

PROJECT MANUAL
FOR
TOWN OF RIDGELAND
SEWER RESILIENCY IMPROVEMENTS
- GRAVITY SEWER REHABILITATION
RIDGELAND, SC

REQUEST FOR BIDS NO.: TOR-2024-07



**THE TOWN OF RIDGELAND,
SOUTH CAROLINA**

VOLUME I
RIA GRANT AWARD #: R-24-1357

PREPARED BY:
FOUR WATERS ENGINEERING, INC.
FOR
THE TOWN OF RIDGELAND, SC
SEPTEMBER 2024

**TOWN OF RIDGELAND
SEWER RESILIENCY IMPROVEMENTS –
GRAVITY SEWER REHABILITATION
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DATE: SEPTEMBER 2024

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ADVERTISEMENT FOR BIDS

**Town of Ridgeland
Ridgeland, SC**

Sewer Resiliency Improvements – Gravity Sewer Rehabilitation

General Notice

Town of Ridgeland (Owner) is requesting Bids for the construction of the following Project:

Sewer Resiliency Improvements – Gravity Sewer Rehabilitation

Grant #R-24-1357

Four Waters Engineering Project #17-1007-043

Bids for the construction of the Project will be received at the Town Hall located at One Town Square, Ridgeland, SC, until **Tuesday, November 5th, 2024**, at 2:00 PM local time. At that time the Bids received will be publicly opened and read.

Mail Bid Response to:

Town of Ridgeland
ATTN: Dennis E. Averkin, Town Administrator
P.O. Box 1119
Ridgeland, SC 29936

Hand Deliver Bid Response to:

Town of Ridgeland
ATTN: Dennis E. Averkin, Town Administrator
1 Town Square
Ridgeland, SC 29936

The Project includes the following Work:

Gravity sewer pipe rehabilitation by Cured-In-Place-Pipe (CIPP), Pipe Bursting, or Open Cut methods, rehabilitation of 45 existing manholes with a varying combination of cementitious mortar interior lining, urethane rubber sealing system for manhole chimney, HDPE manhole inserts, new manhole covers, new manhole frame, adjustment to or above grade. Construction also includes pre-construction sewer pipe cleaning, pre- and post-construction CCTV, all necessary sewer system bypassing operations, sewer lateral restoration, 4 new manholes, removal of 1 manhole, rerouting of an existing water main from a sewer conflict manhole, maintenance of traffic, soil erosion and sediment control, and restoration including pavement repair and overlay to SCDOT standards (all roads are SCDOT).

Bids are requested for the following Contract: **TOR-2024-07 Sewer Resiliency Improvements – Gravity Sewer Rehabilitation**

This project is being funded in part by a grant administered by the South Carolina Rural Infrastructure Authority (RIA). Bidders must comply with all applicable state and federal requirements identified in the Bidding Documents. Bidders must provide a 5% bid bond.

Obtaining the Bidding Documents

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

<https://www.ridgelandsc.gov/bid-opportunities>

Bidding Documents may be downloaded from the designated website. Prospective Bidders are urged to register with the issuing office as a plan holder, even if Bidding Documents are obtained from a plan room or source other than the designated website in either electronic or paper format. The designated website will be updated periodically with addenda, lists of registered plan holders, reports, and other information relevant to submitting a Bid for the Project. All official notifications, addenda, and other Bidding Documents will be offered only through the designated website. Neither Owner nor Engineer will be responsible for Bidding Documents, including addenda, if any, obtained from sources other than the designated website.

The Issuing Office for the Bidding Documents is Four Waters Engineering, Inc. Printed Bidding Documents may be purchased from the Issuing Office at a cost of \$250.00. Cost does not include shipping charges. Upon the Issuing Office's receipt of payment, printed Bidding Documents will be sent via the prospective Bidder's delivery service. The shipping charge amount will depend on the shipping method chosen. Request for printed Bidding Documents shall be directed to Kate Bleuer (email: kbleuer@4weng.com) of the Four Waters Engineering office located at 324 6th Avenue N, Jacksonville Beach, Florida 32250, office phone: (904) 414-2400 Ext 57.

Pre-bid Conference

A non-mandatory pre-bid conference for the Project will be held on **Tuesday, October 22nd, 2024**, at **10:30 am** at Town Hall, One Town Square, Ridgeland, SC 29936. 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: **Town of Ridgeland**
By: **Dennis Averkin**
Title: **Town Administrator**
Date: **October 3, 2024**

INSTRUCTIONS TO BIDDERS FOR CONSTRUCTION CONTRACT

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ARTICLE 1—DEFINED TERMS

- 1.01 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:
- A. *Issuing Office*—The office from which the Bidding Documents are to be issued, and which registers plan holders.
 - B. *RIA* – South Carolina Rural Infrastructure Authority (funding agency)

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 Bidder may register as a plan holder and obtain complete sets of Bidding Documents, in the number and format stated in the Advertisement or invitation to bid, from the Issuing Office. Bidders may rely that sets of Bidding Documents obtained from the Issuing Office 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 most PDF readers. 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.

- C. After the Contract is awarded, the Owner will provide or direct the Engineer to provide for the use of the Contractor documents that were developed by Engineer as part of the Project design process, as Electronic Documents in native file formats.
 - 1. Electronic Documents that are available in native file format include:
 - a. Project Drawings (AutoCAD .dwg)
 - 2. Release of such documents will be solely for the convenience of the Contractor. No such document is a Contract Document.
 - 3. Unless the Contract Documents explicitly identify that such information will be available to the Successful Bidder (Contractor), nothing herein will create an obligation on the part of the Owner or Engineer to provide or create such information, and the Contractor is not entitled to rely on the availability of such information in the preparation of its Bid or pricing of the Work. In all cases, the Contractor shall take appropriate measures to verify that any electronic/digital information provided in Electronic Documents is appropriate and adequate for the Contractor's specific purposes.
 - 4. In no case will the Contractor be entitled to additional compensation or time for completion due to any differences between the actual Contract Documents and any related document in native file format.

ARTICLE 3—QUALIFICATIONS OF BIDDERS

- 3.01 To demonstrate Bidder's qualifications to perform the Work, after submitting its Bid and within 5 days of Owner's request, Bidder must submit the following information:
 - 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. Contractor's license number as evidence of Bidder's State Contractor's License.
 - 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. The pre-Bid conference will be held at Town Hall, 1 Town Square, Ridgeland, SC 29936.
- B. Bidders visiting the Site are required to arrange their own transportation to the Site.
- C. Access to the Site is available however, Bidder must conduct the required Site visit during normal working hours.
- D. Bidder is not required to conduct any subsurface testing, or exhaustive investigations of Site conditions.
- E. 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.
- F. 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.
- G. 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.

5.06 *Other Work at the Site*

- A. Reference is made to Article 8 of the Supplementary Conditions for the identification of the general nature of other work of which Owner is aware (if any) that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) and relates to the Work contemplated by these Bidding Documents. If Owner is party to a written contract for such other work, then on request, Owner will provide to each Bidder access to examine such contracts (other than portions thereof related to price and other confidential matters), if any.

ARTICLE 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. Questions are to be submitted via email in writing, response to questions will be issued as an addenda and provided to registered plan holders. Contact information and submittal procedures for such questions are as follows:
 - A. Engineer:
 - Four Waters Engineering, Inc.
 - Angela Bryan, PE
 - 844-414-2400 Ext 51
 - abryan@4weng.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 91 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.

A. To address possible material delivery delays, attention is called to Paragraph 4.05 of the General Conditions (Delays in Contractor’s Progress).

9.02 This project is funded in part by the RIA. RIA Basic Infrastructure Grant projects must be completed within 24 months of the grant award. Therefore, construction must be completed by August 2025. See the agreement for actual contract times.

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, and those “or-equal” or substitute or materials and equipment subsequently approved by Engineer prior to the submittal of Bids and identified by Addendum. No item of material or equipment will be considered by Engineer as an “or-equal” or substitute unless written request for approval has been submitted by Bidder and has been received by Engineer within 10 days of the issuance of the Advertisement for Bids or invitation to Bidders. Each such request must comply with the requirements of Paragraphs 7.05 and 7.06 of the General Conditions, and the review of the request will be governed by the principles in those paragraphs. The burden of proof of the merit of the proposed item is upon Bidder. Engineer’s decision of approval or disapproval of a proposed item will be final. If Engineer approves any such proposed item, such approval will be set forth in an Addendum issued to all registered Bidders. Bidders cannot rely upon approvals made in any other manner.

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 A Bidder must be prepared to retain specific Subcontractors and Suppliers for the performance of the Work if required to do so by the Bidding Documents or in the Specifications. If a prospective Bidder objects to retaining any such Subcontractor or Supplier and the concern is not relieved by an Addendum, then the prospective Bidder should refrain from submitting a Bid.

11.02 The apparent Successful Bidder, and any other Bidder so requested, must submit to Owner a list of the Subcontractors or Suppliers proposed for the following portions of the Work within five days after Bid opening:

A. **Cured-in-Place-Pipe**

B. Pipe Bursting

- 11.03 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.
- 11.04 If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors 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.
- 11.05 The Contractor shall not award work to Subcontractor(s) in excess of the limits stated in SC 7.07A.

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 *Allowances*

- A. For cash allowances the Bid price must include such amounts as the Bidder deems proper for Contractor's overhead, costs, profit, and other expenses on account of cash allowances, if any, named in the Contract Documents, in accordance with Paragraph 13.02.B of the General Conditions.

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. 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.

BID FORM FOR CONSTRUCTION CONTRACT

[NOTE TO BIDDER: DETACH ENTIRE SECTION AND SUBMIT AS BID. STAPLE SECTION TOGETHER PRIOR TO SUBMITTING.]

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:

Town of Ridgeland

PO Box 1119

One Town Square

Ridgeland, South Carolina 29936

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. 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;
- C. 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.
- D. List of Subcontractors.

ARTICLE 3—BASIS OF BID

3.01 In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.

3.02 In the comparison of Bids, alternates will be applied in the same order of priority as listed in the Bid Form. For comparison purposes alternates will be accepted, following the order of priority established in the Bid Form, until doing so would cause the available 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.

3.03 *Unit Price Bids*

A. Bidder will perform the following Work at the indicated unit prices:

[NOTE TO BIDDER: BIDDER TO ENTER BID UNIT PRICE AND BID AMOUNT FOR EACH LINE-ITEM LISTED. BIDDER TO ALSO ENTER TOTAL OF ALL UNIT PRICE BID ITEMS AND ANY ALTERNATES (IF APPLICABLE).]

Item No.	M&P No.	Item	Quantities	Unit	Unit Price	Total Price
AREA A - GRAVITY SEWER REHABILITATION						
1	3	Sewer Line Cleaning for Construction Prep (Jetting and Disposal)	3,106	LF	\$	\$
2	6	Pre-Construction and Post-Construction CCTV Inspection	5,440	LF	\$	\$
3	8	8" Gravity Sewer Rehabilitation - Pipe Bursting to 10" (includes sewer bypassing)	925	LF	\$	\$
4	8	10" Gravity Sewer Rehabilitation - Pipe Bursting to 12" (includes sewer bypassing)	1,795	LF	\$	\$
TOTAL BASE BID - AREA A - GRAVITY SEWER IMPROVEMENTS					\$	

Item No.	M&P No.	Item	Quantities	Unit	Unit Price	Total Price
AREA B - GRAVITY SEWER REHABILITATION						
1	1	Remove and Replace Asphalt Roadway (Per SCDOT Approved Detail)	125	SY	\$	\$
2	2	Mill Existing Asphalt Roadway and Install 1-1/2 Inch Thick Asphalt Overlay with SCDOT Type C Asphalt; Restripe (Paint) Roadway per SCDOT Standards	230	SY	\$	\$
3	2	Mill Existing Asphalt Roadway and Install 1-1/2 Inch Thick Asphalt Overlay with SCDOT Type C Asphalt; Restripe (Thermoplastic) Roadway per SCDOT Standards	310	SY	\$	\$
4	3	Sewer Line Cleaning for Construction Prep (Jetting and Disposal)	1,933	LF	\$	\$
5	4	Sewer Line Root (Tap) Removal	37	EA	\$	\$
6	5	Intruding Sewer Lateral Cuts	1	EA	\$	\$
7	6	Pre-Construction and Post-Construction CCTV Inspection	3,975	LF	\$	\$
8	7	8" Gravity Sewer Rehabilitation - CIPP (includes sewer bypassing and sewer lateral reinstatement)	1,933	LF	\$	\$
9	9	Sewer Service Lateral Reconnection (for Pipe Bursting or Pipe Replacement)	1	EA	\$	\$
10	11	8" Gravity Sewer Point Repair (< 10' Depth) (includes sewer bypassing)	100	LF	\$	\$

Item No.	M&P No.	Item	Quantities	Unit	Unit Price	Total Price
11	12	New 8" PVC (SDR26) Gravity Sewer Pipe (0' - 10' Depth)	110	LF	\$	\$
12	13	Remove Existing (6" or 8") Gravity Sewer Pipe (0' - 6' Depth) and Restore	215	LF	\$	\$
13	14	New 12" Steel Casing Pipe and Accessories (0'-6' Depth)	70	LF	\$	\$
14	15	Remove Existing Manhole and Restore (0'-6' Depth)	1	LS	\$	\$
15	16	New 4' Diameter Precast Concrete Manhole (0' - 10' Depth)	1	EA	\$	\$
16	18	Install HDPE Manhole Insert	1	EA	\$	\$
17	19	Install Urethane Rubber Seal on Interior Manhole Chimney/Frame	1	EA	\$	\$
18	21	Install Cementitious Mortar Lining in Manhole (4' Dia) (includes sewer bypassing)	15	VF	\$	\$
19	24	12" PVC (DR18) Water Main	60	LF	\$	\$
20	25	Abandon 12" Water Main by Grout Fill and Seal Remaining Openings in Conflict Manhole Walls	25	LF	\$	\$
21	26	12" MJ DI 45 Deg Bend	4	EA	\$	\$
22	26	12" MJ DI Sleeve	2	EA	\$	\$
23	27	A-3 Fill	10	CY	\$	\$
24	28	Stone Bedding	10	CY	\$	\$
TOTAL BASE BID - AREA B - GRAVITY SEWER IMPROVEMENTS					\$	

Total Bid Price (Total of All Lump Sum and Unit Price Bids) in Words

Alternate 1:

Item No.	M&P No.	Item	Quantities	Unit	Unit Price	Total Price
AREA B - GRAVITY SEWER REHABILITATION						
1	1	Remove and Replace Asphalt Roadway (Per SCDOT Approved Detail)	10	SY	\$	\$
2	2	Mill Existing Asphalt Roadway and Install 1-1/2 Inch Thick Asphalt Overlay with SCDOT Type C Asphalt; Restripe (Thermoplastic) Roadway per SCDOT Standards	20	SY	\$	\$
3	3	Sewer Line Cleaning for Construction Prep (Jetting and Disposal)	2,003	LF	\$	\$
4	4	Sewer Line Root (Tap) Removal	7	EA	\$	\$
5	5	Intruding Sewer Lateral Cuts	3	EA	\$	\$
6	6	Pre-Construction and Post-Construction CCTV Inspection	4,423	LF	\$	\$
7	7	8" Gravity Sewer Rehabilitation - CIPP (includes sewer bypassing and sewer lateral reinstatement)	2,003	LF	\$	\$
8	9	Sewer Service Lateral Reconnection (for Pipe Bursting or Pipe Replacement)	7	EA	\$	\$
9	10	Remove and Replace 8" Orangeburg Sewer Pipe with 8" PVC (SDR 26) Gravity Sewer Pipe (4'-10' Depth) (includes sewer bypassing)	350	LF	\$	\$
10	11	8" Gravity Sewer Point Repair (< 10' Depth) (includes sewer bypassing)	10	LF	\$	\$
11	12	New 8" PVC (SDR26) Gravity Sewer Pipe (0' - 10' Depth)	75	LF	\$	\$
13	16	New 4' Diameter Precast Concrete Manhole (0' - 10' Depth)	3	EA	\$	\$
14	18	Install HDPE Manhole Insert	3	EA	\$	\$
15	19	Install Urethane Rubber Seal on Interior Manhole Chimney/Frame	3	EA	\$	\$
TOTAL ALTERNATE BID - AREA B - GRAVITY SEWER IMPROVEMENTS					\$	

Alternate 2:

Item No.	M&P No.	Item	Quantities	Unit	Unit Price	Total Price
AREA B - GRAVITY SEWER REHABILITATION						
1	3	Sewer Line Cleaning for Construction Prep (Jetting and Disposal)	1,826	LF	\$	\$
2	4	Sewer Line Root (Tap) Removal	6	EA	\$	\$
3	5	Intruding Sewer Lateral Cuts	1	EA	\$	\$
4	6	Pre-Construction and Post-Construction CCTV Inspection	3,652	LF	\$	\$
5	7	8" Gravity Sewer Rehabilitation - CIPP (includes sewer bypassing and sewer lateral reinstatement)	1,826	LF	\$	\$
TOTAL ALTERNATE BID - AREA B - GRAVITY SEWER IMPROVEMENTS					\$	

Alternate 3:

Item No.	M&P No.	Item	Quantities	Unit	Unit Price	Total Price
AREA B - GRAVITY SEWER REHABILITATION						
1	17	Replace Manhole Cover	19	EA	\$	\$
2	18	Install HDPE Manhole Insert	26	EA	\$	\$
3	19	Install Urethane Rubber Seal on Interior Manhole Chimney/Frame	26	EA	\$	\$
4	20	Install External Rubber Seal on Manhole Chimney/Frame Above Grade	1	EA	\$	\$
5	21	Install Cementitious Mortar Lining in Manhole (4' Dia) (includes sewer bypassing)	167	VF	\$	\$
6	22	Replace Manhole Frame and Adjust to Above Grade	1	EA	\$	\$
7	23	Replace Manhole Frame and Adjust to Grade (including necessary asphalt/brick/concrete restoration)	18	EA	\$	\$
TOTAL ALTERNATE BID - AREA B - GRAVITY SEWER IMPROVEMENTS					\$	

Alternate 4:

Item No.	M&P No.	Item	Quantities	Unit	Unit Price	Total Price
AREA C - GRAVITY SEWER REHABILITATION						
1	3	Sewer Line Cleaning for Construction Prep (Jetting and Disposal)	2,816	LF	\$	\$
2	6	Pre-Construction and Post-Construction CCTV Inspection	40	LF	\$	\$
3	7	10" Gravity Sewer Rehabilitation - CIPP (includes sewer bypassing and sewer lateral reinstatement)	20	LF	\$	\$
4	11	10" Gravity Sewer Point Repair (< 10' Depth) (includes sewer bypassing)	10	LF	\$	\$
5	17	Replace Manhole Cover	16	EA	\$	\$
6	18	Install HDPE Manhole Insert	19	EA	\$	\$
7	19	Install Urethane Rubber Seal on Interior Manhole Chimney/Frame	19	EA	\$	\$
8	21	Install Cementitious Mortar Lining in Manhole (4' Dia) (includes sewer bypassing)	167	VF	\$	\$
9	23	Replace Manhole Frame and Adjust to Grade (including necessary asphalt/brick/concrete restoration)	15	EA	\$	\$
TOTAL ALTERNATE BID - AREA C - GRAVITY SEWER IMPROVEMENTS					\$	

Total Base Bid and Alternate Bid Price (Total of All Lump Sum and Unit Price Bids) in Words

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.

ARTICLE 4—TIME OF COMPLETION

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

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

ARTICLE 5—BIDDER’S ACKNOWLEDGEMENTS: ACCEPTANCE PERIOD, INSTRUCTIONS, AND RECEIPT OF ADDENDA

5.01 *Bid Acceptance Period*

- A. This Bid will remain subject to acceptance for 90 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

5.02 *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.

5.03 *Receipt of Addenda*

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

[NOTE TO BIDDER: INSERT ADDENDA NUMBER IN THE TABLE BELOW TO ACKNOWLEDGE RECEIPT OF ADDENDA (IF ANY).]

Addendum Number	Addendum Date

ARTICLE 6—BIDDER’S REPRESENTATIONS AND CERTIFICATIONS

6.01 *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.

6.02 *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 6.02.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.

[NOTE TO BIDDER: COMPLETE ENTIRE PAGE BELOW]

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.: _____

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: Town of Ridgeland Address <i>(principal place of business)</i> : One Town Square Ridgeland, SC 29936	Bid Project <i>(name and location)</i> : Town of Ridgeland Sewer Resiliency Improvements – Gravity Sewer Rehabilitation Bid Due Date:
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: _____
<i>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.</i>	

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.

[NOTE TO BIDDER: NOT REQUIRED FOR BID. MAY BE REQUIRED PRIOR TO AWARDING A CONTRACT.]

ARTICLE 1—GENERAL INFORMATION

1.01 Provide contact information for the Business:

Legal Name of Business:			
Corporate Office			
Name:		Phone number:	
Title:		Email address:	
Business address of corporate office:			
Local Office			
Name:		Phone number:	
Title:		Email address:	
Business address of local office:			

1.02 Provide information on the Business’s organizational structure:

Form of Business:	<input type="checkbox"/> Sole Proprietorship <input type="checkbox"/> Partnership <input type="checkbox"/> Corporation		
<input type="checkbox"/> Limited Liability Company <input type="checkbox"/> Joint Venture comprised of the following companies:			
	1.		
	2.		
	3.		
Provide a separate Qualification Statement for each Joint Venturer.			
Date Business was formed:		State in which Business was formed:	
Is this Business authorized to operate in the Project location?		<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Pending	

1.03 Identify all businesses that own Business in whole or in part (25% or greater), or that are wholly or partly (25% or greater) owned by Business:

Name of business:		Affiliation:	
Address:			
Name of business:		Affiliation:	
Address:			
Name of business:		Affiliation:	
Address:			

1.04 Provide information regarding the Business’s officers, partners, and limits of authority.

Name:		Title:	
Authorized to sign contracts: <input type="checkbox"/> Yes <input type="checkbox"/> No		Limit of Authority:	\$
Name:		Title:	
Authorized to sign contracts: <input type="checkbox"/> Yes <input type="checkbox"/> No		Limit of Authority:	\$
Name:		Title:	
Authorized to sign contracts: <input type="checkbox"/> Yes <input type="checkbox"/> No		Limit of Authority:	\$
Name:		Title:	

ARTICLE 2—LICENSING

2.01 Provide information regarding licensure for Business:

Name of License:			
Licensing Agency:			
License No:		Expiration Date:	
Name of License:			
Licensing Agency:			
License No:		Expiration Date:	

ARTICLE 3—DIVERSE BUSINESS CERTIFICATIONS

3.01 Provide information regarding Business’s Diverse Business Certification, if any. Provide evidence of current certification.

Certification	Certifying Agency	Certification Date
<input type="checkbox"/> Disadvantaged Business Enterprise		
<input type="checkbox"/> Minority Business Enterprise		
<input type="checkbox"/> Woman-Owned Business Enterprise		
<input type="checkbox"/> Small Business Enterprise		
<input type="checkbox"/> Disabled Business Enterprise		
<input type="checkbox"/> Veteran-Owned Business Enterprise		
<input type="checkbox"/> Service-Disabled Veteran-Owned Business		
<input type="checkbox"/> HUBZone Business (Historically Underutilized) Business		
<input type="checkbox"/> Other		
<input type="checkbox"/> None		

ARTICLE 4—SAFETY

4.01 Provide information regarding Business’s safety organization and safety performance.

Name of Business’s Safety Officer:			
Safety Certifications			
Certification Name	Issuing Agency	Expiration	

4.02 Provide Worker’s Compensation Insurance Experience Modification Rate (EMR), Total Recordable Frequency Rate (TRFR) for incidents, and Total Number of Recorded Manhours (MH) for the last 3 years and the EMR, TRFR, and MH history for the last 3 years of any proposed Subcontractor(s) that will provide Work valued at 10% or more of the Contract Price. Provide documentation of the EMR history for Business and Subcontractor(s).

Year									
Company	EMR	TRFR	MH	EMR	TRFR	MH	EMR	TRFR	MH

ARTICLE 5—FINANCIAL

5.01 Provide information regarding the Business’s financial stability. Provide the most recent audited financial statement, and if such audited financial statement is not current, also provide the most current financial statement.

Financial Institution:			
Business address:			
Date of Business’s most recent financial statement:		<input type="checkbox"/> Attached	
Date of Business’s most recent audited financial statement:		<input type="checkbox"/> Attached	
Financial indicators from the most recent financial statement			
Contractor’s Current Ratio (Current Assets ÷ Current Liabilities)			
Contractor’s Quick Ratio ((Cash and Cash Equivalents + Accounts Receivable + Short Term Investments) ÷ Current Liabilities)			

ARTICLE 6—SURETY INFORMATION

6.01 Provide information regarding the surety company that will issue required bonds on behalf of the Business, including but not limited to performance and payment bonds.

Surety Name:			
Surety is a corporation organized and existing under the laws of the state of:			
Is surety authorized to provide surety bonds in the Project location?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Is surety listed in “Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies” published in Department Circular 570 (as amended) by the Bureau of the Fiscal Service, U.S. Department of the Treasury? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Mailing Address (principal place of business):			
Physical Address (principal place of business):			
Phone (main):		Phone (claims):	

ARTICLE 7—INSURANCE

7.01 Provide information regarding Business’s insurance company(s), including but not limited to its Commercial General Liability carrier. Provide information for each provider.

Name of insurance provider, and type of policy (CLE, auto, etc.):	
---	--

Insurance Provider		Type of Policy (Coverage Provided)	
Are providers licensed or authorized to issue policies in the Project location?		<input type="checkbox"/> Yes <input type="checkbox"/> No	
Does provider have an A.M. Best Rating of A-VII or better?		<input type="checkbox"/> Yes <input type="checkbox"/> No	
Mailing Address (principal place of business):			
Physical Address (principal place of business):			
Phone (main):		Phone (claims):	

ARTICLE 8—CONSTRUCTION EXPERIENCE

8.01 Provide information that will identify the overall size and capacity of the Business.

Average number of current full-time employees:	
Estimate of revenue for the current year:	
Estimate of revenue for the previous year:	

8.02 Provide information regarding the Business’s previous contracting experience.

Years of experience with projects like the proposed project:			
As a general contractor:		As a joint venturer:	
Has Business, or a predecessor in interest, or an affiliate identified in Paragraph 1.03:			
Been disqualified as a bidder by any local, state, or federal agency within the last 5 years? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Been barred from contracting by any local, state, or federal agency within the last 5 years? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Been released from a bid in the past 5 years? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Defaulted on a project or failed to complete any contract awarded to it? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Refused to construct or refused to provide materials defined in the contract documents or in a change order? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Been a party to any currently pending litigation or arbitration? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Provide full details in a separate attachment if the response to any of these questions is Yes.			

- 8.03 List all projects currently under contract in Schedule A and provide indicated information.
- 8.04 List a minimum of three and a maximum of six projects completed in the last 5 years in Schedule B and provide indicated information to demonstrate the Business's experience with projects similar in type and cost of construction.
- 8.05 In Schedule C, provide information on key individuals whom Business intends to assign to the Project. Provide resumes for those individuals included in Schedule C. Key individuals include the Project Manager, Project Superintendent, Quality Manager, and Safety Manager. Resumes may be provided for Business's key leaders as well.

ARTICLE 9—REQUIRED ATTACHMENTS

- 9.01 Provide the following information with the Statement of Qualifications:
 - A. If Business is a Joint Venture, separate Qualifications Statements for each Joint Venturer, as required in Paragraph 1.02.
 - B. Diverse Business Certifications if required by Paragraph 3.01.
 - C. Certification of Business's safety performance if required by Paragraph 4.02.
 - D. Financial statements as required by Paragraph 5.01.
 - E. Attachments providing additional information as required by Paragraph 8.02.
 - F. Schedule A (Current Projects) as required by Paragraph 8.03.
 - G. Schedule B (Previous Experience with Similar Projects) as required by Paragraph 8.04.
 - H. Schedule C (Key Individuals) and resumes for the key individuals listed, as required by Paragraph 8.05.
 - I. Additional items as pertinent.

This Statement of Qualifications is offered by:

Business: _____
(typed or printed name of organization)

By: _____
(individual's signature)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Date: _____
(date signed)

(If Business 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)

Address for giving notices:

Designated Representative:
Name: _____
(typed or printed)

Title: _____
(typed or printed)

Address: _____

Phone: _____

Email: _____

Schedule A—Current Projects

Name of Organization					
Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Schedule B—Previous Experience with Similar Projects

Name of Organization					
Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Schedule B—Previous Experience with Similar Projects

Name of Organization					
Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Schedule C—Key Individuals

Project Manager			
Name of individual			
Years of experience as project manager			
Years of experience with this organization			
Number of similar projects as project manager			
Number of similar projects in other positions			
Current Project Assignments			
Name of assignment		Percent of time used for this project	Estimated project completion date
Reference Contact Information (listing names indicates approval to contact named individuals as a reference)			
Name		Name	
Title/Position		Title/Position	
Organization		Organization	
Telephone		Telephone	
Email		Email	
Project		Project	
Candidate's role on project		Candidate's role on project	
Project Superintendent			
Name of individual			
Years of experience as project superintendent			
Years of experience with this organization			
Number of similar projects as project superintendent			
Number of similar projects in other positions			
Current Project Assignments			
Name of assignment		Percent of time used for this project	Estimated project completion date
Reference Contact Information (listing names indicates approval to contact named individuals as a reference)			
Name		Name	
Title/Position		Title/Position	
Organization		Organization	
Telephone		Telephone	
Email		Email	
Project		Project	
Candidate's role on project		Candidate's role on project	

Safety Manager			
Name of individual			
Years of experience as project manager			
Years of experience with this organization			
Number of similar projects as project manager			
Number of similar projects in other positions			
Current Project Assignments			
Name of assignment		Percent of time used for this project	Estimated project completion date
Reference Contact Information (listing names indicates approval to contact named individuals as a reference)			
Name		Name	
Title/Position		Title/Position	
Organization		Organization	
Telephone		Telephone	
Email		Email	
Project		Project	
Candidate's role on project		Candidate's role on project	
Quality Control Manager			
Name of individual			
Years of experience as project superintendent			
Years of experience with this organization			
Number of similar projects as project superintendent			
Number of similar projects in other positions			
Current Project Assignments			
Name of assignment		Percent of time used for this project	Estimated project completion date
Reference Contact Information (listing names indicates approval to contact named individuals as a reference)			
Name		Name	
Title/Position		Title/Position	
Organization		Organization	
Telephone		Telephone	
Email		Email	
Project		Project	
Candidate's role on project		Candidate's role on project	

NOTICE OF AWARD

Date of Issuance:

Owner: Town of Ridgeland Owner’s Project No.: R-24-1357
Engineer: Four Waters Engineering, Inc. Engineer’s Project No.: 17-1007:043
Project: Sewer Resiliency Improvements – Gravity Sewer Rehabilitation
Contract Name: Sewer Resiliency Improvements – Gravity Sewer Rehabilitation
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:

Sewer Resiliency Improvements – Gravity Sewer Rehabilitation

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.

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: **Town of Ridgeland**

By (signature): _____

Name (printed): Dennis E. Averkin

Title: Town Administrator

Copy: Engineer, Four Waters Engineering, Inc.

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

This Agreement is by and between **Town of Ridgeland** (“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: Gravity Sewer Rehabilitation.

ARTICLE 2—THE PROJECT

2.01 The Project, of which the Work under the Contract Documents is a part, is generally described as follows: **Gravity sewer pipe rehabilitation by Cured-In-Place-Pipe (CIPP), Pipe Bursting, or Open Cut methods, and rehabilitation of 45 existing manholes. Construction also includes pre-construction sewer pipe cleaning, pre- and post-construction CCTV, all necessary sewer system bypassing operations, sewer lateral restoration, 4 new manholes, removal of 1 manhole, rerouting of an existing water main from a sewer conflict manhole, maintenance of traffic, soil erosion and sediment control, and restoration including pavement repair and overlay to SCDOT standards (all roads are SCDOT).**

ARTICLE 3—ENGINEER

3.01 The Owner has retained Four Waters Engineering, 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.

3.02 The part of the Project that pertains to the Work has been designed by the Engineer.

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.

4.03 *Contract Times: Days*

A. The Work will be substantially complete within **210** 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 **240** days after the date when the Contract Times commence to run.

4.05 *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 and Milestones not achieved within the Contract Times, as duly modified. 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 **\$500.00** 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 **\$500.00** for each day that expires after such time until the Work is completed and ready for final payment.
 4. Liquidated damages for failing to timely attain Milestones, Substantial Completion, and final completion are not additive, and will not be imposed concurrently.
- B. If Owner recovers liquidated damages for a delay in completion by Contractor, then such liquidated damages are Owner's sole and exclusive remedy for such delay, and Owner is precluded from recovering any other damages, whether actual, direct, excess, or consequential, for such delay, except for special damages (if any) specified in this Agreement.

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 Work, at the prices 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. **95** percent of the value of the Work completed (with the balance being retainage).
 - b. **95** 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 **100** percent of the Work completed, less such amounts set off by Owner pursuant to Paragraph 15.01.E of the General Conditions, and less **200** 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.

ARTICLE 7—CONTRACT DOCUMENTS

7.01 *Contents*

- A. The Contract Documents consist of all of the following:
 1. This Agreement.
 2. Bonds:
 - a. Performance bond (together with power of attorney).
 - b. Payment bond (together with power of attorney).
 3. General Conditions.
 4. Supplementary Conditions.
 5. Specifications as listed in the table of contents of the project manual.
 6. Drawings (not attached but incorporated by reference) consisting of 51 sheets with each sheet bearing the following general title: Sewer Resiliency Improvements – Gravity Sewer Rehabilitation.
 8. Addenda (numbers **[number]** to **[number]**, inclusive).
 9. Exhibits to this Agreement (enumerated as follows):
 - a. Contractor's Bid.
 - b. A written statement that Bidder is authorized to do business in the state where the Project is located.

- c. Copy of Bidder's state or other contractor license.
 - d. Subcontractor and Supplier qualification information.
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.
 - e. Warranty Bond, if any.
- 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 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.
 - 5. 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.

6. 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.
7. 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.
8. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
9. 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:

Town of Ridgeland

(typed or printed name of organization)

By:

(individual's signature)

Date:

(date signed)

Name:

Dennis E. Averkin

(typed or printed)

Title:

Town Administrator

(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.)

Contractor:

(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:

NOTICE TO PROCEED

Owner: Town of Ridgeland Owner's Project No.: R-24-1357
Engineer: Four Waters Engineering, Inc. Engineer's Project No.: 17-1007:043
Contractor: _____ Contractor's Project No.: _____
Project: Sewer Resiliency Improvements – Gravity Sewer Rehabilitation
Contract Name: Sewer Resiliency Improvements – Gravity Sewer Rehabilitation
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 **210** 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 **240** 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: Town of Ridgeland
By (signature): _____
Name (printed): Dennis E. Averkin
Title: Town Administrator
Date Issued: _____

Copy: Engineer, Four Waters Engineering, Inc.

