 1) Silt-Saver, Inc.
 - 2) Or approved equal.
 - b. Only use inlet protection appearing on SCDOT approval sheet number 58.
 - c. Consult with manufacturer for specific application.
 - D. Curb Inlets, Weighted Sediment Tube: Type F
 - 1. Use weighted sediment tubes to completely cover inlet.
 - 2. Overlap ends of sediment tubes 1 foot to avoid having seams accessible to sediment.
 - 3. See Section 2.2.B for approved manufacturers.
- 2.6 CONSTRUCTION ENTRANCE
- A. Construction Entrance Installation:
 - 1. Install filter fabric on top of the existing ground. See filter fabric Section for approved manufacturers.
 - 2. The minimum dimensions of the filter fabric are 100 feet by 24 feet.
 - 3. Install 2 to 3 inch D₅₀ aggregate on top of filter fabric at a minimum depth of 6 inches.
 - 4. Install mountable berm parallel to existing pavement at end of entrance.
 - 5. At a minimum, the berm must be 3 feet wide at the top and have a slope of 1H:5V.
- 2.7 PERMANENT DETENTION PONDS
- A. Construction of permanent detention ponds for sediment and stormwater run-off control include construction of the dam, primary spillway, outlet control structure, emergency spillway, sediment forebays, porous baffles, skimmers, excavation for storage, fencing, seeding, erosion protection of outlet, removal and disposal of sediment.
 - 1. Sediment Forebays:
 - a. Constructed of riprap wall along the outlet side of the forebay.
 - b. Provide riprap for inlet and outlet per drawings and Specification Section 31 37 00 - *Riprap*.
 - 2. Porous Baffles:
 - a. Use 100 percent coconut fiber (coir) twine matting woven into a high strength matrix with the following properties:
 - 1) Thickness: 0.30 inch minimum
 - 2) Tensile Strength(Wet): 900 by 680 pound per foot minimum
 - 3) Elongation(Wet): 69 percent by 34 percent maximum

ARDURRA

- 4) Flow Velocity: 10 to 12 feet per second
 - 5) Weight: 20 ounce per square yard (680 g/m²) minimum
 - 6) Minimum Width: 6.5 feet
 - 7) Open Area: 50 percent maximum
- b. Staples should be made of 0.125 inch diameter new steel wire formed into a 'U' shape not less than 12 inches in length with a throat of 1 inch in width. The staples anchor the porous baffles into the sides and bottom of the basin.
 - c. Ensure that steel posts for porous baffles are of a sufficient height to support baffles at desired height based on grades and elevations.
 - 1) Posts should be approximately 1-3/8 inches wide measured parallel to the fence, and have a minimum weight of 1.25 pound per linear foot.
 - 2) The posts must be equipped with an anchor plate having a minimum area of 14.0 square inches and be of the self-fastener angle steel type to have a means of retaining wire and coir fiber mat in the desired position without displacement.
 - d. Use 9-gauge high tension wire for support wire.
 - e. Only use porous baffles appearing on SCDOT approval sheet number 83.
 - f. Consult with manufacturer for specific application.
3. Skimmers:
- a. Manufacturers:
 - 1) Faircloth Skimmer.
 - 2) Or approved equal.
 - b. Only use skimmers appearing on SCDOT approval sheet number 82.
 - c. Consult with manufacturer for specific application.
- B. Provide As-Built survey for all permanent structures prepared by surveyor licensed in the State of South Carolina.

2.8 TEMPORARY SEDIMENT TRAPS

- A. Temporary sediment traps include initial construction, maintenance, final removal and stabilization of area.

2.9 ROCK DITCH CHECK

- A. Comprised of hand placed stone of various sizes on geotextile filter fabric installed on slopes to slow down run-off.
- B. Install 1-inch stone on upstream side of ditch check as shown on drawings. Place riprap on downstream side of ditch check. See Section 31 37 00 - *Riprap*.
- C. See filter fabric Section 2.3 for approved manufacturers.

ARDURRA

2.10 STONE

- A. Filter stone - Gradation 67 as specified in ASTM C33 installed over filter fabric from Section 2.3.
- B. Line Flushing stone - SCDOT No. 1 coarse aggregate installed over filter fabric from Section 2.3.
- C. Outlet Protection stone - SCDOT No. 1 coarse aggregate installed over filter fabric from Section 2.3.

2.11 PIPE SLOPE DRAINS

- A. Provide a compacted berm along the top of the embankment and grade swales or diversions to direct the stormwater runoff to the pipe inlet.
- B. Use non-perforated corrugated plastic pipe for temporary pipe slope drains.
- C. Install wooden or steel hold down stakes firmly to the pipe slope drain. The maximum spacing of the stakes is 10 feet.
- D. Provide a level section of pipe at the bottom of the embankment and stabilize the outlet to reduce the discharge velocity.

2.12 TEMPORARY STREAM CROSSING

- A. Provide rock for stream crossings that is clean with a D50 of 6-inches or greater. Install the rock to the depth and limits shown on the drawings. Adjust the depth as needed to achieve the desired crossing elevation.
- B. Provide pipes perpendicular to the crossing to provide flow past the crossing. The minimum pipe size should be 24-inch with a maximum spacing of 25 feet. The pipe size and spacing should be adjusted based on the stream flow. The pipe material should be chosen based on the heaviest anticipated load on the crossing. Use pipe manufacturer's recommendation for bedding and loading design.

2.13 LEVEL SPREADER

- A. Construct on undisturbed areas that are stabilized with existing vegetation and where concentrated flows are anticipated to occur.
- B. Provide turf reinforcing mat (TRM) which is capable of withstanding 5 pounds per foot shear stress at the lip of the level spreader.

ARDURRA

PART 3 - EXECUTION

3.1 TERRACING

- A. Construct permanent berms and terracing to allow mowing and harvesting equipment to easily traverse the land. Construct all terraces or berms in a manner that will not reduce the minimum earth cover over pipes and structures as required.

3.2 DIVERSIONS

- A. Construct temporary channels as required to divert water away from work areas and/or to collect and divert run-off from work areas to sediment traps.

3.3 SILT FENCING

- A. Silt fences may be used to trap sediment from areas of limited run-off. Sediment fences are temporary and should be removed once ground cover is permanently stabilized.

3.4 SEDIMENT TUBES AND ROCK DITCH CHECKS

- A. Sediment tubes and rock ditch checks may be used in drainage conveyance swales to reduce effects of soil erosion and retain sediment. Sediment tubes and rock ditch checks should be removed after ground cover is permanently stabilized. Provide stabilization to bare areas after BMP removal.

3.5 EROSION CONTROL BLANKETS AND TURF REINFORCEMENT MATTING

- A. Where slopes require protection beyond that of mulching, provide erosion control blankets for gentle slopes and turf reinforcement matting for moderate slopes.
- B. Roll out the fabric down the slope with check trenches installed to prevent washout under the fabric.
- C. Install according to manufacturer's recommendations.

3.6 INLET PROTECTION

- A. Inlet protection should be used to trap sediment and prevent sediment from entering storm drainage structures.

3.7 CONSTRUCTION ENTRANCE

- A. Construction entrances are used to remove mud from vehicle tires before entering the roadway.

3.8 PERMANENT DETENTION PONDS

- A. Permanent detention ponds should be installed as shown on the drawings. The size of the pond is for a specific storm event and is not adjustable.

ARDURRA

1. Sediment Forebays:

- a. Forebays (sumps) should be installed as shown in the details and drawings.

2. Porous Baffles:

- a. Install posts across the width of the sediment trap per manufacturer's recommendations and drawings.
- b. Steel posts should be driven to a depth of 24 inches and spaced a maximum of 4 feet apart.
- c. The top of the fabric should be a minimum of 6 inches higher than the invert of the spillway. Tops of baffles should be a minimum of 2 inches lower than the top of the earthen embankment.
- d. Install at least three (3) rows of baffles between the inlet and outlet discharge point. Basins less than 20 feet in length may use two (2) baffles.
- e. Attach a 9-gauge high tension wire strand to the steel posts at a height of 6 inches above the spillway elevation with plastic ties or wire fasteners to prevent sagging.
- f. Extend 9-gauge minimum high tension wire strand to side of basin or install steel T-posts to anchor baffle to side of basin and secure to vertical end posts mounted at a height of 6 inches above the spillway elevation.
- g. Install the coir fiber mat over the wire strand. Secure the coir fiber mat to the wire strand with plastic ties or wire fasteners.
- h. Anchor the matting to the sides and floor of the basin with 12-inch wire staples, approximately 1 foot apart, along the bottom and side slopes of the basin.
- i. Do not splice the fabric. Use a continuous piece across the basin.
- j. If the temporary sediment basin will be converted to a permanent stormwater basin of a greater depth, the baffle height should be based on the pool depth during use as a temporary sediment basin.
- k. Inspect baffles at least once a week and after each rainfall. Make any required repairs immediately. Remove sediment deposits when it reaches half full, to provide adequate storage volume for the next rain and to reduce pressure on the baffles.

3. Skimmers:

- a. Install skimmer or other approved equivalent device according to manufacturer recommendations.
- b. Install 4 inches Schedule 40 PVC pipe into dam on the lower side of basin 1 foot from the bottom of the basin and according to the manufacturer's recommendations, and extend the pipe so the basin will drain.
- c. Attach a 6-foot arm pipe to the coupling connection and Faircloth skimmer according to manufacturer recommendations.
- d. Attach the rope to the skimmer tee between the vent socket and the tube inlet, and the other end to a wooden stake or metal post. This will aid in cleaning out skimmer device when it becomes clogged with sediment and/or debris and is unable to float at the top of water in skimmer basin.

3.9 TEMPORARY SEDIMENT TRAPS

- A. A sediment trap is designed to capture sediment from stormwater run-off before it leaves a construction site. Seed and mulch bare areas after removal.

ARDURRA

3.10 PIPE SLOPE DRAINS

- A. Pipe slope drains are temporary installations that reduce the risk of erosion by discharging concentrated runoff from the top to the bottom of slopes.
- B. Other BMPs such as tracking, ECBs, and TRMs should be used with pipe slope drains to further protect the slope.

3.11 TEMPORARY STREAM CROSSINGS

- A. Closely follow the environmental permits governing this portion of work.
- B. Remove all portions of the crossing at the end of the project.

3.12 LEVEL SPREADER

- A. Construct on undisturbed areas that are stabilized with existing vegetation and where concentrated flows are anticipated to occur.
- B. Ensure crest of level spreader overflow has a continuous 0 percent grade to ensure that uniform spreading of runoff can be achieved. If there is a depression in the lip, flow will have a tendency to concentrate at this point causing erosion and failure of the level spreader.
- C. Install turf reinforcing mat (TRM) such that it extends 10 feet below the lip of the level spreader and 12 inches beyond the lip on the outside of the spreader. TRM should be buried at least 6 inches within the spreader.
- D. Install spreader for flows anticipated from a 10-year, 24-hour design storm.
 - 1. Minimum width: 6-feet
 - 2. Minimum uniform depth: 0.5 feet
 - 3. Maximum flow into spreader: 30 cfs
 - 4. Maximum outlet slope: 10 percent
 - 5. Maximum inlet transition slope 20 feet before entering level spreader: 1 percent

3.13 DUST CONTROL

- A. Utilize dust control methods whenever there is potential for offsite impacts, especially during periods of drought. Implement dust control until final stabilization is reached.
- B. Methods to limit dust control may include the following:
 - 1. Phasing the Project.
 - 2. Installing temporary or permanent vegetation.
 - 3. Mulch.
 - 4. Sprinkled water application.
 - 5. Other methods as approved by Engineer.

ARDURRA

3.14 INSTALLATION

- A. Provide Best Management Practices (BMPs) as specified herein, as shown on the Drawings, as required by the SCDES and as required by job site conditions and weather.
- B. Provide facilities or other temporary devices and perform work necessary to control soil erosion and minimize the production of water-borne sediment and wind-blown dust and soil during, and as a result of, construction operations.

3.15 PROTECTION

- A. Permanently stabilize the project area affected by construction. See Section 32 92 19 – *Seeding* for permanent grassing.
- B. Maintain such temporary measures and practices as necessary until the drainage area has been permanently stabilized and completion of the project.
- C. Linear projects should install permanent stabilization measures as soon as practicable after the facilities are installed.

3.16 SCHEDULES

- A. Schedule or stage the various earthwork activities so that the smallest possible areas will be unprotected from erosion for the shortest time feasible.
- B. For sites disturbing more than 5 acres, the OS-SWPPP will contain a phased erosion prevention and sediment control plan. Sites that disturb 5 to 10 acres will be two phases. Sites that disturb greater than 10 acres will be three phases.

3.17 HOUSE KEEPING

- A. Pre-Construction Conferences:
 - 1. A pre-construction conference will be held onsite prior to any land disturbing activities to discuss the details of erosion and sediment control plan. See Section 01 31 00 – *Project Management and Coordination* for preconstruction conference requirements.
- B. Onsite Records:
 - 1. Onsite records must remain onsite at all times and include but are not limited to:
 - a. Approved On-Site Stormwater Pollution Prevention Plan for Construction Activities (OS-SWPPP).
 - b. Copy of the Construction General Permit.
 - c. Signed and accepted Notice of Intent.
 - d. Coverage letters.
 - e. Local Permits (MS4, Encroachment, etc.).
 - f. USACOE approvals.
 - g. DHEC 0437 Contractor Certification Form.
 - h. DHEC 0436 Pre-Construction Conference Certification Form.

ARDURRA

C. Operator Certifications:

1. Copies of all operator certifications must be present onsite at all times.

D. Site Logs:

1. A copy of all OS-SWPPP required logs must be kept on site at all times. These documents include:
 - a. Rainfall Logs.
 - b. Inspection Forms.
 - c. Inspection/Maintenance Logs.
 - d. Contractor & Sub-Contractor Logs.
 - e. Pre-Construction Conference Attendance Logs.
 - f. OS-SWPPP Modification Logs.
 - g. Soil Stabilization Logs.
2. An example copy of each log is attached in Schedule A following this Specification Section.

E. Notice of Termination:

1. A Notice of Termination (NOT) must be submitted to the SCDES or the local MS4 prior to the completion of the project. The NOT will be approved once the site has been permanently stabilized at 70 percent coverage.
2. The NOT must include any permanent maintenance agreements required for the operation of the completed project.

END OF SECTION

ARDURRA

S C H E D U L E A

SAMPLE LOGS AND REPORTS

1. OS-SWPPP Inspection Form
2. OS-SWPPP Inspection Log
3. OS-SWPPP Contractor & Sub-Contractor Log
4. OS-SWPPP Pre-Construction Conference Attendance Log
5. OS-SWPPP Modification Log
6. OS-SWPPP Soil Stabilization Log
7. OS-SWPPP Rainfall Log
8. DHEC 0437 – Contractor Certification Form
9. DHEC 0436 – Pre-Construction Conference Certification Form

EROSION PREVENTION AND SEDIMENT CONTROL SITE INSPECTION FORM

DATE: _____ INSPECTOR NAME: _____ QUALIFICATIONS: _____

PROJECT DATA

Project Name: _____ Project No: _____ NPDES Permit # _____

Contractor Name: _____

On-site Responsible Person (if applicable): _____

Rain Gauge Location: _____

Weather: _____ Temperature: _____ Rainfall: _____

Notice of Intent Filed ☐ Yes ☐ No _____ (date)

Pre-construction Inspection ☐ Yes ☐ No _____ (date)

Pre-construction Conference ☐ Yes ☐ No _____ (date)

☐ Yes ☐ No Do the SWPPP inspection logs show inspections every 7 calendar days?

☐ Yes ☐ No Do the SWPPP inspection logs show that maintenance has been performed regarding any deficiencies?

PROJECT INITIATION

☐ Yes ☐ No Is this a Phased Construction Project?

Phase of Construction _____

☐ Yes ☐ No Are perimeter control BMPs functioning? Describe performance issues below.

Notes:

☐ Yes ☐ No ☐ NA Detention/sediment basin installed as the first land disturbing activity if applicable?

☐ Yes ☐ No Are Litter, Debris, Fuel Oils, and Portable Restrooms properly addressed on site?

EROSION PREVENTION

☐ Yes ☐ No Is construction following the construction sequence for the appropriate phase of construction?

☐ Yes ☐ No Are Erosion Prevention measures located in the proper places?

☐ Yes ☐ No Are Erosion Prevention measures installed correctly?

☐ Yes ☐ No Are Erosion Prevention measures protecting disturbed areas?

Notes:

If Erosion Prevention measures are protecting disturbed areas, what are the types of protection:

- | | | | |
|--|--|---|--|
| <input type="checkbox"/> Surface Roughening | <input type="checkbox"/> Outlet Protection | <input type="checkbox"/> Sodding | <input type="checkbox"/> Riprap |
| <input type="checkbox"/> Topsoiling | <input type="checkbox"/> Bench Terracing | <input type="checkbox"/> Seeding | <input type="checkbox"/> Hydro-seeding |
| <input type="checkbox"/> Ground Cover Plants | <input type="checkbox"/> Mulching | <input type="checkbox"/> Clearwater Diversion | <input type="checkbox"/> Stream Bank Stabilization |
| <input type="checkbox"/> Temporary Stabilization | <input type="checkbox"/> Berms | <input type="checkbox"/> Sediment Logs | <input type="checkbox"/> Gravel |
| <input type="checkbox"/> Polyacrylamide (PAM) | <input type="checkbox"/> Other _____ | | |

☐ Yes ☐ No ☐ NA Are drainage conveyances stabilized with vegetation and/or a channel lining if applicable?