PERFORMANCE BOND

<p>Contractor</p> <p>Name: <i>[Full formal name of Contractor]</i></p> <p>Address <i>(principal place of business):</i></p>	<p>Surety</p> <p>Name: <i>[Full formal name of Surety]</i></p> <p>Address <i>(principal place of business):</i></p>
<p>Owner</p> <p>Name: Town of Ridgeland</p> <p>Mailing address <i>(principal place of business):</i></p> <p>PO Box 1119</p> <p>Ridgeland, SC 29936</p>	<p>Contract</p> <p>Description <i>(name and location):</i></p> <p>Sewer Resiliency Improvements – Gravity Sewer Rehabilitation</p> <p>Ridgeland, SC 29936</p> <p>Contract Price:</p> <p>Effective Date of Contract:</p>
<p>Bond</p> <p>Bond Amount:</p> <p>Date of Bond:</p> <p><i>(Date of Bond cannot be earlier than Effective Date of Contract)</i></p> <p>Modifications to this Bond form:</p> <p><input type="checkbox"/> None <input type="checkbox"/> See Paragraph 16</p>	
<p>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.</p>	
Contractor as Principal	Surety
<i>(Full formal name of Contractor)</i>	<i>(Full formal name of Surety) (corporate seal)</i>
By: _____	By: _____
<i>(Signature)</i>	<i>(Signature)(Attach Power of Attorney)</i>
Name: _____	Name: _____
<i>(Printed or typed)</i>	<i>(Printed or typed)</i>
Title: _____	Title: _____
Attest: _____	Attest: _____
<i>(Signature)</i>	<i>(Signature)</i>
Name: _____	Name: _____
<i>(Printed or typed)</i>	<i>(Printed or typed)</i>
Title: _____	Title: _____
<p><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></p>	

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

<p>Contractor</p> <p>Name: <i>[Full formal name of Contractor]</i></p> <p>Address <i>(principal place of business)</i>:</p>	<p>Surety</p> <p>Name: <i>[Full formal name of Surety]</i></p> <p>Address <i>(principal place of business)</i>:</p>
<p>Owner</p> <p>Name: Town of Ridgeland</p> <p>Mailing address <i>(principal place of business)</i>:</p> <p>PO Box 1119 Ridgeland, SC 29936</p>	<p>Contract</p> <p>Description <i>(name and location)</i>:</p> <p>Sewer Resiliency Improvements – Gravity Sewer Improvements Ridgeland, SC 29936</p> <p>Contract Price:</p> <p>Effective Date of Contract:</p>
<p>Bond</p> <p>Bond Amount:</p> <p>Date of Bond:</p> <p><i>(Date of Bond cannot be earlier than Effective Date of Contract)</i></p> <p>Modifications to this Bond form:</p> <p><input type="checkbox"/> None <input type="checkbox"/> See Paragraph 18</p>	
<p>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.</p>	
Contractor as Principal	Surety
<i>(Full formal name of Contractor)</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: _____
<p><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></p>	

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's Application for Payment

Owner: <u>Town of Ridgeland</u>	Owner's Project No.: <u>R-24-1357</u>
Engineer: <u>Four Waters Engineering, Inc.</u>	Engineer's Project No.: <u>17-1007:043</u>
Contractor: _____	Contractor's Project No.: _____
Project: <u>Sewer Resiliency Improvements - Gravity Sewer Rehabilitation</u>	
Contract: <u>Sewer Resiliency Improvements - Gravity Sewer Rehabilitation</u>	
Application No.: _____	Application Date: _____
Application Period: From _____ to _____	

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. <u>5%</u> X \$ - Work Completed =	\$	-
b. <u>5%</u> 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 + Line 5.c)	\$	-

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	Approved by Owner
By: <u>Angela Bryan, PE</u>	By: <u>Dennis E. Averkin</u>
Title: <u>Principal Engineer</u>	Title: <u>Town Administrator</u>
Date: _____	Date: _____
Approved by Funding Agency	
By: _____	By: _____
Title: _____	Title: _____
Date: _____	Date: _____

Progress Estimate - Lump Sum Work

Contractor's Application for Payment

Owner:	Town of Ridgeland	Owner's Project No.:	R-24-1357
Engineer:	Four Waters Engineering, Inc.	Engineer's Project No.:	17-1007:043
Contractor:		Contractor's Project No.:	
Project:	Sewer Resiliency Improvements - Gravity Sewer Rehabilitation		
Contract:	Sewer Resiliency Improvements - Gravity Sewer Rehabilitation		

Application No.:		Application Period:		From		to		Application Date:	
A	B	C	D	E	F	G	H	I	
Item No.	Description	Scheduled Value (\$)	Work Completed		Materials Currently Stored (not in D or E) (\$)	Work Completed and Materials Stored to Date (D + E + F) (\$)	% of Scheduled Value (G / C) (%)	Balance to Finish (C - G) (\$)	
			(D + E) From Previous Application (\$)	This Period (\$)					
Original Contract									
						-		-	
						-		-	
						-		-	
						-		-	
						-		-	
						-		-	
						-		-	
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						-		-	
						-		-	
						-		-	
						-		-	
						-		-	
Original Contract Totals		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	

Progress Estimate - Lump Sum Work

Contractor's Application for Payment

Owner:	Town of Ridgeland	Owner's Project No.:	R-24-1357
Engineer:	Four Waters Engineering, Inc.	Engineer's Project No.:	17-1007:043
Contractor:		Contractor's Project No.:	
Project:	Sewer Resiliency Improvements - Gravity Sewer Rehabilitation		
Contract:	Sewer Resiliency Improvements - Gravity Sewer Rehabilitation		

Application No.:		Application Period:		From		to		Application Date:	
A	B	C	D	E	F	G	H	I	
Item No.	Description	Scheduled Value (\$)	Work Completed		Materials Currently Stored (not in D or E) (\$)	Work Completed and Materials Stored to Date (D + E + F) (\$)	% of Scheduled Value (G / C) (%)	Balance to Finish (C - G) (\$)	
			(D + E) From Previous Application (\$)	This Period (\$)					
Change Orders									
						-		-	
						-		-	
						-		-	
						-		-	
						-		-	
						-		-	
						-		-	
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						-		-	
	Change Order Totals	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Original Contract and Change Orders									
	Project Totals	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	

Progress Estimate - Unit Price Work

Contractor's Application for Payment

Owner:	Town of Ridgeland	Owner's Project No.:	R-24-1357
Engineer:	Four Waters Engineering, Inc.	Engineer's Project No.:	17-1007:043
Contractor:		Contractor's Project No.:	
Project:	Sewer Resiliency Improvements - Gravity Sewer Rehabilitation		
Contract:	Sewer Resiliency Improvements - Gravity Sewer Rehabilitation		

Application No.: _____ Application Period: From _____ to _____ Application Date: _____

A	B	C	D	E	F	G	H	I	J	K	L
Bid Item No.	Description	Contract Information				Work Completed		Materials Currently Stored (not in G) (\$)	Work Completed and Materials Stored to Date (H + I) (\$)	% of Value of Item (J / F) (%)	Balance to Finish (F - J) (\$)
		Item Quantity	Units	Unit Price (\$)	Value of Bid Item (C X E) (\$)	Estimated Quantity Incorporated in the Work	Value of Work Completed to Date (E X G) (\$)				
Original Contract											
					-			-			-
					-			-			-
					-			-			-
					-			-			-
					-			-			-
					-			-			-
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					-			-			-
					-			-			-
					-			-			-
					-			-			-
Original Contract Totals					\$	-		\$	-	\$	-

Progress Estimate - Unit Price Work

Contractor's Application for Payment

Owner: Town of Ridgeland
Engineer: Four Waters Engineering, Inc.
Contractor:
Project: Sewer Resiliency Improvements - Gravity Sewer Rehabilitation
Contract: Sewer Resiliency Improvements - Gravity Sewer Rehabilitation

Owner's Project No.: R-24-1357
Engineer's Project No.: 17-1007:043
Contractor's Project No.:

Application No.: _____ **Application Period:** From _____ to _____ **Application Date:** _____

A	B	C	D	E	F	G	H	I	J	K	L
Bid Item No.	Description	Item Quantity	Units	Contract Information		Work Completed		Materials Currently Stored (not in G) (\$)	Work Completed and Materials Stored to Date (H + I) (\$)	% of Value of Item (J / F) (%)	Balance to Finish (F - J) (\$)
				Unit Price (\$)	Value of Bid Item (C X E) (\$)	Estimated Quantity Incorporated in the Work	Value of Work Completed to Date (E X G) (\$)				
Change Orders											
					Change Order Totals	\$ -		\$ -	\$ -	\$ -	\$ -
Original Contract and Change Orders											
					Project Totals	\$ -		\$ -	\$ -	\$ -	\$ -

Stored Materials Summary

Contractor's Application for Payment

Owner: Town of Ridgeland	Owner's Project No.: R-24-1357
Engineer: Four Waters Engineering, Inc.	Engineer's Project No.: 17-1007:043
Contractor:	Contractor's Project No.:
Project: Sewer Resiliency Improvements - Gravity Sewer Rehabilitation	
Contract: Sewer Resiliency Improvements - Gravity Sewer Rehabilitation	

Application No.:		Application Period: From		to		Application Date:						
A	B	C	D	E	F	Materials Stored			Incorporated in Work			
Item No. (Lump Sum Tab) or Bid Item No. (Unit Price Tab)	Supplier Invoice No.	Submittal No. (with Specification Section No.)	Description of Materials or Equipment Stored	Storage Location	Application No. When Materials Placed in Storage	Previous Amount Stored (\$)	Amount Stored this Period (\$)	Amount Stored to Date (G+H) (\$)	Amount Previously Incorporated in the Work (\$)	Amount Incorporated in the Work this Period (\$)	Total Amount Incorporated in the Work (J+K) (\$)	Materials Remaining in Storage (I-L) (\$)
Totals						\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

CERTIFICATE OF SUBSTANTIAL COMPLETION

Owner: Town of Ridgeland Owner's Project No.: R-24-1357
Engineer: Four Waters Engineering Engineer's Project No.: 17-1007:043
Contractor: Contractor's Project No.:
Project: Sewer Resiliency Improvements – Gravity Sewer Rehabilitation
Contract Name: Sewer Resiliency Improvements – Gravity Sewer Rehabilitation

This Preliminary Final Certificate of Substantial Completion applies to:

All Work The following specified portions of the Work:

[Describe the portion of the work for which Certificate of Substantial Completion is issued]

Date of Substantial Completion: **[Enter date, as determined by Engineer]**

The Work to which this Certificate applies has been inspected by authorized representatives of Owner, Contractor, and Engineer, and found to be substantially complete. The Date of Substantial Completion of the Work or portion thereof designated above is hereby established, subject to the provisions of the Contract pertaining to Substantial Completion. The date of Substantial Completion in the final Certificate of Substantial Completion marks the commencement of the contractual correction period and applicable warranties required by the Contract.

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

Amendments of contractual responsibilities recorded in this Certificate should be the product of mutual agreement of Owner and Contractor; see Paragraph 15.03.D of the General Conditions.

The responsibilities between Owner and Contractor for security, operation, safety, maintenance, heat, utilities, insurance, and warranties upon Owner's use or occupancy of the Work must be as provided in the Contract, except as amended as follows:

Amendments to Owner's Responsibilities: None As follows:

[List amendments to Owner's Responsibilities]

Amendments to Contractor's Responsibilities: None As follows:

[List amendments to Contractor's Responsibilities]

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

[List attachments such as punch list; other documents]

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

Engineer

By *(signature)*: _____

Name *(printed)*: Angela Bryan, PE _____

Title: Principal Engineer, Four Waters Engineering, Inc. _____

NOTICE OF ACCEPTABILITY OF WORK

Owner: Town of Ridgeland Owner’s Project No.: R-24-1357
Engineer: Four Waters Engineering Engineer’s Project No.: 17-1007:043
Contractor: Contractor’s Project No.:
Project: Sewer Resiliency Improvements – Gravity Sewer Rehabilitation
Contract Name: Sewer Resiliency Improvements – Gravity Sewer Rehabilitation
Notice Date: Effective Date of the Construction Contract:

The Engineer hereby gives notice to the Owner and Contractor that Engineer recommends final payment to Contractor, and that the Work furnished and performed by Contractor under the Construction Contract is acceptable, expressly subject to the provisions of the Construction Contract’s Contract Documents (“Contract Documents”) and of the Agreement between Owner and Engineer for Professional Services dated April 7, 2017 (“Owner-Engineer Agreement”). This Notice of Acceptability of Work (Notice) is made expressly subject to the following terms and conditions to which all who receive and rely on said Notice agree:

1. This Notice has been prepared with the skill and care ordinarily used by members of the engineering profession practicing under similar conditions at the same time and in the same locality.
2. This Notice reflects and is an expression of the Engineer’s professional opinion.
3. This Notice has been prepared to the best of Engineer’s knowledge, information, and belief as of the Notice Date.
4. This Notice is based entirely on and expressly limited by the scope of services Engineer has been employed by Owner to perform or furnish during construction of the Project (including observation of the Contractor’s Work) under the Owner-Engineer Agreement, and applies only to facts that are within Engineer’s knowledge or could reasonably have been ascertained by Engineer as a result of carrying out the responsibilities specifically assigned to Engineer under such Owner-Engineer Agreement.
5. This Notice is not a guarantee or warranty of Contractor’s performance under the Construction Contract, an acceptance of Work that is not in accordance with the Contract Documents, including but not limited to defective Work discovered after final inspection, nor an assumption of responsibility for any failure of Contractor to furnish and perform the Work thereunder in accordance with the Contract Documents, or to otherwise comply with the Contract Documents or the terms of any special guarantees specified therein.
6. This Notice does not relieve Contractor of any surviving obligations under the Construction Contract, and is subject to Owner’s reservations of rights with respect to completion and final payment.

Engineer

By *(signature)*: _____
Name *(printed)*: Angela Bryan, PE
Title: Principal Engineer, Four Waters Engineering, Inc.

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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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.

SUPPLEMENTARY CONDITIONS OF THE CONSTRUCTION CONTRACT

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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

SC-1.01.A.8 – Add the following at the end of the Paragraph:

The Change Order form to be used on this Project is EJCDC C-941 (2018). Agency approval is required before Change Orders are effective.

SC-1.01.A.11 – Delete and replace with the following:

11. *Constituent of Concern*—Asbestos; petroleum; radioactive materials; polychlorinated biphenyls (PCBs); lead-based paint (as defined by the HUD/EPA standard); hazardous waste; contaminated environmental media, metal bearing protective coatings, paints, and liners; metals such as but not limited to arsenic, cadmium, chrome, cobalt, lead, and mercury; and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to (a) the Comprehensive Environmental Response, Compensation and Liability Act (Superfund), 42 U.S.C. §9601 et seq.; (b) the Hazardous Materials Transportation Act, 49 U.S.C. §5101 et seq.; (c) the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. §6901 et seq.; (d) the Toxic Substances Control Act, 15 U.S.C. §2601 et seq.; (e) the Clean Water Act (CWA), 33 U.S.C. §1251 et seq.; (f) the Clean Air Act (CAA), 42 U.S.C. §7401 et seq.; or (f) any other federal, state, or local statute, law, rule, regulation, ordinance, resolution, code, order, or decree regulating, relating to, or imposing liability or standards of conduct concerning any hazardous, toxic or dangerous waste, substance, or material.

SC-1.01.A.16 – Add the following at the end of the Paragraph:

The terms Contractor and CONTRACTOR are interchangeable and shall have the same meaning in the Contract Documents.

SC-1.01.A.22 – Add the following at the end of the Paragraph:

The terms Engineer and ENGINEER are interchangeable and shall have the same meaning in the Contract Documents.

SC-1.01.A.30 – Add the following at the end of the Paragraph:

The terms Owner and OWNER are interchangeable and shall have the same meaning in the Contract Documents.

SC-1.01.A.50 – Add the following at the end of the Paragraph:

The Work Change Directive form to be used on this Project is EJCDC C-940 (2018). Agency approval is required before a Work Change Directive is issued.

SC 1.01.A.51 – Add the following new paragraph immediately after Paragraph 1.01.A.50:

51. *Hazardous Waste*—The term Hazardous Waste shall have the meaning provided in 40 CFR 261 titles “Identification and Listing of Hazardous Waste,” as amended from time to time.

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 one 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 20 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 Engineer 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: To be determined in conjunction with Owner and Contractor.

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.

SC-2.06 Supplement Paragraph 2.06 of the General Conditions by adding the following paragraph:

D. *Requests by Contractor for Electronic Documents in Other Formats*

1. Release of any Electronic Document versions of the Project documents in formats other than those identified in the Electronic Documents Protocol (if any) or elsewhere in the Contract will be at the sole discretion of the Owner.
2. To extent determined by Owner, in its sole discretion, to be prudent and necessary, release of Electronic Documents versions of Project documents and other Project information requested by Contractor (“Request”) in formats other than those identified in the Electronic Documents Protocol (if any) or elsewhere in the Contract will be subject to the provisions of the Owner’s response to the Request, and to the following conditions to which Contractor agrees:
 - a. The content included in the Electronic Documents created by Engineer and covered by the Request was prepared by Engineer as an internal working document for Engineer’s purposes solely, and is being provided to Contractor on an “AS IS” basis without any warranties of any kind, including, but not limited to any implied warranties of fitness for any purpose. As such, Contractor is advised and acknowledges that the content may not be suitable for Contractor’s application, or may require substantial modification and independent verification by Contractor. The content may include limited resolution of models, not-to-scale schematic representations and symbols, use of notes to convey design concepts in lieu of accurate graphics, approximations, graphical simplifications, undocumented intermediate revisions, and other devices that may affect subsequent reuse.
 - b. Electronic Documents containing text, graphics, metadata, or other types of data that are provided by Engineer to Contractor under the request are only for convenience of Contractor. Any conclusion or information obtained or derived from such data will be at the Contractor’s sole risk and the Contractor waives any claims against Engineer or Owner arising from use of data in Electronic Documents covered by the Request.

- c. Contractor shall indemnify and hold harmless Owner and Engineer and their subconsultants from all claims, damages, losses, and expenses, including attorneys' fees and defense costs arising out of or resulting from Contractor's use, adaptation, or distribution of any Electronic Documents provided under the Request.
 - d. Contractor agrees not to sell, copy, transfer, forward, give away or otherwise distribute this information (in source or modified file format) to any third party without the direct written authorization of Engineer, unless such distribution is specifically identified in the Request and is limited to Contractor's subcontractors. Contractor warrants that subsequent use by Contractor's subcontractors complies with all terms of the Contract Documents and Owner's response to Request.
3. In the event that Owner elects to provide or directs the Engineer to provide to Contractor any Contractor-requested Electronic Document versions of Project information that is not explicitly identified in the Contract Documents as being available to Contractor, the Owner shall be reimbursed by Contractor on an hourly basis (at \$200 per hour) for any engineering costs necessary to create or otherwise prepare the data in a manner deemed appropriate by Engineer.

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

4.05 Delays in Contractor's Progress

SC-4.05 Amend Paragraph 4.05.C by adding the following subparagraphs:

- 5. *Weather-Related Delays*
 - a. If "abnormal weather conditions" as set forth in Paragraph 4.05.C.2 of the General Conditions are the basis for a request for an equitable adjustment in the Contract Times, such request must be documented by data substantiating each of the following: 1) that weather conditions were abnormal for the period of time in which the delay occurred, 2) that such weather conditions could not have been reasonably anticipated, and 3) that such weather conditions had an adverse effect on the Work as scheduled. Extreme or unusual weather that is typical for a given region, elevation, or season should not be considered abnormal weather conditions. Requests for time extensions due to abnormal weather conditions will be submitted to the Owner within five days of the end of the abnormal weather condition event. Owner will review the request and decide if an extension of Contract Times is warranted. Owner may approve or deny request at his sole discretion. Owner may consult the Engineer for guidance in making the decision.
 - b. Determination of actual bad weather days during performance of the Work will be based on the weather records measured and recorded National Oceanic and Atmospheric Administration weather monitoring station at the nearest location to the Project Site.

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

5.03 *Subsurface and Physical Conditions*

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

- E. The following table lists the reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data, and specifically identifies the Technical Data in the report upon which Contractor may rely:

Report Title	Date of Report	Technical Data
No reports available		

- F. The following table lists the 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 specifically identifies the Technical Data upon which Contractor may rely:

Drawings Title	Date of Drawings	Technical Data
No drawings available		

- G. Contractor may examine copies of reports and drawings identified in SC-5.03.E and SC-5.03.F that were not included with the Bidding Documents at Owner’s Office during regular business hours, or may request copies from Engineer.

5.06 *Hazardous Environmental Conditions*

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

- 4. The following table lists the reports known to Owner relating to Hazardous Environmental Conditions at or adjacent to the Site, and the Technical Data (if any) upon which Contractor may rely:

Report Title	Date of Report	Technical Data
No reports available		

- 5. The following table lists the drawings known to Owner relating to Hazardous Environmental Conditions at or adjacent to the Site, and Technical Data (if any) contained in such Drawings upon which Contractor may rely:

Drawings Title	Date of Drawings	Technical Data
No drawings available		

ARTICLE 6—BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

SC-6.01 Add the following paragraphs immediately after Paragraph 6.01.A:

1. *Required Performance Bond Form:* The performance bond that Contractor furnishes will be in the form of EJCDC® C-610, Performance Bond (~~2010~~, 2013, or 2018 edition).
2. *Required Payment Bond Form:* The payment bond that Contractor furnishes will be in the form of EJCDC® C-615, Payment Bond (~~2010~~, 2013, or 2018 edition).

6.02 *Insurance—General Provisions*

SC-6.02 Add the following paragraph immediately after Paragraph 6.02.B:

1. Contractor may obtain worker’s compensation insurance from an insurance company that has not been rated by A.M. Best, provided that such company (a) is domiciled in the state in which the Project is located, (b) is certified or authorized as a worker’s compensation insurance provider by the appropriate state agency, and (c) has been accepted to provide worker’s compensation insurance for similar projects by the state within the last 12 months.

6.03 *Contractor’s Insurance*

SC-6.03 Supplement Paragraph 6.03 with the following provisions after Paragraph 6.03.C:

- D. *Workers’ Compensation and Employer’s Liability:* Contractor shall purchase and maintain workers’ compensation and employer’s liability insurance, including, as applicable, United States Longshoreman and Harbor Workers’ Compensation Act, Jones Act, stop-gap employer’s liability coverage for monopolistic states, and foreign voluntary workers’ compensation (from available sources, notwithstanding the jurisdictional requirement of Paragraph 6.02.B of the General Conditions).

Workers’ Compensation and Related Policies	Policy limits of not less than:
Workers’ Compensation	
State	Statutory
Applicable Federal (e.g., Longshoreman’s)	Statutory
Foreign voluntary workers’ compensation (employer’s responsibility coverage), if applicable	Statutory
Employer’s Liability	
Each accident	\$500,000
Each employee	\$500,000
Policy limit	\$500,000

- E. *Commercial General Liability—Claims Covered:* Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against claims for:
1. damages because of bodily injury, sickness or disease, or death of any person other than Contractor’s employees,
 2. damages insured by reasonably available personal injury liability coverage, and

3. damages because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.
- F. *Commercial General Liability—Form and Content:* Contractor’s commercial liability policy must be written on a 1996 (or later) Insurance Services Organization, Inc. (ISO) commercial general liability form (occurrence form) and include the following coverages and endorsements:
1. Products and completed operations coverage.
 - a. Such insurance must be maintained for three years after final payment.
 - b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.
 2. Blanket contractual liability coverage, including but not limited to coverage of Contractor’s contractual indemnity obligations in Paragraph 7.18.
 3. Severability of interests and no insured-versus-insured or cross-liability exclusions.
 4. Underground, explosion, and collapse coverage.
 5. Personal injury coverage.
 6. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together). If Contractor demonstrates to Owner that the specified ISO endorsements are not commercially available, then Contractor may satisfy this requirement by providing equivalent endorsements.
 7. For design professional additional insureds, ISO Endorsement CG 20 32 07 04 “Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured” or its equivalent.
- G. *Commercial General Liability—Excluded Content:* The commercial general liability insurance policy, including its coverages, endorsements, and incorporated provisions, must not include any of the following:
1. Any modification of the standard definition of “insured contract” (except to delete the railroad protective liability exclusion if Contractor is required to indemnify a railroad or others with respect to Work within 50 feet of railroad property).
 2. Any exclusion for water intrusion or water damage.
 3. Any provisions resulting in the erosion of insurance limits by defense costs other than those already incorporated in ISO form CG 00 01.
 4. Any exclusion of coverage relating to earth subsidence or movement.
 5. Any exclusion for the insured’s vicarious liability, strict liability, or statutory liability (other than worker’s compensation).
 6. Any limitation or exclusion based on the nature of Contractor’s work.
 7. Any professional liability exclusion broader in effect than the most recent edition of ISO form CG 22 79.

H. *Commercial General Liability—Minimum Policy Limits*

Commercial General Liability	Policy limits of not less than:
General Aggregate	\$2,000,000
Products—Completed Operations Aggregate	\$1,000,000
Personal and Advertising Injury	\$1,000,000
Bodily Injury and Property Damage—Each Occurrence	\$1,000,000

- I. *Automobile Liability*: Contractor shall purchase and maintain automobile liability insurance for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy must be written on an occurrence basis.

Automobile Liability	Policy limits of not less than:
Bodily Injury	
Each Person	\$1,000,000
Each Accident	\$1,000,000
Property Damage	
Each Accident	\$
[or]	
Combined Single Limit	
Combined Single Limit (Bodily Injury and Property Damage)	\$1,000,000

- J. *Umbrella or Excess Liability*: Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer’s liability, commercial general liability, and automobile liability insurance described in the Paragraphs above. The coverage afforded must be at least as broad as that of each and every one of the underlying policies.

Excess or Umbrella Liability	Policy limits of not less than:
Each Occurrence	\$2,000,000
General Aggregate	\$2,000,000

ARTICLE 7—CONTRACTOR’S RESPONSIBILITIES

7.03 *Labor; Working Hours*

SC-7.03 Add the following new subparagraphs immediately after Paragraph 7.03.C:

1. Regular working hours will 7 A.M. to 7 P.M., Monday through Friday.
2. Owner's legal holidays are New Year’s Day, Martin Luther King Jr. Day, Juneteenth, Memorial Day, Independence Day, Labor Day, Veterans Day, Thanksgiving, Christmas Eve, and Christmas.
3. To perform work outside of the regular working hours or on Owner’s legal holiday, Contractor must request permission in writing to Owner. Generally, permission will not

be granted unless construction schedule has been or is anticipated to be affected by severe weather delays or other unforeseen conditions.

SC-7.03 Add the following new paragraph immediately after Paragraph 7.03.C:

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

SC-7.03 Add the following new subparagraph immediately after Paragraph SC-7.03.D:

- 1. For purposes of administering the foregoing requirement, additional overtime costs are defined as \$1,500 per day to cover cost of Resident Project Representative to be present at the Site.

ARTICLE 8—OTHER WORK AT THE SITE

8.02 *Coordination*

SC-8.02 Add the following new Paragraph 8.02.C immediately after Paragraph 8.02.B:

- C. Owner may contract with others for the performance of other work at or adjacent to the Site during the period of the Project.
 - 1. Contractor shall coordinate with others to allow access to worksite.

ARTICLE 9—OWNER'S RESPONSIBILITIES

No suggested supplementary conditions in this article.

ARTICLE 10—ENGINEER'S STATUS DURING CONSTRUCTION

10.03 *Resident Project Representative*

SC-10.03 Add the following new subparagraph immediately after Paragraph 10.03.A:

- 1. On this Project, by agreement with the Owner, the Engineer will furnish a Resident Project Representative to represent Engineer at the Site or assist Engineer in observing the progress and quality of the Work.

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 Agency for concurrence on each Change Order prior to issuance. All Contract Change Orders must be concurred on (signed) by Agency before they are effective.

SC-11.03.A.2 – Add new Paragraph 11.03.A.2 immediately after Paragraph 11.03.A, which shall be renamed Paragraph 11.03.A.1:

2. The Engineer or Owner shall contact the Agency for concurrence on each Work Change Directive prior to issuance. Once authorized by Owner, a copy of each Work Change Directive shall be provided by Engineer to the Agency.

ARTICLE 12—CLAIMS

No suggested Supplementary Conditions in this Article.

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

13.01 Cost of the Work

SC-13.01 Supplement Paragraph 13.01.B.5.c.(2) by adding the following sentence:

The equipment rental rate book that governs the included costs for the rental of machinery and equipment owned by Contractor (or a related entity) under the Cost of the Work provisions of this Contract is the most current edition of Rental Rate Blue Book for Construction Equipment.

SC-13.01 Supplement Paragraph 13.01.C.2 by adding the following definition of small tools and hand tools:

- a. For purposes of this paragraph, “small tools and hand tools” means any tool or equipment whose current price if it were purchased new at retail would be less than \$500.

13.03 Unit Price Work

SC-13.03 Delete Paragraph 13.03.E in its entirety and insert the following in its place:

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 extended price of a particular item of Unit Price Work amounts to 5 percent or more of the Contract Price (based on estimated quantities at the time of Contract formation) and the variation in the quantity of that particular item of Unit Price Work actually furnished or performed by Contractor differs by more than 25 percent from the estimated quantity of such item indicated in the Agreement; and;
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

No suggested Supplementary Conditions in this Article.

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

15.01 *Progress Payments*

15.02 SC-15.01.B.4 – Add the following language at the end of paragraph:

No payments will be made that would deplete the retainage, place in escrow any funds that are required for retainage or invest the retainage for the benefit of the Contractor.

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

5. The Application for Payment form to be used on this Project is EJCDC® C-620. The Agency must approve all Applications for Payment before payment is made.

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

The Application for Payment with Engineer’s recommendations will be presented to the Owner and Agency for consideration. If both the Owner and Agency find the Application for Payment acceptable, the recommended amount less any reduction under the provisions of Paragraph 15.01.E will become due 35 days after the Application for Payment is presented to the Owner, and the Owner will make payment to the Contractor.

SC-15.01 Add the following new Paragraph 15.01.F:

- F. For contracts in which the Contract Price is based on the Cost of Work, if Owner determines that progress payments made to date substantially exceed the actual progress of the Work (as measured by reference to the Schedule of Values), or present a potential conflict with the Guaranteed Maximum Price, then Owner may require that Contractor prepare and submit a plan for the remaining anticipated Applications for Payment that will bring payments and progress into closer alignment and take into account the Guaranteed Maximum Price (if any), through reductions in billings, increases in retainage, or other equitable measures. Owner will review the plan, discuss any necessary modifications, and implement the plan as modified for all remaining Applications for Payment.

SC-15.02.A – Amend paragraph by striking out the following text: “7 days after”.

15.03 *Substantial Completion*

SC-15.03 Add the following new subparagraph to Paragraph 15.03.B:

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

ARTICLE 16—SUSPENSION OF WORK AND TERMINATION

No suggested Supplementary Conditions in this Article.

ARTICLE 17—FINAL RESOLUTIONS OF DISPUTES

17.02 *Arbitration*

SC-17.02 Add the following new paragraph immediately after Paragraph 17.01.

17.02 *Arbitration*

- A. All matters subject to final resolution under this Article will be settled by arbitration administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules (subject to the conditions and limitations of this Paragraph SC-17.02). Any controversy or claim in the amount of \$100,000 or less will be settled in accordance with the American Arbitration Association's supplemental rules for Fixed Time and Cost Construction Arbitration. This agreement to arbitrate will be specifically enforceable under the prevailing law of any court having jurisdiction.
- B. The demand for arbitration will be filed in writing with the other party to the Contract and with the selected arbitration administrator, and a copy will be sent to Engineer for information. The demand for arbitration will be made within the specific time required in Article 17, or if no specified time is applicable within a reasonable time after the matter in question has arisen, and in no event will any such demand be made after the date when institution of legal or equitable proceedings based on such matter in question would be barred by the applicable statute of limitations.
- C. The arbitrator(s) must be licensed engineers, contractors, attorneys, or construction managers. Hearings will take place pursuant to the standard procedures of the Construction Arbitration Rules that contemplate in-person hearings. The arbitrators will have no authority to award punitive or other damages not measured by the prevailing party's actual damages, except as may be required by statute or the Contract. Any award in an arbitration initiated under this clause will be limited to monetary damages and include no injunction or direction to any party other than the direction to pay a monetary amount.
- D. The Arbitrators will have the authority to allocate the costs of the arbitration process among the parties, but will only have the authority to allocate attorneys' fees if a specific Law or Regulation or this Contract permits them to do so.
- E. The award of the arbitrators must be accompanied by a reasoned written opinion and a concise breakdown of the award. The written opinion will cite the Contract provisions deemed applicable and relied on in making the award.
- F. The parties agree that failure or refusal of a party to pay its required share of the deposits for arbitrator compensation or administrative charges will constitute a waiver by that party to present evidence or cross-examine witness. In such event, the other party shall be required to present evidence and legal argument as the arbitrator(s) may require for the making of an award. Such waiver will not allow for a default judgment against the non-paying party in the absence of evidence presented as provided for above.
- G. No arbitration arising out of or relating to the Contract will include by consolidation, joinder, or in any other manner any other individual or entity (including Engineer, and Engineer's

consultants and the officers, directors, partners, agents, employees or consultants of any of them) who is not a party to this Contract unless:

1. the inclusion of such other individual or entity will allow complete relief to be afforded among those who are already parties to the arbitration;
 2. such other individual or entity is substantially involved in a question of law or fact which is common to those who are already parties to the arbitration, and which will arise in such proceedings;
 3. such other individual or entity is subject to arbitration under a contract with either Owner or Contractor, or consents to being joined in the arbitration; and
 4. the consolidation or joinder is in compliance with the arbitration administrator's procedural rules.
- H. The award will be final. Judgment may be entered upon it in any court having jurisdiction thereof, and it will not be subject to modification or appeal, subject to provisions of the Laws and Regulations relating to vacating or modifying an arbitral award.
- I. Except as may be required by Laws or Regulations, neither party nor an arbitrator may disclose the existence, content, or results of any arbitration hereunder without the prior written consent of both parties, with the exception of any disclosure required by Laws and Regulations or the Contract. To the extent any disclosure is allowed pursuant to the exception, the disclosure must be strictly and narrowly limited to maintain confidentiality to the extent possible.

17.03 Attorneys' Fees

SC-17.03 Add the following new paragraph immediately after Paragraph 17.02. [Note: If there is no Paragraph 17.02, because neither arbitration nor any other dispute resolution process has been specified here in the Supplementary Conditions, then revise this to state "Add the following new Paragraph immediately after Paragraph 17.01" and revise the numbering accordingly].

17.03 Attorneys' Fees

- A. For any matter subject to final resolution under this Article, the prevailing party shall be entitled to an award of its attorneys' fees incurred in the final resolution proceedings, in an equitable amount to be determined in the discretion of the court, arbitrator, arbitration panel, or other arbiter of the matter subject to final resolution, taking into account the parties' initial demand or defense positions in comparison with the final result.

ARTICLE 18—MISCELLANEOUS

SC-18.11 Add the following new paragraph immediately after Paragraph 18.10:

18.11 *Termination for Cause and Convenience*

In Addition to the Termination for Cause listed in the General Conditions, please see the additional requirements for RIA-funded grant projects.

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

1. By the Grantee, if a contractor fails to comply with the terms and conditions of the RIA award;
2. By the Grantee, to the greatest extent authorized by law, if an award no longer effectuates the program goals or agency priorities;
3. 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;
4. 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
5. By the Grantee pursuant to termination provisions included in the RIA award.

SC-18.12 Add the following new paragraph immediately after Paragraph 18.11:

18.12 *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:

1. Temporarily Withhold payments pending correction of the deficiency by the contractor;
2. 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;
3. Wholly or partly suspend or terminate this Contract; and
4. 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.

SC-18.13 Add the following new paragraph immediately after Paragraph 18.12:

18.13 Equal Opportunity Clause

Per the definition of “federally assisted construction contract” as defined by 41 CFR Part 60-1.3, the following provisions are required:

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

- B. 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 applications 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:
 - 1. 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 applications 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 received consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.
 - 2. 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.
 - 3. 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.
 - 4. 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.
 - 5. 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.
 - 6. 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.

SC-18.14 Add the following new paragraph immediately after Paragraph 18.13:

18.14 *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."

SC-18.15 Add the following new paragraph immediately after Paragraph 18.14:

18.15 *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.

SC-18.16 Add the following new paragraph immediately after Paragraph 18.15:

18.16 Contractors must comply with any and all applicable funding agency requirements.

WORK CHANGE DIRECTIVE NO.: [Number of Work Change Directive]

Owner: Town of Ridgeland Owner's Project No.: R-24-1357
Engineer: Four Waters Engineering, Inc. Engineer's Project No.: 17-1007:043
Contractor: Contractor's Project No.:
Project: Sewer Resiliency Improvements – Gravity Sewer Rehabilitation
Contract Name: Sewer Resiliency Improvements – Gravity Sewer Rehabilitation
Effective Date of Work Change
Date Issued: Directive:

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

Description:

[Description of the change to the Work]

Attachments:

[List documents related to the change to the Work]

Purpose for the Work Change Directive:

[Describe the purpose for the change to the Work]

Directive to proceed promptly with the Work described herein, prior to agreeing to change in Contract Price and Contract Time, is issued due to:

Notes to User—Check one or both of the following

Non-agreement on pricing of proposed change. Necessity to proceed for schedule or other reasons.

Estimated Change in Contract Price and Contract Times (non-binding, preliminary):

Contract Price: \$ _____ **[increase] [decrease] [not yet estimated].**
Contract Time: _____ days **[increase] [decrease] [not yet estimated].**

Basis of estimated change in Contract Price:

Lump Sum Unit Price Cost of the Work Other

	Recommended by Engineer	Authorized by Owner
By:	Angela Bryan, PE _____	Dennis E. Averkin _____
Title:	Principal Engineer, Four Waters Engineering _____	Town Administrator _____
Date:	_____ _____	_____ _____

CHANGE ORDER NO.: [Number of Change Order]

Owner:	Town of Ridgeland	Owner's Project No.:	R-24-1357
Engineer:	Four Waters Engineering, Inc.	Engineer's Project No.:	17-1007:043
Contractor:		Contractor's Project No.:	
Project:	Sewer Resiliency Improvements – Gravity Sewer Rehabilitation		
Contract Name:	Sewer Resiliency Improvements – Gravity Sewer Rehabilitation		
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: Angela Bryan, PE

Title: Principal Engineer, Four Waters Engineering

Date: _____

Authorized by Owner

Approved by Funding Agency (if applicable)

By: Dennis E. Averkin

Title: Town Administrator

Date: _____

FIELD ORDER NO.: [Number of Field Order]

Owner:	Town of Ridgeland	Owner's Project No.:	R-24-1357
Engineer:	Four Waters Engineering, Inc.	Engineer's Project No.:	17-1007:043
Contractor:		Contractor's Project No.:	
Project:	Sewer Resiliency Improvements – Gravity Sewer Rehabilitation		
Contract Name:	Sewer Resiliency Improvements – Gravity Sewer Rehabilitation		
Date Issued:		Effective Date of Field Order:	

Contractor is hereby directed to promptly perform the Work described in this Field Order, issued in accordance with Paragraph 11.04 of the General Conditions, for minor changes in the Work without changes in Contract Price or Contract Times. If Contractor considers that a change in Contract Price or Contract Times is required, submit a Change Proposal before proceeding with this Work.

Reference:

Specification Section(s):

Drawing(s) / Details (s):

Description:

[Description of the change to the Work]

Attachments:

[List documents supporting change]

Issued by Engineer

By: Angela Bryan, PE
Title: Principal Engineer, Four Waters Engineering, Inc.
Date: _____

**SECTION 01025
MEASUREMENT AND PAYMENT**

A. GENERAL

1. The CONTRACTOR shall receive and accept the compensation provided in the Proposal and the Contract as full payment for furnishing all materials, labor, tools and equipment, for performing all operations necessary to complete the work under the Contract, and also in full payment for all loss or damages arising from the nature of the work, or from any discrepancy between the actual quantities of work and quantities herein estimated by the Engineer, or from the action of the elements or from any unforeseen difficulties which may be encountered during the prosecution of the work until the final acceptance by the OWNER.
2. The prices stated in the proposal include all costs and expenses for taxes, labor, equipment, materials, commissions, transportation charges and expenses, patent fees and royalties, labor for handling materials during inspection, together with any and all other costs and expenses for performing and completing the work as shown on the Drawings and specified herein. The basis of payment for an item at the unit price shown in the proposal shall be in accordance with the description of that item in this Section.
3. The CONTRACTOR's attention is called to the fact that the quotations for the various items of work are intended to establish a total price for completing the work in its entirety. Should the CONTRACTOR feel that the cost for any item of work has not been established by the Bid Form or Payment Items, he shall include the cost for that work in some other applicable bid item, so that his proposal for the project does reflect his total price for completing the work in its entirety.

B. MEASUREMENT

1. The quantities for payment under this Contract shall be determined by actual measurement of the completed items, in place, ready for service and accepted by the OWNER, in accordance with the applicable method of measurement therefor contained herein. A representative of the CONTRACTOR and OWNER shall witness all field measurements.

C. WORK ITEMS NOT PAID FOR SEPARATELY

1. Color Audio-Video Recording: Measurement for pre-construction color audio-video recording will not be made for payment and all items shall be included in the unit price of project unit items installed.
2. Construction Photographs: Measurement for construction photographs will not be made for payment and all items shall be included in the unit price of project unit items installed.
3. Maintenance of Traffic: Measurement for maintenance of traffic/temporary traffic control will not be made for payment and all items shall be included in the unit price of project items installed.
4. Erosion and Sediment Control: Measurement for erosion and sediment control will not be made for payment and all items shall be included in the unit price of project items installed.

5. Temporary Sewer Bypassing Operations: Measurement for temporary sewer bypassing operations will not be made for payment and all items shall be included in the unit price of project items installed.
6. Restoration: Measurement for restoration requirements (including but not limited to grassing, grading, restoring structures damaged by construction to preconstruction condition) other than pavement items noted in bid form will not be made for payment and all items shall be included in the unit price of project items installed.
7. Contractor Storage Site / Lay Down Yard / Temporary Office: Measurement for Contractor Storage Site / Lay Down Yard / Temporary Office will not be made for payment and all items shall be included in the unit price of project unit items installed.
8. Regular Excavation: Measurement for regular excavation will not be made for payment and all items shall be included in the unit price of project unit items installed.
9. Dewatering: Measurement for dewatering operations necessary for construction will not be made for payment and all items shall be included in the unit price of project unit items installed.
10. Stabilization: Measurement for stabilization operations necessary for construction will not be made for payment and all items shall be included in the unit price of project unit items installed.
11. Miscellaneous Work Items: Measurement for miscellaneous work items such as mobilization / demobilization, payment and performance bonds, testing and reporting, temporary fencing, temporary facilities, as-builts/record drawings, and other items not specifically listed in the Bid Proposal Form will not be made for payment and all items shall be included in the unit price of project unit items installed.
12. Project Sign: Measurement for Project Sign will not be made for payment and all items shall be included in the unit price of project unit items installed.

PAY ITEMS

1. REMOVE AND REPLACE ASPHALT ROADWAY (PER SCDOT APPROVED DETAIL)

Payment will be made on a unit price per square yard basis for all equipment, labor, materials and tools necessary for the removal and replacement of asphalt roadway, in accordance with the Contract Drawings, Details and the SCDOT Encroachment Permit. Flowable fill shall be utilized as backfill in all open cuts in the roadway. All pavement markings shall be restored.

2. MILL EXISTING ASPHALT ROADWAY AND INSTALL 1-1/2 INCH THICK ASPHALT OVERLAY WITH SCDOT TYPE ASPHALT (RESTRIPE VARIES)

Payment will be made on a unit price per square yard basis for all equipment, labor, material and tools necessary to mill existing asphalt roadway and install 1-1/2 inch thick asphalt overlay with SCDOT type asphalt in accordance with Contract Drawings, Details and the SCDOT Encroachment Permit. Payment shall include all temporary and permanent pavement markings and striping as required per SCDOT, (paint on secondary roads and thermoplastic on primary

4. Erosion and Sediment Control: Measurement for erosion and sediment control will not be made for payment and all items shall be included in the unit price of project items installed.
5. Temporary Sewer Bypassing Operations: Measurement for temporary sewer bypassing operations will not be made for payment and all items shall be included in the unit price of project items installed.
6. Restoration: Measurement for restoration requirements (including but not limited to grassing, grading, restoring structures damaged by construction to preconstruction condition) other than pavement items noted in bid form will not be made for payment and all items shall be included in the unit price of project items installed.
7. Contractor Storage Site / Lay Down Yard / Temporary Office: Measurement for Contractor Storage Site / Lay Down Yard / Temporary Office will not be made for payment and all items shall be included in the unit price of project unit items installed.
8. Regular Excavation: Measurement for regular excavation will not be made for payment and all items shall be included in the unit price of project unit items installed.
9. Dewatering: Measurement for dewatering operations necessary for construction will not be made for payment and all items shall be included in the unit price of project unit items installed.
10. Stabilization: Measurement for stabilization operations necessary for construction will not be made for payment and all items shall be included in the unit price of project unit items installed.
11. Miscellaneous Work Items: Measurement for miscellaneous work items such as mobilization / demobilization, payment and performance bonds, testing and reporting, temporary fencing, temporary facilities, as-builts/record drawings, and other items not specifically listed in the Bid Proposal Form will not be made for payment and all items shall be included in the unit price of project unit items installed.
12. Project Sign: Measurement for Project Sign will not be made for payment and all items shall be included in the unit price of project unit items installed.

PAY ITEMS

1. REMOVE AND REPLACE ASPHALT ROADWAY (PER SCDOT APPROVED DETAIL)

Payment will be made on a unit price per square yard basis for all equipment, labor, materials and tools necessary for the removal and replacement of asphalt roadway, in accordance with the Contract Drawings, Details and the SCDOT Encroachment Permit. Flowable fill shall be utilized as backfill in all open cuts in the roadway. All pavement markings shall be restored.

2. MILL EXISTING ASPHALT ROADWAY AND INSTALL 1-1/2 INCH THICK ASPHALT

OVERLAY WITH SCDOT TYPE ASPHALT (RESTRIPE VARIES)

Payment will be made on a unit price per square yard basis for all equipment, labor, material and tools necessary to mill existing asphalt roadway and install 1-1/2 inch thick asphalt overlay with SCDOT type asphalt in accordance with Contract Drawings, Details and the SCDOT Encroachment Permit. Payment shall include all temporary and permanent pavement markings and striping as required per SCDOT, (paint on secondary roads and thermoplastic on primary roads per SCDOT determination).

3. SEWER LINE CLEANING FOR CONSTRUCTION PREP (JETTING AND DISPOSAL)

Reference Section 02955 Sewer Cleaning and CCTV item 1.5 A for measurement and payment of Sewer Line Cleaning.

4. SEWER LINE ROOT (TAP) REMOVAL

Reference Section 02955 Sewer Cleaning and CCTV item 1.5 C for measurement and payment for Sewer Line Root Removal

5. INTRUDING SEWER LATERAL CUTS

Reference Section 02955 Sewer Cleaning and CCTV item 1.5 D for measurement and payment for Lateral Cuts.

6. PRE-CONSTRUCTION AND POST-CONSTRUCTION CCTV INSPECTION

Reference Section 02955 Sewer Cleaning and CCTV item 1.5 B for measurement and payment for CCTV Inspection.

7. GRAVITY SEWER REHABILITATION – CIPP (INCLUDES SEWER BYPASSING AND SEWER LATERAL REINSTATEMENT) (VARIES BY SIZE)

Reference Section 02970 Sanitary Sewer CIPP item 1.5 A for measurement and payment for Cured-in-Place-Pipe.

8. GRAVITY SEWER REHABILITATION – PIPE BURSTING (INCLUDES SEWER BYPASSING) (VARIES BY SIZE)

Reference Section 02975 Sanitary Sewer Pipe Bursting item 1.6 A for measurement and payment for Pipe Bursting.

9. SEWER SERVICE LATERAL RECONNECTION (FOR PIPE BURSTING OR PIPE REPLACEMENT)

Reference Section 02975 Sanitary Sewer Pipe Bursting item 1.6 B for measurement and payment for Sewer Lateral Reconnection.

10. REMOVE AND REPLACE 8” ORANGEBURG SEWER PIPE WITH 8” PVC (SDR26) GRAVITY SEWER PIPE (4’ – 10’ DEPTH) (INCLUDES SEWER BYPASSING)

Payment for removal of 8" orangeburg sewer pipe and replacement with 8" PVC (SDR26) at the depth noted will be made on a linear foot basis for all equipment, materials, labor and tools necessary for the footage of wastewater pipe actually removed/replaced. The unit price set forth in the contract will constitute full compensation for excavation; native soil backfilling; dewatering; sheeting and shoring driven and pulled and drag shields for trenches of all depths; traffic control; as-builts; furnishing, laying, jointing and testing the wastewater piping; removal and disposal of the existing wastewater pipe; stoppers for all ends of pipe and fittings; transition couplings; bypass pumping plus all incidental work necessary for a complete installation and restoration to preconstruction condition (except for pavement restoration which has separate pay item).

11. GRAVITY SEWER POINT REPAIR (<10' DEPTH) (INCLUDES SEWER BYPASSING) (VARIES BY SIZE)

Payment for removal of damaged piping to the extents noted on the Contract Drawings and replacement with PVC (SDR26) piping at the depth and size noted will be made on a linear foot basis for all equipment, materials, labor and tools necessary for the footage of wastewater pipe actually removed/replaced. The unit price set forth in the contract will constitute full compensation for excavation; native soil backfilling; dewatering; sheeting and shoring driven and pulled and drag shields for trenches of all depths; traffic control; as-builts; furnishing, laying, jointing and testing the wastewater piping; removal and disposal of the existing wastewater pipe; stoppers for all ends of pipe and fittings; transition couplings; bypass pumping plus all incidental work necessary for a complete installation and restoration to preconstruction condition (except for pavement restoration which has separate pay item).

12. NEW 8" PVC (SDR26) GRAVITY SEWER PIPE (0' – 10' DEPTH)

Reference Section 02640 Sewer System Construction item 1.5 B. 1 for measurement and payment for Gravity Sewer Pipe.

13. REMOVE EXISTING (6" or 8") GRAVITY SEWER PIPE (0'-6' DEPTH) AND RESTORE

Payment will be made on a linear foot basis for all equipment, labor, material and tools necessary for the removal of gravity sewer piping below grade. Payment will be compensation in full for removal of grassing; excavating; removal of piping; transporting and disposal of the pipe and appurtenances; traffic control; A-3 soil fill replacement; backfill and compacting as required, and restoration of area to preconstruction conditions (except for pavement restoration which is a separate pay item).

14. NEW 12" STEEL CASING PIPE AND ACCESSORIES (0' – 6' DEPTH)

Payment will be made on a linear foot basis for all equipment, labor, material, and tools necessary for the installation of casing by open cut actually installed. Measurement shall be made along the horizontal projection of the center line of the casing. Payment for the work will be made at the Contract unit price and shall be full compensation for the items of work, complete, including casing pipe; casing spacers and end caps (if required); locate wiring (if require); excavation; dewatering; traffic control; backfill and compacting, and all incidental work required to complete the work including all materials, labor, tools

and equipment.

15. REMOVE EXISTING MANHOLE AND RESTORE (0'-6' DEPTH)

Payment will be made on a per each unit price basis for all equipment, labor, materials and tools necessary for the removal of existing manhole as specified, and shall include all demolition; A-3 soil fill replacement for voids and unsuitable material; removal of grassing; excavating; backfilling; compacting; sealing any and all pipes leading into and out of the structure; traffic control; transporting and disposal, as required, for complete removal and disposal, and restoration of area to preconstruction conditions (except for pavement restoration which is a separate pay item).

16. NEW 4' DIAMETER PRECAST CONCRETE MANHOLE (0'-10' DEPTH)

Reference Section 02640 Sewer System Construction item 1.5 B. 3 for measurement and payment for Manholes.

17. REPLACE MANHOLE COVER

Reference Section 02960 Sanitary Sewer Manhole Rehabilitation item 1.7 E for measurement and payment for Manhole Cover Replacement.

18. INSTALL HDPE MANHOLE INSERT

Reference Section 02960 Sanitary Sewer Manhole Rehabilitation item 1.7 D for measurement and payment for HDPE Manhole Insert.

19. INSTALL URETHANE RUBBER SEAL ON INTERIOR MANHOLE CHIMNEY/FRAME

Reference Section 02960 Sanitary Sewer Manhole Rehabilitation item 1.7 B for measurement and payment for Manhole Frame and Chimney Seal - Interior.

20. INSTALL EXTERNAL RUBBER SEAL ON MANHOLE CHIMNEY/FRAME ABOVE GRADE

Reference Section 02960 Sanitary Sewer Manhole Rehabilitation item 1.7 C for measurement and payment for Manhole Frame and Chimney Seal – Exterior Above Grade.

21. INSTALL CEMENTITIOUS MORTAR LINING IN MANHOLE (4' DIA) (INCLUDES SEWER BYPASSING)

Reference Section 02960 Sanitary Sewer Manhole Rehabilitation item 1.7 A for measurement and payment for Manhole Protective Coating.

22. REPLACE MANHOLE FRAME AND ADJUST TO ABOVE GRADE

Reference Section 02960 Sanitary Sewer Manhole Rehabilitation item 1.7 F for measurement and payment for Manhole Frame Replacement and Adjustment, At or Above Grade.

23. REPLACE MANHOLE FRAME AND ADJUST TO GRADE (INCLUDING NECESSARY ASPHALT/BRICK/CONCRETE RESTORATION)

Reference Section 02960 Sanitary Sewer Manhole Rehabilitation item 1.7 F for measurement and payment for Manhole Frame and Cover Replacement and Adjustment, At or Above Grade.

24. 12" PVC (DR18) WATER MAIN

Payment will be made on a linear foot basis for all equipment, labor, material, and tools necessary for the installation of 12" PVC (DR18) Water Main. Measurement shall be made along the horizontal projection of the center line of pipe. No deduction in length will be made for the space occupied by valves or fittings. Payment for the work will be at the Contract unit price shown for the respective item and shall be full compensation for the item of work completed, including all required removal of grassing; silt fence, excavation; de-watering; native soil backfilling; laying and jointing pipe; pressure and leakage testing; flushing and disinfecting; de-chlorination (if required); all sheeting, shoring, and bracing required to maintain excavations in a safe condition; protecting existing structures, utilities and property both public and private; traffic control; cleaning up the site; installing silt fence and other erosion, sedimentation protection and control devices; furnishing and installing locate wiring, locate wire test stations, locate wire-related appurtenances and locate wire testing; furnishing all material, labor, tools, and equipment; as-builts; and all incidental and related work required to complete the work of the item.

25. ABANDON 12" WATER MAIN BY GROUT FILL AND SEAL REMAINING OPENINGS IN CONFLICT MANHOLE WALLS

Payment will be made on a linear foot basis for all equipment, labor, material and tools necessary for excavating and grout filling abandoned mains. Payment will be compensation in full for removal of grassing; excavating as required; grout; grout filling; backfilling and compacting; traffic control, for a complete abandonment and restoration other than pavement. Also included in this pay item is the removal of the water main from the sewer conflict manhole and sealing the conflict manhole walls.

26. 12" MJ DI FITTINGS (VARIOUS)

Payment will be made on a per each unit basis for all equipment, labor, material and tools necessary for fittings furnished and installed. Payment for the work will be made at the Contract unit price and shall be full compensation for the items of work including furnishing and installing fittings and mechanical restraints at fitting joints, complete with all necessary incidental work required to complete the work and all materials, labor, tools and equipment.

27. A-3 FILL

Reference Section 02640 Sewer System Construction item 1.5 B. 5 for measurement and payment for Sand Bedding and Backfill.

28. STONE BEDDING

Reference Section 02640 Sewer System Construction item 1.5 B. 4 for measurement and payment for Stone Bedding.

END OF SECTION 01025

SECTION 01100

SUMMARY OF WORK

PART 1-GENERAL

The Summary of Work in this Section comprises the Town of Ridgeland Sewer Resiliency Improvements, Ridgeland, South Carolina. The following scope of work description is intended to be general in nature. The intention is to have the successful Contractor perform all of the work included and presented within the Construction Contract Documents, paying particular attention to the Schedule of Bid Prices. The Contractor shall comply with and be responsible for all of the requirements of the Project Manual including the Drawings and Specifications.

1.01 RELATED REQUIREMENTS INCLUDED

Project Manual, Division 0, Bidding and Contract Documents

The Contractor shall comply with and be responsible for all of the requirements of the Project Manual, without exception.

The Contract Form for this Project shall be as stipulated in Division 0, Section 00520 in the Project Manual.

1.02 SCOPE OF WORK

A. Construction of sewer system resiliency improvements includes rehabilitation within three sewer basins: PS3, WRF, and PS4 Sewer Basins. Specific recommended improvements are as follows:

1. Gravity Sewer Rehabilitation:

Gravity sewer pipe rehabilitation by Cured-In-Place-Pipe (CIPP), Pipe Bursting, or Open Cut methods, rehabilitation of 45 existing manholes with a varying combination of cementitious mortar interior lining, urethane rubber sealing system for manhole chimney, HDPE manhole inserts, new manhole covers, new manhole frame, adjustment to or above grade, and/or external rubber seal on manhole chimney and frame. Construction also includes pre-construction sewer pipe cleaning, pre- and post-construction CCTV, all necessary sewer system bypassing operations, sewer lateral restoration, 4 new manholes, removal of 1 manhole, rerouting of an existing water main from a sewer conflict manhole, maintenance of traffic, soil erosion and sediment control, and restoration including pavement repair and overlay to SCDOT standards (all roads are SCDOT).

Sewer Basin Improvements:

- PS3 Sewer Basin (Area A in Drawings)
 - ~1795 LF pipeburst 10-inch to 12-inch gravity sewer
 - ~925 LF pipeburst 8-inch to 10-inch gravity sewer
 - ~390 LF Clean and Flush gravity sewer only
- WRF Sewer Basin (Area B in Drawings)
 - ~350 LF – Remove 8-inch Orangeburg and replace with 8-inch PVC gravity sewer
 - ~215 LF – Remove 6-inch DIP and 8-inch VCP gravity sewer

- ~5760 LF CIPP 8-inch gravity sewer
 - ~185 LF install new 8-inch PVC gravity sewer
 - ~70 LF install new 12-inch steel casing by open cut
 - ~110 LF point repair of 8-inch gravity sewer
 - 26 manholes rehabilitation
 - 4 new precast manholes
 - 1 manhole removal
 - Reroute ~60 LF 12-inch water main from sewer conflict manhole.
 - PS4 Sewer Basin (Area C in Drawings)
 - ~20 LF CIPP 10-inch gravity sewer
 - ~2800 LF Clean and Flush gravity sewer only
 - 19 manholes rehabilitation.
2. All mobilization and demobilization, restoration, maintenance of traffic, soil erosion and sediment control, and other work implied necessary to complete an operable sewer system rehabilitation.

1.03 SUBSTANTIAL COMPLETION

Substantial completion is the time at which the Work has progressed to the point where, in the opinion of the Engineer, the Work is sufficiently complete in accordance with the Contract Documents so that the facilities can be utilized for the purposes for which they are intended. For this project, Substantial Completion includes all components of the Work of the Project that rehabilitates and restores to service the sewer collection system, which has been inspected and approved by the Town and determined to be functioning properly. This requires the contractor to achieve completion of all Work of the Project less the paving and establishment of final grassing. This is grass planted but not yet established.

1.04 FINAL COMPLETION

Final completion is the time, as certified by the Engineer, when all Work of the Project is complete, post completion documents have been submitted by the contractor and are satisfactory, and the Project is ready for final payment. Final completion requires the contractor to be at the level of functionality defined complete with all “punch list” items addressed, grassing to have been established and to be complete in all respects as contained within the Construction Contract Documents. The date of final completion shall constitute the date of the beginning of the Guarantee and Warranty period.

1.05 USE OF THE PREMISES

- A. Contractor shall have use of the area encompassing the Project Site as shown on the applicable drawings for execution of the Work of this Contract, except as may be otherwise indicated or necessitated by the requirements of the Project Manual, or as may be determined by the Owner.
- B. Contractor shall provide, or cause to be provided, and shall pay for all geotechnical services, testing, labor, equipment, materials, and such other utilities, transportation, and facilities necessary for the proper execution of the Work, whether temporary or permanent, and whether or not incorporated or to be incorporated in the Work.
- C. Contractor shall provide protection at all affected areas of the site during the performance of the Work.
- D. Contractor shall perform all work in conformance with O.S.H.A. requirements, which will be strictly enforced.

- E. Contractor shall coordinate the use of the premises consistent with the Project requirements as may be directed by the Owner.
- F. Contractor shall use access routes for delivery of materials and equipment only as indicated on the drawings approved by the Owner and as may be directed by the Owner. Do not use access routes other than those indicated. Contractor shall keep clean, maintain, and repair all access routes used.
- G. Contractor shall assume full responsibility for the protection and safekeeping of all products under this contract, stored and / or installed on the Project Site as well as those products stored off the Project Site. Materials, products, and equipment shall be stored on the Project Site only in those areas indicated or allowed for staging and approved by the Owner.
- H. Safe staging and material storage shall be limited to the area indicated on the drawings, which have been approved by the Owner and as may be designated by the Owner. Contractor must obtain specific permission from the Owner for the use of other areas for storage and staging.
- I. Contractor shall protect existing sidewalks, pavement, curbs, utilities, building exterior, and interior surfaces subject to damage by Work performed under this contract. Contractor shall, at his sole cost and expense, repair or replace any existing work damaged by his/her prime and/or sub-contractor's personnel or equipment.

1.06 WORK SEQUENCE AND COMPLETION

- A. Contractor shall work in an orderly manner coordinated with the work of other disciplines and trades.
- B. No disruption to, or use of adjacent facilities and access to those facilities will be allowed.
- C. Operation of the existing sewer system must be maintained at all times during the construction without obstruction of the flow. Any sewer system overflows caused by the contractor or sub-contractors' actions shall be reported immediately to the Town and Engineer and shall be properly removed, and the site cleaned up in accordance with all SCDES (formerly SCDHEC) requirements. Every effort shall be made to keep any overflows from reaching the storm sewer system or any surface waters. The cost of any sewer system overflows, cleanup and monitoring, or fines by SCDES shall be paid by the contractor at no expense to the Town.
- D. The Owner may require certain work to be performed after normal working hours or on holidays or weekends or as may be necessitated in the public interest. Such work does not constitute a change of scope or additional cost.

1.07 LIQUIDATED DAMAGES

The Contractor agrees to commence Work under this Contract on the effective date established as "Notice to Proceed", and to complete the Work in conformance with the allotted time described in the Project Manual. Should the Contractor neglect, fail, or refuse to complete the Work within the established Completion date then the Contractor shall pay to the Owner Liquidated Damages in the amount of five hundred dollars (\$500.00) per day for those damages suffered by the Owner as a result of delay for each and every calendar day that the Contractor has failed to complete the work within the established Completion date. The aforementioned Liquidated Damages are not a penalty, but rather are a pre-agreed liquidation of the losses incurred by the Owner due to the failure of the Contractor to complete the Work on time.

1.08 SUBSTITUTIONS AND PRODUCT OPTIONS

Written requests for substitutions shall be forwarded to the Engineer for review and Owner approval.

1.09 SURVEY

Contractor shall verify all survey data, geotechnical reports and investigations included within the Contract Documents and report any errors and inconsistencies in writing to the Owner before any work is performed in those areas where errors and inconsistencies may exist. Refer to Division 1, Section 01310, Project Management and Coordination in the Project Manual.

PART 2- PRODUCTS

Not Used

PART 3- EXECUTION

Not Used

END OF SECTION 01100

SECTION 01300

REGULATORY REQUIREMENTS

PART 1 – GENERAL

1.01 RELATED REQUIREMENTS

- A. Division 0, Bidding and Contract Documents of the Project Manual
- B. Division 1, General Requirements of the Project Manual

1.02 CODES, AUTHORITIES, REGULATORY AGENCIES, AND INDUSTRY REFERENCES

- A. Where references are made on the Drawings or in the Technical Specifications to codes, they shall be considered an integral part of the Construction Contract Documents as minimum standards. Nothing contained in the Construction Contract Documents shall be so construed as to be in conflict with any law, bylaw, ordinance or regulation of the municipal, state, federal or other authorities having jurisdiction. The Contractor shall reflect reference to specific codes, as may be applicable, insuring conformance with code requirements.
- B. Perform Work in compliance with the following code:

Current edition of all applicable building code(s), local, state and federal.
International Building Code – latest edition
- C. Perform Work in compliance with the following Authorities and Regulatory Agencies:
 - 1. Town of Ridgeland, South Carolina
 - 2. South Carolina Department of Environmental Services (former Department of Health Environmental Controls (SCDHEC)) (SCDES/ OCRM)
 - 3. South Carolina Department of Transportation (SCDOT)
 - 4. OSHA Code of Federal Regulations. (OSHA)
 - 5. All federal, state and local clean air, clean water, water rights, resource recovery, and solid waste disposal standards and the Federal Endangered Species Act, and the Occupational Safety and Health Acts.
 - 6. Environmental Protection Agency (EPA).

1.04 PERMITTING

- A. At no additional expense to the Owner, the Contractor shall file for and obtain necessary licenses and permits for any interim phases for construction, and be responsible for complying with any federal, state, county, and municipal laws, codes, regulations and ordinances applicable to the performance of the Work, including, but not limited to, any laws or regulations requiring the use of licensed prime and /or subcontractors to perform parts of the Work.

- B. Town has acquired the following permits for the project work. All other necessary permits are the responsibility of the contractor.
 - 1. SCDOT Encroachment Permit, Permit No. 267757, Expiration Date: 4/15/2025
 - 2. South Carolina Department of Environmental Services (former Department of Health Environmental Controls (SCDHEC)) General Coastal Zone Consistency Determination, Ref # HPN-8F47-58R0S; GCZC-2017-002

1.05 INSPECTION AND CERTIFICATIONS

- A. Arrange inspection and obtain Certificates of approval from applicable authorities having jurisdiction. Furnish Certificates of Approval in accordance with the applicable Technical Specifications and the General Requirements of the Contract.
- B. Notify and coordinate for all appropriate county and state inspections of the work. Allow enough time to maintain progress of the work.

1.06 PERFORMANCE

- A. Should the Contractor knowingly perform any Work that does not conform with the requirements of applicable codes, ordinances, regulations, or standards, without given prior written notice to the Owner and obtaining required variance, etc. from the governing body, Contractor shall assume full responsibility thereof and shall bear all costs involved in correcting such non-complying Work. Costs shall include but not be limited to: All fines, inspection costs, damages, design and management fees in addition to the cost of removal and replacement of the work of all trades involved.

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

Not Used.

END OF SECTION 01300

**SECTION 01310
PROJECT MANAGEMENT AND COORDINATION**

PART 1 – GENERAL

1.01 REQUIREMENTS INCLUDED

- A. The Contractor shall comply with and be responsible for all of the requirements of the Project Manual and the Construction Contract Documents, without exception.
- B. Contractor shall be responsible for general project coordination of all construction phases and aspects, trades, and disciplines of the Work of the Project.
- C. Contractor shall be responsible for general coordination of all construction site operations and with other improvement projects that may be conducted by the Owner.
- D. Contractor shall be responsible for general coordination with other interested parties including, but not limited to SCDES (former SCDHEC), OCRM, SCDOT, Owner, other Contractors working on abutted property projects, and all involved permitting authorities.

1.02 RELATED REQUIREMENTS

- A. Division 0, Bidding and Contract Documents in the Project Manual.
- B. Division 1, General Requirements in the Project Manual

1.03 GENERAL COORDINATION

- A. Coordinate scheduling, submittals, and work of various Sections of the Technical Specifications to assure efficient and orderly sequence of installation of construction elements with provisions for accommodating any items furnished by the Owner, or others, to be installed by the Contractor.
- B. Coordinate sequence of Work to accommodate partial occupancy for the Owner as specified in Section 01100, Summary of Work and / or as directed by the Owner.
- C. Review and coordinate requirements of all Divisions of the Project Manual and Sections of the Technical Specifications. Report any discrepancies to the Owner.
- D. Maintain services of prime and major subcontractors throughout duration of the Contract, except as may be required by provisions of Conditions of Contract. Notify the Owner, in writing, of intention to replace prime or sub-contractor(s), outlying reasons for the action and naming proposed replacement contractor(s).
- E. Coordinate work of prime and sub-contractors and record contractor installation(s) data on Project Record (As Constructed) Drawings.

- F. All communications regarding Contract requirements shall be addressed to the Owner. Outline any special procedures required for coordination and include such items as required notices, reports, and attendance at meetings.
- G. Arbitrate and resolve coordination conflicts between prime and sub-contractors to ensure complete and operational systems.
- H. Coordinate work with all existing utility systems.
- I. Coordinate construction activities to ensure that operations are carried out with due consideration given to energy, water, and materials.
- J. Salvage materials and equipment involved in the performance of, but not actually incorporated in, the Work. Salvage material shall include marketable deciduous and coniferous timber to be cut and removed by the Contractor on the project site.

1.04 COORDINATION MEETINGS

- A. In addition to the meetings referred to in Section 01315, Progress Meetings, the Contractor shall conduct coordination meetings and pre-installation meetings with supervisory personnel, prime and sub-contractors, suppliers, the Owner, and others as necessary and applicable, to assure coordination of different trades and disciplines.
- B. Schedule coordination and pre-installation meetings with prime and sub-contractors, suppliers, and the Owner to discuss hardware installation and specialty systems installation.

1.05 COORDINATION OF SUBMITTALS

- A. Coordinate use of Project space and sequence of installation of equipment, walks, parking areas, mechanical, electrical, plumbing, or other Work that is indicated diagrammatically on the Contract drawings and/or contained in the Technical Specifications. Utilize space efficiently to maximize accessibility for Owner installations, maintenance, and repairs.
- B. Where installation of one part of the Work is dependent on installation of other components, either before or after its own installation, schedule construction activities in sequence required to obtain best results.
- C. Make adequate provisions to accommodate items scheduled for later installation, including accepted Bid Alternates, Owner supplied items, subcontractor installed items, work by others, and installation of products purchased with allowances.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used.

END OF SECTION 01310

SECTION 01315 PROGRESS MEETINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Division 1, General Requirements of the Contract Documents apply to this Section.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for project meetings including but not limited to:
 - 1. Construction Progress Meetings.

1.3 PROGRESS MEETINGS

- A. Conduct bi-weekly construction progress meetings at the Project site at regularly scheduled intervals. Notify the Owner of scheduled meeting dates. Coordinate dates of meetings with preparation of the payment request.
- B. Agenda: Review and correct or approve minutes of the previous Construction progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate in the current status of the Project.
 - 1. Contractor's construction schedule: Provide overall construction schedule and two-week look ahead schedule. Review progress since the last meeting. Determine where each activity is in relation to the Contractor's schedule, whether on time or ahead or behind schedule. Determine how schedule can be improved if behind.
- C. Reporting: After each progress meeting date, the Contractor will distribute copies of minutes of the meeting to each party present and to other parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.
 - 1. Schedule Updating: Revise the construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue the revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS

(Not Applicable)

PART 3 - EXECUTION

(Not Applicable)

END OF SECTION 01315

01315-1

SECTION 01340
SHOP DRAWINGS, WORKING DRAWINGS, AND SAMPLES

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work:

1. The Contractor shall submit to the Engineer for review and approval, such Working Drawings, Shop Drawings, Test Reports and Data on materials and equipment (hereinafter in this Section called Data), and material samples (hereinafter in this Section called Samples) as are required for the proper control of work, including but not limited to those Working Drawings, Shop Drawings, Data and Samples for materials and equipment specified elsewhere in the Specifications and in the Contract Drawings.
2. Within fourteen (14) calendar days after the Effective Date of the Agreement, the Contractor shall submit to the Engineer a complete list of preliminary Data on items for which Shop Drawings are to be submitted. Included in this list shall be the names of all proposed manufacturers furnishing specified items. Review of this list by the Engineer shall in no way expressed or implied relieve the Contractor from submitting complete Shop Drawings and providing materials, equipment, etc., fully in accordance with the Specifications. This procedure is required in order to expedite final review of Shop Drawings.
3. The construction procedures shall comply with this Project Manual and with the latest edition of the Town of Ridgeland Water and Sewer Standards.
4. The Contractor is to maintain an accurate updated submittal log and will bring this log to each scheduled progress meeting with the Owner and the Engineer. This log should include the following items:
 - a. Submittal-Description and Number assigned.
 - b. Date to Engineer.
 - c. Date returned to Contractor (from Engineer).
 - d. Status of Submittal (Approved as Noted, Rejected/Resubmit).
 - e. Date of Resubmittal and Return (as applicable).
 - f. Date material release (for fabrication).
 - g. Projected date of fabrication.
 - h. Projected date of delivery to site.
 - i. Status of O&M manuals submittal.

- j. Specification Section.
- k. Drawing Sheet Numbers.

1.02 CONTRACTOR'S RESPONSIBILITY

- A. It is the duty of the Contractor to check all drawings, Data and Samples prepared by or for him before submitting them to the Engineer for review. Each and every copy of the Drawings and Data shall bear the Contractor's stamp showing that they have been so checked. Shop Drawings submitted to the Engineer without the Contractor's stamp will be returned to the Contractor for conformance with this requirement. Shop Drawings shall indicate any deviations in the submittal from requirements of the Contract Documents. If the Contractor takes exception to the specifications, the Contractor shall note the exception in the letter of transmittal to the Engineer.
- B. Determine and verify:
 - 1. Field measurements.
 - 2. Field construction criteria.
 - 3. Catalog numbers and similar Data.
 - 4. Conformance with Specifications.
- C. The Contractor shall furnish the Engineer a schedule of Shop Drawings submittals fixing the respective dates for the submission of Shop and Working Drawings, the beginning of manufacture, testing and installation of materials, supplies and equipment. This schedule shall indicate those that are critical to the progress schedule.
- D. The Contractor shall not begin any of the work covered by a Shop Drawing, Data, or a Sample returned for correction until a revision or correction thereof has been reviewed and returned to him, by the Engineer, with approval.
- E. The Contractor shall submit to the Engineer all drawings and schedules sufficiently in advance of construction requirements to provide no less than thirty (30) calendar days for checking and appropriate action from the time the Engineer receives them.
- F. All submittals shall be accompanied with a transmittal letter containing the following information:
 - 1. Date.
 - 2. Project Title and Number.
 - 3. Contractor's name, address, phone, and fax numbers.
 - 4. The number of each Shop Drawing, Project Data, and Sample submitted.

5. Notification of Deviations from Contract Documents.
 6. Submittal Log Number conforming to Specification Log Number.
- G. The Contractor shall submit Shop Drawings in electronic pdf format with the file name indicating the submittal and submittal date to the engineer via email. The Engineer will review and make comments electronically to the contractor and require updated shop drawings electronically until approved.
- Upon engineer's request, the contractor shall submit four (4) copies of descriptive or product Data submittals to complement Shop Drawings for the Engineer plus the number of copies which the Contractor requires returned. The Engineer will retain four (4) sets. All blueprint Shop Drawings shall be submitted with four (4) sets of prints plus the number of copies which the Contractor requires returned. The Engineer will review the blueprints and retain four (4) sets, returning the remainder to the Contractor with appropriate review comments.
- H. The Contractor shall be responsible for and bear all costs of damages which may result from the ordering of any material or from proceeding with any part of work prior to the completion of the review and approval by the Engineer of the necessary Shop Drawings.
- I. The Contractor shall be fully responsible for observing the need for and making any changes in the arrangement of piping, connections, wiring, manner of installation, etc., which may be required by the materials/equipment he proposed to supply both as pertains to his own work and any work affected under other parts, headings, or divisions of drawings and specifications.

1.03 ENGINEER'S REVIEW OF SHOP DRAWINGS

- A. The Engineer's review of Shop Drawings, Data and Samples submitted by the Contractor will cover only general conformity to the Specifications, external connections, and dimensions which affect the installation. The Engineer's review and exceptions, if any, will not constitute an approval of dimensions, quantities, and details of the material, equipment, device, or item shown.
- B. The review of drawings and schedules will be general, and shall not be construed:
1. As permitting any departure from the Contract requirements.
 2. As relieving the Contractor of responsibility for any errors, including details, dimensions, and materials.
 3. As approving departures from details furnished by the Engineer, except as otherwise provided herein.
- C. If the drawings or schedules as submitted describe variations per Paragraph 1.02A. herein and show a departure from the Contract requirements which the Engineer finds to be in the interest of the Owner and to be so minor as not to involve a change in Contract Price or time for performance, the Engineer may return the reviewed drawings without noting an exception.

- D. When reviewed by the Engineer, each of the Shop Drawings will be identified as having received such review being so stamped and dated. Shop Drawings stamped "REVISE AND RESUBMIT" and with required corrections shown will be returned to the Contractor for correction and resubmittal.
- E. Resubmittals will be handled in the same manner as first submittals. On resubmittals the Contractor shall direct specific attention, in writing or on resubmittal Shop Drawings, to revisions other than the corrections requested by the Engineer on previous submissions. The Contractor shall make any corrections required by the Engineer.
- F. If the Contractor considers any correction indicated on the drawings to constitute a change to the Contract Drawings or Specifications, the Contractor shall give written notice thereof to the Engineer.
- G. Shop Drawings and submittal Data shall be reviewed by the Engineer for each original submittal and first and second resubmittal; thereafter review time for subsequent resubmittals shall be charged to the Contractor in accordance with the terms of the Engineer's Agreement with the Owner.
- H. When the Shop Drawings have been completed to the satisfaction of the Engineer, the Contractor shall carry out the construction in accordance therewith and shall make no further changes therein except upon written instructions from the Engineer.
- I. No partial submittals will be reviewed. Submittals not complete will be returned to the Contractor for resubmittal. Unless otherwise specifically permitted by the Engineer, make all submittals in groups containing all associated items for:
 - 1. Systems.
 - 2. Processes.
 - 3. As indicated in specific Specifications Sections.All drawings, schematics, manufacturer's product Data, certifications and other Shop Drawing submittals required by a system specification shall be submitted at one time as a package to facilitate interface checking.
- J. The shop drawings shall be approved by the Engineer prior to contractor ordering the construction materials.

1.04 SHOP DRAWINGS

- A. When used in the Contract Documents, the term "Shop Drawings" shall be considered to mean Contractor's plans for materials and equipment which become an integral part of the project. These drawings shall be complete and detailed. Shop Drawings shall consist of fabrication, erection and setting drawings and schedule drawings, manufacturer's scale drawings, and wiring and control diagrams. Cuts, catalogs, pamphlets, descriptive literature, and performance and test data shall be considered only as supportive to required Shop Drawings as defined above. As used herein, the term "manufactured"

applies to standard units usually mass-produced; and "fabricated" means items specifically assembled or made out of selected materials to meet individual design requirements.

- B. Manufacturer's catalog sheets, brochures, diagrams, illustrations and other standard descriptive data shall be clearly marked to identify pertinent materials, product or models. Delete information which is not applicable to the Work by striking or cross-hatching.
- C. Drawings and schedules shall be checked and coordinated with the work of all trades involved, before they are submitted for review by the Engineer and shall bear the Contractor's stamp of approval as evidence of such checking and coordination. Drawings or schedules submitted without this stamp of approval shall be returned to the Contractor for resubmission.
- D. Each Shop Drawing shall have a blank area 3-1/2 inches by 3-1/2 inches, located adjacent to the title block. The title block shall display the following:
 - 1. Project Title and Number.
 - 2. Name of project building or structure.
 - 3. Number and title of the Shop Drawing.
 - 4. Date of Shop Drawing or revision.
 - 5. Name of contractor and subcontractor submitting drawing.
 - 6. Supplier/manufacturer.
 - 7. Separate detailer when pertinent.
 - 8. Specification title and number.
 - 9. Specification section.
 - 10. Application Contract Drawing Number.
- E. If Shop Drawings show variations from Contract requirements because of standard shop practice or for other reasons, the Contractor shall describe such variations in his letter of transmittal. If acceptable, proper adjustment in the Contract shall be implemented where appropriate. If the Contractor fails to describe such variations, he shall not be relieved of the responsibility for executing the work in accordance with the Contract, even though such drawings have been reviewed.
- F. Data on materials and equipment include, without limitation, materials and equipment lists, catalog data sheets, cuts, performance curves, diagrams, materials of construction and similar descriptive material. Materials and equipment lists shall give, for each item thereon, the name and location of the supplier or manufacturer, trade name, catalog reference, size, finish and all other pertinent Data.

- G. For all mechanical and electrical equipment furnished, the Contractor shall provide a list including the equipment name, and address and telephone number of the manufacturer's representative and service company so that service and/or spare parts can be readily obtained.
- H. Only the Engineer will utilize the color "red" in marking Shop Drawing submittals.

1.05 WORKING DRAWINGS

- A. When used in the Contract Documents, the term "Working Drawings" shall be considered to mean the Contractor's plan for temporary structures such as temporary bulkheads, support of open cut excavation, support of utilities, ground water control systems, forming and falsework; for underpinning; and for such other work as may be required for construction but does not become an integral part of the Project.
- B. Copies of Working Drawings as noted in Paragraph 1.05A. above, shall be submitted to the Engineer where required by the Contract Documents or requested by the Engineer, and shall be submitted at least thirty (30) calendar days (unless otherwise specified by the Engineer) in advance of their being required for work.
- C. Working Drawings shall be signed by a registered Professional Engineer, currently licensed to practice in the State of South Carolina and shall convey, or be accompanied by, calculation or other sufficient information to completely explain the structure, machine, or system described and its intended manner of use. Prior to commencing such work, Working Drawings must have been reviewed without specific exceptions by the Engineer, which review will be for general conformance and will not relieve the Contractor in any way from his responsibility with regard to the fulfillment of the terms of the Contract. All risks of error are assumed by the Contractor; the Owner and Engineer shall have no responsibility, therefore.

1.06 SAMPLES

- A. The Contractor shall furnish, for the approval of the Engineer, Samples required by the Contract Documents or requested by the Engineer. Samples shall be delivered to the Engineer as specified or directed. The Contractor shall prepay all shipping charges on Samples. Materials or equipment for which Samples are required shall not be used in work until approved by the Engineer.
- B. Samples shall be of sufficient size and quantity to clearly illustrate:
 - 1. Functional characteristics of the product, with integrally related parts and attachment devices.
 - 2. Full range of color, texture, and pattern.
 - 3. A minimum of two (2) Samples of each item shall be submitted.
- C. Each Sample shall have a label indicating:
 - 1. Name of Project.

2. Name of Contractor and Subcontractor.
3. Material or Equipment Represented.
4. Place of Origin.
5. Name of Producer and Brand (if any).
6. Location in Project.

(Samples of finished materials shall have additional marking that will identify them under the finished schedules.)

- D. The Contractor shall prepare a transmittal letter in triplicate for each shipment of Samples containing the information required in paragraph 1.06B. above. He shall enclose a copy of this letter with the shipment and send a copy of this letter to the Engineer. Approval of a Sample shall be only for the characteristics or use named in such approval and shall not be construed to change or modify any Contract requirements.
- E. Approved Samples not destroyed in testing shall be sent to the Engineer or stored at the site of the work. Approved Samples of the hardware in good condition will be marked for identification and may be used in the work. Materials and equipment incorporated in work shall match the approved Samples. Samples which failed testing or were not approved will be returned to the Contractor at his expense, if so requested at time of submission.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01340

SECTION 01370

SCHEDULE OF VALUES

PART 1 - GENERAL

1.1 Description:

- A. Work Included: Provide a detailed breakdown of the agreed Contract Sum showing values allocated to each of the various parts of the work, as specified herein, and in other provisions of the Contract Documents.
- B. Related Work: Documents affecting the work of this Section include, but are not necessarily limited to, General Conditions and 01025 Measurement and Payment.

1.2 Quality Assurance:

- A. Use required means to assure arithmetical accuracy of the sum described.
- B. When so required by the Engineer, provide copies of the subcontracts or other data acceptable to the Engineer substantiating the sums described.

1.3 Submittals:

Prior to commencement, submit a proposed schedule of values to the Engineer.

- A. Meet with the Engineer and determine data, if any, required to be submitted.
- B. Secure the Engineer's approval of the values prior to commencement.

END OF SECTION 01370

**SECTION 01381
CONSTRUCTION AUDIO-VIDEO RECORDING**

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK:

Progress video tapes shall be made at periodic intervals, not to exceed 30 days, showing the extent and progress of the work performed as of that date. Video tapes shall be taken at each location of work on the day ending the period for which partial payment is requested, during the development of stages and condition of work, and as directed by the Engineer. Typical pipeline work shall be videotaped at different stages of construction at the direction of the Engineer.