☐ Yes ☐ No ☐ NA Are previously stabilized areas being maintained if applicable?

☐ Yes ☐ No ☐ NA Has activity on the site been temporarily ceased for 14 days or more?

☐ Yes ☐ No ☐ NA If activity has ceased for 14 days, have temporary stabilization measures been installed?

☐ Yes ☐ No Photo Documentation

SEDIMENT CONTROL

- ☐ Yes ☐ No ☐ NA Are Sediment Control practices located properly?
☐ Yes ☐ No ☐ NA Are Sediment Control practices installed properly?
☐ Yes ☐ No ☐ NA Are all soil stockpiles adequately contained?
☐ Yes ☐ No ☐ NA Are Sediment Control measures protecting off site areas?

If Sediment Control measures are protecting off site areas, what are the types of protection:

- ☐ Sediment Pond ☐ Sediment Trap ☐ Silt Fence ☐ Ditch Check
☐ Inlet Protection ☐ Vegetated Filter Strips ☐ PAM ☐ Sediment Berms/Dikes
☐ Sediment Tubes ☐ Pond Forebay ☐ Pond Dewatering ☐ Level Spreader
☐ Other _____

Notes:

- ☐ Yes ☐ No Photo Documentation
☐ Yes ☐ No Are any additional Erosion Prevention or Sediment Control practices required?
☐ Yes ☐ No Are any corrective actions required to on-site or perimeter practices? If yes, fully describe in NOTES section below

BUFFER ZONES / OFFSITE IMPACTS

- ☐ Yes ☐ No Is the Buffer appropriately marked?
☐ Yes ☐ No Are BMP's installed in streams or active channels?
If Yes, have them removed unless specified on the plans and check for permits.
☐ Yes ☐ No Is there evidence of work outside the limits of the approved plan?
☐ Yes ☐ No ☐ NA Is construction being de-watered properly if applicable?

Are there off-site impacts? ☐ Yes ☐ No If yes, provide exact location and complete details in NOTES section below.

- | | | | |
|--|-------------------------------|----------------------------------|---|
| <input type="checkbox"/> Waterbody | <input type="checkbox"/> None | <input type="checkbox"/> Minimal | <input type="checkbox"/> Requires Maintenance |
| <input type="checkbox"/> Roadway | <input type="checkbox"/> None | <input type="checkbox"/> Minimal | <input type="checkbox"/> Requires Maintenance |
| <input type="checkbox"/> Adjacent Property | <input type="checkbox"/> None | <input type="checkbox"/> Minimal | <input type="checkbox"/> Requires Maintenance |
| <input type="checkbox"/> Air/Dust | <input type="checkbox"/> None | <input type="checkbox"/> Minimal | <input type="checkbox"/> Requires Maintenance |
| <input type="checkbox"/> Storm Sewer | <input type="checkbox"/> None | <input type="checkbox"/> Minimal | <input type="checkbox"/> Requires Maintenance |

Maintenance Notes:

- ☐ Yes ☐ No Photo Documentation

COMPLIANCE / CORRECTIONS

- ☐ Yes ☐ No Does the SWPPP need modifications as a result of this inspection? Describe Below:

- ☐ Yes ☐ No ☐ NA Have the proper actions been taken regarding previous deficiencies?

What, if any, activities are required as a result of this inspection?

- | | |
|--|--------------------|
| <input type="checkbox"/> No action | Description: _____ |
| <input type="checkbox"/> Maintenance | _____ |
| <input type="checkbox"/> Notice of violation | _____ |
| <input type="checkbox"/> Stop work order | _____ |

Compliance Date: _____

FINAL STABILIZATION

- ☐ Yes ☐ No Have all land disturbing activities at the site ceased?
- ☐ Yes ☐ No Are there any areas of active erosion evident?
- ☐ Yes ☐ No Is there perennial vegetative cover with a density of at least 70% of cover established for the area **OR** have equivalent measures such as mulches, sediment logs, etc. been employed?
- ☐ Yes ☐ No Photo Documentation

ADDITIONAL NOTES

SWPPP Inspection Log

Name of Construction Site		Location of Construction Site				
Date of Inspection	Inspector Name	Does Inspection Report require maintenance of installed BMPs?		Description of Maintenance	Problem Solved?	
		<input type="checkbox"/> Yes	<input type="checkbox"/> No		<input type="checkbox"/> Yes	<input type="checkbox"/> No
		<input type="checkbox"/> Yes	<input type="checkbox"/> No		<input type="checkbox"/> Yes	<input type="checkbox"/> No
		<input type="checkbox"/> Yes	<input type="checkbox"/> No		<input type="checkbox"/> Yes	<input type="checkbox"/> No
		<input type="checkbox"/> Yes	<input type="checkbox"/> No		<input type="checkbox"/> Yes	<input type="checkbox"/> No
		<input type="checkbox"/> Yes	<input type="checkbox"/> No		<input type="checkbox"/> Yes	<input type="checkbox"/> No
		<input type="checkbox"/> Yes	<input type="checkbox"/> No		<input type="checkbox"/> Yes	<input type="checkbox"/> No
		<input type="checkbox"/> Yes	<input type="checkbox"/> No		<input type="checkbox"/> Yes	<input type="checkbox"/> No
		<input type="checkbox"/> Yes	<input type="checkbox"/> No		<input type="checkbox"/> Yes	<input type="checkbox"/> No
		<input type="checkbox"/> Yes	<input type="checkbox"/> No		<input type="checkbox"/> Yes	<input type="checkbox"/> No
		<input type="checkbox"/> Yes	<input type="checkbox"/> No		<input type="checkbox"/> Yes	<input type="checkbox"/> No
		<input type="checkbox"/> Yes	<input type="checkbox"/> No		<input type="checkbox"/> Yes	<input type="checkbox"/> No
		<input type="checkbox"/> Yes	<input type="checkbox"/> No		<input type="checkbox"/> Yes	<input type="checkbox"/> No

SWPPP Contractor & Sub-Contractor Log

Name of Construction Site		Location of Construction Site	
Company/Individual Name		Work Responsibilities	
1.)			
	Start Date:		
	Completion Date:		
2.)			
	Start Date:		
	Completion Date:		
3.)			
	Start Date:		
	Completion Date:		
4.)			
	Start Date:		
	Completion Date:		
5.)			
	Start Date:		
	Completion Date:		
6.)			
	Start Date:		
	Completion Date:		
7.)			
	Start Date:		
	Completion Date:		
8.)			
	Start Date:		
	Completion Date:		
9.)			
	Start Date:		
	Completion Date:		
10.)			
	Start Date:		
	Completion Date:		

SWPPP Contractor & Sub-Contractor Log (Continued)		
Company/Individual Name		Work Responsibilities
11.)		
	Start Date:	
	Completion Date:	
12.)		
	Start Date:	
	Completion Date:	
13.)		
	Start Date:	
	Completion Date:	
14.)		
	Start Date:	
	Completion Date:	
15.)		
	Start Date:	
	Completion Date:	
16.)		
	Start Date:	
	Completion Date:	
17.)		
	Start Date:	
	Completion Date:	
18.)		
	Start Date:	
	Completion Date:	
19.)		
	Start Date:	
	Completion Date:	
20.)		
	Start Date:	
	Completion Date:	
21.)		
	Start Date:	
	Completion Date:	

SWPPP Pre-Construction Conference Attendance Log

[illegible]

SWPPP Pre-Construction Conference Attendance Log (Continued)

[illegible]

SWPPP Modification Log

Name of Construction Site		Location of Construction Site	
Type of Modification		Description of Modification	Location of Modification
<input type="checkbox"/> Major	<input type="checkbox"/> Minor		
Start Date:			
Completion Date:			
Reason for Modifications:		Approved/Implemented By:	
Type of Modification		Description of Modification	Location of Modification
<input type="checkbox"/> Major	<input type="checkbox"/> Minor		
Start Date:			
Completion Date:			
Reason for Modifications:		Approved/Implemented By:	
Type of Modification		Description of Modification	Location of Modification
<input type="checkbox"/> Major	<input type="checkbox"/> Minor		
Start Date:			
Completion Date:			
Reason for Modifications:		Approved/Implemented By:	
Type of Modification		Description of Modification	Location of Modification
<input type="checkbox"/> Major	<input type="checkbox"/> Minor		
Start Date:			
Completion Date:			
Reason for Modifications:		Approved/Implemented By:	
Type of Modification		Description of Modification	Location of Modification
<input type="checkbox"/> Major	<input type="checkbox"/> Minor		
Start Date:			
Completion Date:			
Reason for Modifications:		Approved/Implemented By:	
Type of Modification		Description of Modification	Location of Modification
<input type="checkbox"/> Major	<input type="checkbox"/> Minor		
Start Date:			
Completion Date:			
Reason for Modifications:		Approved/Implemented By:	

SWPPP Modification Log (Continued)

Name of Construction Site		Location of Construction Site	
Type of Modification		Description of Modification	Location of Modification
<input type="checkbox"/> Major	<input type="checkbox"/> Minor		
Start Date:			
Completion Date:			
Reason for Modifications:		Approved/Implemented By:	
Type of Modification		Description of Modification	Location of Modification
<input type="checkbox"/> Major	<input type="checkbox"/> Minor		
Start Date:			
Completion Date:			
Reason for Modifications:		Approved/Implemented By:	
Type of Modification		Description of Modification	Location of Modification
<input type="checkbox"/> Major	<input type="checkbox"/> Minor		
Start Date:			
Completion Date:			
Reason for Modifications:		Approved/Implemented By:	
Type of Modification		Description of Modification	Location of Modification
<input type="checkbox"/> Major	<input type="checkbox"/> Minor		
Start Date:			
Completion Date:			
Reason for Modifications:		Approved/Implemented By:	
Type of Modification		Description of Modification	Location of Modification
<input type="checkbox"/> Major	<input type="checkbox"/> Minor		
Start Date:			
Completion Date:			
Reason for Modifications:		Approved/Implemented By:	
Type of Modification		Description of Modification	Location of Modification
<input type="checkbox"/> Major	<input type="checkbox"/> Minor		
Start Date:			
Completion Date:			
Reason for Modifications:		Approved/Implemented By:	

SWPPP Soil Stabilization Log

Name of Construction Site		Location of Construction Site	
Type of Stabilization		Description of Stabilization	Location of Stabilization
<input type="checkbox"/> Final	<input type="checkbox"/> Temporary		
Initiate Date:			
Completion Date:			
Additional work proposed for this area:		Inspection Frequency for Stabilized Area:	
Type of Stabilization		Description of Stabilization	Location of Stabilization
<input type="checkbox"/> Final	<input type="checkbox"/> Temporary		
Initiate Date:			
Completion Date:			
Additional work proposed for this area:		Inspection Frequency for Stabilized Area:	
Type of Stabilization		Description of Stabilization	Location of Stabilization
<input type="checkbox"/> Final	<input type="checkbox"/> Temporary		
Initiate Date:			
Completion Date:			
Additional work proposed for this area:		Inspection Frequency for Stabilized Area:	
Type of Stabilization		Description of Stabilization	Location of Stabilization
<input type="checkbox"/> Final	<input type="checkbox"/> Temporary		
Initiate Date:			
Completion Date:			
Additional work proposed for this area:		Inspection Frequency for Stabilized Area:	
Type of Stabilization		Description of Stabilization	Location of Stabilization
<input type="checkbox"/> Final	<input type="checkbox"/> Temporary		
Initiate Date:			
Completion Date:			
Additional work proposed for this area:		Inspection Frequency for Stabilized Area:	
Type of Stabilization		Description of Stabilization	Location of Stabilization
<input type="checkbox"/> Final	<input type="checkbox"/> Temporary		
Initiate Date:			
Completion Date:			
Additional work proposed for this area:		Inspection Frequency for Stabilized Area:	

SWPPP Rainfall Records (January - June)

Year:

January	Rainfall	February	Rainfall	March	Rainfall	April	Rainfall	May	Rainfall	June	Rainfall
1		1		1		1		1		1	
2		2		2		2		2		2	
3		3		3		3		3		3	
4		4		4		4		4		4	
5		5		5		5		5		5	
6		6		6		6		6		6	
7		7		7		7		7		7	
8		8		8		8		8		8	
9		9		9		9		9		9	
10		10		10		10		10		10	
11		11		11		11		11		11	
12		12		12		12		12		12	
13		13		13		13		13		13	
14		14		14		14		14		14	
15		15		15		15		15		15	
16		16		16		16		16		16	
17		17		17		17		17		17	
18		18		18		18		18		18	
19		19		19		19		19		19	
20		20		20		20		20		20	
21		21		21		21		21		21	
22		22		22		22		22		22	
23		23		23		23		23		23	
24		24		24		24		24		24	
25		25		25		25		25		25	
26		26		26		26		26		26	
27		27		27		27		27		27	
28		28		28		28		28		28	
29		29		29		29		29		29	
30				30		30		30		30	
31				31				31			

SWPPP Rainfall Records (July - December)										Year:			
July	Rainfall	August	Rainfall	September	Rainfall	October	Rainfall	November	Rainfall	December	Rainfall		
1		1		1		1		1		1		1	
2		2		2		2		2		2		2	
3		3		3		3		3		3		3	
4		4		4		4		4		4		4	
5		5		5		5		5		5		5	
6		6		6		6		6		6		6	
7		7		7		7		7		7		7	
8		8		8		8		8		8		8	
9		9		9		9		9		9		9	
10		10		10		10		10		10		10	
11		11		11		11		11		11		11	
12		12		12		12		12		12		12	
13		13		13		13		13		13		13	
14		14		14		14		14		14		14	
15		15		15		15		15		15		15	
16		16		16		16		16		16		16	
17		17		17		17		17		17		17	
18		18		18		18		18		18		18	
19		19		19		19		19		19		19	
20		20		20		20		20		20		20	
21		21		21		21		21		21		21	
22		22		22		22		22		22		22	
23		23		23		23		23		23		23	
24		24		24		24		24		24		24	
25		25		25		25		25		25		25	
26		26		26		26		26		26		26	
27		27		27		27		27		27		27	
28		28		28		28		28		28		28	
29		29		29		29		29		29		29	
30		30		30		30		30		30		30	
31		31				31				31			



CONTRACTOR CERTIFICATION FORM
For Coverage(s) Under South Carolina
NPDES General Permit For
Stormwater Discharges From Construction Activities SCR100000

(Maintain As Part of On-Site SWPPP)

Date: _____

A. Project Information

1. NPDES Coverage No.: SCR _____ State Permit (Tracking) No.: _____
2. Project/Site Name (As Approved by Department): _____
3. Owner/Operator Name: _____

B. Contractor Information

1. Name: _____ Title/Position: _____
Mailing Address: _____ City: _____ State: _____ Zip: _____
Company Name (As Applicable): _____
Phone: _____ Email Address: _____
2. Describe Construction-Related Responsibilities & Activities (Home construction, site grading, utility line installation, etc.):

C. Contractor Certification Statements & Agreement: *(Read the Contractor Certification statements below (in entirety) and provide date and signature of agreement below).* See Section 122.22 of S.C. Reg. 61-9 for signatory authority requirements. **DO NOT SIGN IN BLACK INK!**

"I certify by my signature below that I or I (on behalf of my company and its contractors and agents), as the case may be,

- (a) Understand, accept, and will adhere to the provisions of the Stormwater Pollution Prevention Plan (SWPPP) as it pertains to the portion of the project I am or my company is responsible for, and as required by the coverage under the National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges From Construction Activities SCR100000 issued to the Owner/Operator of the construction activity with whom I am or my company is under contract to perform construction related professional services;
- (b) Am legally accountable to the SC Department of Health and Environmental Control (DHEC), under the authorities of the Clean Water Act and the SC Pollution Control Act, to ensure compliance with the terms and conditions of the SWPPP applicable to my or my company's portion of the project;
- (c) Must comply with the terms and conditions of the Construction General Permit (CGP), will adhere to applicable standards and stormwater erosion control practices established in the SWPPP and in the Best Management Practices (BMP) manual at all times while performing work at the project site, and agree to implement corrective actions identified by the qualified inspector during a site inspection; and
- (d) Understand that DHEC enforcement actions may be taken against any specific or combination of permittees and contractors if the terms and conditions of the SWPPP are not met.

Therefore, having understood the above information, I am signing this certification as contractor to the aforementioned NPDES general permit."

Printed Name of Contractor

Title/Position

Signature of Contractor

Date Signed

Termination of Contractor Certification Agreement: DO NOT SIGN IN BLACK INK!

(When your land-disturbing activities at this site have been completed, sign and date below). After this date, you may not perform any land-disturbing activities at this site unless you sign a new contractor certification agreement).