- A. Initial video tape inspection of existing conditions shall be taken no later than 14 calendar days after notice to proceed and prior to beginning of any construction.
- B. At each specified time, take video tapes of each major area of work.
- C. Final video tapes shall be submitted and approved by the Engineer/Town prior to final acceptance and payment.

1.2 QUALITY ASSURANCE

- A. Video Camera Operator: The operator may be an employee of the Contractor and must be completely familiar with the proper operation of the video recording device (digital camera) and how to create a DVD. Employ operator only after review of his qualifications by Engineer.

1.3 SUBMITTALS

- A. Submit qualifications and experience record of operator.
- B. DVDs shall be submitted to the Engineer at the time of each payment request and shall become the property of the Town.

PART 2- PRODUCTS

2.1 VIDEO REPORT

- A. Provide a high quality DVD in a MPEG2 format video with a standard resolution of 720x480. Use a camera with lighting suitable to allow a clear picture of the entire project site.

2.2 DIGITAL FILE

- A. Recording can also be completed, stored and submitted as a digital file in Microsoft, Windows, Quicktime, Flash or other formats with file extensions such as AVI, MOV, WMV, etc.

2.3 DIGITAL CAMERA

- A. The video camcorder shall have a minimum resolution of 18.20 megapixels, sensor size 1/2.3-inch with an optical zoom; criteria based off Sony CyberShot DSC Wx500 but any approved equal is acceptable.
- B. At the end of the project all DVDs with index based on elapsed time of tape shall become the property of the Town.

PART 3 - EXECUTION

3.1 GENERAL

- A. The following location information shall be provided on color audio-video tape recording.
 - 1. Audio: Each recording shall begin with a verbal description of the current date, project name and municipality and be followed by the general location, name of the street, viewing side and direction of progress.
 - 2. Video: Transparent information must appear on the viewing screen. This information will consist of the date and time of recording. The date information will contain the month, day and year.
 - 3. Digital: To preclude the possibility of tampering or editing in any manner, all video recordings by electronic means must display continuously and simultaneously generated transparent digital information to include the date and time of recording. The date information will include the month, day and year.
- B. The taped coverage shall include all surface features located within the zone of influence of construction supported by appropriate audio description. Audio description shall be made simultaneously with video coverage. Such coverage shall include, but not be limited to, all existing driveways, sidewalks, fences, curbs, ditches, roadways, landscaping, trees, culverts, headwalls, retaining walls, or buildings located within such zone of influence. Particular and detailed attention shall be given to any defects noted, such as cracks, disturbed areas, damaged items, or as may be required by the Engineer. It is the intent of this coverage to accurately and clearly document pre-existing conditions and especially any items that could result in construction claims. The excavation areas shall be physically marked with high visibility fluorescent paint prior to videotaping. The markings shall include the job number and stationing.
- C. The zone of influence shall be defined as an area within 30 feet of the proposed work.
- D. The Contractor shall be able to televise and tape areas with paved roads, along co-owned easements through parks, lawns, and open fields. If videotaping on private property, the Contractor shall give the Town sufficient prior notice of such entry so that Owners may be advised of and their permission obtained for the work.
- E. To produce the proper detail and perspective, adequate lighting will be required to fill in the shadow area caused by trees, utility poles, road signs and other such objects in residential areas or as directed by the Engineer.
- F. Houses and buildings shall be identified visually by house number, when visible, in such a manner that structures of the proposed system, manholes on a sewer system and hydrants on a water system can be located by reference.
- G. The rate of speed in the general direction of travel of the conveyance used during taping shall not exceed 48 feet per minute in residential areas, nor exceed 100 feet per minute in non-residential areas. Panning rates and zoom-in, zoom-out rates shall be controlled sufficiently such that during playback will produce clarity of the object viewed. The playback picture shall be in focus and be of extreme clarity at all times.
- H. All taping shall be done during times of good visibility. No taping shall be done during periods of visible precipitation unless otherwise authorized by the Engineer.
- I. The Town shall have the authority to designate what areas may be omitted or added for audio-video coverage.

- J. All DVDs shall be properly identified by DVD number, location and project name and municipality in a manner acceptable to the Town.
- K. A record of the contents of each DVD shall be supplied by an index sheet identifying each segment in the recording by location, i.e., street or road viewing, elapsed time of video (no counter numbers), viewing side, point starting from, traveling direction and ending destination point.
- L. Any portion of the recording not conforming to specifications shall be rejected.
- M. Any recording not acceptable to the Town shall be refilmed at no additional charge. The Contractor shall reschedule unacceptable coverage within five (5) days after being notified.
- N. All recordings shall be performed by Contractor and reviewed and accepted prior to construction.
- O. One (1) original and one (1) copy are to be provided. Original to Town and copy to Engineer.

3.2 PROGRESS CONSTRUCTION VIDEO

- A. Submit DVDs on a monthly basis to accompany each request for progress payment to the Town and Engineer.

END OF SECTION 01381

SECTION 01410
TESTING LABORATORY SERVICES

PART 1 – GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Unless otherwise noted in a Section of the Technical Specifications, the Contractor shall employ and pay for the services of an Independent Testing Laboratory to perform specified testing of work and materials at the Project Site or at point of manufacture.
- B. The Contractor shall comply with and be responsible for all of the requirements of the Project Manual, without exception.

1.02 RELATED REQUIREMENTS

- A. Conditions of the Contract: Inspections and testing required by laws, ordinances, rules, regulations, orders, or approvals of public authorities.
- B. Each specification section listed: Inspection and laboratory testing required, and standards for testing.
- C. Division 1, General Requirements of the Project Manual.

1.03 QUALIFICATIONS OF LABORATORY

- A. Meet “Recommended Requirements for Independent Laboratory Qualification,” published by American Council of Independent Laboratories.
- B. Comply with the following requirements:
 - 1. ANSI/ASTM D3740: Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
 - 2. ANSI/ASTM E329: Standard Recommended Practice for Inspection and Testing for Concrete, Steel, and Bituminous Materials as Used in Construction.
- C. Authorized to operate in the State of South Carolina
- D. Submit copy of report of inspection of facilities made by Materials Reference Laboratory of National Bureau of Standards during the most recent tour of inspection, with memorandum of remedies of any deficiencies reported by the inspection.
- E. Testing Equipment:
 - 1. Calibrated at reasonable intervals by devices of accuracy traceable to either:
 - a. National Bureau of Standards.
 - b. Accepted values of natural physical constants.

- F. Employment of testing laboratory shall in no way relieve Contractor of obligation to perform Work in accordance with requirements of Construction Contract Documents.
- G. Failure on part of Owner to make any tests of materials shall in no way relieve the Contractor of responsibility of furnishing materials or performing work conforming to the Construction Contract Documents.

1.04 LABORATORY DUTIES

- A. Cooperate with the Owner and Contractor; provide qualified personnel after due notice from Contractor.
- B. Perform specified inspections, sampling and testing of materials and methods of construction:
 - 1. Comply with specified standards.
 - 2. Ascertain compliance of materials with requirements of Contract Documents.
- C. Promptly notify Owner and Contractor of observed irregularities or deficiencies of work or products.
- D. Promptly submit written report of each test and inspection: one (1) copy each to Owner, noted Agencies, and Contractor. Each report shall include:
 - 1. Date issued.
 - 2. Project title and Bid Number
 - 3. Testing laboratory name, address and telephone number.
 - 4. Name and signature of laboratory inspector.
 - 5. Date and time of sampling or inspection.
 - 6. Record of temperature and weather conditions.
 - 7. Date of test.
 - 8. Identification of product.
 - 9. Location of sample or test in the Project.
 - 10. Type of inspection or test.
 - 11. Results of tests and compliance with Contract Documents.
 - 12. Interpretation of test results, when requested by Owner
- E. Perform additional tests as may be required by the Owner.

1.05 LIMITATIONS OF AUTHORITY OF TESTING LABORATORY

- A. Laboratory is not authorized to:
 - 1. Release, revoke, alter or enlarge on requirements of Contract Documents.
 - 2. Approve or accept any portion of the Work.
 - 3. Perform any duties of the Design/Builder.
 - 4. Stop the Work.

1.06 CONTRACTOR'S RESPONSIBILITIES

- A. Cooperate, together with laboratory personnel, will provide access to the point/location of the Work, and to manufacturer's operations.
- B. Secure and deliver to laboratory at designated location(s) adequate quantities of representational material proposed to be used and which require testing together with applicable proposed design mixes.
- C. Provide to the laboratory the preliminary design mix proposed to be used for concrete, and other material mixes which required control by the testing laboratory.
- D. Furnish copies of Products test reports to the Owner as required.
- E. Furnish incidental labor and facilities:
 - 1. To provide access to Work to be tested.
 - 2. To obtain and handle samples at the Project Site or at the source of the product to be tested.
 - 3. To facilitate inspections and tests.
 - 4. For storage and curing of test samples.
- F. Notify laboratory twelve (12) hours in advance of operations to allow for laboratory assignment of personnel and scheduling of tests.
- G. Make arrangements with laboratory and pay for services to perform:
 - 1. inspections, sampling and testing required;
 - 2. those for the Contractor's convenience;
 - 3. and when the initial tests or inspections indicate Work does not comply with Contract Documents (i.e., re-tests).

1.07 SOURCE OF MATERIALS

- A. Source of supply of each of the materials required shall be acceptable to the Owner.
- B. Representative samples shall be submitted for inspection or tests.
- C. Results obtained from testing samples will be used for preliminary approval, but will not be used as final acceptance of materials.
- D. The Owner may test materials proposed to be used at any time during preparation and use.
- E. If it is found that sources of supply, which have been approved, do not furnish product of uniform quality, or if product from any source proves unacceptable at any time, Contractor shall furnish approved material from another source without additional cost to Owner or delay in completion date.

1.08 IDENTIFICATION

- A. Required samples submitted by Contractor shall be properly labeled for identification.
- B. Materials and/or equipment that have been inspected and/or tested shall be stored in a controlled area with suitable identification referencing tests and certifications.
- C. Continuous inventory shall be kept of all items in this area controlled by log in and log out with receiving and disbursing signatures.
- D. Copies of receiving or disbursing actions shall be sent to the Owner on a daily basis.
- E. Disbursing records shall show final destination and installation.

1.09 MATERIAL STORAGE

- A. Materials shall be stored so as to ensure preservation of their quality and fitness for Work, in accordance with requirements of the Project Manual.

1.10 SCHEDULE OF INSPECTIONS AND TESTS

- A. Refer to each individual Section of the Project Manual for specific testing requirements, or as otherwise required by the Contract Documents or appropriate regulatory agency.

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

Not Used.

END OF SECTION 01410

**SECTION 01510
TEMPORARY CONSTRUCTION CONTROLS**

PART 1- GENERAL

1.01 REQUIREMENTS INCLUDED

- A. The Contractor shall comply with and be responsible for all of the requirements of the Project Manual, without exception.
- B. Furnish, install, and maintain temporary controls required for construction.
- C. Remove at completion of Work.

1.02 RELATED REQUIREMENTS

- A. Division 1, General Requirements of the Project Manual.

1.03 CONSTRUCTION SITE CLEANING

- A. Maintain areas within limits of the Project Work Site free of extraneous debris and litter.
- B. Initiate and maintain specific program to prevent accumulation of debris at construction site, storage and parking areas, or along access roads and off-site hauls routes.
 - 1. Furnish on-site containers for collection of waste materials, debris, and rubbish.
 - 2. Prohibit overloading of trucks to prevent spillage on access and haul routes.
 - 3. Provide periodic inspection of traffic areas to enforce requirements.
 - 4. Remove waste material, debris and rubbish from site and building area daily, or sooner as otherwise needed.
 - 5. Do not drop or throw materials from heights. Lower waste material in a controlled manner and with as few handlings as possible.
 - 6. During the entire construction period, and at all times, keep the site access entry road, parking areas free from accumulation of waste materials, debris, and rubbish caused by the Work of this Project.
 - 7. Dirt and debris shall be removed from all surfaces prior to closure of all areas (walls, ceilings, chases, etc.).
- C. Hazards Control:
 - 1. Store volatile wastes in covered metal containers.
 - 2. Remove containers from premises daily.
 - 3. Prevent accumulation of waste, which creates hazardous conditions.
 - 4. Provide adequate ventilation during use of volatile or noxious substances.
- D. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws:
 - 1. Do not burn or bury rubbish and waste materials on the project site.

2. Do not dispose of waste into streams or waterways.
3. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.

1.04 DUST CONTROL

- A. Provide positive methods and apply dust control materials to minimize raising dust from construction operations and provide positive means to prevent air-borne dust from dispersing into atmosphere.
- B. Clean interior building areas to prevent accumulation of dirt and debris and execute prior to start of finish painting, special coatings, and/or other finish material installations.
- C. Wet down materials and rubbish to prevent blowing dust.
- D. Schedule cleaning operations so that dust and other contaminants resulting from the cleaning process will not fall on wet, newly painted surfaces.
- E. Continue cleaning on an as-needed basis until the building and/or site is ready for beneficial occupancy.

1.05 EROSION AND SEDIMENT CONTROL

- A. Plan and execute construction and earthwork by methods to control surface drainage from cuts and fills, and from borrow and waste disposal areas, to prevent erosion and sedimentation. Wetland areas shall be protected as well.
 1. Hold areas of bare soil exposed at one time to minimum.
 2. Provide temporary control measures such as berms, dikes, and drains.
 3. Comply with federal, state, and local regulations.
- B. Construct fills and soil waste areas by selective placement to eliminate surface soils or clay, which will erode.
- C. Periodically inspect earthwork to detect any evidence of start of erosion, apply corrective measures as required by erosion control.

1.06 POLLUTION CONTROL

- A. Provide methods, means and facilities required to prevent contamination of soil, water, or atmosphere by discharge of noxious substances from construction operations.
- B. Contractor is responsible only for pollution control of the immediate Work of Contract, the actions and operations of the Contractor, and the workers employed or contracted to Contractor. Provide equipment and personnel to perform emergency measures required to contain spillage, and to remove contaminated soil or liquids.
- C. Take special measures to prevent harmful substances from entering public waters. Prevent disposal of wastes, effluents, chemicals, or other such substances adjacent to basins, or in sanitary or storm sewers.

- D. Provide systems for control of atmospheric pollutants. Prevent toxic concentrations of chemicals. Prevent harmful disposal of pollutants into the atmosphere.

1.07 WATER CONTROL

- A. Provide methods to control surface water to prevent damage to project site or adjoining properties. Control fill, grading, and ditching to direct surface drainage away from excavations, pits, tunnels, and other construction areas. Direct drainage to proper runoff.
- B. Provide, operate, and maintain hydraulic equipment of adequate capacity to control surface and water.
- C. Dispose of drainage water in a manner to prevent flooding, erosion, or other damage to any portion of site or adjoining areas.
- D. Dewater areas in accordance with applicable local and state requirements and accepted professional practice.

1.08 EARTH CONTROL

- A. Contractor shall, at his/her sole cost, remove excess soil, pier spoils, etc., at time of generation.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTIONS

3.01 REMOVAL

- A. Contractor shall, at his/her sole cost, remove temporary construction controls at completion of Work or as required by execution of Work.

END OF SECTION 01510

SECTION 01563
HANDLING OF INCIDENTAL FUEL SPILLAGE DURING CONSTRUCTION

PART 1 – GENERAL

1.01 RELATED REQUIREMENTS

- A. Division 0, Bidding and Contract Documents in the Project Manual.
- B. Division 1, General Requirements in the Project Manual.
- C. South Carolina Dept. of Environmental Services (SCDES (former SCDHEC)).

1.02 SCOPE

- A. This section consists of procedures to be followed in handling material contaminated with petroleum fuel products (hydrocarbons including petroleum, petroleum derivatives, hydraulics and like products) caused by incidental spillage (including leaks) from the Contractor's or his/her prime and sub-contractor's equipment.

Incidental spillage shall mean spillage of a quantity not greater than 25 gallons per incident, of vehicular or mechanical equipment fuel products, onto open ground and absorbed or not absorbed by the soils.

Spillage or leakage of petroleum fuel products in quantities in excess of 25 gallons shall be immediately remediated by the Contractor using applicable and appropriate procedure(s). Whenever such spillage or leakage occurs, the Contractor shall immediately implement the appropriate corrective actions as required.

- B. The provisions of this Section are limited to incidental petroleum fuel spillage on ground surfaces, and it excludes fuel spillage onto surface waters.

1.03 APPLICABLE CODES

- A. The Contractor shall comply with all prevailing federal, state, and local environmental protection ordinances and codes governing and having application to and any discharges, intentional or accidental, which may cause water pollution and constitute a nuisance, and sanitary nuisance.
- B. Leaks and spillage may occur when using mechanical equipment. Equipment generated or lubricated with petroleum products, are prone to leaks or spillage, therefore proper management of "spillage incidents" is essential.

PART 2 – PRODUCTS

2.01 ABSORBENT MATERIALS

Contractor shall equip crews and/or provide machinery with the most efficient type of petroleum absorbent materials. These materials are available at petroleum equipment suppliers and must be readily accessible so that spillages can be quickly contained and prevented from becoming greater incidents. Fiber material, sand, or cat litter may be used as an absorbent material. Sufficient

quantity of absorbent material capable of absorbing up to 25 gallons of petroleum fuel products shall be stocked at the job site at all times.

PART 3 - EXECUTION

3.01 PROCEDURES

- A. Personnel handling waste materials must have a minimum of 40 hours training as defined in 29 CFR 1910.120 and in accordance with the certified OSHA course.
- B. Perform work as specified herein and in accordance with the applicable provisions of the South Carolina Dept. of Environmental Services (SCDES (former SCDHEC)). No payment will be made to the Contractor for the cost of handling and disposing of leaks, spillages, and materials contaminated by such leaks or spillages.

The procedure for the proper handling and disposal of contaminated soils and absorbent materials is readily available through the aforementioned agencies.

- C. The steps outlined below are minimum requirements and are merely presented as guidelines. They do not constitute a complete compliance procedure.

STEP 1:

If fuel contamination to open ground has been discovered, check for the origin of that leak or spillage. Then stop the spillage or leak and positively contain it, and then use absorbents to collect the discharged liquid. Immediately notify the Owner.

STEP 2:

Sand may be used to absorb ground surface spills while absorbent materials may be used to absorb ground spills as well as surface water spills.

Once absorption of spilled fuels is complete the impacted (contaminated) absorbent materials shall be stored in 55-gallon steel drums (100-150 lbs.). If leaked or spilled fuel has been absorbed into the soils, excavate, and containerize the impact (contaminated) soils. Soils may be stored in 55- gallon steel drums.

STEP 3:

The contaminated materials must be collected, containerized, and otherwise properly stored and labeled prior to transport to a pre-approved storage, disposal, or treatment facility. All drums used to store impacted (contaminated) absorbent material and/or contaminated soils shall be properly sealed and labeled with the following information.

Name of Company (Contractor)
Contract or Project No.:
Location of origin:
Type of contents:
Type of containment:
Quantity: (e.g. 1 of 1)

Date:
Containerized by:
Labeled by:

END OF SECTION 01563

**SECTION 01570
TRAFFIC REGULATION**

PART 1 – GENERAL

1.01 REQUIREMENTS INCLUDED

- A. The Contractor shall comply with and be responsible for all of the requirements of the Project Manual, without exception.
- B. Construction parking control, flagmen, flares and lights, haul routes, traffic signs and signals, and removal.
- C. Maintenance of safety and convenience of public.

1.02 RELATED WORK

- A. Division 1, General Requirements of the Project Manual.
- B. Section 01300 Requirements
- C. SCDOT Encroachment Permit

1.03 PUBLIC SAFETY AND CONVENIENCE

- A. Materials and equipment shall be stored and Work conducted to minimize obstruction to pedestrian movement and vehicular traffic. Materials and equipment stored in or near path of traffic shall be protected with appropriate warning signs and barricades. At night, or as otherwise required, equipment not in use shall be stored in such manner and location to not interfere with safe passage of pedestrians and vehicles. Contractor shall provide and maintain flagmen at points and for periods of time required to provide safety and convenience of traffic, and as directed by the Owner or project permits.
- B. Contractor shall not close traffic to any bridge or any other portion of public road except as may be designated by the Owner. Prior to closing any access way and/or structure coordinate work schedule with the Owner.
- C. Contractor shall provide the Owner with notice at no less than 48 hours prior to movement of heavy equipment and/or wide or slow moving vehicles to or from Project Site. Contractor shall strictly adhere to vehicular routes established or as may be directed by the Owner or project permits.

1.04 LANE CLOSURE RESTRICTIONS

Contractor shall be responsible to verify with the Town of Ridgeland and/or South Carolina Department of Transportation (SCDOT), as appropriate, lane closure restriction hours. Contractor to verify restrictions on lane closures near schools and meet the required regulations.

Any work on SCDOT roads shall be planned so that closure of intersecting streets, road approaches or other access points is held to a minimum.

1.05 TRAFFIC CONTROLS AND SIGNALS

Traffic controls for utility construction and maintenance operations shall conform with the SCDOT Standard Drawings and Manual on Uniform Traffic Control Devices (MUTCD). All construction and maintenance operations shall be planned with full regard for safety and to keep traffic interference to an absolute minimum.

The contractor shall :

- a. provide, erect and maintain all necessary barricades, lights, danger signals, signs and other control devices, provide qualified, trained and equipped flaggers and watchmen where necessary, as may be directed by the Owner or SCDOT;
- b. take all necessary precautions for the protection of the Work, the warning that work is under construction and the safety of the public. Suitable advance warning signs shall be erected in advance where operations interfere with the use of the road by traffic. Where a lane, or a portion of a lane is closed, traffic control devices and flaggers shall be used in accordance with the Standard Drawings and MUTCD. All barricades, signs and traffic control devices shall conform to the requirements of the MUTCD.

1.06 HAUL ROUTES

Based on regulations prescribed by the Town of Ridgeland, SCDOT, or other agencies having jurisdiction, use only established roadways or use temporary roadways constructed by the contractor when and as authorized by the Owner. When materials and/or equipment are being transported in executing the Work, vehicles shall not be loaded beyond loading capacity recommended by manufacturer of vehicle or prescribed by federal, state or local law or regulation. When it is necessary to cross curbs or sidewalks, contractor shall protect them from damage. Contractor shall repair / replace or pay for all damaged curbs, sidewalks, roads, and / or paving.

1.07 EQUIPMENT STORAGE

When equipment is not in use, on roadways open to public travel, contractor's equipment and vehicles shall be kept at least thirty (30) feet from the edge of the travel lanes. On Interstate routes or Freeways, no vehicles or equipment will be permitted on the shoulders at any time.

1.08 FLARES AND LIGHTS

Use flares and lights during hours of low visibility to delineate traffic lanes and to guide traffic in landside areas only.

PART 2 – PRODUCTS

2.01 SIGNS, SIGNALS AND DEVICES

- A. Post-mounted and wall-mounted at parking areas to indicate spaces designated for use by construction personnel.
- B. Traffic control signals, as may be required, and as approved by SCDOT and the Town of Ridgeland, as appropriate.
- C. Traffic cones and drums and lights, as approved by SCDOT and the Town of Ridgeland, as appropriate.
- D. Flagmen equipment as required by SCDOT and the Town of Ridgeland, as appropriate.

PART 3 – EXECUTION

3.01 REMOVAL

- A. Contractor shall remove equipment and devices, at his/her sole cost, when no longer required. Repair damage caused by installation. Remove post settings to depth of three (3) feet.

END OF SECTION 01570

**SECTION 01700
EXECUTION REQUIREMENTS**

PART 1 – GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Contractor shall comply with and be responsible for all of the requirements of the Project Manual without exception.
- B. Contractor shall provide field engineering and general layout services required on the project as follows:
 - 1. Civil, structural or other professional engineering services specified, or required to execute construction methods.
 - 2. Survey work required for execution of the total Work of the Project.
 - 3. Continuous horizontal and vertical control regarding layout and execution of Work of the Project, as appropriate.
 - 4. Coordinate field engineering services with the Owner.

1.02 RELATED REQUIREMENTS

- A. Division 1, General Requirements of the Project Manual.
- B. The Drawings and all sections of the Technical Specifications as may be applicable.

1.03 CONTROLS

- A. Contractor will establish primary controls, horizontal and vertical control points at various locations at the Site. These will be described and indicated on the Contractor's as constructed drawings and will be coordinated in the field by the Contractor.
- B. Existing control points and property line markers will be shown on the Construction Contract drawings.

1.04 QUALIFICATIONS OF SURVEYOR OR ENGINEER

- A. For required surveying, a qualified engineer or land surveyor, registered in the State of South Carolina and acceptable to the Owner.
- B. For required engineering, a registered professional engineer of a discipline required for this Project licensed in the State of South Carolina and acceptable to the Owner.

1.05 SURVEY REFERENCE POINTS

- A. Existing horizontal and vertical control points for the Project are those designated on the Construction Contract drawings or as determined from investigation of the existing conditions.
- B. Verify property lines, grades, levels and dimensions indicated.
- C. Locate and protect control points prior to starting Site Work and preserve permanent reference points during construction.
 - 1. Make no changes or relocations without prior approval of the Owner
 - 2. Report to the Owner when a reference point is lost, destroyed or requires relocation because of necessary changes in grades or locations.
 - 3. Require surveyor to replace Project control points, which may be lost or destroyed.

1.06 PROJECT LAYOUT REQUIREMENTS

- A. Establish a sufficient number of permanent benchmarks on Site, as may be required, referenced to data established by survey control points. Record locations of benchmarks with horizontal and vertical data on Project Record Documents, Section 01781.
- B. From established control points, layout all new construction Work by establishing all lines and grades at Site necessary to control Work. Contractor shall be responsible for all measurements that may be required for execution of Work.
- C. Furnish, at own expense, all such stakes, steel pins, equipment, tools and material and labor that may be required in laying out Work control points.
- D. Establish lines and levels, locate and layout by instrumentation and similar appropriate means:
 - 1. Site Improvements
 - a. Stakes for grading, fill, and topsoil placement.
 - b. Utility slopes and invert elevations for new utility construction.
 - c. Limits of pavement (pervious concrete and asphalt).
 - 2. Batter boards for structures.
 - 3. Building foundation column locations, piling and floor levels.
 - 4. Controlling lines and levels required for mechanical and electrical trades.
- E. Verify and coordinate in field all existing and proposed underground components including civil, structural, utilities and other components prior to initiation of the Work. Advise the Owner of any conflicts or discrepancies.

1.07 SUBMITTALS AND DOCUMENTS

- A. Submit name and address of Surveyor and Professional Engineer to the Owner

- B. On request of the Owner, submit documentation to certify accuracy of field engineering work and compliance with Contract Documents.
- C. Submit certificate signed by registered engineer or surveyor certifying that elevations and locations of improvements are in conformance, or non-conformance, with Contract Documents.
- D. Standards and Availability: Data and other measurements shall be recorded in accordance with standard and approved methods. All field notes, sketches, recordings, and computation in establishing above horizontal and vertical control points shall be available at all times during progress of Work for ready examination by the Owner.
- E. Maintain complete and accurate record data on underground utilities and obstructions, new and existing, encountered in execution of Work. Record data on Project Record Documents in accordance with requirements of Section 01781, Project Record Documents.
- F. On completion of the sewer main, sewer service laterals, water main, and other major site improvements, prepare as-constructed drawings showing appropriate survey elevations of construction and dimensions, locations, and angles.
- G. Submit, upon request by the Owner, signed and sealed Engineering Calculations, as relevant.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION 01700

**SECTION 01740
WARRANTIES AND BONDS**

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Scope of Work:
 - 1. Compile specified bonds and warranties, as in Article 6 and 7, respectively, of Section 00700: General Conditions and as specified in these Specifications.
 - 2. Co-execute submittals when so specified.
 - 3. Review submittals to verify compliance with Contract Documents.
 - 4. Submit to the Engineer for review and transmittal to Town.

- B. Related Work Described Elsewhere:
 - 1. Instruction to Bidders: Bid Bonds.
 - 2. Conditions of the Contract: Performance Bond and Payment Bond.
 - 3. Agreement between Owner and Contractor for Construction Contract – check summary; Contracting Provisions for Construction Projects: Section 00520.

1.2 SUBMITTAL REQUIREMENTS

- A. Assemble warranties, bonds and service and maintenance contracts executed by each of the respective manufacturers, suppliers, and subcontractors.

- B. Number of original signed copies required: Two (2) each.

- C. Table of Contents: Neatly typed in orderly sequence. Provide complete information for each item.
 - 1. Product of work item.
 - 2. Firm, with name of principal, address, and telephone number.
 - 3. Scope.
 - 4. Date of beginning of warranty, bond or service and maintenance contract.
 - 5. Duration of warranty, bond, or service maintenance contract.
 - 6. Provide information for Town's personnel:

- a. Proper procedure in case of failure.
 - b. Instances which might affect the validity of warranty or bond.
7. Contractor information including name of responsible principal, address, and telephone number.

1.3 FORM OF SUBMITTALS

- A. Prepare in duplicate packets.
- B. Format:
 1. Size 8-1/2 inches by 11 inches, punch sheets for standard three-post binder. Fold larger sheets to fit into binders.
 2. Cover: Identify each packet with typed or printed title "WARRANTIES AND BONDS". List:
 - a. Title of Project.
 - b. Name of Contractor.
- C. Binders: Commercial quality, three-post binder with durable and cleanable plastic covers and maximum post width of two (2) inches.

1.4 WARRANTY SUBMITTALS REQUIREMENTS

- A. For all major pieces of equipment, submit a warranty from the equipment manufacturer. The manufacturer's warranty period shall be concurrent with the Contractor's for one (1) year, unless otherwise specified, commencing at the time of final acceptance by the Town.
- B. The Contractor shall be responsible for obtaining certificates for equipment warranty for all major equipment specified under Divisions 11: Equipment; 15: Mechanical; and 16: Electrical, and which has at least a 1 Hp motor or which lists for more than \$1,000. The Engineer reserves the right to request warranties for equipment not classified as major. The Contractor shall still warrant equipment not considered to be "major" in the Contractor's one-year warranty period even though certificates of warranty may not be required.
- C. The Town shall incur no labor or equipment costs during the guarantee period.
- D. Guarantee shall cover all necessary labor, equipment and replacement parts resulting from faulty or inadequate design, improper assembly or erection, defective workmanship and materials, leakage, breakage or other failure of all equipment and components furnished by the manufacturer.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01740

**SECTION 01770
CLOSEOUT PROCEDURES**

PART 1 – GENERAL

1.01 REQUIREMENTS INCLUDED

- A. The Contractor shall comply with and be responsible for all the requirements of the Project Manual, without exception.
- B. The Contractor shall comply with applicable requirements in this Section and more specific requirements in Division 1, Section 01100, Summary of Work.
- C. The Contractor shall comply with requirements stated in the Contract and in approved Specifications for the Work.

1.02 RELATED REQUIREMENTS

- A. Conditions of the Contract: Fiscal provisions, legal submittals, and additional administrative requirements.
- B. Division 0, Bidding and Contract Documents in the Project Manual.
- C. Division 1, General Requirements in the Project Manual.
- D. Closeout submittals required of trades in various sections of the approved Specifications.

1.03 DAMAGES

- A. If the Contractor neglects, fails, or refuses to complete the work by the Substantial Completion Date, Final Completion Date, subject to any proper extension granted by the Owner, then the Contractor will pay, or cause the Contractor's Surety to pay damages to the Owner as defined in the contract documents.

1.04 SUBSTANTIAL COMPLETION

- A. When Contractor considers the Work is substantially complete, he shall submit to the Owner the following:
 - 1. A written certification that the Work, or designated portion thereof, is substantially complete. All items not complete shall be listed and deficient items noted.
 - 2. Owner will review the Contractor's certification and examine the Work for conformance to the Certification and the Contract Documents.

3. Owner will inform the Contractor of non-compliance or incomplete items.
 4. Contractor shall remedy the deficiencies in the Work within seventy-two (72) hours and send a second written notice of substantial completion to the Owner.
 5. The Owner will re-examine the Work.
- B. When the Owner determines that the Work is substantially complete, the Owner will:
1. Prepare a Certificate of Substantial Completion, accompanied by Contractor's list of items to be completed or corrected, as verified and amended.
 2. Send to Contractor for his/her written acceptance of the responsibilities assigned to them in the Certificate.
- C. After Work is substantially complete, Contractor shall:
1. Obtain and submit Certificate of Occupancy. Owner shall, in detail, list the status of the area affected by partial acceptance and occupancy to establish the existing conditions prior to such acceptance or occupancy.
 2. Complete Work listed for completion or correction within designated form.

1.05 FINAL COMPLETION

- A. Within thirty (30) calendar days after substantial completion, the Contractor shall submit to the Owner written certification that:
1. Contract Documents have been reviewed.
 2. Work has been examined for compliance with Contract Documents.
 3. Work has been completed in accordance with Contract Documents.
 4. Equipment and systems have been tested in the presence of the Owner and the appropriate Utility Operations and Maintenance personnel and are operational.
 5. Work is completed and ready for final examination.
 6. Submittal of Closeout Documents as stipulated in paragraph 1.06 below.
- B. The Owner will make an examination to verify the status of completion within ten (10) calendar days after receipt of such certification.
- C. Should the Owner consider the Work incomplete or defective, or the Contractor has not demonstrated to the Owner that a "good faith" effort has been made within the time allotted in paragraph 1.05 A above, any Damages and/or Liquidated Damages, will be charged against the Contractor as defined and explained in the contract documents.

1. The Owner will promptly notify the Contractor in writing of all deficiencies listing the incomplete or defective work.
 2. Contractor shall take immediate steps to remedy the stated deficiencies and send a second written Certification to the Owner that the Work is complete.
 3. The Owner will re-examine the Work.
- D. When the Owner concludes that the Work is complete, the Owner shall determine the number of days, if any, for which Liquidated Damages will be assessed and request the Contractor to prepare closeout submittals.
- E. Acceptance of the entire project shall commence after all contract work is complete, final inspections are made, corrective actions completed, the Work re-inspected, and after final acceptance by the Owner.
- F. The date established by the Owner as the Final Completion Date shall initiate the guarantee and the warranty periods for all system components and the construction of the Project. The Project shall not be considered Final Complete until all Close Out Documents are properly completed and transmitted to the Owner.
- G. The Owner shall review the status of the Work and compare it to the request for final payment and compare it with the Project records for conformance to the final settlement requirements.
- H. The Owner shall receive from the Contractor, and maintain, the permit drawings and specification package (as relevant), copy of all shop drawings and submittals, the “as-built” set of drawings and specifications, maintenance manuals as required by the contract and submitted by the Contractor. In addition, the Contractor shall provide spare parts and supplies, stored materials, special tools, filters, and other pertinent items as required under the Contract Documents to the Owner.

1.06 CLOSEOUT SUBMITTALS

- A. Evidence of compliance with requirements of governing authorities:
1. Certificate of Occupancy.
 2. Certificates of Inspection:
 - a. Mechanical and Electrical systems as required by the respective sections.
 - b. Sewer main.
 - c. Water main.
 - d. Asphalt Pavement.
 - e. Concrete Pavement.
 3. All Closeout documents required by the Contract Documents.
- B. Project Record Documents, in accordance with Section 01781.
- C. Warranties and Bonds.

D. Certificate of Insurance for Products and Completed Operations.

1.07 EVIDENCE OF PAYMENTS AND RELEASE OF LIENS

A. Contractor's Affidavit of release of Liens.

1. Consent of Surety to Final Payment. Use form acceptable to the Owner.
2. Contractor's Release or Waiver of Liens. Standard Form "Affidavit and Partial Lien Waiver". Use form acceptable to Owner.
3. Separate releases of waivers of liens from prime and subcontractors, suppliers, and others with lien rights against property of the Owner together with a list of those parties, in accordance with Standard Form "Affidavit and Final Lien Waiver". Use form acceptable to Owner.

B. All submittals shall be duly executed before delivery to the Owner.

1.08 FINAL ADJUSTMENT OF ACCOUNTS

A. Submit a final Statement of accounting to the Owner.

B. Statement shall reflect all adjustments to the Contract Sum:

1. The original Contract Sum.
2. Additions and deductions resulting from:
 - a. Previous Change Orders.
 - b. Allowances.
 - c. Unit Prices.
 - d. Deductions for uncorrected Work.
 - e. Deductions for liquidated damages.
 - f. Other adjustments.
3. Total Contract Sum, as adjusted.
4. Previous payments.
5. Sum remaining due.

C. The Owner will prepare a final Change Order reflecting approved adjustments to the Contract Sum, which were not previously made by Change Orders.

1.09 FINAL APPLICATION FOR PAYMENT

A. Contractor shall submit final Application for Payment in accordance with procedures and requirements stated in Division 0 – Bidding and Contract Documents.

1.10 ADDITIONAL ADJUSTMENT

- A. No adjustments to the Contract requested by the Contractor will be allowed if asserted after execution of Final Payment of Contract.

1.11 POST-CONSTRUCTION INSPECTION

- A. Prior to expiration of one (1) year from the Date of Final Completion, the Owner, or its designated representative, will make visual inspection of the Project Work in the company of the Contractor to determine whether further correction of Work is required in accordance with the provisions of the Contract. The Contractor shall be responsible for contacting the Owner and scheduling and coordinating the one (1) year inspection.
- B. The Owner will notify the Contractor, in writing, of any observed deficiencies.
- C. Contractor shall contact the Owner to arrange convenient time and establish schedule for correction of deficiencies.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION 01770

**SECTION 01781
PROJECT RECORD DOCUMENTS**

PART 1 – GENERAL

1.01 REQUIRED INCLUDED

- A. Contractor shall comply with and be responsible for all requirements of the Project Manual, without exception.
- B. Contractor shall comply with the applicable requirements in this section and more specific requirements in: Section 01100, Summary of Work; and Section 01770, Close Out Procedures.
- C. Contractor shall conform to the requirements of the Owner, Town of Ridgeland, and such other federal, state agencies having jurisdiction.

1.02 RELATED REQUIREMENTS

- A. Division 0, Bidding and Contract Documents, in the Project Manual.
- B. Division 1, General Requirements in the Project Manual.

1.03 MAINTENACE OF DOCUMENTS AND SAMPLES

- A. For duration of Project, maintain at job Site the following:
 - 1. One copy of the Drawings, Specifications, Addenda, shop drawings, products data, miscellaneous requested submittal data, Change Orders and other modifications to Contract, field orders, field test or written instructions.
 - 2. One copy of transmittal letters.
 - 3. One set of construction photographs and videos.
 - 4. One set of samples.
 - 5. One copy of Permit Drawings or documents as may be required by the appropriate governing agency.
- B. Store documents and samples in Contractor's field office, or at an alternate location within thirty (30) minutes travel time, apart from documents used for construction.
 - 1. Provide files and racks for storage of documents.
 - 2. Provide locked cabinets or secure storage space for storage of samples.
- C. File documents and samples in accordance with CSI 16-division format.
- D. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.
- E. Make documents and samples available at all times for inspection by the Owner.

- F. Incomplete or out of order documents and samples will be grounds for not approving the Contractor's Application for Payment.
- G. Provide felt tip marking pens for recording information in color code designated by the Owner.
- H. Label each document "PROJECT RECORD" in neat large printed letters. Keep record documents current. Record information concurrently with construction progress. Do not conceal any work until required information is recorded.
 - 1. Drawings: Legibly mark to record actual construction.
 - 2. All underground piping with elevations and dimensions.
 - a. Changes to piping location.
 - b. Horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - c. Actual installed pipe material, class, etc.
 - d. Location of internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structure.
 - 3. Field changes of dimension and detail.
 - 4. Changes made by Change Order.
 - 5. Details not on original Contract Drawings.
 - 6. Equipment and piping relocations.
 - 7. Specifications and Addenda: Legibly mark each section to record.
 - 8.
 - 9. Manufacturer, trade name, catalog number of Supplier of each product and item of equipment actually installed.
 - 10. Changes made by Change Order.

1.04 RECORD DRAWINGS

- A. Permanent and accurate As-built Record Drawings shall be created at Contractor's expense from the approved, original drawings.
 - 1. The record as-built drawings shall be submitted to the Engineer on Auto-CAD, Release 2016 or latest version, two (2) CD's with signed and sealed digital pdf copies, and two (2) signed and sealed original full size (24"x36") paper copies.
 - 2. Accompany submittal with transmittal letter in duplicate, containing:
 - a. Date.
 - b. Project title and number.
 - c. Contractor's name and address.
 - d. Title and number of each Record Document.
 - e. Signature of Contractor or his authorized representative.
- B. Legibly mark actual construction on designated As-built Record Drawing:
 - 1. Depths of various elements of structure(s).

2. Horizontal and vertical locations of underground utilities and appurtenances referenced to permanent surface improvements.
 3. Dimensional locations, vertical and horizontal, of site work, including utilities.
 4. Dimensional location, vertical and horizontal, of rehabilitated sewer mains including depth of pipe;
 5. Dimensional location, vertical and horizontal, of new sewer mains including pipe invert elevations, manhole structures, and top of lid.
 6. Dimensional location and size of sewer service laterals.
- C. Indicate the following installed conditions:
1. Actual installed sewer pipe method of construction.
 2. Field modifications with dimensions and details.
 3. Modifications made by addenda, clarifications, Field Orders or Change Orders.
 4. Details not on original, approved contract drawings.
 5. Record information on a daily basis, or as often as necessary.
 6. Include references to related shop drawings and modifications.
- D. Record data shall be gathered by a Registered Surveyor licensed to conduct work in South Carolina. Reference section 01700 Execution Requirements.
- E. Contractor shall submit As-built Record Documents drawings to the Engineer and Owner for review and acceptance thirty (30) days prior to final closeout.
- F. Make revisions and additions as may be indicated by the Engineer and Owner.
- G. Do not use these Drawings for reference or construction, nor allow them to leave the field office.

1.05 RECORD SPECIFICATIONS AND ADDENDA

- A. Legibly mark up in color code designated by the Owner each Specification Section to record the following:
1. Manufacturer, trade name, catalog name and supplier (with address and phone number) of each product and item of equipment actually installed.
 2. Modifications made by Change Order.
 3. Other matters not originally specified.

1.06 RECORD SAMPLES

- A. Record in transmittal, if not indicated, manufacturer, trade name, catalog number.

1.07 CCTV INSPECTION

- A. Provide copies of all Pre-Construction CCTV and Post Construction CCTV recordings and documentation as required per Section 02955.

1.08 SUBMITTALS

- A. Provide submittals as outlined in the Section 01340 Shop Drawings, Working Drawings, and Samples and in Section 01770 Closeout Procedures. section 4.3 Project Closeout Requirements.

1.09 BURDEN OF ACCURACY

- A. Contractor shall bear all costs of damages of any nature incurred by the Owner due to inaccuracies or incompleteness of the submitted Project Record Documents.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION 01781

**SECTION 02140
DEWATERING**

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Scope of Work: The work to be performed under this section shall include furnishing all equipment and labor necessary to remove storm or subsurface waters from excavation areas in accordance with the requirements set forth and as shown on the Drawings.
- B. Related Work Described Elsewhere
 - 1. SCDOT Standard Specifications for Highway Construction: Division 200 Earthwork.

1.02 QUALITY ASSURANCE

The dewatering of any excavation area and the disposal of the water shall be in strict accordance with the South Carolina Department Environmental Services (SCDES (former SCDHEC) and the latest revision of all local and state government rules and regulations.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 DEWATERING

- A. The Contractor shall provide adequate equipment for the removal of storm or subsurface water which may accumulate in the excavation. The water table should be maintained at least 2 feet below the required depth of excavation.
- B. If subsurface water is encountered, the Contractor shall utilize suitable equipment to adequately dewater the excavation so that it will be dry for work and pipe laying and structure installation. A wellpoint system or other Engineer approved dewatering method shall be utilized if necessary to maintain the excavation in a dry condition for preparation of the trench bottom and for pipe laying and structure installation. The Contractor shall provide a Dewatering Plan prepared by an engineer licensed in the State of South Carolina for submittal and review in accordance with Section 01340.
- C. Dewatering by trench pumping will not be permitted if migration of fine-grained natural material from bottom, side walls, or bedding material will occur.
- D. In the event that satisfactory dewatering cannot be accomplished due to subsurface conditions or where dewatering could damage existing structures, the Contractor shall

obtain the Engineer's approval of wet trench construction or procedure before commencing construction.

3.02 DISPOSAL

- A. Water pumped from the trench or other excavation shall be disposed of in storm sewers having adequate capacity, canals, or suitable disposal pits.
- B. Contractor is responsible for acquiring all permits required to discharge the water and shall protect waterways from turbidity during the operation.
- C. In areas where adequate disposal sites are not available, partially backfilled trenches may be used for water disposal only when the Contractor's plan for trench disposal is approved in writing by the Engineer. The Contractor's plan shall include temporary culverts, barricades, and other protective measures to prevent damage to property or injury to any person or persons.
- D. No flooding of streets, roadways, driveways, or private property will be permitted. Engines driving dewatering pumps shall be equipped with residential type mufflers. Where practical and feasible, electric "drops" should be used in lieu of portable generators.

END OF SECTION 02140

SECTION 02300

PAVEMENT REMOVAL AND REPLACEMENT

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Scope of Work: Work included under this Section consists of cutting, removing, protecting, and replacing existing pavements of the various types encountered.
- B. Protection of Existing Improvements: The Contractor shall be responsible for the protection of all pavements, sidewalks, and other improvements within the work area. All damage to such improvements, as a result of the Contractor's operations, beyond the limits of the work of pavement replacement as described herein shall be repaired by the Contractor at his expense.
- C. All paving removal and restoration for this project shall be in accordance with the contract drawings and details, the standards of the South Carolina Department of Transportation (SCDOT), and the project SCDOT Encroachment Permit.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

3.01 TESTING

- A. All compaction density testing shall be conducted by a Geotechnical Professional Engineer licensed in the State of South Carolina. All results shall be submitted to the Owner for review and shall be submitted directly from the testing laboratory to SCDOT (contact information to be provided by Engineer) for construction in SCDOT rights-of-way. Approval must be received from Owner and SCDOT (for construction in SCDOT rights-of-way) prior to paving.

END OF SECTION 02300

SECTION 02640
SEWER SYSTEM CONSTRUCTION

PART 1 – GENERAL

1.1 DESCRIPTION

- A. Scope of Work: Work included under this Section consists of furnishing all labor, equipment and materials necessary for construction of sanitary sewer, sewer connections, manholes, and appurtenances as shown on the Contract Drawings or specified herein. Sewer system rehabilitation requirements are provided in additional Sections.

- B. Section includes:
 - 1. Sewer Pipes.
 - 2. Manholes and Wetwells.
 - 3. Connect to existing system.
 - 4. Forcemain
 - 5. All necessary appurtenances to collect the wastewater and deliver it to the existing system.

1.2 RELATED SECTIONS

- A. Section 02955 – Sewer Line Cleaning and CCTV Inspection.
- B. Section 02960 – Sanitary Sewer Manhole Rehabilitation.
- C. Section 02970 – Sanitary Sewer Cured-in-Place Pipe (CIPP).
- D. Section 02975 – Sanitary Sewer Pipe Bursting.

1.3 OPTIONS

- A. The specifications describe several materials. Where manufacturers and models of equipment are named in the specifications, it is intended these are to describe quality and function required. **Contractor may use equipment or materials of other manufacturers provided they are reviewed and accepted by the Engineer and Owner as equivalent to those specified.**

1.4 REFERENCES (Latest Revision)

- A. ASTM A 615/A 615 M – Deformed and Plain Carbon – Steel Bars for Concrete Reinforcement.
- B. ASTM C 39/C 39M – Compressive Strength of Cylindrical Concrete Specimens.
- C. ASTM C 443 – Joints for Concrete Pipe and Manholes, Using Rubber Gaskets.
- D. ASTM C 478 – Circular Precast Reinforced Concrete Manhole Sections.
- E. ASTM C 890 – Minimum Structural Design Loading for Monolithic or Sectional Precast Concrete Water and Wastewater Structures.
- F. ASTM C 891 – Installation of Underground Precast Concrete Utility Structures.
- G. ASTM C 913 – Precast Concrete Water and Wastewater Structures.
- H. ASTM D 714 – Evaluating Degree of Blistering of Paints.
- I. ASTM D–1557 – Laboratory Compaction Characteristics of Soil Using Modified Effort.
- J. ASTM D 2241 – Poly (Vinyl Chloride) (PVC) Pressure–Rated Pipe (SDR Series).
- K. ASTM D 2321 – Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity–Flow Applications.
- L. ASTM D 2774 – Underground Installation of Thermoplastic Pressure Piping.
- M. ASTM D 2794 – Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
- N. ASTM D 3034 – Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
- O. ASTM D 3139 – Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.
- P. ASTM D 3212 – Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.
- Q. ASTM D 3740 – Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
- R. ASTM D–6938 – In–Place Density and Water Content of Soil and Soil–Aggregate by Nuclear Methods (Shallow Depth).
- S. ASTM E 96 – Water Vapor Transmission of Materials.
- T. ASTM E 329 – Agencies Engaged in Construction Inspection, Testing, or Special

Inspection.

- U. ASTM F 477 – Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
- V. ASTM F 1417 – Installation Acceptance of Plastic Non-Pressure Sewer Lines Using Low-Pressure Air.
- W. ASTM G 154 – Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for UV Exposure of Nonmetallic Materials.
- X. AWWA C 110 – Ductile-Iron and Gray-Iron Fittings
- Y. AWWA C 111 – Rubber-Gasket Joints for Ductile Iron Pressure Pipe and Fittings.
- Z. AWWA C115 – Flanged Ductile Iron Pipe with Ductile Iron or Gray Iron Threaded Flanges.
- AA. AWWA C 150 – Thickness Design of Ductile Iron Pipe.
- BB. AWWA C 151 – Ductile Iron Pipe, Centrifugally Cast, for Water. FF.
- CC. AWWA C 153 – Ductile-Iron Compact Fittings
- DD. AWWA C-500 – Metal-Seated Gate Valves for Water Supply Service.
- EE. AWWA C-509 – Resilient-Seated Gate Valves for Water Supply Service.
- FF. AWWA C 600 – Installation of Ductile Iron Water Mains and their appurtenances.
- GG. AWWA C900 – Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 Inches through 60 inches, for Water Transmission and Distribution.
- HH. ACI 318 – Building Code Requirements for Structural Concrete.

1.5 MEASUREMENT AND PAYMENT

- A. Measurement – Items listed in the proposal shall be considered as sufficient to complete work in accordance with plans and specifications. Any portion of work not listed in the bid form shall be deemed to be a part of item it is associated with and shall be included in costs of unit shown on bid form. Payment for unit shown on the bid form shall be considered satisfactory to cover cost of all labor, material, equipment, and performance of all operations necessary to complete work in place. The unit of measurement shall be unit shown on bid form. Payment shall be based upon the actual quantity multiplied by unit prices. Where work is to be performed at a lump sum price, the lump sum shall include all operations and elements necessary to complete work.
- B. Payment

1. Gravity Sewer Pipe – Measurements will be made between the centers of manholes or to other pipe ends. Payment will be made at the contract unit price per linear foot for each pipe size at various depths of cut. Depths of cut are measured from existing ground unless otherwise noted. Payment will include cost of pipe, plugs, dewatering, excavating all material, testing, backfilling, compaction, cleaning, metal detector tape, tracing wire, and all work necessary to complete the sewer lines.
2. Trench Wall Supports – No separate payment will be made for bracing and sheeting.
3. Manholes (Installation or Removal and Replacement) – Payment for manholes will be made at the unit price for various types and depths. Manhole depths are measured from invert to proposed finish grade unless otherwise noted. Payment shall include cost of excavating, dewatering, constructing manholes in accordance with plans, furnishing and installing a frame and cover, interior and exterior coatings (unless separate pay item included), pipe connectors, backfilling, and compacting material around the manhole. Payment shall also include all removal and proper disposal of existing manholes.
4. Stone Bedding – Will be measured by using the length and depth for which stone is specified by Engineer or Geotechnical Consultant, times a width of four (4) feet wider than outside barrel of pipe. Payment will include cost of removing unsuitable material and furnishing and placing the stone and structural geotextile.
5. Sand Bedding and Backfill– Will be measured by using the length and depth for which sand is specified by Engineer or Geotechnical Consultant, times a width of four (4) feet wider than outside barrel of pipe. Payment will include excavating the unsuitable material below the invert, furnishing, and compacting the (A-3) sand bedding.
6. Service Connection Restoration – Separate payment will be made for service connection restoration to the new gravity sewer main; such costs shall include any necessary fittings and lateral piping to restore connection.
7. Metal Detector Tape – No separate payment will be made for tape. Cost of furnishing and placing metal detector tape shall be included in the contract unit price for installing sewer and force main pipe.
8. Tracer Wire – No separate payment will be made for wire. The cost of furnishing and placing tracer wire shall be included in the contract unit price for installing force main pipe, sanitary sewer, and service laterals.
9. Fittings – Fittings items noted in bid form will be paid for on a per each unit price. All restraints for fittings shall be included in the associated pricing.

10. Force Mains – Forcemain items noted in bid form will be paid for on a per linear foot price for the various sizes. Payment will include the pipe, thrust blocking, restrained joints, excavation, backfilling, compaction, testing, grassing, metal detector tape, tracing wire, and clean-up.
11. Plug & Gate Valves – Any plug or gate valves items noted in the bid form will be paid on a per each unit price and will include furnishing and installing valve, valve box, backfilling, compacting, grassing, and clean-up.
12. Insert Valves – Any insert valve items noted in the bid form will be paid for on a per each unit price and will include furnishing and installing valve, valve box, backfilling, compacting, and cleanup. Any necessary site preparation, foundation, concrete or other supports, or thrust blocks or restraints necessary for installation of the insert valve shall be included in price.
13. Remove and Replace Existing Pavement and Mill and Resurface Pavement – Payment will be made on a unit price per square yard basis for the various items, and in accordance with the Contract Drawings and project permits.
14. Connect to Existing System – No separate payment will be made for connection to existing sewer system. Such payment shall be included in the appropriate structure or gravity sewer construction item and shall include any necessary dewatering, excavation, coring, furnishing and installing flexible sleeve, grouting in pipe, installing and connecting pipe to sleeve, backfilling, compaction, clean-up, and all work necessary to complete the connection.
15. Grassing – There will be no separate measurement or payment. Grassing shall be a subsidiary obligation of Contractor in the restoration of disturbed areas.
16. Wastewater Bypassing Operations – No separate payment will be made for bypassing operations necessary for project sewer construction. Such payment shall be included in the appropriate facility, structure or gravity sewer construction item and shall include any necessary pump, hoses, plugs, piping and fittings, materials, power or fuel, vehicles, control and monitoring equipment, and all other equipment and labor necessary to properly bypass wastewater flows for construction. Contractor is responsible for the cost cleanup, monitoring, or regulatory fines of any wastewater spills.

1.6 QUALITY ASSURANCE

- A. Contractor will furnish the Engineer and Owner a description of all material before ordering. Engineer will review the Contractor's submittals and provide in writing an acceptance or rejection of material.
- B. Material and equipment shall be the standard products of a manufacturer who has manufactured them for a minimum of five years and provides published data on their

quality and performance.

- C. A subcontractor for any part of the work must have experience on similar work, and if required, furnish Engineer with a list of projects and Owners or Engineers who are familiar with its competence.
- D. If Contractor wishes to furnish devices, equipment, structures, and systems not designed by Engineer, these items shall be designed by either a Professional Engineer registered in the project state or by someone Engineer accepts as qualified. If required, complete design calculations and assumptions shall be furnished to the Engineer or Owner before acceptance.
- E. Testing shall be by a testing laboratory which operates in accordance to ASTM D 3740 or E 329 and shall be acceptable to Engineer prior to engagement. Mill certificates of tests on materials made by manufacturers will be accepted provided the manufacturer maintains an adequate testing laboratory, makes regularly scheduled tests, spot checked by an outside laboratory, and furnishes satisfactory certificates with name of entity making test.
- F. Infiltration and line and grade of sewer shall be made by Contractor with equipment qualified by Engineer and in the presence of Engineer. Engineer or Project Representative reserves the right to accept or reject testing equipment.

1.7 PRODUCT DELIVERY, STORAGE & HANDLING

- A. Material shall be unloaded in a manner avoiding damage and shall be stored where it will be protected and will not be hazardous to traffic. If stored on private property, Contractor shall obtain permission from property owner and shall repair any damage caused by the storage. Material shall be examined before installation. Neither damaged nor deteriorated material shall be used in the work.

1.8 JOB CONDITIONS

- A. Installation of the wastewater collection system must be coordinated with other work on site. Generally, wastewater pipes will be installed first and shall be backfilled and protected so subsequent excavating and backfilling of other utilities does not disturb them. Contractor shall replace or repair any pipe or structure damaged by Contractor's actions at no additional expense to the Owner.

1.9 SEQUENCING AND SCHEDULING

- A. Contractor shall arrange the work so sections of sewers between manholes are backfilled and tested, lateral sewers connected, pavement replaced, and placed in service as soon as reasonable after installation.

1.10 ALTERNATIVES

- A. The intention of these specifications is to produce the best system for the Owner. If the Contractor suggests alternate material, equipment or procedures will improve results at no additional cost, Engineer and Owner will examine suggestion, and if accepted, it may be used. The basis upon which acceptance of an alternate will be given is its value to Owner, and not for Contractor's convenience.

1.11 GUARANTEE

- A. Contractor shall guarantee quality of materials, equipment, and workmanship for 12 months, unless specified otherwise elsewhere, after acceptance of the completed Project. Defects discovered during this period shall be repaired by Contractor at no cost to the Owner.

1.12 EXISTING UTILITIES

- A. All known Town of Ridgeland utility facilities are shown schematically on the construction drawings and are not necessarily accurate in location as to plan or elevation. Utilities such as service lines or unknown facilities not shown will not relieve the Contractor of responsibility under this requirement. Contractor will be held responsible for cost of repairs to damaged underground facilities, even when such facilities are not shown on the drawings.
- B. The Contractor shall call for underground utility locations before starting work. Underground utilities location service can be contacted at (888) 721-7877 (SC) or 811.

1.13 TESTING

- A. Laboratory tests for moisture density relationship for fill materials shall be in accordance with ASTM D 1557, (Modified Proctor).
- B. In place density tests in accordance with ASTM D 2922.
- C. Testing laboratory shall operate in accordance with ASTM D 3740 and E 329 and be acceptable to the Engineer.
- D. Testing laboratory and Project Engineer/Project Representative shall be given a minimum of 48-hours' notice prior to taking any tests.
- E. Testing shall be Contractor's responsibility and shall be performed at the Contractor's expense by a commercial testing laboratory operating in accordance with subparagraph C above.
- F. Test results shall be furnished to the Engineer prior to continuing with associated or subsequent work.

PART 2 – PRODUCTS

Materials used in the work shall be those named in Bid Form. In multiple type bids, selection of material types will be at the opinion of Owner. Materials and products used shall conform to one of the following:

2.1 SEWER PIPE

- A. PVC Pipe (4”–15” Gravity Sewer) – Shall be polyvinyl chloride plastic (PVC) and shall meet all requirements of ASTM D 3034 SDR 26. All pipe shall be suitable for use as a gravity sewer conduit. Provisions must be made for contraction and expansion at each joint with a rubber gasket. Pipe sizes and dimensions shall be as shown below. All pipe shall be green in color with factory marked homing lines. Fittings shall meet the same specification requirements as pipe.

Nom. Size	Outside Diameter		Min. Wall Thickness
	Average	Tolerance	
4	4.215	± 0.009	.162
6	6.275	± 0.011	.241
8	8.400	± 0.012	.323
10	10.500	± 0.015	.404
12	12.500	± 0.018	.481

Tests on PVC Pipe – Pipe shall be designed to pass all tests at 73 ° F. (+_ 3° F.).

- B. PVC Pipe (16” – 64” Gravity Sewer) – Shall be polyvinyl chloride plastic (PVC) and shall meet all requirements of AWWA C900 with a minimum DR of 18. All pipe shall be suitable for use as a gravity sewer conduit. Provisions must be made for contraction and expansion at each joint with a rubber gasket. Pipe sizes and dimensions shall conform to AWWA C900. All pipe shall be green in color with factory marked homing lines. Fittings shall meet the same specification requirements as pipe.

Tests on PVC Pipe – Pipe shall be designed to pass all tests at 73 ° F. (+_ 3° F.).

2.2 JOINTS – GRAVITY SYSTEM

- A. Joints for PVC Pipe – Shall be integral wall bell and spigot with a rubber ring gasket. Joints shall conform to ASTM D 3212 and gaskets to ASTM F 477.
- B. Jointing PVC to Vitrified Clay Pipe: Unless specifically indicated otherwise, connections of PVC to vitrified clay pipe in the run of the gravity sewer main shall be made with an approved cast coupling.

2.3 MANHOLES AND WETWELLS

- A. Any required conflict manholes shall be provided and constructed in accordance with

South Carolina Department of Transportation (SCDOT) standards and as detailed in the Contract Drawings.

- B. Masonry – Shall be new whole brick of good quality laid in masonry mortar or cement mortar made of one part Portland cement and two parts clean sharp sand. Every brick shall be fully bedded in mortar. Manholes and Wetwells shall conform to locations and details shown on the plans.
- C. Precast Concrete – Shall be reinforced concrete constructed in accordance with ASTM C 478 and details shown on the Construction Drawings. Coarse aggregate shall be granite stone. The joints shall be tongue and groove sealed with flexible gaskets or mastic sealant. Gaskets shall be O-Ring or equivalent to Type A or B "Tylox" conforming to ASTM C 443. Mastic shall be equivalent to "Ram- nek" with primer. Primer shall be applied to all contact surfaces of manhole and wetwell joint at the factory in accordance with manufacturer's instructions.
- D. Frames and Covers –
 - 1. Manhole frames and covers shall be gray cast iron conforming to minimum requirements ASTM A48, Class 35, and shall conform in general to the details for each type shown on the plans. Castings shall be of uniform quality, and free from blowholes, porosity, hard spots, shrinkage distortion and other defects. Frames and covers shall be smooth, well-cleaned by shot blasting and shall remain unpainted. All castings shall be manufactured true to pattern, and component parts shall fit together in a satisfactory manner. Frames shall have a clear opening of 22-3/4". There shall be no holes or perforations in the cover. The frame and cover shall have a rubber gasket that is fitted in a machined groove manufactured in the bottom of the cover. All manhole frames and covers shall be traffic bearing unless otherwise specified. Manholes shall be adjustable to changes in final pavement elevation without the use of spaces or rings. Casting patterns shall conform to those shown on the Drawings. Manhole frame and cover shall be as manufactured by U.S. Foundry, Model 680.
 - 2. Wetwell frames and hatches shall be per the requirements listed in Section 11305 and shall include protective grating.
- E. Pipe Connections – Shall have flexible watertight joints at sewer main point of entry into the manhole. The joint shall be an EPDM or polyisoprene sleeve equivalent to "Kor-N-Seal."
- F. Coatings – New sanitary sewer manholes and wetwells shall have all interior surfaces coated with cementitious mortar lining.
 - 1. Condition of Manhole or Wetwell to be Coated
 - a. Standard Portland cement or new concrete (not quick setting high strength cement) must be well cured prior to application of the

protective coating. Generally, 28 days is adequate cure time for standard Portland. If earlier application is desired, compressive or tensile strength of the concrete can be tested to determine if acceptable cure has occurred.

- b. Cementitious patching and repair materials should not be used unless their manufacturer provides information as to its suitability for topcoating with the proposed protective coating. Project specific submittals should be provided including application, cure time and surface preparation procedures which permit optimum bond strength with the protective coating.
- c. Contractor is to maintain strict adherence to applicable NACE and SSPC recommendations with regard to proper surface preparation and compatibility with existing coatings.

2. Repair Materials

- a. Repair materials shall be used to fill voids, structurally reinforce, and/or rebuild surfaces, etc. as determined necessary by Engineer and Contractor prior to application of the protective coating. Repair materials must be compatible with the specified coating and shall be applied in accordance with manufacturer’s recommendations.
- b. The following products are acceptable as compatible repair basecoat materials for calcium aluminate topcoating:
 - i. SewperCoat 100% calcium aluminate mortar by Kerneos Aluminate Technologies.

3. Protective coating material shall be:

- a. Calcium aluminate mortar mix designed to withstand long-term exposure to a bacterically corrosive hydrogen sulfide environment. The mortar mix shall only require clean, potable water as an admixture to produce a material suitable for spray application. Mortar mix shall have the following chemical composition:

Al ₂ O ₃	CaO	FeO + Fe ₂ O ₃	SiO ₂
39 – 44%	35 – 39%	9 – 14%	5 – 7%

Design properties of the mortar mix shall be as follows:

Compressive Strength (ASTM C495)	> 7,000 psi	24 hours
	> 9,000 psi	28 days
Flexural Strength (ASTM C293)	> 1,200 psi	24 hours
	> 1,400 psi	28 days
Splitting Tensile Strength (ASTM C496)	> 800 psi	24 hours
Bond Strength/Slant Shear (ASTM C882)	> 1,600 psi	28 days
Shrinkage at 28 days (ASTM C596) Freeze/Thaw after 300 Cycles (ASTM C666)	< 0.06% cured @ 90% relative humidity. No visible damage after 300 cycles	

Mortar mix shall be stored with adequate provisions for the prevention of moisture absorption. It shall be stored in a manner permitting easy access for inspection and identification.

4. Protective Coating Application Equipment – Specifically designed spray equipment, accepted for use by the protective coating manufacturer.

2.4 TEES AND WYES

- A. Gravity sewer tees and wyes shall be four or six inches and same diameter as the run of pipe. They shall be of same material as the sewer main.
- B. Wyes for cleanouts shall be of same material as the lateral pipe.

2.5 LATERALS AND CLEANOUTS

- A. Shall be Polyvinyl Chloride pipe with bells and rubber gaskets for jointing, conforming, to Paragraph 2.1–A, PVC Pipe.
- B. Cleanout Access Box shall be equivalent to U.S. Foundry USF 7623 in pavement or Genova Products 4–inch Schedule 40 PVC–DWV Cleanout Fitting with threaded plug out of pavement.

2.6 FORCEMAIN

- A. P.V.C. – All pipe shall be green in color with factory marked homing lines. Pipe with diameter less than 4 inches shall conform to all requirements of ASTM D 2241, SDR 26, Class 160. Pipe 4 inches through 18 inches shall conform to all requirements of AWWA C900 with CI outside diameter, minimum DR of 18, Pressure Class of 235 p.s.i. Joints shall be in accordance with ASTM D 3139.
- B. Ductile Iron pipe, unless otherwise noted, shall only be used at pump station facility sites as noted on the drawings. Reference Section 11305 for requirements. Push–on–Joints shall be slip–on rubber equivalent to "Fastite," "All–tite," or "Tyton." Flanged joints shall conform to AWWA C 115. Gaskets shall conform to AWWA C 111.

- C. Thrust blocking shall be sized as detailed on the construction drawings details and at the locations noted.
- D. Restrained Joints – Restrained joints for pipe, valves and fittings shall be mechanical joints with ductile iron retainer glands equivalent to “Megalug” or push-on type joints equivalent to "Lok-Ring," "TR Flex," or "Super Lock" and shall have a minimum rated working pressure equal to the item restrained with a minimum safety factor of 2:1. Joints shall be in accordance with the applicable portions of AWWA C-111. Manufacturer of joints shall furnish certification, witnessed by an independent laboratory, stating joints furnished have been tested without signs of leakage or failure. Restrained joints shall be capable of being deflected after assembly.
- E. Fittings:
 - 1. Fittings for Ductile Iron or Plastic Pipe – Shall be ductile iron, manufactured in accordance with AWWA C-153. Fittings shall be Protecto 401 epoxy lined in accordance with AWWA C-104. Fittings shall be designed to accommodate the type of pipe used.
 - 2. Fittings for Flanged Pipe – Shall be manufactured in accordance with AWWA C-110, Class 125 flanges.
 - 3. Fittings for Plastic Pipe – Less than 4 inches shall be PVC with ring tite rubber conforming to ASTM D-3139.
 - 4. For pump station facilities, reference construction drawings and Section 11305 for fittings requirements.

2.7 METAL DETECTOR TAPE

- A. Will be installed above all new pipe. Tape shall consist of 0.35 mils thick solid foil core encased in a protective plastic jacket resistant to alkalis, acids, and other destructive elements found in the soil. The lamination bond shall be strong enough so layers cannot be separated by hand. Total composite thickness shall be 5.0 mils. Foil core to be visible from unprinted side to ensure continuity. The tape shall have a minimum 3 inch width and a tensile strength of 35 lbs. per inch.

A continuous warning message indicating “sewer line” repeated every 16 inches to 36 inches shall be imprinted on the tape surface. Tape shall contain an opaque color concentrate designating color code appropriate to the line being buried (Sewer Line – Green)

2.8 TRACER WIRE

- A. Will be used over all new force main, sanitary sewer and service lateral lines. Tracer wire shall be #12 AWG High-Strength Copper Clad Steel (HS-CCS) Conductor, insulated

with 30 mil High Density Polyethylene (HDPE) Insulation, and rated for direct burial. Insulation color shall meet APWA color code standards for identification of buried utilities.

- B. Wire connectors shall be designed for direct burial and moisture resistance. Connectors shall be equivalent to 3M DBR/Y-6 Direct Bury Splice Kit.

2.9 GATE VALVES

- A. Two Inches and Larger – Shall be cast iron or ductile iron body, bronze mounted, double disc or resilient wedge design, with non-rising stems, conforming to AWWA C 500, C 509, or C 515. Valves shall have ends to match the pipe to which they are attached. Attachment to plastic pipe shall be made by special adapters. Valves shall have a working pressure of 200 p.s.i. and be tested at 400 p.s.i.

Valves shall be furnished with "O" ring packing. One "O" ring shall be located above the thrust collar and one below. Thrust collar shall be permanently lubricated and have an anti-friction washer on top of the thrust collar.

- B. Smaller than 2 inches – Shall be all brass, ball valve type. The pressure rating shall be 175 p.s.i.
- C. Valve Boxes – Underground valves shall be installed in acceptable valve boxes. Valve boxes shall have a suitable base that does not damage valve or pipe, and shaft extension sections to cover and protect the valve and permit easy access and operation. The box, cover, and extensions shall be cast or ductile iron having a crushing strength of 1,500 pounds per linear foot.

2.10 PLUG VALVES

- A. Shall be fully ported and of the same diameter as pipes to which they are attached.
- B. They shall have semi-steel bodies, all metal plugs, stainless steel bearings, and be equivalent to DeZurik 100% port eccentric (PEF) valves or Clow, lever operated. All valves 6 inches and larger shall be equipped with gear actuator and handwheel.

2.11 INSERT VALVES

- A. The insert valve shall be a resilient wedge gate valve designed for use in potable water, raw water, reclaimed water, or sewage systems. The valve shall be installed in an existing pressurized pipeline while maintaining constant pressure and service. The valve shall have a minimum working pressure rating of 150 psi. The valve shall be ductile iron construction meeting ASTM A536 Grade 65-45-12 with a fusion bonded epoxy coating. Hardware shall be stainless steel.
- B. Contractor shall be responsible for installing any foundations, thrust blocks or thrust collars as recommended by the insert valve manufacturer or installer.

- C. Insertion valve shall be Insta Valve by Hydra-Stop or Engineer approved equal.

2.12 STONE BEDDING

- A. Shall be graded crushed granite with the following gradation:

Square Opening Size	Percent Passing
1 inch	100%
3/4 inch	90 to 100%
3/8 inch	0 to 65%
No. 4	0 to 25%

2.13 SAND BEDDING AND BACKFILL

- A. Shall be clean sand free from clay and organic material. Not more than 10% shall pass the No. 100 sieve.

2.14 BORROW

- A. Where it is determined sufficient suitable material is not available from the site to satisfactorily backfill pipe to at least two feet above top of pipe, Contractor shall furnish suitable sandy borrow material to accomplish requirements. Material shall not have more than 60% passing the No. 100 sieve, nor more than 20% passing a No. 200 sieve.

2.15 PRODUCT REVIEW

- A. Contractor shall provide the Engineer with a complete description of all products before ordering. Engineer will review all products before they are ordered by Contractor.

PART 3 – EXECUTION

3.1 CONSTRUCTION OBSERVATION

- A. The line, grade, deflection, and infiltration of sewers shall be tested by Contractor under the direction of Engineer. Engineer or Project Representative will have the right to require any portion of work be completed in their presence. If work is covered up after such instruction, it shall be exposed by Contractor for observation. However, if Contractor notifies Engineer such work is scheduled and Engineer fails to appear within 48 hours, the Contractor may proceed. All work completed and materials furnished shall be subject to review by the Engineer or Project Representative. All improper work shall be reconstructed. All materials not conforming to requirements of specifications shall be removed from the work upon notice being received from

Engineer for rejection of such materials. Engineer shall have the right to mark rejected materials to distinguish them as such.

Contractor shall give the Project Engineer or Project Representative a minimum of 48 hours notice for all required observations or tests.

It will also be required by Contractor to keep accurate, legible records of the location of all sanitary lines, service laterals, manholes, force mains, valves, bends, and appurtenances. These records will be prepared in accordance with Section 01781 Project Record Documents. Final payment to the Contractor will be withheld until all such information is received and accepted.

3.2 LOCATION AND GRADE

- A. Line and grade of sewers and position of all manholes and other structures are shown on the drawings. Grade line as given on the profile or mentioned in these specifications means invert or inside bottom of pipe. Price for trenching shall include trench for depth below this line necessary to lay sewer to grade, but measurements for payment will be made only to grade line. Master control lines and bench marks have been provided, as appropriate, by the Engineer. The Contractor shall be responsible for proper locations and grades of sewers.

3.3 SEWER EXCAVATION

- A. Contractor shall perform all excavations of every description and of whatever substance encountered to the depth shown on the plans or specified for all sewers, manholes, and other appurtenances. All excavations shall be properly dewatered before installations are made, by the use of well points, pumping, or other methods accepted by Engineer. Trenches shall be excavated in conformance with the Occupational and Safety Health Administration's (OSHA) Regulations.

Where the character of soil is unsuitable for pipe bedding as determined by Engineer or Geotechnical Consultant, additional excavation will be authorized. Engineer or Geotechnical Consultant shall determine the depth needed for additional bedding and whether material will be sand or stone. The unsuitable material shall be disposed of at Contractor's expense in a proper manner. Bottom of all trenches shall be rounded to conform to the bottom of pipe, to afford full bearing on pipe barrel. Excavation in excess of depths and widths required for sewers, manholes, and other structures shall be corrected by pouring subfoundations of 3,000 p.s.i. concrete and half cradle at the Contractor's expense.

- B. Trenches shall not be excavated more than 400 feet in advance of pipelaying.

3.4 TRENCH WALL SUPPORT

- A. Bracing and Sheeting – The sides of all trenches shall be securely held by stay bracing, or by skeleton or solid sheeting and bracing, as required by soil conditions encountered,

to protect adjoining property and for safety. Where shown on drawings or where directed by Engineer, the Contractor must install solid sheeting to protect adjacent property and utilities. Sheeting shall be steel or timber and Contractor shall submit design data, including the section modulus of members and arrangement for bracing at various depths, to Engineer for review before installing sheeting. It shall penetrate at least 3–feet below the pipe invert. Contractor shall ensure support of pipe and its embedment is maintained throughout installation and ensure sheeting is sufficiently tight to prevent washing out of the trench wall from behind sheeting.

- B. Sheeting Removal – Sheeting shall be removed in units and only when backfilling elevation has reached the level necessary to protect pipe, adjoining property, personnel, and utilities. Removal of sheeting or shoring shall be accomplished in a manner to preclude loss of foundation support and embedment materials. Fill voids left on removal of sheeting or shoring and compact all materials to required densities.
- C. Movable Trench Wall Supports – Do not disturb installed pipe and its embedment when using movable trench boxes and shields. Movable supports should not be used below top of pipe zone unless acceptable methods are used for maintaining the integrity of embedment material. Before moving supports, place and compact embedment to sufficient depths to ensure protection of the pipe. As supports are moved, finish placing and compacting embedment.
- D. When sheeting or shoring cannot be safely removed, it shall be left in place. Sheeting left in place shall be cut off at least 2 feet below the surface. No separate payment shall be made for bracing and sheeting except where shown on drawings or authorized by the Engineer.

3.5 LAYING PIPE

- A. All sewer pipe shall be laid upgrade with spigots pointing downgrade and in accordance with ASTM D 2321. The pipe shall be laid in a ditch prepared in accordance with Paragraph 3.3 "Sewer Excavation." When sewer is complete, the interior surface shall conform on bottom accurately to grades and alignment fixed or given by Engineer. Special care shall be taken to provide a firm bedding in good material, select borrow, stone backfill or 3,000 p.s.i. concrete, as authorized, for length of each joint and 1/2 of the circumference. Holes shall be provided to relieve bells from bedding strain, but not so large to allow separation of the bell from barrel by settlement after backfilling. All pipe shall be cleaned out, and left clean. Every third joint shall be filled around immediately after being properly placed.
- B. Jointing – Comply with manufacturer's recommendations for assembly of joint components, lubrication, and making joints. When pipe laying is interrupted, secure piping against movement and seal open ends to prevent the entrance of water, mud, or foreign material.
- C. Placing and Compacting Pipe Embedment – Place embedment materials by methods that will not disturb or damage the pipe. Work in and tamp haunching material in area

between the bedding and underside of pipe before placing and compacting remainder of embedment in pipe zone. Do not permit compaction equipment to contact and damage the pipe. Use compaction equipment and techniques compatible with materials used and location in the trench. Before using heavy compaction or construction equipment directly over the pipe, place sufficient backfill to prevent damage, excessive deflections, or other disturbance of the pipe.

- D. Rock or Unyielding Materials in Trench Bottom – If ledge rock, hard pan, shale, or other unyielding material, cobbles, rubble, debris, boulders, or stones larger than 1.5–inches are encountered in the trench bottom, excavate a minimum depth of 6–inches below pipe bottom and replace with proper embedment material.
- E. Vertical Risers – Provide support for vertical risers as commonly found at service connections, cleanouts, and drop manholes to preclude vertical or lateral movement. Prevent the direct transfer of thrust due to surface loads and settlement, and ensure adequate support at points of connection to main lines.
- F. Exposing Pipe for Making Service Line Connections – When excavating for a service line connection, excavate material from above the top of main line before removing material from sides of pipe. Materials and density of service line embedment shall conform to specifications for the main line.
- G. Cleanouts and access boxes shall be installed as shown on the construction drawings. Install concrete collar around access box as shown on detail.
- H. Manhole and Wetwell Connections – Use flexible water stops, resilient connectors, or other flexible systems acceptable to the Engineer making watertight connections to manholes, wetwells, and other structures. Fill annular space between pipe and precast concrete on inside of manhole with non–shrink grout.

Before commencing work within the right–of–way of railroads or South Carolina Department of Transportation, Contractor shall verify Owner has obtained required permits and shall notify appropriate agency in accordance with permit requirements.

3.6 SEPARATION BETWEEN WATER & SANITARY SEWER

- A. Parallel Installation:
 - 1. Water mains shall be laid at least 10 feet horizontally from any existing or proposed sanitary sewer, storm sewer, or sewer manhole. The distance shall be measured edge–to–edge.
 - 2. When conditions prevent a horizontal separation of 10 feet, water main may be laid closer to a sewer (on a case–by–case basis) provided the water main is laid in a separate trench or on an undisturbed earth shelf located on one side of the sewer at such an elevation where bottom of water main is at least 18 inches above top of sewer. It is advised the sewer be constructed of materials and

with joints equivalent to water main standards of construction and be pressure tested to assure water-tightness prior to backfilling.