Signature of Contractor

Date Signed

CONTRACTOR CERTIFICATION FORM

NPDES Coverage No.: SCR _____
Project/Site Name: _____

State Permit (Tracking) No.: _____

C. Contractor Certification Statements:

All contractors performing any land disturbing activity at a construction site must be certified and listed in the On-Site SWPPP (OS-SWPPP) in order to work on the site. *Read the Certification statements below (in entirety) and provide date and signature of agreement below.*

"I certify by my signature below that I or I (on behalf of my company and its contractors and agents), as the case may be,

- (a) Understand, accept, and will adhere to the provisions of the Stormwater Pollution Prevention Plan (SWPPP) as it pertains to the portion of the project I am or my company is responsible for, and as required by the coverage under the National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges From Construction Activities SCR100000 issued to the Owner/Operator of the construction activity with whom I am or my company is under contract to perform construction related professional services;*
- (b) Am legally accountable to the SC Department of Health and Environmental Control (DHEC), under the authorities of the Clean Water Act and the SC Pollution Control Act, to ensure compliance with the terms and conditions of the SWPPP applicable to my or my company's portion of the project;*
- (c) Must comply with the terms and conditions of the Construction General Permit (CGP), will adhere to applicable standards and stormwater erosion control practices established in the SWPPP and in the Best Management Practices (BMP) manual at all times while performing work at the project site, and agree to implement corrective actions identified by the qualified inspector during a site inspection; and*
- (d) Understand that DHEC enforcement actions may be taken against any specific or combination of permittees and contractors if the terms and conditions of the SWPPP are not met.*

Therefore, having understood the above information, I am signing this certification as contractor to the aforementioned NPDES general permit."

C. CONTRACTOR CERTIFICATION AGREEMENTS
(Sheet 1)

NPDES Coverage No.: SCR _____
Project/Site Name: _____

State Permit (Tracking) No.: _____

Please print legibly and complete all spaces on the form. *If you are an approved Blanket Utility Provider, you do not need to sign this form, but you must submit a copy of your Annual Blanket NOI registration information to the Owner/Operator.* Abbreviate if necessary and submit the completed form to the Owner/Operator. (When your land-disturbing activities at this site are complete, sign and date the termination agreement below. After this date, you may *not* perform any land-disturbing activities at this site unless you sign a new contractor certification agreement). **Additional certification agreement pages may be attached as necessary. DO NOT SIGN IN BLACK INK!**

Contractor Information:

Name: _____ Title/Position: _____
Company Name (As Applicable) _____
Mailing Address: _____ City: _____ State: _____ Zip: _____
Phone: _____ Email Address: _____

Contractor Certification (Signature of Agreement): Provide date and signature. **DO NOT SIGN IN BLACK INK!**

Signature of Contractor

Date Signed

Termination of Contractor Certification Agreement: Provide date and signature. **DO NOT SIGN IN BLACK INK!**

Signature of Contractor

Date Signed

Contractor Information:

Name: _____ Title/Position: _____
Company Name (As Applicable) _____
Mailing Address: _____ City: _____ State: _____ Zip: _____
Phone: _____ Email Address: _____

Contractor Certification (Signature of Agreement): Provide date and signature. **DO NOT SIGN IN BLACK INK!**

Signature of Contractor

Date Signed

Termination of Contractor Certification Agreement: Provide date and signature. **DO NOT SIGN IN BLACK INK!**

Signature of Contractor

Date Signed

Contractor Information:

Name: _____ Title/Position: _____
Company Name (As Applicable) _____
Mailing Address: _____ City: _____ State: _____ Zip: _____
Phone: _____ Email Address: _____

Contractor Certification (Signature of Agreement): Provide date and signature. **DO NOT SIGN IN BLACK INK!**

Signature of Contractor

Date Signed

Termination of Contractor Certification Agreement: Provide date and signature. **DO NOT SIGN IN BLACK INK!**

Signature of Contractor

Date Signed

C. CONTRACTOR CERTIFICATION AGREEMENTS
(Company Certifications)
(Sheet 2)

Use this sheet for certification agreements of contractors, subcontractors, etc. employed by the Contracting Company identified below ONLY. If you do not work for the company listed below, do not sign this sheet. If you are an approved Blanket Utility Provider, you do not need to sign this form, but you must submit a copy of your Annual Blanket NOI registration information to the Owner/Operator. Abbreviate if necessary and submit the completed form to the Owner/Operator. (When your land-disturbing activities at this site are complete, sign and date the termination agreement below. After this date, you may *not* perform any land-disturbing activities at this site unless you sign a new contractor certification agreement). Additional certification agreement pages may be attached as necessary. Please print legibly and complete all spaces on the form. **DO NOT SIGN IN BLACK INK!**

NPDES Coverage No.: SCR _____ State Permit (Tracking) No.: _____
Project/Site Name: _____

Contracting Company Information:

Company Name: _____
Mailing Address: _____ City: _____ State: _____ Zip: _____
Phone: _____ Email Address: _____

Contractor Information:

Contractor Name: _____ Title/Position: _____

Contractor Certification (Signature of Agreement): Provide date and signature. **DO NOT SIGN IN BLACK INK!**

Signature of Contractor

Date Signed

Termination of Contractor Certification Agreement: Provide date and signature. **DO NOT SIGN IN BLACK INK!**

Signature of Contractor

Date Signed

Contractor Name: _____ Title/Position: _____

Contractor Certification (Signature of Agreement): Provide date and signature. **DO NOT SIGN IN BLACK INK!**

Signature of Contractor

Date Signed

Termination of Contractor Certification Agreement: Provide date and signature. **DO NOT SIGN IN BLACK INK!**

Signature of Contractor

Date Signed

Contractor Name: _____ Title/Position: _____

Contractor Certification (Signature of Agreement): Provide date and signature. **DO NOT SIGN IN BLACK INK!**

Signature of Contractor

Date Signed

Termination of Contractor Certification Agreement: Provide date and signature. **DO NOT SIGN IN BLACK INK!**

Signature of Contractor

Date Signed

Instructions for Completing the Contractor Certification Form

If you are uncertain whether you need to obtain coverage under the NPDES General Permit for Stormwater Discharges From Construction Activities SCR100000 (CGP), if you cannot access the websites listed in these instructions, or if you have any questions, contact the Bureau of Water Stormwater Permitting Section at (803) 898-4300 or the Coastal Stormwater Permitting Section at (843) 953-0200. Please see the Bureau of Water, Stormwater Permitting website (<http://www.scdhec.gov/stormwater>) for guidance and additional information.

Who Must Complete a Contractor Certification Form

Contractors (who are not Permittees or Annual Blanket Utility providers), employed by a Primary or Secondary Permittee of a construction project or site, must complete a Contractor Certification Form before performing any land-disturbing activities at the construction site. Contractor Certification Forms do not require Department approval, however, this form must be signed, dated, and submitted by each contractor to the Owner/Operator prior to commencement of land-disturbing activities by the contractor.

General Guidance for this Form

Are there Other Requirements for Contractors Completing this form?

Contractors completing this form must also attend a pre-construction conference, and sign and date a Pre-Construction Conference Certification Agreement for each project or construction site where they will be performing construction activities. Contractors *cannot* work at a construction site until they sign this certification form and document attendance at the Pre-Construction Conference held for the project or construction site. See Section 4.1 of the 2012 CGP for additional information.

What Does This Certification Mean?

Upon signing this certification, the contractor is accountable to DHEC to ensure the terms and conditions of the approved Stormwater Pollution Prevention Plan (developed for the respective construction project or site) and the Construction General Permit (CGP) are implemented and adhered to in the respective area(s) of the plan where each contractor and/or company signing this form will be performing work. Each contractor becomes subject to DHEC enforcement actions if permit conditions are not met. See Sections 2.2.3 and 2.3.2 of the 2012 CGP for additional information.

Should the Owner/Operator Retain This Form?

The Owner/Operator of the construction site must retain completed Contractor Certification Forms with the approved On-Site SWPPP. This form must be retained for at least three years from the date permit coverage expires or is terminated.

Instructions for Completing this Form

Please print legibly and complete all spaces on the form. Abbreviate if necessary to stay within the space allowed for each item and submit the completed form to the Owner/Operator for the specific project or construction site listed in Section A.

Section A - Project Information

Provide all requested information. Enter the date, NPDES coverage number, and Tracking No. provided by the Department for the approved SWPPP. Enter the official or legal name of the project or site, as approved by the Department. If this project is for an individual lot or group of lots, provide the lot number(s). Provide the name of the Owner/Operator.

Section B - Contractor Information

Provide your legal name and title/position. As applicable, provide the legal (formal) name of the company, firm, public organization, or any other entity (you are employed by or represent) on whose behalf you will be performing contractor construction activities. Provide your mailing address, telephone and e-mail address. Briefly describe construction-related duties and responsibilities you or your company will perform for this project at the construction site.

Section C - Contractor Certification Statements & Agreement

Read the certification statements (in entirety). Provide your printed name and title or position. Date and sign the certification agreement. Return the signed and dated form to the Owner/Operator. **DO NOT SIGN IN BLACK INK.** Sheets 1 and 2 are formatted for multiple contractor signatures. Sheet 2 is **ONLY** for signatures within a specific company. Each may be copied as necessary. Sign and date the Termination of Contractor Certification Agreement when the services you provide for this project are complete. Return the signed and dated form to the Owner/Operator for record retention as a part of the On-Site SWPPP (OS-SWPPP).



PRE-CONSTRUCTION CONFERENCE CERTIFICATION FORM
For Coverage(s) Under South Carolina
NPDES General Permit For
Stormwater Discharges From Construction Activities SCR100000

(Maintain As Part of On-Site SWPPP)

A Pre-Construction Conference must be held for each project with an approved Comprehensive Stormwater Pollution Prevention Plan (C-SWPPP) and must be attended by all contractors, subcontractors, Blanket Utility Providers, etc. prior to their performing any construction-related or land-disturbing activities at the site. Documentation of attendance must be included in the On-Site SWPPP (OS-SWPPP). In some instances, the Department or the respective MS4 may require a pre-construction conference normally conducted off-site, be held on-site or, when justified, the Department may allow a conference normally conducted on-site, be held off-site by the Owner/Operator. An Owner/Operator may also choose, at their discretion, to hold a conference normally held off-site, at the construction site (on-site). (See Sections 2.2.3 and 4.1 of the CGP for additional information).

A. Pre-Construction Conference Information: (This section must be completed by person(s) conducting the conference ONLY)

1. Pre-Construction Conference Information:

Date of Pre-Construction Conference: _____ Time: _____

Project/Site Name (As Approved by Department): _____

NPDES Coverage No.: SCR _____ State Permit (Tracking) No.: _____

Owner/Operator Name: _____

2. Person(s) Conducting Pre-Construction Conference:

☐ C-SWPPP Preparer or ☐ Registration Equivalent: ☐ Engineer ☐ Land Surveyor ☐ Landscape Architect

Printed Name: _____

S.C. Registration#: _____

Signature: _____

☐ Primary Permittee or ☐ Secondary Permittee or ☐ Duly Authorized Representative (Per Section 122.22(b) of SC Reg. 61-9):

Printed Name: _____

Title/Position: _____

Signature: _____

☐ Other

Printed Name: _____

Title/Position: _____

Signature: _____

3. Construction/Project Type & Conference Location:

☐ Non-Linear (≥ 10 Disturbed Acres) ☐ Non-Linear (< 10 Disturbed Acres) ☐ Linear (Not Part of LCP) ☐ Linear Activity (LCP)

Conference Location (See Notes below): ☐ On-Site ☐ Off-Site ☐ Approved Alternate Location
(If offsite or Department or MS4-approved alternate location, identify or describe the specific location below): _____

Notes: Unless specifically required in writing or as a condition of the approved SWPPP by the Department or by the respective MS4 to be conducted otherwise, pre-construction conferences for:

(a) Non-linear projects/sites that disturb 10 acres or more must be held on-site

(b) Non-linear projects/sites that disturb less than 10 acres may be held off-site

(c) Linear construction projects/sites (not part of a LCP) may be held off-site

(d) Linear construction activities (within a LCP) must be held in accordance with disturbed area (< 10 acres or ≥ 10 acres) criterion established for non-linear projects/sites

PRE-CONSTRUCTION CONFERENCE CERTIFICATION FORM

Date: _____

NPDES Coverage No.: SCR _____

State Permit (Tracking) No.: _____

Project/Site Name: _____

B. Pre-Construction Conference Certification Statements:

All contractors, subcontractors, Annual Blanket Utility Providers, etc. performing any construction-related (land-disturbing) activity at the above-listed construction project/site must attend a Pre-Construction Conference for that construction project/site and complete a Pre-Construction Conference Certification prior to their starting to work at the above-listed construction project/site. *Read the Certification statements below (in entirety) and provide date and signature of agreement below.*

"I certify by my signature below that:

- (a) I or I on behalf of my company, as the case may be, participated in a pre-construction conference for the above-listed project in accordance with the requirements of the Construction General Permit (CGP) with the individual who is responsible for the operational control of the Stormwater Pollution Prevention Plan (SWPPP) or the duly authorized representative, and/or the preparer of the SWPPP or person with registration equivalent to that of the preparer of the SWPPP, and
- (b) I or I on behalf of my company accept the terms and conditions of the SWPPP as it pertains to the portion or portions of the plan I or my company am responsible for, and as required by the National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges From Construction Activities SCR100000 issued to the Owner/Operator of the construction activity for which I or my company have been contracted to perform construction-related professional services."
- (c) Annual Blanket Utility Providers ONLY: "I also certify by my signature below that as a Blanket Utility Provider, I will only perform construction-related (land-disturbing) activities for this project that are covered in the approved SWPPP or approved subsequent modifications to the approved SWPPP."

PRE-CONSTRUCTION CONFERENCE CERTIFICATION FORM
(Sheet 1)

Date: _____
NPDES Coverage No.: SCR _____ State Permit (Tracking) No.: _____
Project/Site Name: _____

C. Pre-Construction Conference Certification Agreements:

Please print legibly and complete all spaces on the form. *Annual Blanket Utility providers must also provide their annual blanket registration number and expiration date.* Abbreviate if necessary and submit the completed form to the person(s) conducting the pre-construction conference. Additional certification agreement pages may be attached as necessary. **DO NOT SIGN IN BLACK INK!**

Contractor Information

Name: _____ Title/Position: _____
Company Name (As Applicable) _____
Mailing Address: _____ City: _____ State: _____ Zip: _____
Phone: _____ Email Address: _____
(Blanket Utility Only): Annual Blanket Registration Number: _____ Blanket Expiration Date: _____

Pre-Construction Conference Certification (Signature of Agreement): Provide date and signature. **DO NOT SIGN IN BLACK INK!**

Signature of Agreement

Date Signed

Contractor Information

Name: _____ Title/Position: _____
Company Name (As Applicable) _____
Mailing Address: _____ City: _____ State: _____ Zip: _____
Phone: _____ Email Address: _____
(Blanket Utility Only): Annual Blanket Registration Number: _____ Blanket Expiration Date: _____

Pre-Construction Conference Certification (Signature of Agreement): Provide date and signature. **DO NOT SIGN IN BLACK INK!**

Signature of Agreement

Date Signed

Contractor Information

Name: _____ Title/Position: _____
Company Name (As Applicable) _____
Mailing Address: _____ City: _____ State: _____ Zip: _____
Phone: _____ Email Address: _____
(Blanket Utility Only): Annual Blanket Registration Number: _____ Blanket Expiration Date: _____

Pre-Construction Conference Certification (Signature of Agreement): Provide date and signature. **DO NOT SIGN IN BLACK INK!**

Signature of Agreement

Date Signed

Contractor Information:

Name: _____ Title/Position: _____
Company Name (As Applicable) _____
Mailing Address: _____ City: _____ State: _____ Zip: _____
Phone: _____ Email Address: _____
(Blanket Utility Only): Annual Blanket Registration Number: _____ Blanket Expiration Date: _____

Pre-Construction Conference Certification (Signature of Agreement): Provide date and signature. **DO NOT SIGN IN BLACK INK!**

Signature of Agreement

Date Signed

C. PRE-CONSTRUCTION CONFERENCE CERTIFICATION AGREEMENTS
(Company Certification Agreements)
(Sheet 2)

Use this sheet for certification agreements of contractors, subcontractors, annual blanket utility providers, etc. employed by the Contracting Company identified on this sheet **ONLY**. If you do not work for the company listed on this sheet, do not sign this sheet. Please print legibly and complete all spaces on the form. *Blanket utility providers must complete this agreement and provide their annual blanket registration number and expiration date.*

Date: _____

NPDES Coverage No.: SCR _____

State Permit (Tracking) No.: _____

Project/Site Name: _____

Contracting Company Information:

Company Name _____

Mailing Address: _____ City: _____ State: _____ Zip: _____

Phone: _____ Email Address: _____

Contractor Information:

Contractor Name: _____ Title/Position: _____

(Blanket Utility Only): Annual Blanket Registration Number: _____ Blanket Expiration Date: _____

Pre-Construction Conference Certification (Signature of Agreement): Provide date and signature. **DO NOT SIGN IN BLACK INK!**

Signature of Agreement

Date Signed

Contractor Name: _____ Title/Position: _____

(Blanket Utility Only): Annual Blanket Registration Number: _____ Blanket Expiration Date: _____

Pre-Construction Conference Certification (Signature of Agreement): Provide date and signature. **DO NOT SIGN IN BLACK INK!**

Signature of Agreement

Date Signed

Contractor Name: _____ Title/Position: _____

(Blanket Utility Only): Annual Blanket Registration Number: _____ Blanket Expiration Date: _____

Pre-Construction Conference Certification (Signature of Agreement): Provide date and signature. **DO NOT SIGN IN BLACK INK!**

Signature of Agreement

Date Signed

Contractor Name: _____ Title/Position: _____

(Blanket Utility Only): Annual Blanket Registration Number: _____ Blanket Expiration Date: _____

Pre-Construction Conference Certification (Signature of Agreement): Provide date and signature. **DO NOT SIGN IN BLACK INK!**

Signature of Agreement

Date Signed

Instructions for Completing the Pre-Construction Conference Certification Agreement

If you are uncertain whether you need to obtain coverage under the NPDES General Permit for Stormwater Discharges From Construction Activities (SCR100000 (CGP)), if you cannot access the websites listed in these instructions, or if you have any questions, contact the Bureau of Water Stormwater Permitting Section at (803) 898-4300 or Coastal Stormwater Permitting Section at (843) 953-0200. Please see the Bureau of Water, Stormwater Permitting website (<http://www.scdhec.gov/stormwater>) for guidance and additional information.