B. Crossing:

1. Water mains crossing house sewers, storm sewers, or sanitary sewers shall be laid to provide a separation of at least 18 inches between the bottom of water main and top of sewer. At crossings, one full length of water pipe shall be located so both joints will be as far from the sewer as possible. Special structural support for the water and sewer pipes may be required.
2. When conditions prevent a vertical separation of 18 inches, the sewer passing over or under water mains shall be constructed of materials and with joints equivalent to water main standards of construction and shall be pressure tested to assure water-tightness prior to backfilling.
3. When water mains cross under sewers, additional measures shall be taken by providing:
 - a. a vertical separation of at least 18 inches between bottom of the sewer and top of water main;
 - b. adequate structural support for sewers to prevent excessive deflection of joints settling on and breaking the water mains;
 - c. length of water pipe be centered at the point of crossing so joints will be equidistant and as far as possible from sewer; and
 - d. both sewer and water main shall be constructed of water pipe and subjected to hydrostatic tests, as prescribed in this document. Encasement of the water pipe in concrete shall also be considered.

3.7 **BACKFILLING**

- A. All trenches and excavation shall be backfilled immediately after pipes are laid therein, unless other protection of the pipe line is directed. Backfilling material shall be selected and deposited with special reference to the future safety of pipes and in accordance with Contract Drawings and SCDOT Encroachment Permit. Except where special methods of bedding and tamping are provided for, clean earth or sand shall be solidly tamped about pipe up to a level at least 2 feet above top of pipes, and shall be carefully deposited to uniform layers, each layer solidly tamped or rammed with proper tools to not injure or disturb the pipeline. Remainder of the trench backfilling shall be carried on simultaneously on both sides of pipe in such a manner preventing injurious side pressure. The material used shall be selected from excavations anywhere on site if any of this soil is suitable. Backfill material shall be clean and free of rock, organic and other deleterious matter.

Under traffic areas, backfill material and compaction shall be to SCDOT standards and project Encroachment Permit requirements. In non-traffic areas, the backfill material shall be compacted to a density of not less than 95% of maximum laboratory density at optimum moisture unless otherwise accepted by Engineer. Compaction tests shall be conducted in accordance with ASTM D 6938 by an independent testing laboratory. Tests are to be taken at the direction of Engineer.

Whenever trenches have not been properly backfilled, or if settlement occurs, they shall be refilled, smoothed off and finally made to conform to the ground surface. Backfilling shall be carefully performed, and original surface restored to the full satisfaction of Engineer immediately after installation.

Where thermoplastic (PVC) pipe is installed, Contractor shall take precautions in accordance with ASTM D 2321, during backfilling operations so not to create excessive side pressures, or vertical or horizontal deflection of the pipe nor impair flow capacity.

3.8 MANHOLES

- A. Manholes shall be constructed where shown on the drawings or where directed by Engineer. The channel in bottom of manholes shall be smooth and properly rounded. Special care must be exercised in laying the channel and adjacent pipes to grade. Manhole top elevations shall be greater than or equal to the 50-year flood elevation, unless watertight covers are provided. Tops of manholes outside of roads shall be built as noted on Contract Drawings but at a minimum to grades 1-inch above ground surface in developed areas and 6 inches above ground surface in undeveloped areas. Manholes in roads shall be built to grades designated by the Engineer. Manhole sections with either honeycomb defects; exposed reinforcing; broken/fractured tongue or groove; or cracked walls will be subject to rejection by Engineer for use on the project. When mastic sealant is used, improperly applied primer will also be cause for rejection.

No leaks in any manhole will be acceptable. All repairs made from inside the manhole shall be made with mortar composed of one-part Portland cement and two parts clean sand. The mixing liquid shall be straight bonding agent equivalent to "Acryl 60."

3.9 MANHOLE AND WETWELL PROTECTIVE COATING (CEMENTITIOUS MORTAR LINING)

- A. Examination
 - 1. All structures to be coated shall be readily accessible to Contractor.
 - 2. Any active flows shall be dammed, plugged, or diverted as required to ensure the liquid flow is maintained below surfaces to be coated. Flows should be totally plugged and/or diverted when coating the invert. All extraneous flows

into manhole at or above area coated shall be plugged and/or diverted until coating has set hard to the touch.

3. No leaks may be present prior to commencing and during work.
4. Installation of protective coating shall not commence until the concrete substrate has properly cured in accordance with these specifications.
5. Temperature of the surface to be coated should be maintained between 40 deg F and 120 deg F during application, or as required by coating manufacturer. Prior to and during application, care should be taken to avoid exposure of direct sunlight or other intense heat source to the structure being coated. Where varying surface temperatures do exist, care should be taken to apply coating when the temperature is falling versus rising (i.e. late afternoon into evening vs. morning into afternoon).

B. Surface Preparation

1. All contaminants including: oils, grease, incompatible existing coatings, waxes, form release, curing compounds, efflorescence, sealers, salts, or other contaminants shall be removed.
2. Surface preparation method(s) should be based upon conditions of substrate, service environment and requirements of the protective coating to be applied.
3. All surfaces shall be repaired as required by protective coating system in the intended service condition.
4. Surfaces to receive protective coating shall be cleaned and abraded to produce a sound surface with adequate profile and porosity to provide a strong bond between the protective coating and substrate. Generally, this can be achieved with a high pressure water cleaning using equipment capable of 5,000 psi at 4 gpm. Other methods such as high-pressure water jetting (refer to NACE Standard No. 5/SSPC-SP12), abrasive blasting, shotblasting, grinding, scarifying or acid etching may also be used. Detergent water cleaning and hot water blasting may be necessary to remove oils, grease, or other hydrocarbon residues from the concrete. Whichever method(s) are used, they shall be performed in a manner providing a uniform, sound, clean neutralized surface not excessively damaged. Contractor shall catch debris from cleaning efforts within the manhole. Debris passing into pipelines shall be cleaned at the Contractor's expense.
5. Test prepared surfaces after cleaning but prior to application of protective coating to determine if a specific pH or moisture content of the concrete is required according to manufacturer's recommendations.
6. Area between the manhole and manhole ring and any other area which might exhibit movement or cracking due to expansion and contraction, shall be

grouted with a flexible or elastomeric grout or gel. Castings can be abrasive blasted and coated to prevent corrosion if desired.

- a. Where chimney seal is required in conjunction with the lining, the Contractor shall contact the chimney seal manufacturer to determine the proper preparation required for effectively installing the chimney seal after the coating has been applied and cured.

7. All surfaces shall be checked by Engineer's Representative during and after preparation.

C. Application of Repair Materials

1. Repair materials shall meet the specifications herein. Materials shall be trowel or spray applied utilizing proper equipment onto specified surfaces. Material thickness shall be specified by the Engineer according to Owner's requirements and manufacturer's recommendations.
2. Cementitious repair materials shall be trowelled to provide a smooth surface with an average profile equivalent to coarse sandpaper to optimally receive the protective coating. No bugholes or honeycomb surfaces should remain after the final trowel procedure of repair mortar.
3. The repair materials shall be permitted to cure according to manufacturer recommendations. Curing compounds should not be used unless formulated for compatibility with the specified protective coating.
4. Application of repair materials, if not performed by a coating certified applicator, shall be checked by the protective coating certified applicator to ensure proper finishing for suitability to receive specified coating.
5. After abrasive blast and leak repair is performed, all surfaces shall be checked for remaining laitance prior to protective coating application. Any evidence of remaining contamination or laitance shall be removed by additional abrasive blast, shotblast or other acceptable method. If repair materials are used, refer to these specifications for surface preparation. Areas to be coated must also be prepared in accordance with these specifications after receiving a cementitious repair mortar and prior to application of the protective coating.
6. All surfaces shall be checked during and after preparation and before the protective coating is applied.

D. Application of Protective Coating

1. Application procedures shall conform to recommendations of the protective coating manufacturer, including material handling, mixing, environmental controls during application, safety, and spray equipment.

2. The spray equipment shall be specifically designed to accurately ratio and apply specified protective coating materials and shall be regularly maintained and in proper working order.
3. Protective coating material must be spray applied by a certified applicator of the protective coating manufacturer.
4. Manhole and Wetwell walls, benches, and frame shall be coated by spray application of the protective coating with a uniform thickness. Material shall be applied to bench area to provide for proper drainage. Spray application of calcium aluminate mortar will have a minimum finished thickness of 1/2 inch.
5. Airless spray application equipment acceptable to coating manufacturer shall be used to apply each coat of the protective coating.
6. If necessary, subsequent top-coating or additional coats of the protective coating should occur as recommended by protective coating manufacturer.

E. Testing

1. Visual Inspection – verify no infiltration, cracks, or loose material.
2. Thickness of calcium aluminate will be measured with a ruler while the material is still wet.
3. Measurement of protective coating bond strength to the substrate can be measured in accordance with ASTM D4541. Any areas detected to have inadequate bond strength shall be evaluated by the Engineer. Further bond tests may be performed in failed area to determine the extent of potentially deficient bonded area and repairs shall be made by Applicator in strict accordance with manufacturer's recommendations.
4. Manhole Testing – Type A: Vacuum test. All pipes entering manhole shall be plugged, taking care to securely place plugs from being drawn into the manhole. The test head shall be placed and seal inflated in accordance with manufacturer's recommendations. A vacuum of 10 inches of mercury shall be drawn and the vacuum pump shut off. With the valves closed, time shall be measured for the vacuum to drop to nine (9) inches. Following are minimum allowable test times for manhole acceptance at the specified vacuum drop:

DEPTH (FEET) (Manhole length)	TIME (SECONDS)		
	48-Inch diam.	60-Inch diam	72-Inch diam
4	10	13	16
8	20	26	32
12	30	39	48
16	40	52	64

	20	50	65	80
	24	60	78	96
Add for 2–feet more depth:		5	6.5	8

Note: These numbers have been taken from ASTM C 924.

If a manhole fails the initial test, repairs and adjustments necessary due to extenuating circumstances (i.e. pipe joint, liner, plug sealing) should be made. Retesting shall proceed until a satisfactory test is obtained.

Manhole Testing – Type B: Exfiltration test. Incoming and outgoing sewer and service lines shall be plugged, plugs restrained and the manhole filled with water to top of manhole frame. A soaking period of up to one hour will be allowed if bypassing of the sewage is not required or has been provided. At the end of this optional soaking period, manhole shall be refilled with water and test begun. If water loss exceeds amount shown in the following table, manhole will have failed test. Repairs and adjustments necessary due to extenuating circumstances (i.e. pipe joint, liner, plug sealing) should be made. Retesting shall proceed until a satisfactory test is obtained. Maximum Allowable Loss is determined assuming a standard 4-foot diameter manhole.

<u>Depth of Manhole</u>	<u>Maximum Allowable Loss</u>
Under 8 feet deep	1 inch in 5 minutes
Over 8 feet deep	1/8 inch per foot of depth in 5 minutes

Limitations and considerations include recognizing exfiltration and vacuum testing may be impractical or cost– prohibitive for all manholes; therefore, use of either method is subject to the following limitations and considerations:

Complete Sealing: These methods are used only when the entire manhole has been sealed or rehabilitated. The lack of sealing or rehabilitation of some portions of manhole may prevent passage of either of these tests. Spot repairs and partial sealing or rehabilitation are therefore subject to infiltration and visual testing only.

Structural Condition: Structural condition of some manholes may be such the testing with these methods is impractical or destructive. The Owner’s Representative and Contractor shall therefore deem as structurally sound, prior to testing using these methods, those manholes which have not been structurally lined.

5. Wetwell Testing: Any wetwell section or lid found to have defects, including but not limited to leaks and cracks shall be removed and replaced. Wetwell leaking joints (infiltration of ground water) will not be accepted. Owner will

not accept leak repairs on new construction of wetwells. The leaking wetwell is to be removed and replaced.

6. A final visual observation shall be made by the Engineer and manufacturer's representative. Any deficiencies in the finished coating shall be marked and repaired according to the procedures set forth herein by Manufacturer's Representative.
7. The system may be put back into non-severe operational service as soon as final observation has taken place. However, for severe corrosion duty such as high concentrations of acids, bases or solvents, 3 to 7 days and/or force cure by heat induction to the coated surfaces may be necessary prior to returning to service. Consult coating manufacturer for further details.

3.10 STONE BEDDING

- A. Where, in the Engineer's or Geotechnical Consultant's opinion, subgrade of pipe trench is unsuitable material, Contractor shall remove unsuitable material to a depth determined by Engineer or Geotechnical Consultant and furnish and place stone backfill in trench to stabilize subgrade. Presence of water does not necessarily mean stone backfill is required. If well points or other types of dewatering will remove the water, Contractor shall be required to completely dewater trench in lieu of stone backfill. Stone bedding will be limited to areas where well pointing and other conventional methods of dewatering will not produce a dry bottom.
- B. Stone shall be placed 4 feet wider than the outside diameter of pipe. The pipe shall be carefully bedded in stone as specified, or in accordance with manufacturer's recommendations.

3.11 SAND BEDDING AND BACKFILL

- A. Where, in the Engineer's or Geotechnical Consultant's opinion, character of soil is unsuitable for pipe bedding, even though dewatered, additional depth of excavation as determined by Engineer or Geotechnical Consultant shall be made and replaced with clean sand furnished by Contractor.

3.12 DEFLECTION

- A. It is the Contractor's responsibility to assure backfill is sufficient to limit pipe deflection to no more than 5%. When flexible pipe is used, a deflection test shall be made by Contractor on the entire length of installed pipeline, not less than 30- days after completion of all backfill and placement of any fill. Deflection shall be determined by use of a deflection device or by use of a spherical, spheroidal, or elliptical ball, a cylinder, or circular sections fused to a common shaft. Ball, cylinder, or circular sections shall have a diameter, or minor diameter as applicable, of 95% the inside pipe diameter. The ball, cylinder, or circular sections shall be of a homogeneous material throughout, shall have a density greater than 1.0 as related to water at 39.2

degrees F, and shall have a surface brinell hardness of not less than 150. The device shall be center bored and through bolted with a 1/4 inch minimum diameter steel shaft having a yield strength of 70,000 p.s.i. or more, with eyes at each end for attaching pulling cables. The eye shall be suitably backed with flange or heavy washer; a pull exerted on opposite end of shaft shall produce compression throughout remote end of ball, cylinder, or circular section. Circular sections shall be spaced so distance from the external faces of front and back sections shall equal or exceed diameter of circular section. Failure of the ball, cylinder, or circular section to pass freely through a pipe run, either by being pulled through by hand or by being flushed through with water, shall be cause for rejection of individual run. When a deflection device is used for the test in lieu of a ball, cylinder, or circular sections described, such device shall be acceptable to Engineer prior to use. Device shall be sensitive to 1.0% of diameter of pipe being measured and shall be accurate to 1.0% of indicated dimension. Installed pipe showing deflections greater than 5% of the normal diameter of pipe shall be retested by a run from opposite direction. If retest also fails, the suspect pipe shall be repaired or replaced at no cost to Owner.

3.13 LEAKAGE

- A. In no stretch of sewer between any two adjoining manholes shall infiltration/exfiltration exceed 25 gallons/day/inch of pipe diameter per mile of pipe. In case leakage exceeds this amount, the sewer shall not be accepted until such repairs and replacements are made to comply with above requirements. Such corrections will be made at the Contractor's expense. All visible leaks shall be repaired, regardless of the amount of leakage.
- B. Lines shall be tested for leakage by low pressure air testing, infiltration tests, or exfiltration tests, as appropriate. Low pressure air testing for PVC pipe shall be as prescribed in ASTM F 1417. Prior to infiltration or exfiltration tests, trench shall be backfilled up to at least the lower half of pipe. If required, sufficient additional backfill shall be placed to prevent pipe movement during testing, leaving the joints uncovered to permit inspection. Visible leaks encountered shall be corrected regardless of leakage test results. When water table is 2 feet or more above top of pipe at the upper end of pipeline section to be tested, infiltration shall be measured using a suitable weir or other device acceptable to Engineer. When Engineer determines infiltration cannot be properly tested, an exfiltration test shall be made by filling the line to be tested with water so a head of at least 2 feet is provided above both water table and top of pipe at upper end of pipeline to be tested. The filled line shall be allowed to stand until pipe has reached its maximum absorption, but not less than 4 hours. After absorption, the head shall be re-established. The amount of water required to maintain this water level during a 2-hour test period shall be measured. Leakage as measured by either the infiltration test or exfiltration test shall not exceed 25 gallons per inch diameter per mile of pipeline per day. When leakage exceeds the maximum amount specified, satisfactory correction shall be made and retesting accomplished. Testing, correction, and retesting shall be made at no additional cost to the Owner.
- C. Forcemain pressure testing shall be conducted in accordance with the requirements of

Section 15045.

- D. Closed circuit video observation shall be performed following sewer system construction as described in Section 02955 Sewer Line Cleaning and CCTV Inspection. CCTV inspection videos shall be provided to Owner and Engineer for review.

3.14 CLEANING AND ACCEPTANCE

- A. Before acceptance of sewer system, it shall be tested and cleaned to the satisfaction of Engineer. Where any obstruction is met, Contractor will be required to clean sewers by means of rod and swabs or other instruments. The pipe line shall be straight and show a uniform grade between manholes. The Engineer shall check lines by lamping or other methods as completed by Contractor to determine final acceptance.

3.15 CLOSING PIPE

- A. When work or pipe installation is suspended, either for the night or at other times, end of sewer must be closed with a tight cover. Contractor will be held responsible for keeping the sewer free from obstruction.

3.16 PARTIAL ACCEPTANCE OF THE WORK

- A. Owner reserves right to accept and use any part of the work. Engineer shall have power to direct on what line the Contractor shall work and order thereof.

3.17 RECORD DATA

- A. It will be required of the Contractor to keep accurate, legible records, locating all sewers, tees, and laterals. These records will be made available to Engineer for review with each pay application. Final payment to the Contractor will be withheld until all such information is received and accepted.

3.18 REMOVE AND REPLACE PAVEMENT

- A. Pavement shall only be removed after prior written authorization by the Owner. Pavement removed and replaced shall be constructed in accordance with latest specifications of the South Carolina Department of Transportation, the Contract Drawings, and the project SCDOT Encroachment Permit. Traffic shall be maintained and controlled per SCDOT regulations, Contract Drawings, and project Encroachment Permit.

3.19 CONNECT SEWERS TO EXISTING STRUCTURES

- A. Contractor shall connect the system to existing structures where indicated. For brick structures, a hole not more than 4 inches larger than the outside diameter of new pipe shall be cut neatly in structure, new pipe laid so it is flush with inside face of structure,

and annular space around pipe filled with a damp, expanding mortar or grout to make a watertight seal. For precast structures, core proper size hole in structure for pipe being connected, attach flexible sleeve into cored hole and connect new pipe into flexible sleeve with a stainless steel band.

3.20 FIELD QUALITY CONTROL

- A. Soil and density tests shall be made by a testing laboratory acceptable to the Engineer. Laboratory tests of the soil shall be made in accordance with ASTM D 1557. In-place density tests shall be made in accordance with ASTM D 6938. Results of the tests shall be furnished to the Engineer. All tests within SCDOT rights-of-way shall be in compliance with SCDOT requirements.

The minimum number of tests required shall be:

- Backfill over sewer in traffic areas..... 1 per 100 linear feet or less for each 4 feet of depth or portion thereof.
- Backfill over sewer in non-traffic areas... 1 per 500 linear feet or less for each 6 feet of depth or portion thereof.

3.21 BYPASSING

- A. Bypassing of raw wastewater onto the ground or into a receiving stream is prohibited.

Bypassing shall be accomplished with pumping equipment sufficient to maintain the flow of wastewater. Contractor shall provide pump, hoses, materials, and labor to operate and maintain the bypassing operation. A backup pump shall also be made available by the Contractor. Bypassing operations shall be in accordance with Section 02961 and shall be reviewed and acceptable to the sewer system operator before being implemented.

END OF SECTION 02640

**SECTION 02660
WATER DISTRIBUTION SYSTEM**

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. The Contractor shall furnish and install a potable water piping system, complete, tested and ready for operation. The work shall also include such connections, reconnections, temporary service and all other provisions in regard to the existing operation and modification as is required to perform the new work. All references to Industry Standards (ASTM, ANSI, AWWA, etc.) shall be to the latest revision unless otherwise stated. Only those materials included in the Town of Ridgeland Standard Water and Sewer Specifications, details and testing shall be installed, unless otherwise approved by Owner or Engineer. All materials shall be new unless specifically called for otherwise.
- B. Shop Drawing Submittals
- Complete shop drawings, actual catalog data, brochures and descriptive literature will be required and shall meet the requirements of the Town of Ridgeland Water and Sewer Standards. Submittals shall be in accordance with Section 01340: Shop Drawings, Working Drawings, and Samples. The Engineer may at any time require the Contractor to provide a complete detailed shop drawing submittal for any material which may, in the Engineer's opinion, not be in compliance with the Town of Ridgeland Water and Sewer Standards.
1. The Contractor shall make submittals in the format(s) noted in Section 01340: Shop Drawings, Working Drawings, and Samples for the approval of the Engineer.
 2. The Contractor shall submit all drawings and schedules sufficiently in advance of construction requirements to allow ample time for checking, correcting, resubmitting, and rechecking; no claim by the Contractor for delays arising from his failure in this respect shall be allowed.
 3. All shop drawings submitted must bear the stamp of approval of the Contractor as evidence that the drawings have been checked by the Contractor. Any drawings without this stamp of approval shall not be considered and will be returned to the Contractor for resubmission. If documents vary from the requirements of the Contract Documents because of standard shop practice or other reason, the Contractor shall make mention in such letter of variation in his letter of transmittal in order that, if acceptable, suitable action may be taken for proper adjustment; otherwise, the Contractor shall not be relieved of the responsibility of executing the work in accordance with the Contract Documents even though such shop drawings have been approved.
 4. Where a shop drawing is submitted by the Contractor indicates a departure from the Contract which the Engineer deems to be a minor adjustment in the interest of the Town and which does not involve a change in Contract Price or extension of time, the Engineer will approve the drawings.
 5. The approval by the Engineer of shop drawings will be general and shall not relieve the Contractor from the responsibility for inherent error which may exist.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. All material shall be free from defects impairing strength and durability, shall be of the best commercial quality for the purpose specified, and shall have structural properties sufficient to safely sustain or withstand strains and stresses to which it is normally subjected and be true to detail.

B. Pipe

Pipe for potable water lines in sizes up to and including 48 inches shall be ductile iron, or polyvinyl chloride (PVC) as shown on the drawings and as herein specified. Pipe for potable water lines larger than 48 inches shall be ductile iron. Pipe to be used as a casing in sizes 4 inches and larger shall be welded steel pipe as shown on the drawings and as herein specified. Pipe to be installed underground shall be push-on joint type. Pipe installed on bridges, piles or other above ground installations shall be restrained joint ductile iron pipe or flanged ductile iron pipe as described in these specifications. PVC pipe shall not be used in above ground applications. Underground pipe shall be furnished in nominal 18 or 20-foot laying lengths unless indicated otherwise on the drawings. Pipe shall be cut to length as required to fit installation conditions. Pipe sizes and applications shall conform to the following chart.

PIPE	PIPE SIZE	JOINT TYPE	APPLICATION
Ductile Iron	3 inches and larger	Mechanical joint, push-on joint, flanged joint, ball joint, etc.	water mains and services-3 inches & 4 inches for services only
PVC DR 14, DR 18	14 inches thru 48 inches	Push-on joint	water mains and services-4 inches for services only
PVC, DR 14, DR 18 (C900)	4 inches thru 12 inches	Mechanical joint, restrained	Water fire mains / lines
SDR 21 PVC	2 inches only	Push-on joint	water mains only
Polyethylene	2 inches and smaller	No joints in pipe	services only
Galvanized	smaller than 3 inches	I.P.T.	flushing valves and contaminated soil sites
Steel	4 inches and larger	Welded	casing only

1. Ductile Iron Pipe

Ductile iron pipe wall thickness and pressure class shall conform to ANSI Specification ANSI A21.50 (AWWA C150) and ANSI A21.51 (AWWA C151) with pressure class 150 as a minimum. Pipe shall also be certified by ISO 9000 by an accredited registrar. Each length shall be clearly marked with the name of the manufacturer, location of the foundry, pressure rating, thickness or pressure class, nominal pipe diameter, weight of pipe without lining and length. All pipe furnished by the manufacturer shall be cast and machined at one foundry location to assure quality control and provide satisfactory test data. All ductile iron pipes shall be externally coated and internally lined as specified in this section. All ductile iron pipe shall be color coded blue by field painting a blue stripe, 3 inches wide, along the crown of the pipe barrel.

2. Polyvinyl Chloride Pressure Pipe

- a. Water mains 4” and larger shall be constructed of Polyvinyl Chloride (PVC) pipe with a dimension ratio (DR) of 18 or 14 suitable for a working pressure of 150 PSI at 73.4 F. Pipe shall conform to AWWA Standard C900 for Polyvinyl Chloride Pressure Pipe, 4” through 12” for water distribution, latest edition or revision. Pipe shall be manufactured to cast iron equivalent diameters. PVC DR 25 pipe shall conform to AWWA Standard C905 for 16 inch pipe. Pipe is to be manufactured to ductile iron pipe equivalent outside diameters.
- b. Water mains and fittings smaller than 4” shall be Polyvinyl Chloride (PVC) pipe SDR 21

PR 200 and shall conform to ASTM D2241, latest revision. The pipe shall have a gasketed bell with rubber ring conforming to ASTM F477. Fittings for 2" water mains shall be compatible with the type pipe specified except for flushing connections which shall use solvent weld fittings. Pipe for flushing connections shall be Polyvinyl Chloride (PVC) pipe, Schedule 40 and shall conform to ASTM D1785.

- c. Fittings for four inch (4") and larger pipe shall be ductile iron and shall conform to the type of pipe being installed. The fittings shall have a minimum working pressure of 150 psi. Fittings shall be cement lined in accordance with AWWA C104/ANSI A21.4 American National standard for Cement- Mortar Lining for Ductile-Iron pipe and Fittings for Water and shall be furnished with an external asphaltic coating.
- d. Buried Warning and Identification Tape: Polyethylene plastic and metallic core or metallic-faced, acid and alkali-resistant, polyethylene plastic warning tape manufactured specifically for warning and identification of buried utility lines. Provide tape on rolls, three inch (3") minimum width, color coded as specified below for the intended utility with warning and identification imprinted in bold black letters continuously over the entire tape length. Warning and identification to read, "CAUTION, BURIED (intended service) LINE BELOW" or similar wording. Color and printing shall be permanent, unaffected by moisture or soil.
 - i. Warning Tape Color Codes: Blue (Water Systems)
 - ii. Tape shall be manufactured with integral wires, foil backing, or other means of enabling detection by a metal detector when tape is buried up to three feet (3') deep.
- e. Locate Wire: All water mains shall be provided with 12 gauge continuous wire on top of water main. All 12-gauge wiring shall be terminated inside valve boxes or at a maximum of 475' intervals with a minimum of 36 inches excess wiring rolled up inside the valve box.

3. Steel Casing Pipe (N/A THIS PROJECT)

C. Service Lines

1. Polyethylene Tubing

All services 2 inches and smaller shall be polyethylene tubing. Tubing shall be manufactured of PE 3408, High Density Polyethylene (HDPE), in accordance with AWWA C901, ASTM D1248, ASTM D2239, ASTM D2737 and ASTM D302660. The tubing shall have a minimum working pressure of 200 psi. Polyethylene tubing shall be copper tube size SDR9 and shall be colored blue. HDPE pipe shall have ultraviolet (UV) inhibitors for protection against direct sunlight for 4 years. Inserts for polyethylene tubing shall be 316 stainless steel. Tubing shall be approved for use with potable water by the National Sanitation Foundation (NSF-14) and shall be continuously marked at intervals of not more than two feet with the following:

- a. Nominal size
- b. Pressure rating
- c. NSF seal
- d. Manufacturer's name or trademark
- e. Standard dimension ratio
- f. ASTM specification

D. Fittings

Fittings shall have joints that match the type of pipe furnished except as follows or as otherwise specified. Fittings on 2-inch PVC pipe may be PVC with push-on bell type joint or solvent weld. Fittings 3-inches and larger on push-on joint pipe installed underground shall be ductile iron with mechanical joint ends or PVC with restrained push-on bell type joint. Fittings 3 inches and larger installed above ground shall be ductile iron with flanged ends or restrained joints unless shown otherwise on the drawings. Fittings for fire hydrant laterals shall be ductile iron, including tee to lateral.

FITTING MATERIAL	FITTING SIZE	JOINT TYPE
Ductile Iron	3 inches and larger	mechanical joint, flanged joint, ball joint
PVC DR18	4 inch through 12 inch	push on joint; restrained joint
SCH 40	2 inches only	solvent weld
SCH 80	2 inches only	solvent weld, threaded
SDR 21	2 inches only	push on joint
Polyethylene	2 inches only	butt fused, compression joint
Galvanized	2 inches only	I.P.T.

1. Ductile Iron Fittings

Ductile iron fittings shall have a minimum working pressure of 150 psi. Fittings shall conform to ANSI Specification A21.10 (AWWA C110), A21.11 (AWWA C111), A21.15 (AWWA C115) and/or A21.53 (AWWA C153). Fittings shall also be certified by ISO 9000 by an accredited registrar. Compact fittings shall normally be installed. Long body fittings shall be used where the drawings specifically call for long body fittings, where compact fittings are not available, or at the option of the Contractor when the laying length is not controlled by compact fitting patterns. All fittings shall be UL/FM approved and shall conform to NSF Standard 61 as applicable. All fittings furnished by the approved manufacturer shall be cast and machined at one foundry location to assure quality control and provide satisfactory test data. Fittings shall have cast on them the pressure rating, nominal diameter of openings, manufacturer's name, foundry location, plant code and degrees or fraction of the circle. Cast letters and figures shall be on the outside body of the fitting. The Town may require random ductile testing of manufacturer's fittings. All ductile iron fittings shall be externally coated and internally lined as specified in this section.

a Ductile iron Integral Restraint Joint (IRJ) fittings in sizes 4" through 12" shall meet or exceed the applicable standards cited in this specification. Fittings shall be manufactured of ductile iron (65.45.12) and shall conform to the material and performance requirements of ANSI/AWWA C153/A21.53. Fittings shall be designed for use on ductile iron pipe conforming to ANSI/AWWA C151/A21.51 and PVC pipe conforming to AWWA C900. All fittings shall be provided with integral restraint joints and have seals conforming to ASTM F 477 and the physical testing requirements of AWWA C111. All fittings shall be internally and externally coated as described in paragraph 2.1F. Assembly of fitting joints shall not require beveling of the plain end of a cut pipe and shall not require the use of jacks or power equipment to force the pipe end past the gasket. Fittings shall be manufactured by (Ebba Iron Restrainers, Uni-flange, or Mega-lugs.), or engineer approved equal.

2. Polyvinyl Chloride Fittings

Fittings that are 2-inch may be PVC with push-on bell type joint or PVC with solvent weld joints as outlined in chart of Section 2.1D. Fittings that are 4 inch and larger shall be restrained

push on bell joint. Restraints shall be in accordance with this specification regarding installation and material. The fittings shall conform to the appropriate sections of these specifications for PVC pipe and PVC pipe joints.

a. PVC 1120, Class 150, DR18 Fittings

Fittings shall be PVC injection molded, made from materials meeting or exceeding the requirements of cell class 12454-B material as defined in ASTM D1784. All PVC fittings must comply with, or exceed, AWWA C907. All fittings must be designed to the pressure class of DR18, with a pressure rating of 150 psi and a 2.5 to 1 factor of safety. Virgin materials only shall be used in the manufacture of PVC pressure fittings. These fittings must have UL-FM approval and shall comply with or exceed all ASTM Standards for PVC fittings. All fittings must have NSF-61 approval. The elastomeric gasket shall comply with the requirements specified in ASTM F477 and shall be attached to the bell utilizing glue (AWWA and manufacturer approved type) or rieber ring.

b. PVC 1120, SDR 21, Fittings

SDR 21 fittings shall be injection molded, push on bell type with electrometric rubber seals in accordance with ASTM D3139. Seals shall conform to ASTM F477.

c. PVC 1120, Schedule 40 And Schedule 80 Fittings

Schedule 40 and schedule 80 fittings shall have solvent weld joints and shall be in accordance with ASTM D2672.

3. Polyethylene Fittings

All polyethylene fittings shall comply with NSF-14 requirements. All fittings and couplings shall be thermoplastic nylon 6/6 material suitable for working pressure of 200 psi. Joints on all thermoplastic fittings shall be compression type with 360-degree restraint or threaded as required for a complete installation.

4. Nonstandard Fittings and Wall Castings (N/A THIS PROJECT)

5. Tapping Sleeves

a. Stainless Steel

Stainless steel tapping sleeves shall be used on 4 inch pipe and larger. Stainless steel tapping sleeves shall be all 304 stainless steel, including flanges, bolts and nuts and shall be rated for 150 psi minimum operating pressure and 200 psi minimum test pressure. The tapping sleeve shall have a pilot flange recessed for tapping per MSS SP-60. The pilot flange shall be pressure rated Class D according to AWWA C207 with 125 pound drilling conforming to ANSI B16. Each sleeve shall be supplied with a flange gasket bonded to the flange. The body gasket shall be a full circle, grid pattern, covering the entire length of the sleeve, cloth reinforced, with attached stainless steel bridge to support the gasket at the lugs. The gasket shall be made of SBR rubber or similar material, compounded for use with water, salt solution, mild acids, bases and sewage. The sleeve shall have a 3/4 inch NPT bronze or stainless steel test plug. All welds shall conform to ASTM A380 and shall be fully passivated.

E Joints: Type of joint used shall be approved by the Engineer prior to installation. Joints shall be made in accordance with approved printed instructions of the manufacturer, and shall be absolutely watertight.

1. Mechanical Joints

All jointing materials for mechanical joints shall be provided by the pipe and/or fitting manufacturer. Material assembly and bolting shall be in accordance with ANSI Specification A21.11 (AWWA C111). All glands shall be made of ductile iron only.

2. Push-On Joints

a. Ductile Iron

Push-on joints shall be in accordance with ANSI Specification A21.11 (AWWA C111). All joint material shall be provided by the pipe manufacturer and installation shall be in accordance with the manufacturer's recommended practice.

b. Polyvinyl Chloride (PVC)

PVC pipe joints shall be the manufacturer's standard push-on bell type with rubber sealing ring in accordance with ASTM D3139. Electrometric gaskets shall conform to ASTM F477.

3. Ball and Socket Joints (N/A THIS PROJECT)

4. Flanged Joints

Ductile iron flanged joints shall conform to ANSI A21.10 (AWWA C110) and ANSI A21.15 (AWWA C115). Flanges shall be in accordance with ANSI Specification B16.1, Class 125 with any special drilling and tapping as required to insure correct alignment and bolting. Screwed flanges shall be screwed in tight at the foundry by machine before they are faced and drilled. Flanges for flanged joints and flanged specials shall be integrally cast at right angles to the axis, accurately faced, and drilled smooth and true. Gaskets shall be rubber ring type, cloth inserted, minimum thickness of 1/8 inch and shall be used on all flanges. The entire gasket, including the retainer and sealing ring, shall be one continuous piece. Retainers glued together will not be accepted. Flanged joints shall be made with bolts, bolt studs with a nut on each end, or studs with nuts where the flange is tapped. The number and size of bolts shall conform to the same ANSI standard as the flanges. All flange bolts and nuts shall be 316 stainless steel. Bolt studs shall be of the same quality as machine bolts. Bolts shall be tightened so as to distribute evenly the stress in the bolts and bring the pipe in alignment. The Contractor shall provide suitable filling rings where the layout of the flange piping is such as to necessitate their use. In materials, workmanship, facing and drilling, such rings shall conform to ANSI B16.1 Class 125.

5. Machined Surfaces

Machined surfaces shall be cleaned and coated with a suitable rust preventive coating at the shop immediately after being machined.

6. Steel Casing Pipe Joints (N/A THISPROJECT)

Steel casing pipe joints shall be electric fusion (arc) welded by operators whose qualifications meet the requirements of the American Welding Society Standard procedures and in conformance with AWWA C206.

7. Polyvinyl Chloride Solvent Weld Joints

Pipe joints for schedule 40 or schedule 80 pipe shall be solvent weld joints. The solvent cement shall comply with ASTM D2564. The joint shall be made in accordance with ASTM D2855. The joint shall conform to ASTM D2672.

8. Polyethylene Joints

Polyethylene joints shall be butt-fused, done with polyethylene fittings or brass compression fittings.

9. Restrained Joints

a. Restrainers

The restrainer shall be manufactured of ductile iron and shall meet or exceed all the requirements of ANSI A21.11 (AWWA C111) and ASTM A536. The restrainer system shall provide anchoring of PVC pipe to mechanical joint fittings or bell to spigot PVC pipe joints. Restraints shall provide a full 360 degree contact with sufficient gripping action to secure the clamp to the pipe and be designed so that restraint action is increased as a result of increases in line pressure. The restrainer shall accommodate the full working pressure rating of the pipe plus surge allowance.

b. Retainer Glands

Retainer glands shall be manufactured of ductile iron grade 64-42-10, ASTM A536 or the pre-approved equal and shall be designed to fit standard mechanical joint bells conforming to applicable sections of ANSI A21.10 (AWWA C110), ANSI A21.11 (AWWA C111) and ANSI A21.53 (AWWAC153). The restraining device shall be rated for the full working pressure of the pipe type used including surge allowance and a 2:1 safety factor. Mechanical restraints shall include a restraining mechanism which, when actuated, imparts a wedging action against the pipe, increasing its resistance as the pressure increases. The restraint shall be compatible with the type of joint being installed. The joint deflection shall not exceed 80% of the pipe manufacturer's recommended maximum deflection. Deflection, if necessary shall be made before tightening the set screws. Bolts and set screws shall be tightened alternately, 180 degrees apart, to the torque recommended by the manufacturer. Retainer glands having set screws that make point contact with the pipe without using a pad to disperse point loading shall not be used on PVC pipe. The restraining device shall not damage or lower the working pressure of the pipe installed. Retainer glands shall be either EBBA Iron or Uniflange.

10. Flange Adapters

Flange adapters shall be ductile iron manufactured to ASTM A536 standards. Bolt circles and bolt holes shall meet ANSI B16.1 for 125 pounds. Adapter flanges shall meet or exceed all test requirements of AWWA C900, ASTM D2241 and ASTM D1599.

11. Pipe Couplings

The Contractor shall furnish and install pipe couplings as required to complete the work. Pipe couplings used to join two pieces of ductile iron pipe or PVC pipe shall be sized to match the outside diameter of the pipeline. Transition couplings shall be used to join pipes of different outside diameters. The coupling sleeve shall be manufactured of ductile iron conforming to ASTM A536 and be coated with 14 mils of epoxy. The bolts shall be manufactured of a metal of high corrosion resistance and shall conform to ANSI 21.11 (AWWA C111). Gaskets shall be wedge-type and manufactured of virgin SBR for water and sewer service. The installation of all couplings shall be in accordance with manufacturer's recommendations. After installation, all coupling surfaces including bolts and nuts shall be coated with an approved coating as specified in this section of these specifications. Couplers and adapters for polyethylene pipe shall be brass conforming to AWWA C800 and shall be female IPT, pack joint or compression nut.

12. Full Circle Repair Clamps

Full circle repair clamps shall have type 304 stainless steel shells, lugs, bolts, nuts and washers as per ASTM A193, A194, A240, or shall have type 304 stainless steel shells per ASTM A240, ductile iron lugs as per ASTM A536, and 304 stainless steel bolts, washers and nuts. Gaskets for both types shall be virgin SBR as per ASTM D2000 for water and sewer service.

F. Corrosion Protection for Ductile Iron Pipe Interior Lining

The interior of all ductile iron pipe, fittings and specials shall be thin cement lined. The lining shall

comply with ANSI Standard A21.4 (AWWA C104).