Who Must Sign a Pre-Construction Conference Certification Agreement

All contractors, subcontractors, annual blanket utility providers, etc., who will work for an Owner/Operator at a construction site with an approved C-SWPPP, must attend a Pre-Construction Conference (in person) before performing any construction-related or land-disturbing activities that may affect the implementation of the approved SWPPP. This conference may be held simultaneously with all contractors and builders or may be conducted separately with one or more contractors or builders present. See Section 4.1 (Pre-Construction Conferences) of the Construction General Permit (CGP) for additional information.

General Guidance for This Form

Why Must I Attend a Pre-Construction Conference?

A Pre-Construction Conference must be held for each project or construction site with an approved Comprehensive Stormwater Pollution Prevention Plan (C-SWPPP). Each contractor, subcontractor, blanket utility provider, etc., who will work at a site must attend this conference. The primary purpose of this conference is for the preparer of the SWPPP, or someone with a registration equivalent to that of the preparer of the SWPPP, and/or the person with operational control of the plans and specifications (the Primary or Secondary Permittee or their duly authorized representative (as defined in Section 122.22(b) of SC Regulation 61-9)) to review and explain the On-Site SWPPP (OS-SWPPP) so that all contractors, subcontractors, etc. are aware of the requirements before they start performing construction-related (land disturbing) activities that may affect the implementation of the approved SWPPP. *Pre-Construction Conference attendance must also be documented and maintained within the On-Site SWPPP (OS-SWPPP).*

Where Should I Hold the Pre-Construction Conference?

Unless specifically required by the Department or the respective MS4 (in writing or as a condition of the approved SWPPP to be held otherwise), Pre-Construction Conferences must be conducted as follows:

- a) Non-linear projects or sites that disturb 10 acres or more must be held on-site;
- (b) Non-linear projects or sites that disturb less than 10 acres may be held off-site;
- (c) Linear construction projects or sites (not part of a Larger Common Plan, subdivision or development) may be conducted off-site
- (d) Linear construction within a Larger Common Plan, subdivision, etc. are considered to be linear construction activities under the Construction General Permit (CGP) and are not defined as linear construction projects or sites. Conferences for linear construction activities must be conducted in accordance with disturbed area (<10 acres or \geq 10 acres) criterion listed above for non-linear sites under the CGP. See Appendix A, Definitions, for additional information.

In addition, person(s) conducting the conference (Owner/Operator) may choose, at their discretion, to hold a conference normally held off-site, on-site.

Instructions for Completing This Form

Please print legibly and complete all spaces on the form. Abbreviate if necessary to stay within the space allowed for each item. Submit the completed form to the person(s) conducting the Pre-Construction Conference.

Section A - Pre-Construction Conference Information

Persons conducting the conference may complete this section before the conference. Provide all requested information, including the date, time, project, and Owner/Operator identification information. Enter the official or legal name of the project or site as approved by the Department. Identify the person or persons conducting the conference. Identify the construction project type and conference location (on-site, off-site, or an alternate location approved by the Department or the respective MS4.) If your conference will be held off-site or at an alternate location, list or identify the specific location.

Section B - Pre-Construction Conference Certification Statements

Read the certification statements in entirety. If you are an Annual Blanket Utility, read the blanket utility statement also.

Section C - Pre-Construction Conference Certification Agreements

Sign Sheet 1 or 2 as applicable. Sheets 1 and 2 are formatted for multiple contractor certifications. Sheet 1 provides individual (person) certifications. Sheet 2 is ONLY for signatures within a specific company. If you use Sheet 1, provide your legal name, title or position, the name of your company, your mailing address, telephone and email address. If you use Sheet 2, provide the name, mailing address telephone, and email address of your company in Contracting Company Information. If you are an approved Annual Blanket Utility Provider, you must also provide your approved Annual Blanket Utility registration number and expiration date.

Sign and date the Pre-Construction Conference Certification (Signature of Agreement). **DO NOT SIGN IN BLACK INK.**

Return the signed and dated form to the Owner/Operator for record retention as a part of the On-Site SWPPP (OS-SWPPP)

ARDURRA

SECTION 31 37 00

RIPRAP

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide all labor, materials, equipment, tools, and incidentals required to provide riprap as shown on the Drawings, as specified herein.

PART 2 - PRODUCTS

2.1 STONE

- A. Stone used for riprap shall be hard quarry or fieldstone and shall be of such quality that they will not disintegrate on exposure to water or weathering. The stone shall be suitable in all respects for the purpose intended.
- B. Stone shall range in weight from a minimum of 25 pounds to a maximum of 150 pounds. At least 50 percent of the stone pieces shall weigh more than 60 pounds. The stone pieces, except spalls, shall have a minimum dimension of at least 12 inches.
- C. Acceptable concrete, broken into proper size pieces and meeting the requirements as specified may be used in lieu of stone for hand-placed riprap.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Provide thickness of hand-placed riprap no less than that specified, measured perpendicular to the slope. Place 12-inch riprap a minimum thickness of 12 inches.
- B. Place stone on properly prepared compacted slope, each piece being placed, by hand, perpendicular to the slope or earth surface. Firmly imbed stone against the earth material and the adjoining piece with the sides in contact and with well-broken joints. Fill the spaces between the layer pieces with spalls of suitable size which will be thoroughly rammed into place. The finished surface shall present an even, tight surface true to line, grade and section.
- C. Do not mix stone and broken concrete.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

ARDURRA

SECTION 31 50 00

EXCAVATION SUPPORT AND PROTECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide all labor, materials, equipment, tools, and incidentals for excavation support and protection as specified herein.
- B. Section includes:
 - 1. This Section includes temporary excavation support and protection systems, such as trench boxes, bracing, shoring and any supports required to stabilize excavations in order to proceed with the Work.

1.2 PERFORMANCE REQUIREMENTS

- A. Design, furnish, install, monitor, and maintain excavation support and protection system capable of supporting excavation sidewalls and of resisting soil and hydrostatic pressure and superimposed and construction loads.
 - 1. Provide professional engineering services needed to assume engineering responsibility, including preparation of shop drawings and a comprehensive engineering analysis by a qualified professional engineer. Ardurra Group, Inc. does not assume any responsibility for design or implementation of temporary or permanent excavation support and protection of any kind.
 - 2. Prevent surface water from entering excavations by grading, dikes, or other means.
 - 3. Install excavation support and protection systems without damaging existing buildings, pavements, and other improvements adjacent to excavation.

1.3 SUBMITTALS

- A. Shop Drawings for Information only: Prepared by or under the supervision of a qualified professional engineer for excavation support and protection systems. These shop drawings will not be reviewed for approval by the Engineer or Owner. The Contractor's Engineer shall be solely responsible for review and approval.
 - 1. Include shop drawings signed and sealed by the qualified professional engineer responsible for their preparation.
- B. Qualification Data: For installer and professional engineer.
- C. Photographs or videotape, sufficiently detailed, of existing conditions of adjoining construction and site improvements that might be misconstrued as damage caused by the absence of, the installation of, or the performance of excavation support and protection systems.

ARDURRA

1.4 QUALITY ASSURANCE

- A. Professional Engineer Qualifications: Comply with Section 01 40 00 – *Quality Requirements*.

1.5 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Engineer and then only after arranging to provide temporary utility services according to requirements indicated.
- B. Project-Site Conditions: Conduct test borings and other exploratory operations necessary for excavation support and protection.
- C. Survey adjacent structures and improvements, employing a qualified professional engineer or land surveyor; establish exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations.
 - 1. During installation of excavation support and protection systems, regularly resurvey benchmarks, maintaining an accurate log of surveyed elevations and positions for comparison with original elevations and positions. Promptly notify Architect if changes in elevations or positions occur or if cracks, sags, or other damage is evident in adjacent construction.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. The Contractor and Contactor's Engineer shall be responsible for determining appropriate materials to use for temporary excavations support and protection.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Sheet and brace the trench consistent with OSHA Regulations when necessary to prevent caving in during excavation or to protect adjacent structures, property, workmen, and the public. Increase trench widths accordingly by the thickness of the sheeting. Maintain sheeting in place until the pipe has been placed and backfilled at the pipe zone. Shoring and sheeting shall be removed in accordance with OSHA regulations and, as the backfilling is done, in a manner that will not damage the pipe or permit voids in the backfill. All sheeting, shoring, and bracing of trenches shall conform to the safety requirements of the Federal, State, or local public agency having jurisdiction. The most stringent of these requirements shall apply.

ARDURRA

- B. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards that could develop during excavation support and protection system operations.
 - 1. Shore, support and protect utilities encountered.
 - C. Install excavation support and protection systems to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
 - D. Locate excavation support and protection systems clear of permanent construction so that forming and finishing of concrete surfaces is not impeded.
 - E. Excavations should be sloped or shored in accordance with local, state, and federal regulations, including OSHA (29 CFR Part 1926) excavation trench safety standards.
 - F. Monitor excavation support and protection systems daily during excavation progress and for as long as excavation remains open. Promptly correct bulges, breakage, or other evidence of movement to ensure that excavation support and protection systems remain stable.
 - G. Promptly repair damages to adjacent facilities caused by installing excavation support and protection systems.
- 3.2 SOLDIER BEAMS AND LAGGING
- A. Contractor and Contractor's Engineer shall design and specify.
- 3.3 SHEET PILING
- A. Contractor and Contractor's Engineer shall design and specify.
- 3.4 TIEBACKS
- A. Contractor and Contractor's Engineer shall design and specify.
- 3.5 BRACING
- A. Contractor and Contractor's Engineer shall design and specify.
- 3.6 REMOVAL AND REPAIRS
- A. Contractor's Engineer shall determine when excavation support and protection systems can be removed without causing damage or harm to structures, property or persons. In general

ARDURRA

remove excavation support and protection systems when construction has progressed sufficiently to support excavation and bear soil and hydrostatic pressures. Remove in stages to avoid disturbing underlying soils or damaging structures, pavements, facilities, and utilities.

1. Remove excavation support and protection systems completely.
2. Repair or replace, as approved by Engineer, adjacent work damaged or displaced by removing excavation support and protection systems.

END OF SECTION

ARDURRA

SECTION 32 11 23

AGGREGATE BASE COURSES

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide all labor, materials, equipment, tools and incidentals to install aggregate base course as shown on the Drawings and specified herein.

1.2 REFERENCES

- A. ASTM D698 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 pound Rammer and 12-inch Drop.
- B. ASTM D1556 - Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
- C. ASTM D2167 - Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
- D. ASTM D3017 - Test Methods for Moisture Content of Soil and Soil-Aggregate Mixtures.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Coarse Aggregate:
 - 1. In accordance with SCDOT Standard Specifications for Highway Construction, 2000 Edition, Section 305.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify substrate has been inspected, is dry, and gradients and elevations are correct.

3.2 PREPARATION

- A. Correct irregularities in substrate gradient and elevation by scarifying, reshaping and recompacting.

ARDURRA

- B. Do not place fill on soft, muddy, or frozen surfaces.

3.3 AGGREGATE PLACEMENT

- A. Spread aggregate over prepared substrate to a total compacted thickness of eight (8) inches for access road.
- B. Place aggregate in 6-inch layers and for fenced vault site.
- C. Level and contour surfaces to elevations and gradients indicated.
- D. Add small quantities of fine aggregate to coarse aggregate as appropriate to assist compaction.
- E. Add water to assist compaction. If excess water is apparent, remove aggregate and aerate to reduce moisture content.
- F. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

3.4 TOLERANCES

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

3.5 FIELD QUALITY CONTROL

- A. Perform compaction testing in accordance with ASTM D1556, ASTM D698, ASTM D2167 and ASTM D3017.
- B. If tests indicate Work does not meet specified requirements, remove Work, replace and retest.
- C. Frequency of Tests: One test per 200 square yards.

3.6 SCHEDULES

- A. Under Asphalt Pavement:
 - 1. Compact placed aggregate materials to achieve compaction of 100 percent.
- B. Under Concrete Pavement:
 - 1. Compact placed aggregate materials to achieve compaction of 100 percent.
- C. Under Asphalt Pavement in Driveways:

ARDURRA

1. Compact placed aggregate materials to achieve compaction of 98 percent.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

ARDURRA

SECTION 32 12 16

ASPHALT PAVING

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide all labor, materials, equipment, tools, and incidentals required to install hot-mix asphalt paving as shown on the Drawings and specified herein.
- B. Asphalt Contractor must be on SCDOT approved list.

1.2 REFERENCES

- A. ASTM D946 - Penetration-Graded Asphalt Cement for Use in Payment Construction.
- B. TAI - (The Asphalt Institute) - MS-2 Mix Design Methods for Asphalt Concrete and Other Hot Mix Types.
- C. TAI - (The Asphalt Institute) - MS-3 Asphalt Plant Manual.
- D. TAI - (The Asphalt Institute) - MS-8 Asphalt Plant Manual.
- E. TAI - (The Asphalt Institute) - MS-19 Basic Asphalt Emulsion Manual.
- F. SCDOT - Standard Specifications For Highway Construction – 2000 Edition; Division 400 - Bituminous Pavements.

1.3 QUALITY ASSURANCE

- A. Perform Work in accordance with State of South Carolina Department of Transportation standard.
- B. Mixing Plant: Conform to State of South Carolina Department of Transportation standard.
- C. Obtain materials from same source throughout.
- D. The Contractor shall guarantee all pavement work and repair completed incidental to the installation of the water distribution system for a period of one (1) year following acceptance by The City of Goose Creek, and shall repair or replace, at no cost to The City of Goose Creek, any pavement or pavement repair which crumbles, cracks, settles, or is otherwise unsound or unacceptable during this one year period.

1.4 REGULATORY REQUIREMENTS

- A. Conform to applicable code for paving work on public property.

ARDURRA

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Apply tack coats only when ambient temperature is above 50 degrees F, and when temperature has not been below 35 degrees F for 12 hours immediately prior to application. Do not apply when base is wet or contains excess moisture.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Asphalt Cement: In accordance with State of South Carolina Department of Transportation standards.
- B. Aggregate for Base Course Mix: See Section 32 11 23 – *Aggregate Base Course*.
- C. Aggregate for Binder Course Mix: In accordance with State of South Carolina Department of Transportation standards.
- D. Aggregate for Wearing Course Mix: In accordance with State of South Carolina Department of Transportation standards.
- E. Fine Aggregate: In accordance with State of South Carolina Department of Transportation standards.
- F. Mineral Filler: Finely ground particles of limestone, hydrated lime or other mineral dust, free of foreign matter.
- G. Primer: Homogeneous, medium curing, liquid asphalt. In accordance with State of South Carolina Department of Transportation standards.
- H. Tack Coat: Homogeneous, medium curing, liquid asphalt. In accordance with State of South Carolina Department of Transportation standards.

2.2 ASPHALT PAVING MIX

- A. Use dry material to avoid foaming. Mix uniformly.
- B. Wearing Course: 4.8 - 6.8 percent of asphalt cement by weight in mixture in accordance with State of South Carolina Department of Transportation standards.

2.3 SOURCE QUALITY CONTROL AND TESTS

- A. Submit proposed mix design for review prior to beginning of work.

ARDURRA

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that compacted granular base is dry and ready to support paving and imposed loads.
- B. Verify that gradients and elevations of base are correct.

3.2 BASE

- A. Prepare in accordance with Section 31 20 01 - *Trenching, Backfilling and Compacting*.

3.3 PREPARATION- TACK COAT

- A. Apply tack coat on asphalt or concrete surfaces over subgrade surface at uniform rate of 0.05 to 0.15 gallons per square yard.
- B. Apply tack coat to contact surfaces of curbs, gutters and existing pavement.
- C. Coat surfaces of catch basin frames with oil to prevent bond with asphalt pavement. Do not tack coat these surfaces.

3.4 PLACING ASPHALT PAVEMENT

- A. Install Work in accordance with State of South Carolina Department of Transportation standards.
- B. Place asphalt within 24 hours of applying tack coat.
- C. Install catch basin frames in correct position and elevation.
- D. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.
- E. Perform rolling with consecutive passes to achieve even and smooth finish without roller marks.

3.5 TOLERANCES

- A. Thickness of all courses shall comply with those shown on the drawings.
- B. Flatness: Maximum variation of 1/8-inch measured with 10-foot straight edge.
- C. Scheduled Compacted Thickness: Within 1/4-inch.
- D. Variation from True Elevation: Within 1/4-inch.

ARDURRA

3.6 PROTECTION

- A. Immediately after placement, protect pavement from mechanical injury for three (3) days or until surface temperature is less than 140 degrees F.

END OF SECTION

ARDURRA

SECTION 32 13 13

CONCRETE PAVING

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide all labor, materials, equipment, tools and incidentals to install cement concrete paving as shown on the Drawings and specified herein.
- B. This Section includes exterior cement concrete pavement for the following:
 - 1. Curbs and gutters.
 - 2. Walkways.
 - 3. Parking driveway aprons.

1.2 PROJECT CONDITIONS

- A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

PART 2 - PRODUCTS

2.1 FORMS

- A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces.
 - 1. Use flexible or curved forms for curves of a radius 100 feet or less.
- B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

2.2 STEEL REINFORCEMENT

- A. Plain-Steel Welded Wire Fabric: ASTM A185, fabricated from as-drawn steel wire into flat sheets.
- B. Deformed-Steel Welded Wire Fabric: ASTM A497, flat sheet.
- C. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcement bars, welded wire fabric, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or

ARDURRA

precast concrete or fiber-reinforced concrete of greater compressive strength than concrete, and as follows:

1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.

2.3 CONCRETE MATERIALS

- A. Use concrete conforming to the requirements of Division 3 Section 03 30 00 "Cast-in-Place Concrete" for air-entrained, 4,000 psi mix design.

2.4 CURING MATERIALS

- A. Absorptive Cover: AASHTO M182, Class 2, burlap cloth made from jute or kenaf, weighing approximately nine (9) ounces per square yard dry.
- B. Moisture-Retaining Cover: ASTM C171, polyethylene film or white burlap-polyethylene sheet.
- C. Water: Potable.
- D. Clear Waterborne Membrane-Forming Curing Compound: ASTM C309, Type 1, Class B.
- E. White Waterborne Membrane-Forming Curing Compound: ASTM C309, Type 2, Class B.
- F. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

1. Clear Waterborne Membrane-Forming Curing Compound:
 - a. AH Curing Compound #2 DR WB; Anti-Hydro International, Inc.
 - b. Aqua Resin Cure; Burke Group, LLC (The).
 - c. Safe-Cure Clear; ChemMasters.
 - d. W.B. Resin Cure; Conspec Marketing & Manufacturing Co., Inc.
 - e. Day Chem Rez Cure (J-11-W); Dayton Superior Corporation.
 - f. Nitocure S; Fosroc.
 - g. Aqua Kure-Clear; Lambert Corporation.
 - h. L&M Cure R; L&M Construction Chemicals, Inc.
 - i. 1100 Clear; W. R. Meadows, Inc.
 - j. Resin Cure E; Nox-Crete Products Group, Kinsman Corporation.
 - k. Rich Cure E; Richmond Screw Anchor Co.
 - l. Resi-Chem Clear Cure; Symons Corporation.
 - m. Horncure 100; Tamms Industries Co., Div. of LaPorte Construction Chemicals North America, Inc.
 - n. Hydro Cure; Unitex.
 - o. Certi-Vex Enviocure; Vexcon Chemicals, Inc.
2. White Waterborne Membrane-Forming Curing Compound:
 - a. AH Curing Compound #2 WB WP; Anti-Hydro International, Inc.

ARDURRA

- b. Aqua Resin Cure; Burke Group, LLC (The).
- c. W.B. Resin Cure; Conspec Marketing & Manufacturing Co., Inc.
- d. Thinfilm 450; Kaufman Products, Inc.
- e. Aqua Kure-White; Lambert Corporation.
- f. L&M Cure R-2; L&M Construction Chemicals, Inc.
- g. 1200-White; W. R. Meadows, Inc.
- h. White Pigmented Resin Cure E; Nox-Crete Products Group, Kinsman Corporation.
- i. Rich Cure White E; Richmond Screw Anchor Co.
- j. Resi-Chem High Cure; Symons Corporation.
- k. Horn cure 200-W; Tamms Industries Co., Div. of LaPorte Construction Chemicals North America, Inc.
- l. Hydro White 309; Unitex.

2.5 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D1751, asphalt-saturated cellulosic fiber.

2.6 CONCRETE MIXES

- A. Prepare design mixes as required in Division 3 Section 03 30 00 "Cast-in-Place Concrete."
- B. Proportion mixes to provide concrete with the following properties:
 - 1. Compressive Strength (28 Days): 4,000 psi.
 - 2. Maximum Water-Cementitious Materials Ratio: 0.45.
 - 3. Slump Limit: 3 inches.
 - a. Slump Limit for Concrete Containing High-Range Water-Reducing Admixture: Not more than 8 inches after adding admixture to plant- or site-verified, 2- to 3-inch slump.
- C. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content as follows within a tolerance of plus or minus 1.5 percent:
 - 1. Air Content: 6.0 percent.

2.7 CONCRETE MIXING

- A. Ready-Mixed Concrete: Comply with requirements and with ASTM C94.

ARDURRA

PART 3 - EXECUTION

3.1 PREPARATION

- A. Proof-roll prepared subbase surface to check for unstable areas and verify need for additional compaction. Proceed with pavement only after nonconforming conditions have been corrected and subgrade is ready to receive pavement.
- B. Remove loose material from compacted subbase surface immediately before placing concrete.

3.2 EDGE FORMS AND SCREED CONSTRUCTION

- A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for pavement to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.
- B. Clean forms after each use and coat with form release agent to ensure separation from concrete without damage.

3.3 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating reinforcement and with recommendations in CRSI's "Placing Reinforcing Bars" for placing and supporting reinforcement.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.
- C. Install welded wire fabric in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

3.4 JOINTS

- A. General: Construct construction, isolation, and contraction joints and tool edgings true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline, unless otherwise indicated.
 - 1. When joining existing pavement, place transverse joints to align with previously placed joints, unless otherwise indicated.
- B. Construction Joints: Set construction joints at side and end terminations of pavement and at locations where pavement operations are stopped for more than one-half hour, unless pavement terminates at isolation joints.
 - 1. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of pavement strips, unless otherwise indicated.

ARDURRA

2. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, walks, other fixed objects, and where indicated.
1. Locate expansion joints at intervals of 50 feet, unless otherwise indicated.
 2. Extend joint fillers full width and depth of joint.
 3. Terminate joint filler less than 1/2 inch or more than one (1) inch below finished surface if joint sealant is indicated.
 4. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
 5. Protect top edge of joint filler during concrete placement with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.
- D. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows:
1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with groover tool to the following radius. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover marks on concrete surfaces.
 - a. Radius: 3/8 inch.
 2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.
- E. Edging: Tool edges of pavement, gutters, curbs, and joints in concrete after initial floating with an edging tool to the following radius. Repeat tooling of edges after applying surface finishes. Eliminate tool marks on concrete surfaces.
1. Radius: 3/8 inch.

3.5 CONCRETE PLACEMENT

- A. Inspection: Before placing concrete, inspect and complete formwork installation, reinforcement steel, and items to be embedded or cast in. Notify other trades to permit installation of their work.
- B. Remove snow, ice, or frost from subbase surface and reinforcement before placing concrete. Do not place concrete on frozen surfaces.
- C. Moisten subbase to provide a uniform dampened condition at the time concrete is placed. Do not place concrete around manholes or other structures until they are at the required finish elevation and alignment.

ARDURRA

- D. Comply with requirements and with recommendations in ACI 304R for measuring, mixing, transporting, and placing concrete.
- E. Do not add water to concrete during delivery, at Project site, or during placement unless authorized by Engineer.
- F. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.
- G. Consolidate concrete by mechanical vibrating equipment supplemented by hand-spading, rodding or tamping. Use equipment and procedures to consolidate concrete according to recommendations in ACI 309R.
 - 1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand-spreading and consolidation. Consolidate with care to prevent dislocating reinforcement, dowels, and joint devices.
- H. Screed pavement surfaces with a straightedge and strike off. Commence initial floating using bull floats or darbies to form an open textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading dry-shake surface treatments.
- I. Curbs and Gutters: When automatic machine placement is used for curb and gutter placement, submit revised mix design and laboratory test results that meet or exceed requirements. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing as specified for formed concrete. If results are not approved, remove and replace with formed concrete.
- J. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
 - 1. When air temperature has fallen to or is expected to fall below 40 degrees F uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 degrees F and not more than 80 degrees F at point of placement.
 - 2. Do not use frozen materials or materials containing ice or snow.
 - 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators, unless otherwise specified and approved in mix designs.
- K. Hot-Weather Placement: Place concrete according to recommendations in ACI 305R and as follows when hot-weather conditions exist:
 - 1. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90 degrees F. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 - 2. Cover reinforcement steel with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
 - 3. Fog-spray forms, reinforcement steel, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

ARDURRA

3.6 CONCRETE FINISHING

- A. General: Wetting of concrete surfaces during screeding, initial floating, or finishing operations is prohibited.
- B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and the concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats, or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots, and fill low spots. Refloat surface immediately to uniform granular texture.
 - 1. Medium-to-Fine-Textured Broom Finish: Draw a soft bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture.

3.7 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and follow recommendations in ACI 305R for hot-weather protection during curing.
- B. Begin curing after finishing concrete, but not before free water has disappeared from concrete surface.
- C. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound, or a combination of these as follows:
 - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven (7) days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
 - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
 - 3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

3.8 PAVEMENT TOLERANCES

- A. Comply with tolerances of ACI 117 and as follows:
 - 1. Elevation: 1/4 inch.

ARDURRA

2. Thickness: Plus 3/8 inch, minus 1/4 inch.
3. Surface: Gap below 10-foot- long, unleveled straightedge not to exceed 1/4 inch.
4. Joint Spacing: 3 inches.
5. Contraction Joint Depth: Plus 1/4 inch, no minus.
6. Joint Width: Plus 1/8 inch no minus.

3.9 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing and inspection agency to sample materials, perform tests, and submit test reports during concrete placement. Sampling and testing for quality control will be in accordance with Division 3 Section 03 30 00 - *Cast-in-Place Concrete*.

3.10 REPAIRS AND PROTECTION

- A. Remove and replace concrete pavement that is broken, damaged, or defective, or does not meet requirements in this Section.
- B. Protect concrete from damage. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.
- C. Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material. Sweep concrete pavement not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION

ARDURRA

SECTION 32 92 19

SEEDING

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide labor, materials and equipment, tools, and incidentals to establish grass as shown on the Drawings and in all those areas where construction has disturbed, damaged, or destroyed the ground cover.

1.2 DEFINITIONS

- A. Finish Grade: Elevation of finished surface of planting soil.
- B. Manufactured Soil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.
- C. Planting Soil: Native or imported topsoil, manufactured topsoil, or surface soil modified to become topsoil; mixed with soil amendments.
- D. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill immediately beneath planting soil.

1.3 SUBMITTALS

- A. Submit in accordance with Section 01 33 00 – *Submittal Procedures*.
- B. Product Data: For each type of product indicated.
- C. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture stating the botanical and common name and percentage by weight of each species and variety, and percentage of purity, germination and weed seed. Include the year of production and date of packaging.
- D. Planting Schedule: Indicating anticipated planting dates for each type of planting.
- E. Maintenance Instructions: Recommended procedures to be established by Owner for maintenance of lawns during a calendar year. Submit before expiration of required maintenance periods.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Seed: Deliver seed in original sealed, labeled and undamaged containers.
- B. Weather Limitations: Proceed with planting only when existing and forecasted weather

ARDURRA

conditions permit.

PART 2 - PRODUCTS

2.1 SEED MIXTURE

A. Seed mixture is based on Berkeley County standards.

B. Temporary Grassing:

<u>Schedule No.</u>	<u>Common Name of Seed</u>	<u>Lbs./Acre</u>	<u>Planting Dates</u>
1	Brown Top Millet	40	March 10 - August 30
	Lime	3,000	
	Fertilizer (10-10-10)	500	
2	Rye Grain	56	August 30 - March 15
	Lime	3,000	
	Fertilizer (10-10-10)	500	

C. Permanent Grassing:

<u>Schedule No.</u>	<u>Common Name of Seed</u>	<u>Lbs./Acre</u>	<u>Planting Dates</u>
1	Sericea Lespedeza	10	March 15 - August 30
	Bermuda Common (hulled)	12	
	Brown Top Millet	10	
	Lime	3,000	
	Fertilizer (10-10-10)	1,000	
	Mulch	4,000	
2	Sericea Lespedeza	5	August 30 - November 15
	Pensacola Bahia	40	
	Rye Grain	10	
	Lime	3,000	
	Fertilizer (10-10-10)	1,000	
	Mulch	4,000	

2.2 SOIL MATERIALS

A. Topsoil:

1. Excavated and reused topsoil material generally occurring from the top of the ground to a depth of 6 to 18 inches.
2. Free of roots, rocks larger than 1/2-inch, subsoil, debris, large weeds and foreign matter.

ARDURRA

2.3 MULCHES

- A. Straw Mulch: Provide air-dry, clean, mildew- and seed-free, salt hay or threshed straw of wheat, rye, oats, or barley.
- B. Fiber Mulch: Biodegradable, dyed-wood, cellulose-fiber mulch; nontoxic; free of plant-growth or germination inhibitors; with maximum moisture content of 15 percent and a pH range of 4.5 to 6.5.
- C. Nonasphaltic Tackifier: Colloidal tackifier recommended by fiber-mulch manufacturer for slurry application; nontoxic and free of plant-growth or germination inhibitors.
- D. Asphalt Emulsion: ASTM D977, Grade SS-1; nontoxic and free of plant-growth or germination inhibitors.

2.4 LIME

- A. Provide agricultural grade, ground limestone conforming to the requirements of the South Carolina Department of Agriculture.

2.5 EROSION-CONTROL MATERIALS

- A. Erosion-Control Blankets: Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a photodegradable plastic mesh. Include manufacturer's recommended steel wire staples, 6 inches long.
- B. Erosion-Control Fiber Mesh: Biodegradable twisted jute or spun-coir mesh, a minimum of 0.92 pound per square yard, with 50 to 65 percent open area. Include manufacturer's recommended steel wire staples, 6 inches long.

2.6 ACCESSORIES

- A. Fertilizer: FS O-F-241, recommended for grass, with fifty percent of the elements derived from organic sources; of proportion necessary to eliminate any deficiencies of topsoil to the following proportions: Nitrogen 15 percent, phosphoric acid 10 percent, and soluble potash 10 percent.
- B. Water: Clean, fresh, and free of substances or materials which could inhibit vigorous growth of grass.
- C. Herbicide: Pre-Emergent.
- D. Stakes: Softwood lumber, chisel pointed.
- E. String: Inorganic fiber.

ARDURRA

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive lawns and grass for compliance with requirements and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Newly Graded Subgrades: Loosen subgrade to a minimum depth of 6 inches. Remove stones larger than 1 inch in dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
- B. Fertilizing:
 - 1. Apply lime uniformly at a rate of 2,000 pounds per acre.
 - 2. Apply fertilizer in accordance with manufacturer's instructions at a rate of 1,000 pounds per acre.
 - 3. Apply after smooth raking of topsoil and prior to roller compaction.
 - 4. Do not apply fertilizer at the same time or with the same machine as will be used to apply seed. Mix thoroughly into upper 2 inches of topsoil.
- C. Finish Grading: After fertilizing, grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2-inch of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit fine grading to areas that can be planted in the immediate future.
- D. Moisten prepared areas before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
- E. Restore areas if eroded or otherwise disturbed after finish grading and before planting.

3.3 SEEDING

- A. Apply seed at a rate consistent with Schedule 1 or 2, paragraph 2.1.A, evenly in two intersecting directions. Sow seed with spreader or seeding machine. Do not broadcast or drop seed when wind velocity exceeds 5 mph. Rake in lightly.
- B. Do not seed areas in excess of that which can be mulched on same day.
- C. Planting Season: March 15 to August 30, Schedule 1; August 30 to November 15, Schedule 2.
- D. Do not sow immediately following rain, when ground is too dry, or during windy periods. Roll seeded area with roller not exceeding 112 pounds.
- E. Immediately following seeding and compacting, apply mulch to a thickness of 1-1/2 inches. Maintain clear of shrubs and trees. Spread by hand, blower, or other suitable equipment.

ARDURRA

1. Anchor straw mulch by crimping into topsoil with suitable mechanical equipment.
2. Bond straw mulch by spraying with asphalt emulsion at the rate of 10 to 13 gallons per 1,000 square feet. Take precautions to prevent damage or staining of structures or other plantings adjacent to mulched areas. Immediately clean damaged or stained areas.

- F. Apply water with a fine spray immediately after each area has been mulched. Saturate to 4 inches of soil.

3.4 HYDROSEEDING

- A. Mix specified seed, fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.

1. Mix slurry with non-asphaltic tackifier.
2. Apply slurry uniformly to all areas to be seeded in a two-step process. Apply first slurry application at a minimum rate of 12 pounds per 1,000 square feet dry weight but not less than the rate required to obtain specified seed-sowing rate. Apply slurry cover coat of fiber mulch at a rate of 25 pounds per 1,000 square feet.