1. Exterior Coating

All ductile iron pipe and fittings except on bridges or as otherwise noted, shall receive an exterior bituminous coating as specified in ANSI A21.51. The finished coating shall be continuous smooth, neither brittle when cold nor sticky when exposed to the sun, and be strongly adherent to the fitting. All bolts, nuts, studs and other uncoated parts of joints for underground installation shall be coated with asphalt or coal-tar prior to backfilling. Pipes crossing under ditches, culverts, rivers, creeks, etc., shall be considered as buried pipe. All ductile iron pipe shall be color coded blue by field painting a blue stripe, 3 inches wide, along the crown of the pipe barrel.

2. Polyethylene Wrap

a. Material

The polyethylene material shall meet or exceed the requirements of AWWA C105 in all respects. The wrap shall be virgin, high density polyethylene, 4 mils thick minimum. The polyethylene wrap shall be white with 2 each, 6 inch wide, continuous blue tapes located at the 2:00 and 10:00 o'clock position on the pipe.

b. Installation

Although not intended to be a water-tight enclosure, the polyethylene shall prevent contact between the pipe and the surrounding backfill. Installation shall be done according to one of the methods described in AWWA C105, subject to approval by the Engineer and the manufacturer.

G. Piping Supports (NOT USED)

1. Casing Spacers (NOT USED)

H. Material Warranty

The manufacturer of materials furnished on the project shall supply to the Town of Ridgeland, a one (1) year unconditional warranty. The warranty shall be limited to the material which shall constitute complete replacement and delivery to the site of materials only to replace defective materials with new materials conforming to the specifications. This warranty is contingent upon determination of failure by a private independent testing laboratory. The testing shall prove that the failure was caused by failure of the material. The testing laboratory shall be selected by and agreed upon by both parties involved. This warranty is in addition to any warranty required for pipe linings herein before specified.

I. Material Testing

The Town of Ridgeland requires all materials furnished to conform to the following standards. The entire product of any manufacturer or of any one part may be rejected when, in the opinion of the Town of Ridgeland, the methods of manufacture fail to secure uniform results acceptable to the requirements of these specifications. Pipe and materials shall be tested in, and for conformity with, the latest editions of the following:

<u>Item</u>	<u>Specifications</u>
Ductile Iron Pipe and Fittings	ANSI A21.50 (AWWA C150) ANSI A21.51 (AWWA C151) ANSI A21.53 (AWWA C153)
Polyvinyl Chloride Pipe and Fittings	ASTM D1598 ASTM D1599 ASTM D1784 ASTM D1785

ASTM D2122
ASTM D2241
ASTM D2564
ASTM D2672
ASTM D2837
ASTM D2855
ASTM D3139
ASTM F477
AWWA C900
AWWA C905
AWWA C907

Polyethylene Tubing ASTM D1248
 ASTM D2239
 ASTM D2737
 ASTM D302660
 AWWA C901

J. Water Meter Boxes:

Water meter boxes shall be manufactured by GlasMasters Jacksonville, FL or equal. One Inch Water Meter Boxes shall be 11” x 18” in size with Reader Lid 4 x 7, hinged, Part No S1118RN Access Cover. Enclosures shall be flared with mouse holes Part No S111812F2N. One and a half inch or Two Inch Water Meter Boxes shall be 15” x 27” in size with Reader Lid 4 x 7, hinged, Part No S1527RN Access Cover. Enclosures shall be flared with mouse holes Part No S152712F2N. For applications where water meter box is to be placed in the sidewalk or grassed areas Load Rating to be TIER 8. For applications where water meter box is to be placed in a parking area Load Rating to be TIER 15.

PART 3 - EXECUTION

3.1 REFERENCE POINTS AND LAYOUT

A. The Contractor shall be responsible for setting all grade, lines and levels. The Contractor or Contractor’s Surveyor will provide centerline of construction; the engineer will provide a reference benchmark. Any reference points, points of intersection, property corners, or bench marks, which are disturbed during construction, shall be restored by a Land Surveyor registered to practice in the State of South Carolina, and all costs thereof shall be borne by the Contractor. The Contractor shall assume all responsibility for the correctness of the grade and alignment stakes.

3.2 HANDLING AND CUTTING PIPE

A. Every care shall be taken in handling and laying pipe and fittings to avoid damaging the pipe, scratching or marring machined surfaces, and abrasion of the pipe coating. Any fitting showing a crack and any fitting or pipe which has received a severe blow that may have caused an incipient fracture, even though no such fracture can be seen, shall be marked as rejected and removed at once from the work. In any pipe showing a distinct crack in which it is believed there is no incipient fracture beyond the limits of the visible crack, the cracked portion, if so approved by the Town of Ridgeland, may be cut off before the pipe is laid so that the pipe used shall be perfectly sound. The cut shall be made in the sound barrel at a point at least 12 inches from the visible limits of the crack. Except as otherwise approved, all cutting shall be done with a power driven cut off saw. All cut ends shall be examined for possible cracks caused by cutting.

3.3 PIPE INSTALLATION

A. General Requirements

Water mains shall be constructed of the materials specified and as shown on the drawings. All PVC C900/C905 pipe shall be laid in accordance with AWWA C605. Pipe and fittings shall be carefully handled to avoid damage, and if feasible, while they are suspended over the trench before lowering, they shall be inspected for defects and to detect cracks. Defective, damaged or unsound pipe or fittings shall be rejected. Each section of the pipe shall rest upon the pipe bed for the full length of its barrel, with recesses excavated to accommodate bells and joints. Any pipe which has its grade or joint disturbed after laying shall be taken up and re-laid. All precautions shall be taken to prevent sand or other foreign material from entering the pipe during installation. If necessary, a heavy, tightly woven canvas bag of suitable size shall be placed over each end of the pipe before lowering into the trench and left there until the connection is made to the adjacent pipe. Any time the pipe installation is not in progress, the open ends of pipe shall be closed by a watertight plug or other method approved by the Engineer. Plugs shall remain in pipe ends until all water is removed from the trench. Any sand or foreign material that enters the pipe shall be removed from the pipe immediately. No pipe shall be installed when trench conditions (standing water, excess mud, etc.) or the weather (rain, etc.) is unsuitable for such work, except by permission of the Engineer. Any section of pipe already laid which is found to be defective or damaged shall be replaced with new pipe.

B. Pipe Cover

The cover over all piping shall be a minimum of 30 inches in unpaved areas and 36 inches in paved areas with a maximum of 60 inches unless specifically approved otherwise. Cover for pipe under pavement shall be measured from the finished grade. Any reduction in pipe cover will require approval from the Town of Ridgeland and the Engineer. Greater depths will be permitted where required to miss obstructions only. Lines shall be located as shown on the drawings. The Contractor shall investigate well in advance of pipe laying any conflicts which may require readjustments in planned locations and advise the Engineer of the results of these investigations so that the Engineer may give instructions as to the modifications required. Refer to backfill and compaction requirements in Section 02640 Sewer System Construction.

C. Installation of Iron Piping

All iron pipe and fittings shall be laid in accordance with the pipe manufacturer's recommendations and the American Water Works Association Specification AWWA C600.

D. Thrust Restraint

1. All non-flanged fittings and valves shall be restrained using one of the following methods:

- a. Mechanical restraint at fittings and valves and mechanical restraint along adjacent joints of pipe to a length as specified in the following table.

All Mechanical Joint Fittings must be restrained using either EBBA Iron Restrainers, Uni-flange, or Mega-lugs. Rod restraints will be approved on an individual basis only.

No thrust blocks will be used without prior approval of Town of Ridgeland Water and Sewer Department.

CHART “F”

MINIMUM LENGTH TO BE RESTRAINED ON EACH SIDE OF FITTING (FEET)									
NOMINAL PIPE SIZE (INCHES)	11 1/4° Horizontal Elbow	22 1/2° Horizontal Elbow	45° Horizontal Elbow	90° Horizontal Elbow	Horizontal Tees	Horizontal Plugs and Valves	45° Vertical Offset Upper length/low per length	22½° Vertical Offset Upper length/lower length	Reducer (to 1 size smaller) Length on Larger Size Side
4	2	4	8	20	20 - run 1 - branch	50	20/3	8 / 1	n/a
6	2	5	10	28	20 - run 1 - branch	70	28/4	11 / 2	28
8	3	6	14	36	20 - run 1 - branch	90	36/5	14 / 3	30
10	4	8	18	40	20 - run 1 - branch	110	45/6	17 / 3	29
12	4	9	20	50	20 - run 1 - branch	120	52/8	20 / 4	50
14	5	10	23	56	20 - run 10 - branch	140	60/9	23 / 4	30
16	6	11	26	60	20 - run 26 - branch	160	67/10	26 / 5	30
18	6	12	29	69	20 - run 41 - branch	180	74/12	29 / 5	29
20	7	13	32	75	20 - run 55 - branch	195	80/13	36 / 6	29
24	7	15	33	76	20 - run 58 - branch	200	81/14	37 / 7	55
30	9	18	36	88	20 - run 77 - branch	235	97/16	44 / 8	77
36	10	20	40	100	20 - run 115 - branch	270	110/20	51 / 10	77

NOTE: Table assumptions: PVC pipe, Safety Factor = 1.5, Soil = GM or SM, 3 ft. bury depth to top of pipe, trench type 3, branch on tee is one size smaller than run of tee size and 20 feet of pipe is installed past the tee on the run side (smaller branch sizes must be calculated by the engineer). Vertical offsets are 3 feet deep on top and 8 feet deep on bottom. Reducers are calculated for one size reduction. Test pressure of 150 psi.

The use of thrust blocks shall be limited to situations such as point repair where exposing several joints of pipe is not feasible due to existing ground conditions and also must be used with mechanical joint restraining devices when, in the judgment of the Engineer, the nature and criticality of an

installation is such as to require positive assurance of stability. Concrete collars with tie rods may be used on dead end lines at the Contractor's discretion.

Concrete used for this purpose shall be 2,500 psi minimum. When applicable, schedule and details for the required thrust blocks are included on the drawings. The use of thrust blocks will only be approved by the Town of Ridgeland for special conditions.

2. Joint Restraints within Carrier Pipe (N/A THIS PROJECT)
 3. Casing Spacer Installation (N/A THISPROJECT)
- E. Water Main and Non-Water Main Separation Requirements
1. Separation of Water Mains and Sewers shall conform to the requirements of South Carolina DES (formerly DHEC) State Primary Drinking Water Regulations 61-58, Finished Water Pumping, Storage and Distribution Facilities section D. Distribution Systems (12).
 - (a) Parallel installation - Water mains shall be laid at least ten (10) feet horizontally from any existing or proposed sewer. The distance shall be measured edge to edge. In cases where it is not practical to maintain a ten foot separation, the Department may allow deviation on a case-by-case basis, if supported by data from the design engineer. Such deviation may allow installation of the water main closer to a sewer, provided that the water main is laid in a separate trench or on an undisturbed earth shelf located on one side of the sewer at such an elevation that the bottom of the water main is at least eighteen (18) inches above the top of the sewer.
 - (b) Crossings - Water mains crossing sewers shall be laid to provide a minimum vertical separation of eighteen (18) inches between the outside of the water main and the outside of the sewer. This shall be the case whether the water main is either above or below the sewer line. Whenever possible, the water main shall be located above the sewer line. Where a new water main crosses a new sewer line, a full length of pipe shall be used for both the water main and sewer line and the crossing shall be arranged so that the joints of each line will be as far as possible from the point of crossing and each other. Where a new water main crosses an existing sewer line, one full length of water pipe shall be located so both joints will be as far from the sewer line as possible. Where a water main crosses under a sewer, adequate structural support shall be provided for the sewer line to prevent damage to the water main.
 - (c) Special Conditions - When it is impossible to obtain the distances specified in R.61-58.4(D)(12)(a) and (b) the Department may allow an alternative design. Any alternative design shall:
 - (i) maximize the distances between the water main and sewer line and the joints of each;
 - (ii) use materials which meet the requirements R.61-58.4(D)(1) for the sewer line; and,
 - (iii) allow enough distance to make repairs to one of the lines without damaging the other.
 - (d) Force mains - There shall be at least a ten (10) foot horizontal separation between water mains and sanitary sewer force mains. There shall be an eighteen (18) inch vertical separation at crossing as required in R.61-58.4(D)(12)(a) and (b).

- (e) Sewer manholes - No water pipe shall pass through or come in contact with any part of a sewer manhole. Water lines may come in contact with storm sewers or catch basins if there is no other practical alternative, provided that ductile iron is used, no joints of the water line are within the storm sewer or catch basin and the joints are located as far as possible from the storm sewer or catch basin.
- (f) Drain-fields and Spray-fields - Potable water lines shall not be laid less than twenty-five (25) feet horizontally from any portion of a waste-water tile-field or spray- field, or shall be otherwise protected by the method approved by the Department.

F. System Connections

All connections and ties to the Town of Ridgeland Water System and transfer of services will be performed by the Contractor under supervision of the Town of Ridgeland's representative.

1. Water Main Connections

Tapped connections in the barrel of a pipe shall be less than the diameter of pipe being tapped except 4 inch pipe which may be tapped with a 4 inch tapping sleeve and valve. No taps shall be made within 5 feet of a joint. When making 2 inch PVC water main connections to water mains, a flexible connection shall be made using 2 inch polyethylene pipe one foot long (minimum). The polyethylene pipe shall tie to the existing water main and then tie to the new 2 inch PVC water main. There shall be a stainless steel nipple between saddle and valve on 2 inch water main connections.

2. Water Service Connections

Water services to be Polyethylene – Orangeburg #4-05110, 3406 or Drisco pipe 3408, 5100 ultra-line. All long and short side water services are to be one inch (1") minimum.

G. Field Testing

1. Disinfection Tests

- a. All water pipe and fittings of whatever size and wherever installed on potable water lines shall be thoroughly disinfected prior to being placed in service. Disinfection shall follow the applicable provisions of the procedure established for the disinfection of water mains as set forth in AWWA Standard C651 entitled "AWWA Standard for Disinfecting Water Mains".

Temporary blow-offs, shall be installed for the purpose of clearing the water main. Blow-offs installed on water mains up to and including 12 inches shall be the same diameter as the water main. Blow-offs installed on 16 inch water mains and larger shall be the next smaller size, in diameter, than the water main being tested. Temporary blow-offs shall be removed and plugged after the main is cleared. The Town of Ridgeland Representative shall be present prior to and during the operation of blow- offs. The main shall be flushed prior to disinfection.

The new water main shall be connected to the existing water main at one point only for flushing purposes (no looping). The new main MUST have a blow off on the end as required previously. After the new main is thoroughly flushed, the open end shall be sealed and restrained and the main shall be thoroughly disinfected as specified.

The contractor may use a separate source of water for flushing purposes. Upon completion of the flushing, the contractor shall proceed with disinfection as specified.

Anytime the new line is reopened (to repair defective joints or pipe, defective fitting or valve) the complete disinfection process shall be repeated.

Once bacteriological clearance (on 2 days of samples) has been approved, the main may be pressure tested against an existing system valve.

No new water main may be put in service until a Certification of Completion has been approved by the South Carolina Department of Environmental Services (SCDES formerly SCDHEC). The contractor must supply to the Engineer SCDES acceptable record drawings or As-Builts, accurately depicting installed conditions for the Certification of Completion. The Contractor shall allow time for this process to be completed.

2. Leakage and Pressure Tests

See Section 15045 Pressure Testing

3. Locate Wiring Testing

Installed locate wiring shall be tested by the contractor with an approved testing company using approved equipment. Locate wire testing company must be provided a copy of the As-Builts.

4. Soil and Density Tests

Reference soil and density testing requirements in Section 02640 Sewer System Construction, paragraph 3.2 Field Quality Control.

H. Inspection

All pipe and fittings shall be subject to inspection at time of delivery and also in the field just prior to installation. All pipe and fittings which in the opinion of the Engineer do not conform to these specifications will be rejected and shall be removed by the Contractor at the Contractor's expense. An authorized Town of Ridgeland representative must be present for all pressure and leakage testing, connections to the Town's existing lines and the collection of water samples.

I. State Highway Crossings

Permits for all work within the right-of-way of a State Highway will be obtained by the Engineer. The Contractor shall, however, verify the existence of the permit before commencing work in this area. All work related to the State Highway crossing shall be in full compliance with the requirements of the South Carolina Department of Transportation permit and in accordance with the South Carolina Department of Transportation standard specifications. Unless otherwise shown on the drawings or specified herein, State Highway crossings shall be made by jacking a steel pipe casing, of the size shown on the drawings and shown in the Town of Ridgeland Standard Details, under the highway at the elevations and locations shown. The water main shall then be placed in the casing with approved casing spacers as specified in this section. All joints within carrier pipe shall be mechanically restrained joints. After inspection, the ends of the casing shall be filled with 2500 psi concrete not less than 8 inches thick.

J. Railroad Crossings (N/A THIS PROJECT)

K. Locate Wiring

Contractor shall furnish and install #12 copper locate wiring and warning tape on all PVC water mains and polyethylene and PVC water services installed. Locate wire on services shall be limited to a continuous loop of wire extending 3 feet along the service from the main. Locate wire must be attached to water mains and services with plastic zipper type ties at each side of bell joint or fitting and at 10-foot intervals along pipeline. Locate wire shall be brought to within 8 inches of grade within a valve box or water meter box flush with finished surface with 36 inches of locate wire rolled up inside box at 475 foot intervals. Locate wire shall be installed in box and along pipeline as detailed in the Town of Ridgeland Standard Details. Locate wire shall be installed in either the 1:00 or 11:00 position on the pipe. Locate wire shall be attached to intersecting ductile iron or galvanized pipeline using a three way splice and brass split ground clamp with wire installed around brass nipple. Locate wiring must have the ability to conduct an electrical current; therefore, the wiring must be continuous without any breaks in the line spliced as per the Town of Ridgeland Standard Details. Locate wire shall be spliced with the Town of Ridgeland approved wire connectors.

L. New Water Services

New water services shall be furnished and installed in the sizes and locations indicated on the Contract documents. Short services shall be services installed on the same side of the road as the water main. Long services shall be services installed on the opposite side of the road as the water main. Typically water services for Town of Ridgeland projects will be installed by the jack & boring or underground piercing tool method. No open cutting of roadway will be allowed for water services.

M. Renewal and Transfer of Water Service

1. General

Where a new water main is installed or where an existing water main is relocated or replaced, as shown on the drawings or where necessary due to a direct conflict with proposed construction and when approved by the Engineer, the Contractor shall install new piping from the water main to each existing water meter.

2. Service Line Size

Service lines and component parts thereof shall be sized based on the existing meter size as follows:

SINGLE METER SERVICES		
Meter Size	Service & Tap Size	Curb Stop Size
3/4"	1"	1"
1"	1"	1"
1-1/2"	1-1/2"	1-1/2"
2"	2"	2"

N. Contractor Warranty

The Contractor shall supply to the Town of Ridgeland a one (1) year unconditional warranty. The warranty shall include materials and installation and shall constitute complete replacement and delivery to the site of materials and installation of same to replace defective materials or defective workmanship with new materials/workmanship conforming to the specifications.

END OF SECTION 02660

**SECTION 02661
WATER VALVES & APPURTENANCES**

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. The Contractor shall furnish, install, joint, and test all gate valves, butterfly valves, check valves and other special valves and appurtenances as shown on the drawings and herein specified. All references to Industry Standards (ASTM, ANSI, AWWA, etc.) shall be to the latest revision unless otherwise stated. Only those materials included in the Town of Ridgeland Water and Sewer Standards, Details and Materials Manual shall be installed. All materials shall be new unless specifically called for otherwise.

1.2 ROTATION OF OPENING

- A. All valves larger than two inches installed within a water system to be the Town of Ridgeland owned shall open by turning to the left or counter-clockwise, when viewed from the stem.

1.3 EXTENSION STEMS

- A. Where extension stems are required substantial, adjustable wall brackets and extension stems shall be furnished and located as directed. Extension stems shall be provided on all buried valves when the operating nut is deeper than 30 inches below the final grade. Sufficient stem extension shall be provided so that the nut will be no more than 30 inches below finished grade.

1.4 PAINTING OF VALVES AND VALVE BOX LIDS

- A. The top side of all water valve box covers shall be painted blue except for gate valves at fire hydrants. Top of valve box covers at fire hydrants shall be painted yellow. Oil based, traffic-rated paint shall be used.

1.5 HYDROSTATIC AND LEAKAGE TEST

- A. The Contractor shall be required to perform a separate hydrostatic/leakage field test on each valve installed to insure it is bubble tight. The duration of this test shall be 15 minutes at 150 psi and conform to AWWA C504. The method of performing this test shall be left up to Contractor with the Engineer's approval. The failure of the valve to perform will result in its removal from the job site and replacement by the Contractor at the contractor's expense.

1.6 LOCATING MARKERS FOR VALVES

- A. A 'V' cut shall be carved in the curb closest/adjacent to a below grade valve. This 'V' cut shall be painted blue.

PART 2 - PRODUCTS

2.1 GATE VALVES

- A. General

Gate valves 3 to 12 inches in diameter shall be designed for 200 psi minimum working pressure. Valves over 12 inches in diameter shall be designed for 150 psi minimum working pressure. When full open,

gate valves shall have a clear waterway equal to the nominal diameter of the pipe. The operating nut or wheel shall have an arrow cast in the metal indicating the direction of opening. Each valve shall have the manufacturer's distinctive marking, pressure rating and year of manufacture cast on the body. Prior to shipment from the factory, each valve shall be tested by applying to it a hydraulic pressure equal to twice the specified working pressure.

B. Buried Valves

Buried gate valves shall be iron body bronze mounted, rubber encapsulated, resilient seat, solid wedge, non-rising stem type with operating nuts and adjustable valve boxes and covers. Operating nuts shall be two inches square. Resilient seat gate valves shall conform to applicable sections of AWWA Standards C509 resilient seat. All gate valves 20 inches or larger must be bevel geared for both horizontal and vertical installations. All valves shall be installed vertically unless additional depth of bury is impossible due to physical obstructions. Gate valves shall open counterclockwise.

C. Above Ground Valves

Gate valves located above ground or inside structures shall be hand wheel operated, non-rising stem type with flanged ends and be of the same general construction as buried valves.

D. Valve Joints

All gate valves shall have mechanical joint ends, flanged ends, or screw joints to fit the pipe run in which they are used, except valves installed on push-on joint pipe shall have mechanical joint ends unless otherwise specified.

2.2 MISCELLANEOUS VALVES AND APPURTENANCES

A. Tapping Valves

1. General

Tapping valves shall be iron body, bronze mounted gate valves, non-rising stem, open left, resilient seat, 2 inch square operating nut, for vertical mounting in approximately level setting on buried water lines. The valve ends shall be mechanical joint for use with ductile iron pipe on one side and standard flanged (Class 125) on the other. Valves shall conform to the applicable section of these specifications.

2. Disinfection of Tapping or Drilling Machine

Prior to tapping a potable water main, the drilling machine's pilot drill, shell cutter and cutter hub shall be sterilized in accordance with the following procedure:

Four gallons of potable water shall be combined with 8 oz. of sodium hypochlorite (household bleach); the pilot drill, shell cutter and cutter hub shall be swabbed until clean or totally immersed in the sterilizing solution and allowed to remain wet at least five minutes before tapping operation commences. It is not necessary to rinse the sterilizing solution from tapping components prior to use.

3. Hydrostatic and Leakage Test

After installing a tapping sleeve and valve, and prior to tapping of a pressurized water main, a hydrostatic and leakage test shall be performed. The test will be conducted by introducing water into tap or test hole located at the neck of the outlet half of the sleeve, on sleeves furnished with

said tap, and with the tapping valve in the closed position. Sleeves shall be provided with a test plug. The sleeve and valve shall be capable of maintaining a test pressure of 150 psi for 30 minutes duration, with no sign of visible leaks. All leaks shall be repaired by removing and replacing defective items with items free of defects, after which the sleeve and valve shall be re-tested. Such repair and re-testing shall be done until the installation passes the specified test. The Contractor shall furnish and install any necessary temporary restraints, gauges, pumps and other incidental and appurtenant items necessary to complete this work, and shall remove same upon completion of the test. A watertight plug shall then be inserted into the testhole.

B. Corporation Stops

All corporation stops to be Ford ball corp. FB 1600 AWWA/cc taper thread inlet by female iron pipe thread outlet or FB1000 ball corp with grip joint, McDonald 4701BT. Corporation stops shall be required on all services regardless of service size.

C. Curb Stop

Curb stops must be either Ford B41-343W-G (3/4' x 1") and B41-344W-G (1") both with grip joints or McDonald 6102 W.T.

Adapters can be Ford C84 series with grip joint or Mueller H-15428.

Separate services to be terminated with a curb stop in meter box one foot (1') off property line and minimum of two feet (2') off side property line. Either Brook #37 with 37H lid, for one inch (1"), Brook #38 with 38H lid for 1½", Brook #65 with 65H for 2", or DPW Model D-1200 for one inch (1") services. When performing pressure tests, curb stops must be capped or plugged and tested in the open position.

D. Ball Valves

Ball valves shall be limited to 3/4 inch through 2 inches in size and shall have cast bronze body, bronze tee head, stem with check, full roundway opening and provisions for locking in a closed position. Ball valves for use with copper services shall have an inlet connection with a flare nut fitting for Type K copper tubing and an outlet connection with female iron pipe thread, or shall have an inlet connection with a compression joint (insert stiffener will be used with plastic service connections) and an outlet connection with female iron pipe thread. Ball valves for use with Schedule 40 PVC pipe shall have an outlet connection with female iron pipe threads and an inlet connection with either a compression joint or female iron pipe threads. The latter will require the use of an approved Schedule 40 PVC Adapter (MIPT X SLIP). Compression joints will require insert stiffeners. Below grade ball valves on water mains must have two inch (2") operating nuts and be installed in standard valve boxes.

E. Service or Tapping Saddle

Water services to be made with service saddle for C.I. or AC to be double strapped JCM 402, Mueller H- 10500, Smith-Blair 313, or Ford 202 and must be CC threads (AWWA) unless otherwise indicated in the contract plans.

Service saddles for PVC C-900 water pipe are Mueller (H-134—series or Ford S90). Taps to existing water mains will be made with an approved stainless steel tapping sleeve and resilient seat tapping valve.

Taps to existing water mains will be made with an approved stainless steel tapping sleeve and resilient seat tapping valve.

2.3 FIRE HYDRANTS

A. General

Fire hydrants shall be 4 ½ inch ductile iron body, fully bronze mounted, for 150 psi working pressure, complying with AWWA Standard C502. Fire hydrants to be Mueller #A421 or #A423, Clow Medallion, or M&H AWWA C-502 style 129 Traffic Model, 4½” main valve size. Unless otherwise stated, all drain holes must be rocked with 57 stone. The inlet connection shall be mechanical joint type, with accessories, for 6 inch ductile iron pipe. The hydrant foot shall be epoxy coated and have integral cast tie-back lugs. The integral shut-off valve shall be compression type opening against water pressure, right hand openings. Valve diameter and general interior design shall be sufficient to provide head loss/flow quantity ratios less than specified in the above cited Standard. The main valve seat and the threaded portion of the hydrant into which it screws shall be bronze. The hydrant barrel drain valve and port shall be bronze. The hydrant barrel drain shall be actuated by operation of the main valve stem. The stem operating threads and thrust bearing shall be sealed by "O" rings, from exposure to moisture and shall be provided with means for lubrication. The hose nozzles shall be bronze with National Standard fire hose coupling screw threads, one 4 inch pumper nozzle and two 2 ½ inch hose nozzles. The hydrant operating nut and nozzle cap nuts shall be 1¼” square. Pipe used for fire hydrant laterals shall be ductile iron Pressure Class 350, or Class 150 DR18 PVC. Tees and bends leading to fire hydrants shall be ductile iron only. The nozzle caps shall be securely chained to the hydrant barrel. The chains shall be free from rust or corrosion and painted to match the color of the hydrant. The hydrants shall be "Traffic" type with a frangible flange or lugs and operating stem section at the ground line. The hydrant shall be painted with the above ground finish color "Traffic Yellow".

B. Installation

Fire hydrants shall be installed at the locations shown on the drawings in accordance with the Town of Ridgeland Standard Details.

C. Independent Valve

Independent valve furnished with each hydrant shall be 6 inch, non-rising stem gate valve with mechanical joint ends in conformance with the sub-section entitled "Gate Valves" of these specifications. Independent valves shall be provided with a cast iron valve box in conformance with the sub-section entitled "Valve Boxes".

D. Hydrostatic and Leakage Test

Hydrostatic and leakage tests shall be conducted in accordance with AWWA C502, Section 5.

2.4 VALVE BOXES

A. General

The Contractor shall furnish, assemble and install a valve box for each buried valve. Each valve box installed in non-paved areas shall be installed with a 24 inch round, 6 inch thick concrete collar with #4 reinforcing bars, poured around the top of the valve box cover. The concrete shall have a minimum strength of 3000 psi. Provide brass identification tag with "Water", valve size and valve type epoxyed or riveted to interior of valve box. Tag shall be 2 inch diameter, 1/8 inch thick brass, located a maximum of 2 inches below the top of the valve box.

B. Valve Boxes

Adjustable valve boxes of suitable length shall be used. Cover shall be marked "Water". The top section

shall be adjustable for elevation and shall be set to allow equal movement above and below finished grade. The base shall be centered over the valve and shall be on line with nut at top of valve stem and the entire assembly shall be plumb. Boxes for paved areas shall be cast iron. Boxes for non-paved areas may be PVC. Cast iron castings shall be manufactured of clean, even grain, gray cast iron conforming to ASTM Designation A48, Class 20B, Gray Iron Castings; and shall be smooth, true to pattern, free from blow holes, sand holes, projections, or other harmful defects and shall be coated with a single thin coat of coal tar epoxy. The cover will not rock after it has been seated in any position in its associated jacket.

C. Debris Cap

Debris caps shall be required in all valve boxes. The debris cap shall be comprised of a hollow member having a cylindrical outer surface, a closure for one end and three point resilient contact pads projecting from the outer surface. One contact pad shall be movable by means of a cam having a low angle of advance whereby external forces applied to the cam via the movable contact pad will not cause rotation of said cam. The cap shall have a flexible skirt providing an outward seal preventing debris from getting past the cap. The cap must withstand without slippage, a minimum vertical force of 50 lbs. at a loading rate of 1.0 inches/minute. The cap shall have retaining prongs to retain a standard locating coil, and shall be capable of installing a standard fitting for “Lock-out/Tag-out” in compliance to all standards and requirements of State and Federal OSHA guidelines.

2.5 METER BOXES

A. Concrete

Where called for on the drawings, concrete meter boxes shall be the type as listed in the Town of Ridgeland Water and Sewer Standards, Details and Materials and shall be installed in accordance with the Town of Ridgeland Water and Sewer Standard Details. Concrete meter boxes will only be allowed in driveway and sidewalk areas.

B. Copolymer

Where called for on the drawings, copolymer meter boxes shall be the type as listed in the Town of Ridgeland Water and Sewer Standards, Details and Materials and shall be installed in accordance with the Town of Ridgeland Water and Sewer Standard Details. Copolymer meter boxes will be used in all grass areas.

2.6 BACKFLOW PREVENTION DEVICES

A. Backflow Preventers for Water Service

1. General: Backflow preventers shall work on the reduced pressure principle. The backflow preventer assembly shall consist of two (2) spring-loaded check valves, automatic differential pressure relief valve, drain valves and shut-off valves. The body material shall be bronze or cast iron for a working pressure of not less than 150 psi, with bronze or stainless steel trim. Drain lines with air gaps shall be provided. Rock type hot box enclosure shall be provided to enclose backflow preventer assembly.
2. Manufacturers:
 - a. Febco, Fresno, CA.
 - b. Hersey, Cleveland, NC.
 - c. Ames, Woodland, CA.
 - d. Watts Regulator Co., N. Andover, MA.

- e. Wilkins, Paso Robles, CA.
- f. Conbraco, Matthews, NC.

2.7 WATER METERS

A. Compound Water Meter

Where called for on the drawings, compound water meters shall be the type as listed in the Town of Ridgeland Water and Sewer Standards, Details and Materials and shall be installed in accordance with the Town of Ridgeland Water and Sewer Standard Details.

B. Turbine Water Meter

Where called for on the drawings, turbine water meters shall be the type as listed in the Town of Ridgeland/ Water and Sewer Standards, Details and Materials and shall be installed in accordance with the Town of Ridgeland Water and Sewer Standard Details.

C. Compact Fireline Water Meters

Where called for on the drawings, compact fireline water meters shall be the type as listed in the Town of Ridgeland Water and Sewer Standards, Details and Materials and shall be installed in accordance with the Town of Ridgeland Water and Sewer Standard Details.

PART 3 - WARRANTY

3.1 MATERIAL WARRANTY

The manufacturer of materials furnished on the project shall supply to the Town of Ridgeland, a one (1) year unconditional warranty. The warranty shall be limited to the material which shall constitute complete replacement and delivery to the site of materials only to replace defective materials with new materials conforming to the specifications. This warranty is contingent upon determination of failure by a private independent testing laboratory. The testing shall prove that the failure was caused by failure of the material. The testing laboratory shall be selected by and agreed upon by both parties involved. This warranty is in addition to any warranty required for pipe linings herein before specified.

3.2 CONTRACTOR WARRANTY

The Contractor shall supply to the Town of Ridgeland one (1) year unconditional warranty. The warranty shall include materials and installation and shall constitute complete replacement and delivery to the site of materials and installation of same to replace defective materials or defective workmanship with new materials/workmanship conforming to the specifications.

END OF SECTION

SECTION 02922
LOAMING, SEEDING AND MULCHING

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Scope of Work: The Contractor shall furnish all labor, materials, equipment, and incidentals necessary and place loam finish grade, seed, and maintain all seeded areas as specified herein including all areas disturbed by the Contractor's operations where solid sodding is not specifically required.

1.2 GUARANTEE

- A. All restoration and revegetation work shall be subject to the one (1) year guarantee period of the Contract as specified in the General Conditions of the Contract herein.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Loam (topsoil) shall be fertile, natural soil, typical of the locality, free from large stones, roots, sticks, peat, weeds and sod and obtained from naturally well-drained areas. It shall not be excessively acid or alkaline nor contain toxic material harmful to plant growth. Topsoil stockpiled under other Sections of this Division may be used, but the Contractor shall furnish additional loam at his own expense, if required. All areas disturbed by the Contractor's operations, which are not identified to be sodded shall be seeded as specified herein, in addition to those areas delineated on the plans for seeding.
- B. Fertilizer shall be complete commercial fertilizer, 5-10-10 grade. It shall be delivered to the site in the original unopened containers each showing the manufacturer's guaranteed analysis. Store fertilizer so that when used it shall be dry and free flowing.
- C. Lime shall be ground limestone.
- D. Seed shall be from the same or previous year's crop; each variety of seed shall have a percentage of germination not less than 90, a percentage of purity not less than 85, and shall have not more than one percent weed content.
- E. Seed shall be a Scarified Argentine Bahia applied at a rate of 400 pounds per acre.
- F. Seed shall be delivered in sealed containers bearing the dealer's guaranteed analysis.
- G. Mulch shall be clean small-grain straw.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Loam shall be placed to a minimum depth of 4 inches.
- B. Lime shall be applied at the rate necessary to achieve a pH of 6 to 7.
- C. Fertilizer shall be applied at the rate of 800 pounds per acre.
- D. The subgrade of all areas to be loamed and seeded shall be raked and all rubbish, sticks, roots, and stones larger than 2-inches shall be removed. Loam shall be spread and lightly compacted to finished grade. Compacted loam shall not be less than the depth specified. No loam shall be spread in water or while frozen or muddy.
- E. After the loam is placed and before it is raked to true lines and rolled, limestone shall be spread evenly over loam surface and thoroughly incorporated with loam. Lime shall be added in sufficient quantity to provide a soil pH of 6 to 7.
- F. Fertilizer shall be uniformly spread and immediately mixed with the upper 2-inches of topsoil.
- G. Immediately following this presentation, the seed shall be uniformly applied and lightly raked into the surface. Lightly roll the surface and water with fine spray.
- H. All seeded areas shall be mulched with clean small-grain straw at a rate of 1-1/2 to 2 tons per acre. Asphalt emulsion shall be applied uniformly at a rate of 300 gallons per acre to tack the mulch, unless otherwise shown on the plans. Mechanical tacking will be considered on a case-by-case basis as approved by the Engineer.
- I. The Contractor shall keep all seeded areas watered and in good condition, reseeding if and when necessary, until a good, healthy, uniform growth is established over the entire area seeded, and shall maintain these areas in an approved condition until final acceptance of the Contract.
- J. On slopes, the Contractor shall provide against washouts by an approved method. Any washout, which occurs shall be regraded and reseeded at the Contractor's expense until good sod is established.
- K. The Contractor shall maintain the areas in grass in a neat manner by watering, mowing, raking clippings and leaves, and appurtenances until the project is completed.

END OF SECTION 02922

SECTION 02955
SEWER LINE CLEANING AND CCTV INSPECTION

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

- A. Sewer line cleaning will be performed to remove foreign materials from lines and restore the sewer to a minimum of 95% of original carrying capacity or as required for proper seating of internal pipe rehabilitation equipment and materials. The successes of other phases of work depend a great deal on cleanliness of lines. Should Contractor encounter conditions such as broken pipe and major blockages which prevent cleaning from being accomplished or where additional damage would result if cleaning were attempted or continued, the Contractor will not be required to clean those specific pipe sections.
- B. Closed circuit video observation shall be performed on all cleaned pipelines (Pre-Construction) and following sewer system rehabilitation described in other Sections (Post-Construction).
- C. Root Removal from Existing Sewer Lines as determined necessary by Engineer or Owner. Subsequent and successful pipeline rehabilitation at joints depends upon adequate root removal.
- D. Lateral Cuts to Remove Protruding Laterals from Existing Sewer Lines as determined necessary by Engineer or Owner.

1.2 SECTION INCLUDES

- A. Sewer Line Cleaning.
- B. Grease removal.
- C. Debris Removal.
- D. Video Observation and Recording.
- E. Root Removal.
- F. Lateral Cuts.

1.3 RELATED SECTIONS

- A. Section 02640 – Sewer System Construction
- B. Section 02960 – Sanitary Sewer Manhole Rehabilitation

- C. Section 02970 – Sanitary Sewer Cured-in-Place Pipe (CIPP)
- D. Section 02975 – Sanitary Sewer Pipe Bursting

1.4 OPTIONS

- A. The specifications describe several materials. Where manufacturers and models of equipment are named in the specifications, it is intended these are to describe quality and function required. **Contractor may use equipment or materials of other manufacturers provided they are reviewed and accepted by Engineer and Owner as equivalent to those specified.**

1.5 MEASUREMENT AND PAYMENT

- A. Sewer Line Cleaning – Measurements will be made between centers of manholes or to other pipe ends. Payment will be made at the contract unit price per linear foot of sewer pipe cleaned and shall include cleaning pipe and manholes, grease removal, debris removal in manholes, disposal of materials and all necessary materials, labor, tools and equipment, and performance of all operations necessary to complete work.
- B. C.C.T.V. Inspection – Measurements will be made between centers of manholes or to other pipe ends. Payment will be made at the contract unit price per linear foot of sewer pipe video observed and recorded (C.C.T.V.) including all necessary materials, labor, tools and equipment, and performance of all operations necessary to complete work and provide required documentation.
- C. Sewer Line Root Removal – Measurements will be made for tap root removal per each joint. Payment will be made at the contract unit price per sewer joint for tap root removal and shall include all necessary materials, labor, tools and equipment, and performance of all operations necessary to complete root removal and dispose of root material properly. All other non-tap roots shall be removed as necessary and such price shall be included in the unit price for sewer line cleaning.
- D. Lateral Cuts. – Measurements will be made per lateral for lateral cuts to remove protruding lateral pipes from sewer main. Payment will be made at the contract unit price per lateral requiring cutting and shall include all necessary materials, labor, tools and equipment, and performance of all operations necessary to complete lateral cut properly.