3.5 SEED PROTECTION

- A. Identify seeded areas with stakes and string around area periphery. Set string height to 6 inches. Space stakes at 48 inches.
- B. Cover seeded slopes where grade is steeper than 3:1 with erosion fabric. Roll fabric onto slopes without stretching or pulling.
- C. Lay fabric smoothly on surface, bury top end of each section in 6-inch-deep excavated topsoil trench. Provide 12-inch overlap of adjacent rolls. Backfill trench and rake smooth, level with adjacent soil.
- D. Secure outside edges and overlaps at 36-inch intervals with stakes.
- E. Lightly dress slopes with topsoil to ensure close contact between fabric and soil.

3.6 CLEANUP AND PROTECTION

- A. Promptly remove soil and debris created by lawn work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.
- B. Erect and maintain barricades and warning signs during maintenance period as required to protect newly planted areas from traffic. Remove after lawn is established.
- C. Remove erosion-control measures after grass establishment period.
- D. Maintain the planted areas in a satisfactory condition until final acceptance of the project. Perform necessary watering, filling, leveling, and repairing of any washed or eroded areas to

ARDURRA

maintain and protect grades as established.

- E. Assume responsibility for permanently establishing grass cover over the entire site. Implement suitable measures as are necessary to maintain and protect grades as established.
- F. Work will receive final acceptance when the permanent stand of grass is established and erosion/washing is completely checked to the satisfaction of the Engineer.

3.7 MAINTENANCE

- A. Mow grass at regular intervals to maintain at a maximum height of 2-1/2 inches. Do not cut more than 1/3 of grass blade at any one mowing.
- B. Neatly trim edges and hand clip where necessary.
- C. Immediately remove clippings after mowing and trimming.
- D. Water to prevent grass and soil from drying out.
- E. Roll surface to remove minor depressions or irregularities.
- F. Control growth of weeds. Apply herbicides in accordance with manufacturer's instructions. Remediate damage resulting from improper use of herbicides.
- G. Immediately reseed areas which show bare spots.

END OF SECTION

ARDURRA

SECTION 33 05 23.16

STEEL PIPE SLEEVES

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide all labor, materials, equipment, tools and incidentals to install steel pipe to be used as casing pipe for roadway crossings as shown on the Drawings and specified herein.

1.2 SUBMITTALS

- A. Submit in accordance with Section 01 33 00 – *Submittal Procedures*.
- B. Shop drawings:
 - 1. Dimensions.
 - 2. Size.
 - 3. Materials of Construction.
 - 4. Weight.
- C. Quality Control Submittals:
 - 1. Manufacturer Certificate:
 - a. Prior to shipment of steel pipe, submit an affidavit of compliance from the manufacturer stating that the pipe for this project have been manufactured and tested in accordance with ASTM A139 standard and has a minimum yield of 35,000 psi.

PART 2 - PRODUCTS

2.1 HIGHWAY SLEEVES

- A. Unless otherwise specified in the encroachment permit, provide steel pipe for sleeves under highways conforming to ASTM A139, latest revision, Grade B, with a yield strength of 35,000 psi. Provide sleeve pipe of the lengths shown on the Drawings.
- B. Provide sleeve pipes that are bituminous coated on the inside and outside.
- C. The sizes and wall thicknesses of the sleeve pipe shall be as shown on the Drawings.

Carrier Pipe Size (Inches)	Sleeve Pipe Size (Inches)	Sleeve Pipe Wall Thickness (Inches)
6	12	0.188
10	18	0.3122

ARDURRA

2.2 CASING SPACERS

- A. Provide “spider” type casing spacers for positioning carrier pipe within the casing pipe, Model CCS as manufactured by Cascade Waterworks Manufacturing, Yorkville, Illinois, or approved equal. A minimum of two (2) casing spacers will be installed per joint of pipe.
 - 1. Shell: Bolt-on style with at least two sections.
 - 2. Band: 14-gauge T304 stainless steel with 90 mil PVC liner.
 - 3. Risers: 10-gauge T304 stainless steel.
 - 4. Runners: Minimum seven (7) inches in length.

2.3 END SEALS

- A. Provide pull-on type synthetic rubber end seals for casing pipe, Model CCES as manufactured by Cascade Waterworks Manufacturing, Yorkville, Illinois, or approved equal.
 - 1. Seal: 1/8-inch-thick neoprene rubber.
 - 2. Bands: Two (2) ½-inch wide 304 stainless steel bands with 304 stainless steel worm gear clamps.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Highway Crossing:
 - 1. Install all pipe crossings under highways in accordance with the requirements of the South Carolina Department of Transportation governing the method and materials of construction. Pay for any and all expenses incurred by such authority in protecting its highway while pipes are being placed under same and for any damage to the highway. Arrange with the governing authority for the proper bracing, shoring, and other necessary protection of the highway before excavation beneath any of said highway.

3.2 CARRIER PIPE INSTALLATION

- A. Install carrier pipe by using “spider” type casing spacers and synthetic rubber end seals as described in Paragraph 2.2 and 2.3. Install spacers and seals in accordance with manufacturer’s recommendations.

END OF SECTION

ARDURRA

SECTION 33 11 00

PRESSURE PIPING - GENERAL

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide all labor, equipment, material, tools and incidentals required to install the various piping, valves, accessories, and fire hydrant assemblies for water lines as shown on the Drawings and specified herein.

1.2 SUBMITTALS

- A. Submit in accordance with Section 01 33 00 – *Submittal Procedures*.
- B. Product Data:
 - 1. Manufacturer's literature for the various types of pipe, fittings, restraints, and related materials.
- C. Shop Drawings:
 - 1. Manufacturer's drawings and catalog cuts for all pipe, fittings, restraints and related materials showing details and materials of construction, including dimensions.
- D. Manufacturer's Certificates:
 - 1. Furnish affidavit that the pipe, fittings and lining furnished comply with all applicable provisions of the ANSI and/or AWWA Standards.
- E. Record Drawings:
 - 1. Submit in accordance with the requirements of Section 01 33 00 – *Submittal Procedures* and Section 01 77 00 – *Closeout Procedures*.
- F. Test Reports:
 - 1. Submit reports on pressure and leakage tests for all pipelines.
 - 2. Submit reports on bacteriological tests for potable water system piping.

1.3 JOB CONDITIONS

- A. Minimize interruptions to utility services. Submit plans and schedules to the Engineer for approval by the proper authority before any shutdown or any interruption in service takes place.

ARDURRA

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Provide "lead free" materials in the construction of piping systems shown on the Drawings. "Lead free" as used in these Specifications is defined as containing less than 0.2 percent lead in solder and flux, and containing less than 8.0 percent lead in pipe fittings.
- B. Provide all materials which will come in contact with potable water, including valves, fittings, piping, packing, and jointing and gasket material that are third party certified as meeting the Specifications of the American National Standard Institute/ National Sanitation Foundation Standard 61, Drinking Water System Components – Health Effects. The certifying party shall be accredited by ANSI.
- C. Provide all pipe, fittings, packing, jointing materials, valves and fire hydrants that conform to the appropriate Section C of the AWWA Standards.
- D. Provide all new piping materials. Used materials are not acceptable.
- E. Provide asbestos cement pipe for the repair of existing asbestos cement waterlines only. Do not use asbestos cement pipe for new waterline construction.
- F. Do not use steel pipe for potable water lines.
- G. Store rubber gaskets and polyethylene film under cover and out of direct sunlight. Do not store nuts, bolts, glands, and other accessories directly on the ground. Keep insides of pipe and fittings free of dirt and debris.

PART 3 - EXECUTION

3.1 INSPECTION

- A. The Engineer or Owner reserves the right to inspect all pipe at the factory. Provide a production schedule in sufficient time so plans can be made for in-plant inspection of the pipe or fittings during production, should it be required.
- B. Ensure that applicable pipe is plainly marked with special markings indicating the weight, proper location of the pipe or fitting in the line by reference to layout drawings and schedules, class of pipe, casting period, manufacturer's mark and year pipe was produced.
- C. Examine all piping materials for compliance with the requirements for installation tolerances and other conditions that may affect performance.

3.2 TESTS

- A. Perform all tests in the presence of the Owner or Engineer unless waived in writing. Notify the Engineer in sufficient time when tests are being conducted to allow for travel time to the manufacturer's plant.

ARDURRA

3.3 INSTALLATION OF UNDERGROUND PIPING

- A. Conduct installation of waterlines and all appurtenances in accordance with the appropriate Section C of the AWWA Standards, and/or manufacturer's recommended installation procedures.
- B. Perform excavation, trenching and backfilling for the installation of underground piping system as specified in Section 31 20 01 – *Trenching, Backfilling and Compacting*. Install pipe in a level trench. Smooth out irregularities or fill in with sand and tamp. Scoop out holes for bells, leaving the entire barrel of the pipe bearing on the pipe bed. Install the pipe a minimum of 36 inches below grade.
- C. Begin installation of the pipe immediately after the excavation is started and keep pipe operation laying close behind the trenching. Install pipe in accordance with the manufacturer's instructions and recommendations. Remove damaged or unsound pipe or fittings and replace at no additional cost to the Owner. Before jointing of the pipe, remove all lumps, blisters, excess coating material or oil from the bell and spigot ends of the pipe.
- D. Wipe the ends of mechanical joint pipe, fittings, rubber gasket joint pipe, spigot and the inside of the bell clean of all dirt grease, and foreign matter.
- E. Restrain lines 2.5 inches in diameter and larger to prevent movement under pressure. Furnish mechanical joint restraint devices as specified in the individual Specification Sections and as shown on the Drawings. Install thrust restraints at all bends, tees, crosses, wyes, plugs, and reducers, or as shown in details of typical thrust restraint on the Drawings. Additionally, install restraints for valves, as shown on the Drawings and specified herein.
 - 1. For mechanical joint restraint devices, provide a restraining mechanism, which imparts multiple wedging actions against the pipe, increasing its resistance as the pipeline pressure increases. Use twist-off nuts to ensure proper actuation of mechanical joint restraining devices. Provide mechanical joint restraining devices by EBAA Iron, Inc., Megalug or approved equal.
 - a. Additional joint restraint may be required for multiple pipe joints in any direction from the mechanical joint restraint device. These shall be considered integral to the mechanical restraint system and shall be provided along with the mechanical joint restraint to meet the requirement of restraining the water lines as indicated on the Drawings.
 - b. Joint restraints are required for all pipe installed within a casing pipe. Refer to the drawings and individual specification sections for the restraint system requirements.
- F. Where there is no adequate natural foundation upon which to construct a pipe bed, install the pipe on a prepared stabilized subgrade or rock bedding as defined in ASTM D2774, section 9. Replace or stabilize unsuitable subgrade materials as described in Section 31 20 01 – *Trenching, Backfilling and Compacting*. Where dewatering is required, use Class I materials as described in ASTM D2774.
- G. Place pipe and fittings along the route of construction with the spigot ends pointing in the direction of flow. Place pipe where it will cause least interference with traffic. Handle pipe with mechanical equipment. Before it is lowered into the trench, swab or brush out the pipe to ensure that no dirt or foreign material gets into the finished line. Provide a test plug to close

ARDURRA

the pipe and to keep out trench water whenever Work is not in progress. Provide the means of dewatering the trench, the cost of which is included in the price of installing the pipe.

- H. Do not exceed 75% of the manufacturer's recommendations regarding deflections from a straight line or grade made necessary by vertical curves, horizontal curves or offsets. If the specified or required alignment requires deflection in excess of those recommended, either provide special bends as approved by the Engineer or a sufficient number of shorter lengths of pipe to provide a greater number of angular deflections within the required limit.
- I. All valves, ductile iron pipe, hydrants, fittings, bolts and appurtenances are to be wrapped in an 8 mil polyethylene film in accordance with ANSI Standard A21.5 (AWWA C105). Close all open ends and damaged areas, securely tape two linear feet beyond last fitting to ensure complete protection. Damaged polyethylene film cannot be repaired, replace with new film.
- J. Ensure that all joints are watertight and immediately repair any leaks or defects discovered to the satisfaction of the Engineer. Remove, clean and properly relay any pipe that has been disturbed after being installed. Flush or remove any superfluous material inside the pipe by means of an approved follower or scraper after joints are made. Install fittings and pipe joints in strict accordance with the manufacturer's recommendations.
- K. Where water mains are stubbed out with a reducer and valve, provide restrained joints in addition to thrust blocks from the valve back to the tee.
- L. For the protection of exposed reinforcing in anchor blocks, furnish and apply two coats of Koppers Bitumastic No. 505 protective coating, or approved equal.
- M. For the protection of exposed reinforcing in anchor blocks, furnish and apply two coats of Koppers Bitumastic No. 505 protective coating, or approved equal

3.4 MISCELLANEOUS INSTALLATION CONDITIONS

- A. Sewer and Water Main Crossing:
 - 1. Install water mains at least 10 feet horizontally from any existing or proposed sanitary sewer. Measure the distance from edge to edge.
 - 2. Install water mains crossing sanitary sewers, either above or below, to provide a minimum vertical separation of 18 inches between the outside of the water main and the outside of the sewer. Whenever possible, install the water main above the sewer. Provide adequate structural support for water mains crossing under sewers.
 - 3. Where water mains and sanitary sewers cross, install a 20-foot section of ductile iron pipe, centered over the point of crossing. For waterlines less than 4-inches, encase the pipe in concrete.
 - 4. Where water mains are laid within 10 feet horizontally of a sanitary sewer, install the water main in a separate trench or on an undisturbed earth shelf located on one side of the sewer at an elevation such that the bottom of the water main is at least 18 inches above the top of the sewer.
 - 5. Do not install water mains in such a manner that they come in contact with or penetrate sewer manholes, storm sewers or catch basins.
 - 6. Do not locate potable water mains within 25 feet horizontally of a wastewater tile field or spray field.

ARDURRA

7. Special Conditions: When it is impossible to obtain the distances specified above, SCDHEC may allow an alternative design. Include the following guidelines in any alternative design or conditions:
 - a. Maximize the distances between the water main and sewer line and the joints of each.
 - b. Use materials for the sewer line which meet the requirements specified herein for waterlines.
 - c. Allow enough distance to make repairs to one of the lines without damaging the other.

B. Stream Crossings:

1. The Owner will obtain the necessary construction permits from the governing authorities. Do not begin Work on any stream crossing until a copy of the approved permit is received. The Work will be subject to any additional requirements of the governing authority.
2. Underwater Crossings:
 - a. Install the pipe with a minimum of 2 feet of cover.
 - b. For crossings exceeding 15 feet in width, place an isolation valve on each side of the crossing, in an area that is easily accessible and not subject to flooding. Provide a blow-off assembly on the side opposite the supply. Install the blow-off in accordance with construction detail Drawings.
3. Above-water Crossings: Install the pipe with adequate supports and anchors. Protect pipe from damage and freezing. Make pipe accessible for repair and replacement.
4. Control turbidity to within 50 NTU above normal at a distance greater than 100 feet from the point of Work. Include the necessary fittings, restraints, socket clamps, blocking and anchorage, riprap, and ground stabilization as shown in the Drawings.

C. Crossings Under Highways, Railroads, Pipelines, and Other Rights-of-Way:

1. Install all pipe under City, County or State highways, railroads, pipelines and other public or private rights-of-way in accordance with the requirements of the highway department, railroad, agency or entity having jurisdiction, ownership or governing authority.
2. The entity involved will govern the method and materials of construction. The Owner will obtain the necessary permits or agreements to enter said rights-of-way. Accept responsibility for any and all expenses to protect the highway, utility, land, and other appurtenances within the rights-of-way involved. Secure any additional information as may be necessary to meet the conditions of the permit or agreement and perform the Work accordingly.
3. Where open cut or installation without casing is permissible in a crossing instead of jacking and boring, make the necessary provisions for handling traffic or maintaining service as required.

D. Connection to Existing Mains:

1. Where connections are required between new Work and existing water mains, make connections in a thorough and workmanlike manner, using proper specials and fittings to suit the actual conditions.

ARDURRA

2. Where a connection is to be made to an existing fitting in the line, schedule the Work so that digging and locating the existing fittings can be completed prior to starting trench work on the line. Perform cut-ins into lines at a time approved by the Owner's representative. Verify the dimensions of all pipe before ordering special fittings and couplings.

E. Harnessing:

1. Where harnessing is shown on the Drawings or approved by the Engineer, coat all harnessing rods, clamps, bolts, and nuts after assembly. Use Koppers Bitumastic No. 505 protective coating, or approved equal, to at least a 4-mil dry thickness.

F. Do not connect pits, chambers or manholes containing valves, blow-offs, meters, air relief valves, or other such appurtenances directly to any storm drain or sanitary sewer.

G. Contaminated Areas:

1. Do not locate waterlines in areas of known contamination.

H. Watertight Construction:

1. Build all gravity sewers, manholes and service connections practically watertight and adhere rigidly to the Specifications for material and workmanship. Give special care and attention to securing watertight construction.

I. Testing:

1. Low pressure air test all gravity sewer lines in accordance with Section 01 73 32 - *Testing Piping Systems*. Include the expense of the above tests in the unit prices Bid per foot of sewer line under each respective size and depth category.
2. The Owner may inspect any section of the sewer lines by television equipment before the Project is completed.

J. Repair:

1. Uncover and repair all leaks evident at the surface, or evident by visual observation, regardless of the total leakage as indicated by the test.
2. Remove and replace all pipes and other materials found defective under the test at no additional expense to the Owner.
3. Repeat tests until leakage has been reduced below the allowable amount.

3.5 PRESSURE TESTING OF SYSTEM

- A. Pressure test piping systems in accordance with Section 01 73 32 – *Testing Piping Systems*.

3.6 CROSS CONNECTION CONTROL

- A. Ensure that there are no connections between the distribution system and any pipes, pumps, hydrants, or tanks from which unsafe water or other contaminated materials may be discharged or drawn into the water system.

ARDURRA

- B. Do not include any bypasses, unless the bypass is equipped with an approved backflow prevention device.
- C. Provide an air gap separation or an approved reduced pressure backflow preventer for any high hazard category cross connections.
- D. Do not install reduced pressure principle backflow prevention assemblies in any area or location subject to possible flooding. This includes pits or vaults which are not provided with a gravity drain to the ground's surface that is capable of exceeding the discharge rate of the relief valve. If the device is installed in a pit, provide a drain that is a minimum of two times the size of the line entering the backflow prevention device. Do not discharge the drain into any ditch or storm drain which could flood water back into the pit.
- E. Ensure that all inlet piping to the backflow prevention device is approved for potable water service, and is AWWA or NSF approved.
- F. Protect potable waterlines from contamination by fire line sprinkler systems and dedicated fire lines, except those in high hazard category, by an approved double check valve assembly.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

ARDURRA

SECTION 33 11 13

DUCTILE IRON PIPE

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide all labor, materials, equipment, tools, and incidentals required to install complete ductile iron piping and fittings for water main as shown on the Drawings and specified herein.
- B. This Section includes the following:
 - 1. Install piping as shown on the Drawings. Engineer reserves the right to make such modifications in locations to avoid interference between pipes or for other reasons.

1.2 DEFINITIONS

- A. Where the word "pipe" is used it shall refer to pipe, fittings and all related appurtenances unless otherwise shown or noted.

1.3 SUBMITTALS

- A. Submit in accordance with Section 01 33 00 – *Submittal Procedures*.
- B. Product Data:
 - 1. Manufacturer's specifications, catalog cuts and literature:
 - a. Pipe.
 - b. Inside linings.
 - c. Mechanical and push-on joints.
 - d. Standard fittings.
 - e. Special fittings.
 - f. Restraining devices.
 - g. Polyethylene Encasement ("Pipe Wrap") material.
- C. Shop Drawings:
 - 1. Manufacturer's drawings and cut sheets showing all important details of construction, including dimensions.
 - 2. Tabulated laying schedule showing station, invert elevation, pipe class, joint type, fittings, outlets, solid sleeves, and specials.
- D. Manufacturer Certificate:
 - 1. Prior to shipment of pipe, submit an affidavit of compliance from the manufacturer stating that the pipe, fittings, lining, and exterior coatings for this Project have been

ARDURRA

manufactured and tested in accordance with ANSI, AWWA, ASTM standards and meet NSF-61 approval for use with potable water.

E. Test Reports:

1. Submit three (3) certified copies of the tests made by the manufacturer or by a reliable commercial laboratory to the Engineer with each shipment of pipe.
2. Test reports in accordance with Section 01 73 31 – *Disinfection of Potable Water Mains*.
3. Test reports in accordance with Section 01 73 32 – *Testing Piping Systems*.

F. Submit anticipated production and delivery schedule.

1.4 QUALITY ASSURANCE

- A. Furnish all similar items specified under this Section from a single manufacturer which is regularly engaged in the production of such materials. Proper functioning of the items as furnished is the sole responsibility of the manufacturer.
- B. This section is intended to give a general description of the Project requirements. It does not cover all details since they may vary in accordance with the exact requirements of the items provided. They are, however, intended to cover the furnishing, delivery, installation, field testing and field calibration of all materials and appurtenances as required. Furnish and install all additional appurtenances necessary for the proper operation of the proposed installation not specifically mentioned in these Specifications or shown on the Drawings at no additional cost to the Owner.
- C. Hydrostatically test each length of ductile iron pipe supplied at the point of manufacture, in accordance with AWWA C151.
- D. Mark all pipe and fittings with the following information:
1. Manufacture date.
 2. Size.
 3. Type, class or wall thickness.
 4. Standard to which it is manufactured: AWWA, ASTM, etc.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Do not ship materials until shop drawings are approved by Engineer in writing.
- B. Do not disassemble factory assembled parts and components for shipment unless permission is received in writing from the Engineer.
- C. Properly protect unpainted finished iron surfaces to prevent rust and corrosion.
- D. Properly handle and store all materials so that no damage or deterioration will occur during shipment or prolonged delay from the time of shipment until installation is completed and ready for operation.

ARDURRA

- E. Materials damaged during shipping, storage or installation will not be accepted.

1.6 WARRANTY

- A. Provide manufacturer's and Contractor's warranties for all materials supplied under this Section.
- B. Provide materials that are free from defects in workmanship, design and materials. If any part of the materials should fail during the warranty period, replace it and restore the unit(s), at no additional expense to the Owner.
- C. The Manufacturer's warranty period shall run concurrently with the Contractor's warranty period. No exception to this provision will be allowed.
- D. Warranty Period: One (1) year, unless otherwise specified. Begin warranty period as outlined in the General Conditions and Division 1.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. American Cast Iron Pipe Company.
- B. Griffin Pipe Company.
- C. McWane, Inc.
- D. United States Pipe and Foundry Company.
- E. Or approved equal.

2.2 MATERIALS

- A. Pipe:
 - 1. Design in accordance with ANSI A21.50/AWWA C150, latest revision.
 - 2. Manufacture in accordance with ANSI A21.51/AWWA C151, latest revision.
 - 3. All sizes of pipe shall be laying length of 18'-0" to 20'-0".
 - 4. Pipe shall have the following thickness classes:
 - a. 6"-54" pipe shall be class 50
 - b. 4" pipe shall be class 51.
 - c. Flanged pipe shall be class 53.
 - d. Underwater pipe shall be a minimum of class 60.
 - 5. Minimum rated working pressure of 150 psi unless noted otherwise on the Drawings.

ARDURRA

6. Determine earth loads from the standard tables in the manual based on a minimum 150-psi working pressure, trench condition 3, width d+2 feet and minimum depth of cover over pipe of 24 inches.

B. Pipe Joints:

1. Provide ductile iron pipe with push-on joints conforming to ANSI A21.11/AWWA C111, latest revision.
2. Provide a boltless, integral restraining system rated for 150 psi in accordance with the performance requirements of ANSI/AWWA C111/A21.11, unless noted otherwise on the Drawings.
 - a. Boltless restrained joint system shall be American "Flex Ring", U. S. Pipe "TR-Flex", McWane "TR-Flex", "Amarillo Fast-Grip" Gasket, "Barracuda" Gasket, or approved equal. Restrained gaskets shall be yellow or orange in color and color shall be consistent throughout the entire cross section of the gasket. The color shall not be attained by surface coating; it shall be inherent within the rubber.
 - b. Field adaptable restraining gaskets shall not be used on pipe joints located within a casing pipe or at stream crossing locations
3. Gauge pipe ends (spigot end, bell, and socket) for all pipe with suitable gauges at sufficiently frequent intervals to ensure compliance to the standard dimensions of ANSI/AWWA C151/A1.5, latest addition. Manufacturer must have a recommended ovality tolerance for 18 inches and larger size pipe. Each end of each pipe 18 inches and larger shall be measured and approved by manufacturer's quality assurance inspector to meet such out of round tolerances. Provide manufacturer's certification that ovality has been measured and controlled in accordance with manufacturer's standard.

C. Fittings:

1. For ductile iron pipe, provide mechanical joint type below ground fittings or restrained joint type fittings manufactured of ductile iron and conforming to the requirements of ANSI/AWWA C110/A21.10 or ANSI/AWWA C153/A21.53, latest revision. Provide fittings compatible with the pipe and designed for 250 psi working pressure, unless noted otherwise on the Drawings. Provide linings and coatings of the fittings as specified for the pipe.
2. Restrained mechanical joint fittings using EBAA Iron, Inc., Megalug or equal. Use twist-off nuts to ensure proper actuation of mechanical joint restraining devices.

D. Lining:

1. Provide standard cement lining and bituminous seal coat for the interior of ductile iron pipe and fittings in accordance with ANSI A21.4, latest revision (AWWA C104).
2. Fusion-bonded epoxy interior finish will be accepted for fittings in accordance with AWWA C116.

E. Exterior Finish:

1. Provide the standard bituminous coat on the exterior of pipe and fittings in accordance with AWWA C151.

ARDURRA

2. Fusion-bonded epoxy exterior finish will be accepted for fittings in accordance with AWWA C116.

F. Gaskets:

1. Provide gaskets made of synthetic rubber type and suitable for service at maximum operating temperature of piping system as specified in piping system specification section. Do not use natural rubber or other material which will support microbiological growth for any gaskets, O-rings, and other products used for jointing pipes, setting meters or valves, or other appurtenances which will expose the material to the water.

G. Joint Lubricants:

1. Provide joint lubrication as recommended by the manufacturer of the pipe and meeting the requirements of NSF 61.
2. Do not use lubricants which support microbiological growth, including vegetable shortening, for pipe joints.

H. Bolts, Nuts, and All-Thread Rod:

1. Bolts, nuts and all-thread rod shall be made of either high-strength cast iron containing a minimum of 0.50 percent copper, or high-strength low-carbon steel per ASTM A307, specifications for carbon steel externally threaded standard fasteners, Grade B, having minimum yield strength of 60,000 psi.
2. Stainless steel materials shall contain sufficient chromium to resist corrosion, oxidation, and rust.
3. Materials shall be sound, clean, and coated with a rust resistant lubricant.
4. Threads shall be in accordance with ANSI B1.1, Unified Inch Screw Threads (UN and UNR Thread Forms), Screw Threads, Gages, and Gaging, conforming to the coarse thread series (UNC) Unified Coarse, with threads Class 2A internal and Class 2B external.
5. Bolts $\frac{3}{4}$ " and smaller shall be furnished with heavy hex heads conforming to ANSI B18.2.1.
6. Bolts larger than $\frac{3}{4}$ " may have either standard or heavy hex heads conforming to ANSI B18.2.1.

I. Polyethylene Encasement ("Pipe Wrap"):

1. Provide polyethylene wrap in tube or sheet form. Polyethylene wrap will be installed for the entire length of piping.
2. Polyethylene wrap will also be installed around the ductile iron pipe at locations where a minimum of 2 feet of separation cannot be maintained between steel natural gas and petroleum pipelines, and at other locations as determined by the Engineer.
3. Ductile iron pipe that is installed less than 2 feet from steel natural gas and petroleum lines shall be double wrapped in polyethylene encasement.
4. Polyethylene encasement for use with ductile iron pipe systems shall consist of three layers of co-extruded linear low-density polyethylene (LLDPE), fused into a single thickness of not less than eight mils. The inside surface of the polyethylene wrap to be in contact with the pipe exterior shall be infused with a blend of anti-microbial biocide to mitigate microbiologically influenced corrosion and a volatile corrosion inhibitor to control galvanic corrosion.

ARDURRA

- 5. Polyethylene encasement shall be V-Bio or approved equal, clearly marked and installed in accordance with the requirements of AWWA C105.
- J. All materials/products that contain potable water must be third party certified as meeting the specifications of ANSI/NSF Standard 61.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine all materials for compliance with requirements for installation tolerances and other conditions affecting performance.

3.2 INSTALLATION

- A. All pipe, fittings and appurtenances are to be wrapped in a low-density 8 mil. polyethylene film blue in color in accordance with ANSI Standard A21.5 (AWWA C105). Close all open ends with poly tape. Install poly wrap in accordance with AWWA C600 and ANSI/AWWA C105/A21.5 and also in accordance with all recommendations and practices of the AWWA M41, Manual of Water Supply Practices.
- B. Install in strict accordance with manufacturer's written instructions and approved submittals.
- C. Install in accordance with Section 33 10 00 – *Pressure Piping - General*.
- D. When pipe laying is not in progress, temporarily close open ends of the pipe using a water-tight plug to prevent contamination.
- E. Maintain pipe interior dry and broom clean throughout construction period.
- F. Seal and protect field cut ends in accordance with manufacturer's instructions.
- G. Provide trench type recommended by manufacturer based on pipe diameter and depth of bury. At a minimum, provide trench type 3.

3.3 FIELD QUALITY CONTROL

- A. Pressure Testing:
 - 1. Pressure test piping in accordance with Section 01 73 32 – *Testing Piping Systems*.
- B. Disinfection:
 - 1. Disinfect all piping which comes in contact with finished or potable water in accordance with Section 01 73 31 – *Disinfection of Potable Water Mains*.

END OF SECTION

ARDURRA

SECTION 33 11 13.23

POLYVINYL CHLORIDE (PVC) PIPE - (POTABLE WATER)

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide all labor, materials, equipment, tools, and incidentals to install PVC pipe and related accessories as shown on the Drawings and specified herein.
- B. This Section includes the following:
 - 1. Polyvinyl chloride pipe for underground potable waterlines.
 - 2. Fittings.
 - 3. Accessories.
 - 4. Installation.

1.2 DEFINITIONS

- A. Where the word "pipe" is used, it refers to pipe, fittings, and all related appurtenances, unless otherwise shown or noted.

1.3 SUBMITTALS

- A. Submit in accordance with Section 01 33 00 – *Submittal Procedures*.
- B. Product Data:
 - 1. Manufacturer's specifications, catalog cuts, and literature:
 - a. Pipe.
 - b. Mechanical and push-on joints.
 - c. Standard fittings.
 - d. Special fittings.
- C. Shop Drawings:
 - 1. Manufacturer's drawings and cut sheets showing all important details of construction, including dimensions.
- D. Manufacturers Certificate:
 - 1. Prior to shipment of pipe, submit an affidavit of compliance from manufacturer stating that the pipe for this Project has been manufactured and tested in accordance with ANSI, AWWA and ASTM standards and meet NSF-61 approval for use with potable water. These shall include:

ARDURRA

- a. Quick Burst Test, ASTM D1599.
- b. Drop Impact Test, ASTM D2444.

E. Test Reports:

- 1. Submit three (3) certified copies of the tests made by the manufacturer or by a reliable commercial laboratory to the Engineer with each shipment of pipe.
- 2. Submit results of bacteriological tests specified in Section 01 73 31 – *Disinfection of Potable Water Mains*.
- 3. Submit results of pressure and leakage tests specified in Section 01 73 32 – *Testing Piping Systems*.

F. Submit anticipated production and delivery schedule.

1.4 DELIVERY AND STORAGE

- A. Do not ship materials until Shop Drawings are approved by Engineer in writing.
- B. Protect stored pipe units by dunnage in the same way they were protected while loaded on the truck. String out or store pipe flat to protect against bending.
- C. Cover pipe with canvas or other opaque material to protect it from prolonged exposure to the sun if pipe is to be stored outside longer than 15 days.
- D. Materials damaged during shipment, storage, or installation will not be accepted.

1.5 WARRANTY

- A. Provide manufacturers and Contractor's warranties for all materials supplied under this Section.
- B. Provide materials that are free from defects in workmanship, design, and materials. If any part of the materials should fail during the warranty period, replace, and restore the unit(s) at no additional expense to the Owner.
- C. Ensure that the Manufacturer's warranty period runs concurrently with the Contractor's warranty period. No exception to this provision will be allowed.
- D. Warranty Period: One (1) year, unless otherwise specified. Begin warranty period as outlined in the General Conditions and Division 1.

PART 2 - PRODUCTS

2.1 PVC PIPE (4 INCHES THROUGH 12 INCHES)

- A. Provide PVC pipe conforming to the requirements of AWWA C900, Table 2 and latest revision, having elastomeric gasket bell ends and elastomeric seals meeting the requirements of ASTM D3139 and ASTM F477. Provide pipe in standard 20-foot lengths. Provide pipe that

ARDURRA

bears the National Sanitation Foundation seal for potable water pipe and is marked with manufacturer's name, nominal size, class pressure or SDR number, and material designation.

- B. PVC pipe shall have outside diameter dimensions conforming to ductile iron pipe and shall be a minimum Class 200 (DR14) and shall meet the requirements of AWWA C900, Table 2.
- C. PVC pipe shall have a minimum pressure rating of 150 psi.
- D. Provide PVC water pipe with rubber ring type joints consisting of integral, thickened, solid wall bells that maintain the same D.R. as the pipe barrel. Install joints in accordance with the manufacturer's instructions and recommendations. Joints shall be of the bell and spigot or similar type utilizing a rubber gasket for straight runs. All joints at bends, tees, reducers, valves, etc. shall be mechanical joint type. Rubber gasket shall conform to ASTM F477.
- E. Provide appropriate adaptors where plastic pipe is connected to pipes or fittings of other materials.
- F. Fittings and Specials:
 - 1. Provide ductile iron short body fittings and specials conforming to the requirements of ANSI Standard A21.10, latest revision.
 - 2. Provide ductile iron fittings with mechanical or push-on type joints designed in accordance with ANSI Standard A21.11, latest revision. Provide bolts and nuts of ductile iron conforming to ANSI Standard A21.11. Provide fittings that are cement mortar lined and bituminous coated in accord with ANSI Standard A21.4, latest revision.
 - 3. Provide fittings that have the standard bituminous coating on the exterior.
 - 4. All fittings shall be 250 psi pressure class rating.

2.2 GASKETS

- A. Provide gaskets of synthetic rubber, suitable for service at maximum operating temperature of piping system as specified in piping system Specification section. Do not use natural rubber or other material which will support microbiological growth for any gaskets, O-rings, and other products used for jointing pipes, setting meters or valves, or other appurtenances which will expose the material to the water. Rubber gaskets shall conform to ASTM F477.

2.3 JOINT LUBRICANTS

- A. Provide joint lubrication as recommended by the manufacturer of the pipe and meeting the requirements of NSF 61.
- B. Do not use lubricants that support microbiological growth, such as vegetable shortening, for slip-on joints.

ARDURRA

2.4 JOINT RESTRAINT

- A. Provide joint restraint for water lines 2.5 inches diameter and larger in accordance with Section 33 11 00 – *Pressure Piping – General*, of these Specifications. Mechanical restraint devices shall be specifically designed for use on PVC pipe.
- B. Bell Restraint Harness for ASTM D2241 pipe bells shall consist of the following: The restraint shall be manufactured of ductile iron conforming to ASTM A536. Side clamp bolts shall be of SAE J429 Grade 5 material. A split serrated ring shall be utilized behind the pipe bell. A split serrated ring shall be used to grip the pipe, and a sufficient number of bolts shall be used to connect the bell ring to the gripping ring. The restraint devices shall be coated using MEGA-BOND® or approved equal.
 - 1. The restraint shall be the Series 6500, as manufactured by EBAA Iron, Inc., or approved equal.
 - 2. Coating for restraint devices shall consist of the following:
 - a. All wedge assemblies and related parts shall be processed through a phosphate wash, rinse, and drying operation prior to coating application. The coating shall consist of a minimum of two coats of liquid thermoset epoxy coating with heat cure to follow each coat. All casting bodies shall be surface pretreated with a phosphate wash, rinse, and sealer before drying. The coating shall be electrostatically applied and heat cured. The coating shall be a polyester based powder to provide corrosion, impact, and UV resistance. The coating system shall be MEGA-BOND, by EBAA Iron, Inc., or approved equal. Requests for approved equal must submit coating material and process details for review.

2.5 METALLIC DETECTION WIRE

- A. Provide for all PVC pipe installed.
- B. Provide 12 AWG gauge, solid conductor, insulated copper wire.
- C. Splices shall be made with a mechanical waterproof connection such as “3M DBR” or approved equal and shall be watertight and provide electrical continuity.

2.6 METALLIC DETECTION TAPE

- A. Provide 6” wide metallic detection tape on all buried piping.
 - 1. Provide 5.0 mil overall thickness with no less than a 50-gauge solid aluminum foil core.
 - 2. Foil to be visible from both sides.
 - 3. No inks or printing extended to the edges of the tape.
 - 4. Encase printing to avoid ink rub-off.
 - 5. Tensile strength – 28 lbs/inch
 - 6. Use heat set myler inks.
- B. Locate tape 18” above pipe in trench.

ARDURRA

- C. Color to be Safety Precaution Blue.
- D. Wording on tape to indicate "Potable Water" at no greater than 24" on center.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install PVC pipe and fittings in accordance with AWWA C605, Section 33 11 00 - *Pressure Piping - General*, and manufacturer's recommendations.
- B. Do not use PVC pipe for installations within a roadway.
 - 1. PVC pipe, 4-inch diameter and below may be used in encased bores.
 - 2. PVC pipe, 6-inch diameter and above may not be used within a roadway bore.
- C. Do not use PVC pipe for above-grade applications.
- D. Do not use solvent-weld PVC pipe and fittings in waterlines 1.5 inches and larger.
- E. Install #12 single conductor tracer wire for marking and identifying underground PVC pipe waterline utilities. Use solid copper conductor per ASTM B-1, B-3, or B-8, insulated with polyethylene complying with the physical and electrical properties per ASTM D1248, colored blue. Tape the conductor to the PVC pipe or wrap it around the pipe.
 - 1. In instances where PVC pipe is installed with more than four (4) feet of cover, provide locator tape in the trench, one (1) foot below finished grade, in addition to the tracer wire. Provide electrical connection between tracer wire and locator tape.

3.2 FIELD QUALITY CONTROL

- A. Pressure Testing:
 - 1. Pressure test piping in accordance with Section 01 73 32 – *Testing Piping Systems*.
- B. Disinfection:
 - 1. Disinfect all piping which comes in contact with potable water in accordance with Section 01 73 31 – *Disinfection of Potable Water Mains*.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

ARDURRA

SECTION 33 12 16

WATER UTILITY DISTRIBUTION
VALVES AND ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide all labor, materials, equipment, tools and incidentals to install complete buried valves, appurtenances and related accessories as shown on the Drawings and specified herein. Accessories include, but are not limited to valves, valve boxes, wrenches, extensions, handles, and operators. As a minimum, provide one (1) 4-foot-long T-handle valve wrenches for every ten (10) valves installed, to be used with below grade valves with square operating nuts. Provide valve wrench extensions as required.
- B. Provide polyethylene wrap in tube or sheet form for all pipe, fittings, valves and appurtenances for the entire length of the project. Furnish and install polyethylene wrap over valves in accordance with Section 33 11 13 – *Ductile Iron Pipe*.

1.2 SUBMITTALS

- A. Submit in accordance with Section 01 33 00 – *Submittal Procedures*.
- B. Shop drawings:
 - 1. Dimensions.
 - 2. Size.
 - 3. Materials of construction.
 - 4. Weight.
 - 5. Coatings.
 - 6. Polyethylene Encasement ("Pipe Wrap") material.
- C. Quality Control Submittals:
 - 1. Manufacturer Certificate:
 - a. Prior to shipment of valves and accessories, submit a sworn affidavit of compliance from the manufacturer stating that the valves for this project have been manufactured and tested in accordance with ANSI/AWWA, ASTM standards and meet NSF-61 approval for use with potable water.
 - 2. Test Reports:
 - a. Three (3) copies of all certified shop test results specified herein.
- D. Contract Closeout Submittals:

ARDURRA

1. Submit complete operation and maintenance manuals including copies of all approved shop drawings and warranty information.

1.3 QUALITY ASSURANCE

- A. Provide valves and appurtenances under this Section which are standard products in regular production by manufacturers whose products have proven reliable in similar service for at least five (5) years. If required, the manufacturer shall provide evidence of installations in satisfactory operation.
- B. Provide all similar items specified under this Section from a single manufacturer. The proper functioning of these items as furnished is the sole responsibility of the manufacturer.
- C. Shop test all valves in accordance with applicable AWWA standards for each type and class of valve.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Do not ship materials until shop drawings are approved by Engineer in writing.
- B. Factory assembled parts and components shall not be disassembled for shipment unless permission is received in writing from the Engineer.
- C. Protect threads and seats from corrosion and damage.
- D. Protect rising stems and exposed stems with protective oil film and maintain until time of use.
- E. Furnish covers for all openings.
- F. Store all valves in covered storage off the ground.
- G. Properly protect all finished iron surfaces not painted to prevent rust and corrosion.
- H. Properly handle and store all materials so that no damage or deterioration will occur during shipment or prolonged delay from the time of shipment until installation is completed and ready for operation.
- I. Materials damaged during shipping, storage or installation will not be accepted.

1.5 WARRANTY

- A. Provide Contractor's and Manufacturer's warranties for all materials supplied under this section.
- B. Provide materials that are warranted to be free from defects in workmanship, design, and materials. If any part of the materials should fail during the warranty period, it shall be replaced and the unit(s) restored, at no expense to the Owner.

ARDURRA

- C. Ensure that the Manufacturer's warranty period runs concurrently with the Contractor's warranty period. No exception to this provision shall be allowed.
- D. Warranty Period: One (1) year, unless otherwise specified. Warranty period shall commence as outlined in the General Conditions and Division 1.

PART 2 - PRODUCTS

2.1 GATE VALVES

- A. Manufacturers:
 - 1. Mueller.
 - 2. Or approved equal.
- B. Provide gate valves that are cast iron bodied, bronze mounted, resilient wedge, O-ring type with non-rising stem and opening counterclockwise. Provide valves that are manufactured in accordance with AWWA C509, latest revision, for resilient-seated gate valves, designed for 200 psi working pressure for 4-inch through 12-inch. Provide valves with Grade B cast iron bodies conforming to ASTM A126 or ductile iron ASTM A536. Provide valves constructed with 316 stainless steel bolts on bonnets, thrust collars, and operating nuts. Provide valves for buried service that have mechanical joint ends in accordance with AWWA C111 and 2-inch square operating nut in accordance with AWWA C500. Valves shall be epoxy coated inside and outside with rubber encapsulated discs conforming to AWWA C550. All valves installed deeper than four feet bury depth shall have a riser installed on the operating nut to bring operation to 3-feet to 4-feet bury depth.

2.2 VALVE BOXES

- A. Provide valve boxes for all buried valves. Furnish valve boxes of cast iron base and adjustable top section with cover marked "Water." Provide extensions as required to meet grade.
 - 1. Provide two (2) piece adjustable screw type valve boxes.
 - 2. Provide 5-1/4 inch diameter valve box.
 - 3. Provide boxes and covers constructed of cast iron suitable for heavy traffic use in accordance with ASTM A48, Class 20.
 - 4. Provide valves with extended stem where valve nut will be more than 2 feet below the top of the valve box.
 - 5. Terminate stem a minimum of 12 inches below box cover.
 - 6. All parts shall have an asphaltic coating inside and outside with a minimum of 1 mil thickness.

2.3 TAPPING SLEEVES AND VALVES

- A. Manufacturers:
 - 1. Mueller.

ARDURRA

2. Or approved equal.

- B. Use cast iron tapping sleeves and valves rated for 150-psi working pressure to make “wet” taps into the existing water mains, where shown on the Drawings. Provide tapping sleeve of the split type with mechanical joints, cast iron bolts and flanged outlet for connection to the tapping valve. Verify type of existing main before ordering sleeve.
- C. Provide resilient seat type tapping valves, conforming to AWWA C509. Provide tapping valve with an inlet flange to match the sleeve and a mechanical joint outlet for connection to water main pipe conforming to ANSI B16.1, Class 125 and ANSI/AWWA C111/ A21.11, respectively. Provide tapping valves with Grade B cast iron bodies conforming to ASTM A126 or ductile iron ASTM A536. Provide tapping valves with a 2-inch square operating nut for buried service. All valves installed deeper than four feet bury depth shall have a riser installed on the operating nut to bring operation to 3-4 feet of bury depth. Provide tapping valves with counterclockwise operation, a non-rising stem, and having BUNA-N O rings. Tapping valves shall be constructed with 316 stainless steel bolts on bonnets, thrust collars, and operating nuts. Provide valve with box. Air test tapping sleeve and valve assembly at the rated pressure after installation and prior to tapping.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install valves, gates and accessories as shown on the drawings and in accordance with applicable paragraphs of Section 33 10 00 – *Pressure Piping – General*, and individual piping specification sections.
- B. Install valves, gates and accessories plumb and true in accordance with the manufacturer’s recommendations.
- C. Install valves, gates and accessories with care to prevent undue strain upon the valve, operators, or other associated pieces of equipment.

3.2 SETTING VALVES AND BOXES

- A. Install valves and valve boxes as specified in the preceding paragraphs where shown on the drawings unless otherwise directed. Set valves plumb with the base of the valve box centered over the valve and resting on compacted backfill. Set the top section of the box to allow equal movement above and below finished grade. After correctly positioning the box, carefully tamp fill for a distance of 4 feet on all sides of the box. In paved areas, place the top of the cover flush with the finished paving. In off-street areas, set the cover 1 inch above existing grade unless otherwise directed by the Engineer. Place a precast concrete collar around the top of the box as shown in the typical details.

END OF SECTION

ARDURRA

SECTION 33 12 19

FIRE HYDRANT ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide all labor, materials, equipment, tools, and incidentals required to install complete hydrant assemblies as shown on Drawings and specified herein.

1.2 DEFINITIONS

- A. Where the expression "fire hydrant assembly" is used, it includes the fire hydrant tee, fire hydrant valve, valve box, valve marker, connecting pipes, the fire hydrant body, restraint devices, washed stone, touch-up paint, and all other necessary materials and equipment for a complete and functional installation as shown on the Construction Drawings and Construction Details.

1.3 SUBMITTALS

- A. Submit in accordance with Section 01 33 00 – *Submittal Procedures*.
- B. Product Data:
 - 1. Manufacturer's specifications, catalog cuts and literature:
 - a. Hydrant.
 - b. Hydrant tee.
 - c. Hydrant valve.
 - d. Standard fittings.
 - e. Restraining devices.
- C. Shop Drawings:
 - 1. Manufacturer's drawings and cut sheets showing all important details of construction, including dimensions.

PART 2 - PRODUCTS

2.1 FIRE HYDRANTS

- A. Manufacturers:
 - 1. Mueller Company (A-421).

ARDURRA

2. American-Darling (Mark 73).
3. Or approved equal.

B. Hydrant Design:

1. Breakaway traffic type.
2. 6-inch mechanical joint pipe connection.
3. Minimum 4.5-inch valve opening.
4. 2 – 2.5-inch hose nozzles.
5. 1 – 4.5-inch pumper nozzle with mechanical removal feature, set screw, and lock ring.
6. 150 psi working pressure.
7. Hydrants shall open left.
8. An all bronze seat ring shall thread directly into an all bronze drain ring or heavy bronze bushing located between the lower hydrant barrel and shoe securely retained in this position, or it may be threaded into a heavy bronze busing in the hydrant shoe. Drain rings cast into iron body are not acceptable.
9. All bronze or brass internal working parts in contact with service water to be low in zinc content.
10. National Standard hose threads.
11. Lubricant sealed bonnet assembly.
12. Compression type, opening against pressure and closing with the pressure conforming to AWWA C502,
13. Interior shall be two part thermosetting epoxy coated holiday free to a minimum of 4 mils thick conforming to AWWA C550.
14. Barrel lengths shall generally be for 3.5-foot bury. No riser kits will be accepted.
15. Retaining bolts of shoe to lower barrel shall be stainless steel.
16. Upper assembly shall be provided with a grease or oil reservoir that automatically lubricates all operating stem threads and bearing surfaces each time of operation. The system shall be completely sealed from the waterway and external contaminants. The reservoir is to have an external filler point that does not require dismantling any portion of the hydrant during regular maintenance.
17. Casting shall indicate type, design, and date of manufacture.
18. All hydrants shall be tested to 300 psi test pressure before shipping.
19. Conforming to AWWA Specification C502 and NFPA No. 194 (ANSI B26).

C. Compatibility:

1. Verify that connections are as typically found in the system and are compatible with equipment of the local fire department.

D. Polyethylene Encasement

1. Hydrants shall be wrapped in accordance with ANSI A21.5. Encasement material to be no less than 8 Mils thick.

E. Paint:

1. Exterior coating shall be as follows:
 - a. Hydrant barrel, bonnet and nozzle caps will be painted fire hydrant red.
 - b. Hydrant parts below ground will be asphalt coated.

ARDURRA

2.2 FIRE HYDRANT CONNECTOR PIPE

- A. Provide ductile iron connector pipe positioned between the fire hydrant and the gate valve.
- B. Offset design connector pipe may be used so that the fire hydrant can be adjusted to ensure placement at the proper grade, with an anchoring feature at both ends so that when used with M.J. split glands, a restrained joint is provided, such as the Gradelock, manufactured by Assured Flow Sales, Inc.
- C. Use plain end ductile iron pipe for connector pipe, by Meg-a-lug, manufactured by EBAA Iron, Inc.

2.3 WATER MAIN HYDRANT TEE

- A. Provide water main hydrant tee with a 6-inch tee outlet to the hydrant.
- B. Provide water main hydrant tee with an anchoring feature on the 6-inch leg so that when used with an M.J. split gland, a restrained joint is provided between the tee and the gate valve.

2.4 HYDRANT ISOLATION VALVES

- A. Provide mechanical joint gate valves in accordance with Section 33 12 16 – *Water Utility Distribution Valves and Accessories*.
- B. Provide Valve Boxes in accordance with Section 33 12 16 – *Water Utility Distribution Valves and Accessories*.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. See Section 33 11 00 - *Pressure Piping - General*, Part 3 for installation.

3.2 SETTING VALVES AND BOXES

- A. See Section 33 05 10 – *Valves and Accessories*, Part 3 for setting valves and boxes.

3.3 SETTING HYDRANTS

- A. Connect fire hydrants to the mains with a mechanical joint hydrant tee, ductile iron connector pipe, and a gate valve, all part of the assembly. After connections are made, bury the hydrant at such elevation that the “bury line” on the hydrant is at finished grade. Backfill around the fire hydrant with gravel as shown on the Drawings and in such a manner as to ensure complete drainage of the hydrant when closed. Thoroughly compact all backfill around the hydrant to the surface of the ground. Before installing any hydrant or valve,

ARDURRA

exercise care to see that all foreign material is removed from the interior of the barrel. Tighten stuffing boxes and open and close the hydrant and valve to see that all parts are in working condition.

- B. Where hydrants are being connected to an existing water main, verify the depth of bury and order barrel and shaft extensions as required for the measured bury.

3.4 TESTING HYDRANTS

- A. Upon completion of installation of waterlines, perform flow tests of fire hydrants. Record available pressure, flow rate, and residual pressure to demonstrate conformance with SCDES requirements.

END OF SECTION