1.6 JOB CONDITIONS

- A. Sewer line cleaning, C.C.T.V. inspection, root removal, and lateral cuts must be coordinated with other work on the site. Contractor shall replace or repair any materials or structures damaged through the course of work.
- B. Contractor shall conform to all local, state, and federal regulations including those set forth by OSHA, RCRA and the EPA and any other applicable authorities.
- C. It is the responsibility of the Contractor to determine if field conditions are suitable for the work required, including soil conditions, prior to any cleaning, root removal, lateral

cuts, C.C.T.V. inspection work, or any bypass pumping. Loose soils may be present near access points (including manholes), and it is the responsibility of the Contractor to prevent displacement of these sorts throughout the entire course of the work. In the event of any sinkholes due to Contractor's operations, it is the responsibility of the Contractor to fully repair the area and restore the entire area to its previous condition.

1.7 SEQUENCING AND SCHEDULING

- A. Sewer line cleaning and Pre-Construction CCTV work (if required) must be completed for all project sewer pipe segments prior to performance of any other rehabilitation work on any project sewer pipe, except approved root removal and lateral cuts.
- B. Method statements and design procedures shall be provided to Owner or Engineer by the Contractor when confined space entry, flow diversion, or bypass is necessary.

1.8 ALTERNATIVES

- A. The intention of these specifications is to produce the best system for the Owner. If Contractor suggests alternate material, equipment or procedures will improve results at no additional cost, Engineer and Owner will examine the suggestion and if it is accepted, it may be used. The basis upon which acceptance of an alternate will be given is its value to Owner, and not for convenience of Contractor, prior to commencing any work.

1.9 QUALITY ASSURANCE

- A. Sewer cleaning, root removal, lateral cut, and video observation personnel shall be trained and certified in their field with a minimum of five (5) years' experience specializing in the cleaning and televising of sewers.
- B. Contractor shall provide Owner or Engineer sample video of a previous project showing quality of video produced by equipment being used.

1.10 MAINTENANCE OF TRAFFIC

- A. Traffic shall be maintained and controlled per SCDOT regulations, Contract Drawings, and project Encroachment Permit.

PART 2 – PRODUCTS

2.1 CLEANING EQUIPMENT

- A. Hydraulically Propelled Equipment – Equipment used shall be of a movable dam type and be constructed so a portion of dam may be collapsed at any time during cleaning operation to protect against flooding of the sewer. The movable dam shall be equal in diameter to pipe being cleaned and shall provide a flexible scraper around outer periphery to ensure removal of grease or other material adhered to pipe walls. If sewer cleaning balls or other equipment which cannot be collapsed are used, special

precautions to prevent flooding of the sewers and public or private property shall be taken.

- B. High-Velocity Jet (Hydrocleaning) Equipment – All high-velocity sewer cleaning equipment shall be constructed for ease and safety of operation. The equipment shall have a selection of two or more high-velocity nozzles. The nozzles shall be capable of producing a scouring action from 15 to 45 degrees, in all size lines designated to be cleaned. Equipment shall also include a high-velocity gun for washing and scouring manhole walls and floor. The gun shall be capable of producing flows from a fine spray to a solid stream. The equipment shall carry its own water tank, auxiliary engines, pumps, and hydraulically driven hose reel.
- C. Mechanically Powered Equipment – Bucket machines shall be in pairs with sufficient power to perform the work in an efficient manner. Machines shall be belt operated or have an overload device. Machines with direct drive causing damage to the pipe will not be allowed. A power rodding machine shall be either a sectional or continuous rod type capable of holding a minimum of 750- feet of rod. The rod shall be specifically heat-treated steel. To insure safe operation, the machine shall be fully enclosed and have an automatic safety clutch or relief valve.
- D. Water for cleaning will be provided by the Owner from onsite fire hydrants. Contractor shall provide appropriate equipment, hoses, and backflow prevention for filling the high velocity jet cleaner or in use with other types of cleaning equipment.

2.2 LATERAL CUT EQUIPMENT

- A. Equipment for cutting/grinding the protruding service connection shall be a remote grinding/cutting device capable of removing, concrete, vitrified clay, PVC and other types of pipe material. The device shall be specifically designed to cut/grind protruding service connections. The Contractor shall use remote CCTV equipment to monitor the progress of the work and ensure that the service connection is not damaged.

2.3 VIDEO EQUIPMENT

- A. Pan and tilt color camera providing a 300 degree viewing angle both horizontally and vertically with 360 degree camera head rotation. Camera shall be skid or tractor mounted. Camera shall be mounted so lens is situated in the center of pipe.
- B. Closed circuit color monitor shall be provided to view video of sewer line. Monitor shall be 12-inch minimum.
- C. DVD Video Recorder – Provide two color recordings simultaneously.
- D. Keypad for entering text to on-screen display.
- E. On-screen footage counter.
- F. Audio commentary capability.

- G. DVD disks or flash drives.

PART 3 – EXECUTION

3.1 CLEANING PRECAUTIONS

- A. During sewer cleaning operation, satisfactory precautions shall be taken in the use of cleaning equipment. When hydraulically propelled cleaning tools (which depend upon water pressure to provide their cleaning force) or tools which retard flow in sewer line are used, precautions shall be taken to insure water pressure created does not damage or cause flooding of public or private property being served by the sewer. When possible, flow in the sewer shall be utilized to provide necessary pressure for hydraulic cleaning devices. When additional water from fire hydrants is necessary to avoid delay in normal work procedures, water shall be conserved and not used unnecessarily. No fire hydrant shall be obstructed in case of a fire in area served by the hydrant.

3.2 SEWER LINE CLEANING

- A. The designated sewer pipe sections shall be cleaned using hydraulically propelled, high-velocity jet, or mechanically powered equipment. Selection of the equipment used shall be based on conditions of lines at time work commences. The equipment and methods selected shall be satisfactory to Owner and Engineer. The equipment shall be capable of removing dirt, grease, rocks, sand, and other materials and obstructions from the sewer lines and manholes. If cleaning of an entire section cannot be successfully performed from one manhole, the equipment shall be set up on another manhole and cleaning again attempted. If, again, successful cleaning cannot be performed or the equipment fails to traverse entire manhole section, it will be assumed a major blockage exists and cleaning effort shall be abandoned.
- B. High-velocity jet cleaning nozzles shall be moving at all times when inside a pipeline. The maximum speed during cleaning shall be 30 feet per minute.

3.3 ROOT REMOVAL

- A. Roots shall be removed in designated sections where root intrusion is a problem. Special attention should be used during cleaning operation to assure almost complete removal of roots from the joints. Any roots preventing the seating of rehabilitation equipment and materials shall be removed. Procedures may include the use of mechanical equipment such as rodding machines, bucket machines and winches using root cutters and porcupines, and equipment such as high-velocity jet cleaners.

3.4 LATERAL CUTS

- A. The protruding break-in service connection shall be cut/ground flush to the main sewer pipe without scouring or damaging the main sewer or service connection. All cuttings must be screened, collected, and removed from the sewer for proper disposal.

- B. During the post-cleaning (pre-construction) television inspection, the Contractor shall slowly pan the entire circumference of the trimmed connection to verify the quality of the work.
- C. The Contractor shall immediately notify the Owner and Engineer if he believes that the pipe is not structurally sound. The Contractor and Owner and Engineer shall discuss the severity and risk of cutting/grinding the lateral. The Owner shall then determine, if they want the lateral cut/ground, at the Owners risk, or if the work should not be performed on this contract.
- D. If other than typical lateral materials are encountered, the Contractor shall notify the Owner and Engineer and the Owner, Engineer and Contractor should discuss the ability, costs and risks associated with cutting/grinding the lateral. The Owner shall decide, whether to cut/grind the lateral or to not cut/grind the lateral. If the Owner decides to cut/grind the lateral, the price should be negotiated between the Owner and Contractor, prior to cutting/grinding the lateral.

3.5 DEBRIS REMOVAL

- A. Debris such as dirt, sand, rocks, grease, and other solid or semisolid material resulting from the cleaning operation shall be removed at downstream manhole of section being cleaned. Passing material from manhole section to manhole section, which could cause line stoppages, accumulations of sand in wet wells, or damage pumping equipment, shall not be permitted.

3.6 DISPOSAL OF MATERIALS

- A. The Contractor shall obtain a legal dumpsite for all debris removed from sewers during cleaning operation.

3.7 VIDEO OBSERVATION

- A. After the existing sewer is completely cleaned, internally check with television camera and video recording as required (Pre-Construction). The finished video recording shall be continuous over entire length of sewer between two manholes.
- B. Video observation (C.C.T.V.) of pipelines shall be performed by experienced personnel trained in locating breaks, obstacles, and service connections by closed circuit color television. Video observation shall include the following:
 - 1. Closed circuit video observation shall be performed on all cleaned pipelines (Pre-Construction) and following sewer system rehabilitation described in other Sections (Post-Construction). Recordings and required reports/logs shall be submitted to the Engineer and Owner for approval.
 - 2. Required documentation for all video observation:
 - a. Video files on DVD or flash drive with voice description.

- b. Logs/Report of observation and inspection noting at a minimum segment run with identified upstream and downstream manholes; pipe size and material; direction of observation; station distance of all noted defects, joints, and laterals; description of defects. Logs/reports shall be provided in electronic format (PDF) on DVD or flash drive.
3. Camera shall be centered in pipeline and travel a maximum of 25 feet per minute.
4. On screen footage shall be calibrated with above ground measurements.
5. Video recordings to remain property of the Owner; Contractor to retain second copy for its use.
6. All flows tributary to section of sewer being videoed are to be completely bypassed around the section during observation, if necessary.
7. Should any portion of the video recordings be of inadequate quality or coverage, as determined by Owner or Engineer, Contractor will have the portion videoed and recorded again at no additional expense to Owner.
8. If damaged areas are found in addition to those noted on the contract drawings, Contractor shall notify Owner or Engineer and a decision about repair will be made.
9. Contractor shall utilize Pre-Construction CCTV documentation (video files, logs and reports) to verify existing rehabilitation methods noted on Contract Drawings, or provide recommended alternative rehabilitation methods. Verification or recommended alternative rehabilitation methods shall be presented to Engineer for review and is considered part of the required Pre-Construction CCTV documentation.

3.8 FINAL ACCEPTANCE

- A. Acceptance of sewer line cleaning shall be made upon successful completion of the C.C.T.V observation and shall be to satisfaction of Owner. If video recordings show the cleaning to be unsatisfactory, Contractor shall be required to re-clean and re-video sewer line until cleaning is shown to be satisfactory. If internal pipe rehabilitation is to follow television observation, particular attention should be given to adequacy of cleaning to ensure proper seating of the equipment and materials can be achieved.

END OF SECTION 02955

SECTION 02960
SANITARY SEWER MANHOLE REHABILITATION

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

- A. This section covers all work, materials, equipment, and testing required for the rehabilitation of sanitary sewer manholes as part of this project. The contract drawings indicate what type of rehabilitation is required for each manhole.

1.2 SECTION INCLUDES

- A. Manhole Protective Coating (Cementitious Mortar Lining)
- B. Manhole Chemical Grouting (for sealing random or isolated leaks in brick or precast concrete manholes)
- C. Manhole Frame and Chimney Seal – Interior
- D. Manhole Frame and Chimney Seal – Exterior Above Grade
- E. Manhole Invert Repair
- F. HDPE Manhole Insert
- G. Manhole Frame and/or Cover and Adjustment

1.3 RELATED SECTIONS

- A. Section 02640 – Sewer System Construction
- B. Section 02955 – Sewer Line Cleaning and CCTV Inspection
- C. Section 02970 – Sanitary Sewer Cured-in-Place Pipe (CIPP)
- D. Section 02975 – Sanitary Sewer Pipe Bursting

1.4 OPTIONS

- A. The specifications describe several materials. Where manufacturers and models of equipment are named in the specifications, it is intended these are to describe the quality and function required. **Contractor may use equipment or materials of other manufacturers provided they are reviewed and accepted by Engineer and Owner as equivalent to those specified.**

1.5 REFERENCES (LATEST REVISION)

- A. ASTM C 62 – Building Brick (Solid Masonry Units Made from Clay or Shale).
- B. ASTM C 109 – Compressive Strength of Hydraulic Cement Mortars.
- C. ASTM C 144 – Aggregate for Masonry Mortar.
- D. ASTM C 150 – Portland Cement.
- E. ASTM C 207 – Hydrated Lime for Masonry Purposes.
- F. ASTM C 293 – Test Method for Flexural Strength of Concrete (Using Simple Beam with Center-point Loading).
- G. ASTM C 348 – Flexural Strength of Hydraulic Cement Mortars.
- H. ASTM C 478 – Precast Reinforced Concrete Manhole Sections.
- I. ASTM C 495 – Test Method for Compressive Strength of Lightweight Insulating Concrete.
- J. ASTM C 496 – Test Method for Splitting Tensile Strength of Cylindrical Concrete Specimens.
- K. ASTM C 579 – Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes.
- L. ASTM C 596 – Test Method for Drying Shrinkage of Mortar Containing Hydraulic Cement.
- M. ASTM C 666 – Test Method for Resistance of Concrete to Rapid Freezing and Thawing.
- N. ASTM C 882 – Test Method for Bond Strength of Epoxy-Resin Systems Used with Concrete by Slant Shear.
- O. ASTM C 924 – Testing Concrete Pipe Sewer Lines by Low-Pressure Air Test Method.
- P. ASTM D 543 – Evaluating the Resistance of Plastics to Chemical Reagents.
- Q. ASTM D 638 – Tensile Properties of Plastics.
- R. ASTM D 695 – Compressive Properties of Rigid Plastics.
- S. ASTM D 790 – Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
- T. ASTM D 2240 – Rubber Property – Durometer Hardness.
- U. ASTM D 2584 – Ignition Loss of Cured Reinforced Resins.

- V. ASTM D 4414 – Measurement of Wet Film Thickness by Notch Gages.
- W. ASTM D 4541 – Pull-off Strength of Coatings Using Portable Adhesion Testers.
- X. ACI 506.2 – Specification for Shotcrete.

1.6 SUBMITTALS

- A. The following items shall be submitted:
 - 1. Technical data sheet on each product used, including ASTM test results indicating the product conforms to and is suitable for its intended use per these specifications.
 - 2. Material Safety Data Sheets (MSDS) for each product used.
 - 3. Project specific guidelines and recommendations.
 - 4. Qualification of Product Installer:
 - a. Manufacturer certification stating product installer has been trained and permitted in the handling, mixing, and application of products to be used.
 - b. Certification the equipment to be used for applying products has been manufactured or accepted by the manufacturer and installer's personnel have been trained and certified for proper use of the equipment.
 - c. Five recent references of Contractor and installer indicating successful application, submitted at Engineer's request.
 - d. Proof of any necessary federal, state, or local permits or licenses necessary for the project.
 - 5. Design details for any additional ancillary systems and equipment to be used in site and surface preparation, application, and testing.

1.7 MEASUREMENT AND PAYMENT

- A. Manhole Protective Coating – Payment will be made at the contract unit price per vertical foot for manhole diameter noted. Payment will include examination of existing manhole, interior surface preparation, application of repair materials, manhole chemical grouting (for sealing random or isolated leaks in brick or precast concrete manholes), invert/channel repair (if necessary), and protective coating, and labor, testing, and all work necessary to complete the manhole protective coating including sewer bypassing operations.
- B. Manhole Frame and Chimney Seal – Interior – Payment will be made at the contract

unit price for each installation. Payment will include all labor, material, and sealant system accessories, and all work necessary to complete the manhole frame and chimney seal on the interior of the manhole including sewer bypassing operations.

- C. Manhole Frame and Chimney Seal – Exterior Above Grade – Payment will be made at the contract unit price for each installation. Payment will include all labor, materials, and rubber seal system and accessories, and all work necessary to complete the manhole frame and chimney seal on the exterior of the manhole including sewer bypassing operations.
- D. HDPE Manhole Insert – Payment will be made at the contract unit price per insert. Payment will include all labor, materials, and equipment necessary to complete the installation.
- E. Manhole Cover Replacement – Payment will be made at the contract unit price per each manhole cover replaced. Payment will include all labor, materials, and equipment necessary to complete the installation.
- F. Manhole Frame Replacement and Adjustment, At or Above Grade– Payment will be made at the contract unit price per each installation by type – At Grade or Above Grade. Payment will include excavation, removal and disposal, and replacement of existing frame, cleaning, adjusting materials, labor, and all work necessary to complete the adjustment and installation including sewer bypassing operations. Work within roadway areas includes the required pavement restoration in the Manhole Frame Replacement and Adjustment contract unit price. Manhole Cover Replacement is under separate pay item.

1.8 QUALITY ASSURANCE

- A. Contractor will furnish the Engineer and Owner a description of all material before ordering. The Engineer will review Contractor's submittals and provide in writing an acceptance or rejection of material.
- B. Material and equipment shall be the standard product of a manufacturer who has manufactured them for a minimum of five (5) years and who provides published data on quality and performance of product.
- C. A subcontractor for any part of the work must have experience on similar work, and if required, furnish Engineer with a list of projects and Owners or Engineers who are familiar with their competence.
- D. Devices, equipment, and systems not designated by Engineer that the Contractor wishes to furnish, shall be designed by either a Registered Professional Engineer or by someone Engineer accepts as qualified. If required, complete design calculations and assumptions shall be furnished to the Engineer or Owner before acceptance.
- E. Contractor shall initiate and enforce quality control procedures consistent with applicable ASTM, NACE and SSPC standards and the manufacturer's recommendations.

- F. Contractors performing repairs shall be trained to properly apply the repair products according to manufacturer's recommendations.
- G. Contractors performing application of protective coating must be certified by the protective coating manufacturer and perform work according to manufacturer specifications.
- H. Appropriate actions shall be taken to comply with local, state, and federal regulatory and other applicable agencies with regard to environment, health, and safety.

1.9 PRODUCT DELIVERY, STORAGE & HANDLING

- A. Material shall be unloaded in a manner avoiding damage and shall be stored where it will be protected and will not be hazardous to traffic. If stored on private property, Contractor shall obtain permission from the property owner and shall repair any damage caused by storage. Material shall be examined before installation and neither damaged nor deteriorated material shall be used in the work.
- B. Materials are to be kept dry, protected from the weather, and stored under cover.
- C. Protective coating materials are to be stored between 50° F and 90° F, or per manufacturers' requirements. Do not store near flame, heat, or strong oxidants.
- D. Protective coating materials are to be handled according to their material safety data sheets.

1.10 JOB CONDITIONS

- A. The manhole rehabilitation work must be coordinated with other work on site. Contractor shall replace or repair any pipe, materials, or structures damaged through the course of work.
- B. Contractor shall conform with all local, state, and federal regulations including those set forth by OSHA, RCRA and the EPA and any other applicable authorities.

1.11 SEQUENCING AND SCHEDULING

- A. The Contractor shall arrange work so rehabilitated manholes are placed in service as soon as reasonable after work is completed.
- B. Method statements and design procedures shall be provided to the Owner or Engineer by Contractor when confined space entry, flow diversion, or bypassing is necessary.

1.12 ALTERNATIVES

- A. The intention of these specifications is to produce the best system for the Owner. If Contractor suggests alternate material, equipment or procedures that will improve

results at no additional cost, Engineer and Owner will examine the suggestion, and if it is accepted, it may be used. The basis upon which acceptance of an alternate will be given is its value to Owner, and not for convenience of Contractor.

1.13 GUARANTEE

- A. Contractor shall guarantee the quality of materials, equipment, and workmanship for 12 months, unless specified otherwise elsewhere, after acceptance of completed project. Defects discovered during the 12-month guarantee period shall be repaired by Contractor at no cost to the Owner. Defects discovered in project components with longer guarantee periods shall be repaired in accordance with the specific guarantee terms.
- B. Manhole Protective Coating (Cementitious Mortar Lining) – the manhole protective coating shall have a ten (10) year warranty on both materials and labor.
- C. HDPE Manhole Insert – a five (5) year warranty on the body of the HDPE Manhole Insert shall be provided by the manufacturer.

1.14 EXISTING UTILITIES

- A. All known Town of Ridgeland utility facilities are shown schematically on the construction drawings and are not necessarily accurate in location as to plan or elevation. Utilities such as service lines or unknown facilities not shown will not relieve the Contractor of responsibility under this requirement. Contractor will be held responsible for cost of repairs to damaged underground facilities, even when such facilities are not shown on the drawings.
- B. The Contractor shall call for underground utility locations before starting work. Underground utilities location service can be contacted at (888) 721-7877 (SC) or 811.

1.15 MAINTENANCE OF TRAFFIC

- A. Traffic shall be maintained and controlled per SCDOT regulations, Contract Drawings, and project Encroachment Permit.

PART 2 – PRODUCTS

2.1 MANHOLE PROTECTIVE COATING (CEMENTITIOUS MORTAR LINING)

- A. General
 - 1. The Contractor shall provide a cementitious restoration material designed for structural build-back, inflow and infiltration abatement, corrosion resistance, and repairing inverts to design requirements. All materials applied to a structure shall be compatible, as specified by the manufacturer.
- B. Condition of Manhole to be Coated

1. Standard Portland cement or new concrete (not quick setting high strength cement) must be well cured prior to application of the protective coating. Generally, 28 days is adequate cure time for standard Portland. If earlier application is desired, compressive or tensile strength of the concrete can be tested to determine if acceptable cure has occurred.
2. Cementitious patching and repair materials should not be used unless their manufacturer provides information as to its suitability for topcoating with the proposed protective coating. Project specific submittals should be provided including application, cure time and surface preparation procedures which permit optimum bond strength with the protective coating.
3. Remove existing coatings prior to application of the new protective coating. Contractor is to maintain strict adherence to applicable NACE and SSPC recommendations with regard to proper surface preparation and compatibility with existing coatings.

C. Repair Materials

1. Repair materials shall be used to fill voids, structurally reinforce, and/or rebuild surfaces, etc. as determined necessary by Engineer and Contractor prior to application of the protective coating. Repair materials must be compatible with the specified coating and shall be applied in accordance with manufacturer's recommendations.
2. The following products are acceptable as compatible repair basecoat materials for calcium aluminate topcoating:
 - a. SewperCoat 100% calcium aluminate mortar by Kerneos Aluminate Technologies.

D. Protective coating material shall be:

1. Calcium aluminate mortar mix designed to withstand long-term exposure to a bacterially corrosive hydrogen sulfide environment. The mortar mix shall only require clean, potable water as an admixture to produce a material suitable for spray application. Mortar mix shall have the following chemical composition:

Al ₂ O ₃	CaO	FeO + Fe ₂ O ₃	SiO ₂
39 – 44%	35 – 39%	9 – 14%	5 – 7%

Design properties of the mortar mix shall be as follows:

Compressive Strength (ASTM C495)	> 7,000 psi	24 hours
	> 9,000 psi	28 days
Flexural Strength (ASTM C293)	> 1,200 psi	24 hours
	> 1,400 psi	28 days
Splitting Tensile Strength (ASTM C496)	> 800 psi	24 hours
Bond Strength/Slant Shear (ASTM C882)	> 1,600 psi	28 days
Shrinkage at 28 days (ASTM C596) Freeze/Thaw after 300 Cycles (ASTM C666)	< 0.06% cured @ 90% relative humidity. No visible damage after 300 cycles	

Mortar mix shall be stored with adequate provisions for the prevention of moisture absorption. It shall be stored in a manner permitting easy access for inspection and identification.

- E. Protective Coating Application Equipment – Specifically designed spray equipment, accepted for use by the protective coating manufacturer.

2.2 MANHOLE CHEMICAL GROUTING

- A. Chemical grouting may be used to seal random or isolated leaks of a brick or precast concrete manhole.
- B. Grout – Shall be acrylamide, acrylic, or urethane gels equivalent to those manufactured by Avanti International. The type of grout to be used shall be in accordance with the manufacturer’s recommendation for the specific application area of the project.

The following properties shall be exhibited by the grout:

1. Documented service of satisfactory performance in similar usage.
 2. Controllable reaction times and shrinkage through use of chemicals supplied by the same manufacturer. The minimum set time shall be established so adequate grout travel is achieved.
 3. Resistance to chemicals; to most organic solvents, mild acids, and alkali.
 4. The chemical shall be essentially non-toxic in a cured form.
 5. Sealing material shall not be rigid or brittle when subjected to dry atmosphere. The material shall be able to withstand freeze/thaw and moving load conditions
 6. Acrylate grouts may not be used.
- C. Additives – Grout additions may be utilized for catalyzing reaction, inhibiting reaction, buffering solution, lowering the freezing temperature of solution, acting as filler, providing strength, or for inhibition of root growth.

- D. Material Identification – Contractor shall completely identify types of grout, mortar, and sealant to be used for project and provide case histories of successful use or defend choice of grouting materials based on chemical and physical properties, ease of application, and expected performance, to the satisfaction of Engineer.
- E. Mixing and Handling – Mixing and handling of chemical grout, which may be toxic under certain conditions, shall be in accordance with recommendations of the manufacturer and in such a manner as to minimize hazard to personnel. It is the responsibility of Contractor to provide appropriate protective measures to ensure chemicals or gels are handled by authorized personnel in a proper manner. All equipment shall be subject to acceptance by Engineer. Only personnel thoroughly familiar with the handling of grout material and additives shall perform grouting operations.

2.3 MANHOLE FRAME AND CHIMNEY SEAL - INTERIOR

- A. Manhole Frame and Chimney Seal – Interior, shall be designed to prevent leakage of water into the manhole through the frame joint area and the area above the manhole cone including all extensions to the chimney area. Extensions shall include but are not limited to lifting rings, brick and/or block material that may have been used to achieve grade. The seal shall remain flexible allowing for the repeated vertical or horizontal movements of the frame due to frost lift, ground movement or the thermal movement of pavements.
- B. The sealing system shall be applied to the entire interior of the adjustment area from the top 2-inches of the cone/top of the manhole, over the grade ring adjustment area, and up a minimum of 2-inches on to the inside of the casting frame. If the manhole has been relined prior to the seal installation, the seal shall cover a minimum of 12 vertical inches to cover the casting-cone interface.
- C. The sealing system material shall be an aromatic urethane rubber to the standards noted below, such as Flex-Seal Utility Sealant manufactured by Sealing Systems Inc., Loretto, MN or approved equal.
 - 1. The lining product shall have an aromatic urethane primer resin on the complete application surface.
 - 2. The final seal material shall be no less than 170 mils of corrosion resistant aromatic flexible urethane resin coating, or as recommended by manufacturer based on project location.
 - 3. The product shall have a minimum elongation of 800% and hardness (Durometer) of 75. Final seal shall have minimum tensile and adhesion strengths of 1150 psi and 175 lb. l/in. respectively.
 - 4. The sealing system shall conform to the physical requirements of ASTM D- 412.

2.4 MANHOLE FRAME AND CHIMNEY SEAL – EXTERIOR AND ABOVE GRADE

- A. Manhole Frame and Chimney Seal – Exterior and Above Grade, shall be used as noted

on the Contract Drawings where manhole chimney extends above grade. The sealing product shall seal the manhole frame casting to the manhole structure. The seal shall be designed to prevent leakage of water into the manhole through these areas.

B. Product Materials:

1. The seal shall be a continuous seamless band made of high-quality UV resistant EPDM (Ethylene Propylene Diene Monomer) rubber with a minimum thickness of 65 mils.
2. There shall be a preformed L-shaped corner molded into the top of the seal. The top section and the side section will extend from the L-shaped corner at a generally 90° angle to each other. The seal shall be pre-formed in substantially the same shape as when attached to the manhole structure. The thickness of the L-shaped corner extending 1-inch into the top section and 1-inch down the side section is increased and may be at least twice the thickness of the top section reinforcing the seal at this particular area.
3. There shall be a 2-inch to 3-inch wide strip of butyl mastic attached to the underside of top section of the seal. There shall be a 2-inch wide strip of butyl mastic attached to the inside of the side section at the bottom of the seal. The mastic shall be non-hardening butyl rubber sealant, with a minimum thickness of 1/8-inch, and shall seal to the cone/top of the manhole section and over the flange of the casting frame.
4. An aerosol primer shall be used to enhance the bond strength of the seal to the structure.

C. The external sealing system shall be Infi-Shield Uni-Band Manhole Sealing System by Sealing Systems, Inc., Loretto, MN, or Engineer approved equal.

2.5 MANHOLE INVERT REPAIR

A. Concrete with a minimum compressive strength of 3,000 psi at 28 days.

B. Brick and Mortar

1. Brick – Shall conform to ASTM C62, Grade SW or C-55, Grade S.
2. Mortar – Shall be composed of one part by volume of portland cement and two parts of sand. Portland cement shall conform to ASTM C-150, Type I or II. The sand shall conform to ASTM C-144 and shall be of an accepted gradation. Hydrated lime may be added to mixture of sand and cement in an amount equal to 25% of the volume of cement used. Hydrated lime shall conform to ASTM C-207, Type S. Quantity of water in the mixture shall be sufficient to produce a workable mortar but shall in no case exceed 7 gallons of water per sack of cement. Water shall be clean and free of harmful acids, alkalis, and organic impurities. The mortar shall be used within 30 minutes from time ingredients are mixed with water.

2.6 HDPE MANHOLE INSERT

- A. HDPE Manhole Insert shall be made of ultra-high density polyethylene copolymer material that meets ASTM D1248, Class A, Category 5, Type 111 with a minimum impact brittleness temperature of <-131°F. Thickness shall be uniform 0.187 mils (3/16") minimum. Material shall be corrosion proof from all gases associated with wastewater collection systems.
- B. HDPE Manhole Insert shall be customized to fit the existing/proposed casting frame and lid.
- C. HDPE Manhole Insert shall have a lift strap made of woven polypropylene web which is attached to the bowl of the dish by a wide head stainless steel rivet and a stainless steel 3/4" backup washer. All cut edges shall be seared to prevent raveling.
- D. HDPE Manhole Insert shall provide ventilation with 1/8" vent hole and/or a valve located on the side of the insert. The hole or valve shall allow a maximum release of 10 gallons of water per 24 hours and shall not be affected by debris on the bottom of the dish. Gases shall be vented at one (1) PSI or less.
- E. A neoprene gasket shall be provided with each HDPE Manhole Insert. The gasket shall be 1/8" thick by 5/8" wide.
- F. HDPE Manhole Insert shall be as manufactured by Sealing Systems, Inc., Loretto, MN 55357, www.ssisealingsystems.com or an accepted equivalent.

2.7 MANHOLE FRAME AND/OR COVER REPLACEMENT AND ADJUSTMENT

- A. For manholes where both manhole frame and cover are to be replaced:
 - 1. Manhole frames and covers shall be gray cast iron conforming to minimum requirements ASTM A48, Class 35, and shall conform in general to the details for each type shown on the plans. Castings shall be of uniform quality, and free from blowholes, porosity, hard spots, shrinkage distortion and other defects. Frames and covers shall be smooth, well-cleaned by shot blasting and shall remain unpainted. All castings shall be manufactured true to pattern, and component parts shall fit together in a satisfactory manner. Frames shall have a clear opening of 22-3/4". There shall be no holes or perforations in the cover. The frame and cover shall have a rubber gasket that is fitted in a machined groove manufactured in the bottom of the cover. All manhole frames and covers shall be traffic bearing unless otherwise specified. Manholes shall be adjustable to changes in final pavement elevation without the use of spaces or rings. Casting patterns shall conform to those shown on the Drawings. Manhole frame and cover shall be as manufactured by U.S. Foundry, Model 680.
- B. For manholes where only cover is to be replaced:
 - 1. Manhole covers shall be gray cast iron conforming to minimum requirements ASTM A48, Class 35, and shall conform in general to the details for each type shown on the plans. Castings shall be of uniform quality, and free from blowholes, porosity, hard spots, shrinkage distortion and other defects. Covers shall be smooth, well-cleaned by shot blasting and shall remain unpainted. Cover

dimensions shall be selected to ensure satisfactory fit with existing casting. There shall be no holes or perforations in the cover. The cover shall have a rubber gasket that is fitted in a machined groove manufactured in the bottom of the cover. All manhole covers shall be traffic bearing unless otherwise specified. Manhole cover shall be as manufactured by U.S. Foundry.

C. For frame adjustment:

1. Mortar – Shall be composed of one part by volume of Portland cement and two parts of sand. The Portland cement shall conform to ASTM C–150, Type I or II. The sand shall conform to ASTM C–144 and shall be of an acceptable gradation. Hydrated lime may be added to mixture of sand and cement in an amount equal to 25% of the volume of cement used. Hydrated lime shall conform to ASTM C–207, Type S. Quantity of water in the mixture shall be sufficient to produce a workable mortar, but shall in no case exceed 7 gallons of water per sack of cement. Water shall be clean and free of harmful acids, alkalis and organic impurities. The mortar shall be used within 30 minutes from time ingredients are mixed with water.
2. Brick shall conform to ASTM Specification C–62, Grade SW or C–55, Grade S.
3. Precast concrete adjusting rings.

2.8 PRODUCT REVIEW

- A. Contractor shall provide the Engineer with a complete description of all products before ordering. Engineer will review and approve all products by the submittal of shop drawings before they are ordered.

PART 3 – EXECUTION

3.1 MANHOLE PROTECTIVE COATING (CEMENTITIOUS MORTAR LINING)

A. Examination

1. All structures to be coated shall be readily accessible to Contractor.
2. Any active flows shall be dammed, plugged, or diverted as required to ensure the liquid flow is maintained below surfaces to be coated. Flows should be totally plugged and/or diverted when coating the invert. All extraneous flows into manhole at or above area coated shall be plugged and/or diverted until coating has set hard to the touch.
3. Pipe joint seals shall be installed by others. No leaks may be present prior to commencing and during work.
4. Installation of protective coating shall not commence until the concrete substrate has properly cured in accordance with these specifications.

5. Temperature of the surface to be coated should be maintained between 40 deg F and 120 deg F during application, or as required by coating manufacturer. Prior to and during application, care should be taken to avoid exposure of direct sunlight or other intense heat source to the structure being coated. Where varying surface temperatures do exist, care should be taken to apply coating when the temperature is falling versus rising (i.e. late afternoon into evening vs. morning into afternoon).

B. Surface Preparation

1. All manhole steps shall be removed prior to a coating or lining application.
2. Contractor shall inspect all surfaces specified to receive a protective coating prior to surface preparation. Contractor shall notify Owner and Engineer of any noticeable disparity in surfaces which may interfere with proper preparation or application of the repair mortar and protective coating.
3. All concrete or mortar which is not sound or has been damaged by chemical exposure shall be removed to a sound surface.
4. All contaminants including oils, grease, incompatible existing coatings, waxes, form release, curing compounds, efflorescence, sealers, salts, or other contaminants shall be removed.
5. Surface preparation method(s) should be based upon conditions of substrate, service environment and requirements of the protective coating to be applied.
6. All surfaces shall be repaired as required by protective coating system in the intended service condition.
7. Surfaces to receive protective coating shall be cleaned and abraded to produce a sound surface with adequate profile and porosity to provide a strong bond between the protective coating and substrate. Generally, this can be achieved with a high-pressure water cleaning using equipment capable of 5,000 psi at 4 gpm. Other methods such as high-pressure water jetting (refer to NACE Standard No. 5/SSPC-SP12), abrasive blasting, shotblasting, grinding, scarifying or acid etching may also be used. Detergent water cleaning and hot water blasting may be necessary to remove oils, grease, or other hydrocarbon residues from the concrete. Whichever method(s) are used, they shall be performed in a manner providing a uniform, sound, clean neutralized surface not excessively damaged. Contractor shall catch debris from cleaning efforts within the manhole. Debris passing into pipelines shall be cleaned at the Contractor's expense.
8. A mild chlorine solution may be used to neutralize the surface to diminish microbiological bacteria growth prior to final rinse and coating.
9. Infiltration shall be stopped by using a material which is compatible with the specified repair mortar and is suitable for topcoating with specified protective coating.

10. Test prepared surfaces after cleaning but prior to application of protective coating to determine if a specific pH or moisture content of the concrete is required according to manufacturer's recommendations.
11. Area between the manhole and manhole ring and any other area which might exhibit movement or cracking due to expansion and contraction, shall be grouted with a flexible or elastomeric grout or gel. Castings can be abrasive blasted and coated to prevent corrosion if desired.
 - a. Where chimney seal is required in conjunction with the lining, the Contractor shall contact the chimney seal manufacturer to determine the proper preparation required for effectively installing the chimney seal after the coating has been applied and cured.
12. All surfaces shall be checked by Engineer's Representative during and after preparation and before the repair mortar is applied.

C. Application of Repair Materials

1. Areas where structural steel has been exposed or removed shall be repaired in accordance with the Engineer's recommendations.
2. Repair materials shall meet the specifications herein. Materials shall be trowel or spray applied utilizing proper equipment on specified surfaces. Material thickness shall be specified by the Engineer according to Owner's requirements and manufacturer's recommendations.
3. Cementitious repair materials shall be trowelled to provide a smooth surface with an average profile equivalent to coarse sandpaper to optimally receive the protective coating. No bug holes or honeycomb surfaces should remain after the final trowel procedure of repair mortar.
4. The repair materials shall be permitted to cure according to manufacturer recommendations. Curing compounds should not be used unless formulated for compatibility with the specified protective coating.
5. Application of repair materials, if not performed by a coating certified applicator, shall be checked by the protective coating certified applicator to ensure proper finishing for suitability to receive specified coating.
6. After abrasive blast and leak repair is performed, all surfaces shall be checked for remaining laitance prior to protective coating application. Any evidence of remaining contamination or laitance shall be removed by additional abrasive blast, shotblast or other acceptable method. If repair materials are used, refer to these specifications for surface preparation. Areas to be coated must also be prepared in accordance with these specifications after receiving a cementitious repair mortar and prior to application of the protective coating.

7. All surfaces shall be checked during and after preparation and before the protective coating is applied.

D. Application of Protective Coating

1. Application procedures shall conform to recommendations of the protective coating manufacturer, including material handling, mixing, environmental controls during application, safety, and spray equipment.
2. The spray equipment shall be specifically designed to accurately ratio and apply specified protective coating materials and shall be regularly maintained and in proper working order.
3. Protective coating material must be spray applied by a certified applicator of the protective coating manufacturer.
4. Manhole walls, benches, and frame shall be coated by spray application of the protective coating with a uniform thickness. Material shall be applied to bench area to provide for proper drainage. Spray application of calcium aluminate mortar will have a minimum finished thickness of 1/2 inch.
5. Airless spray application equipment acceptable to coating manufacturer shall be used to apply each coat of the protective coating.
6. If necessary, subsequent top-coating or additional coats of the protective coating should occur as recommended by protective coating manufacturer.

E. Testing

1. Visual Inspection – verify no infiltration, cracks, or loose material.
2. Thickness of calcium aluminate will be measured with a ruler while the material is still wet.
3. Measurement of protective coating bond strength to the substrate can be measured in accordance with ASTM D4541. Any areas detected to have inadequate bond strength shall be evaluated by the Engineer. Further bond tests may be performed in failed area to determine the extent of potentially deficient bonded area and repairs shall be made by Applicator in strict accordance with manufacturer's recommendations.
4. Manhole Testing – Type A: Vacuum test. All pipes entering manhole shall be plugged, taking care to securely place plugs from being drawn into the manhole. The test head shall be placed, and seal inflated in accordance with manufacturer's recommendations. A vacuum of 10 inches of mercury shall be drawn and the vacuum pump shut off. With the valves closed, time shall be measured for the vacuum to drop to nine (9) inches. Following are minimum allowable test times for manhole acceptance at the specified vacuum drop:

DEPTH (FEET) (Manhole length)	TIME (SECONDS)		
	48-Inch diam.	60-Inch diam	72-Inch diam
4	10	13	16
8	20	26	32
12	30	39	48
16	40	52	64
20	50	65	80
24	60	78	96
Add for 2-feet more depth:	5	6.5	8

Note: These numbers have been taken from ASTM C 924.

If a manhole fails the initial test, repairs, and adjustments necessary due to extenuating circumstances (i.e. pipe joint, liner, plug sealing) should be made. Retesting shall proceed until a satisfactory test is obtained.

Manhole Testing – Type B: Exfiltration test. Incoming and outgoing sewer and service lines shall be plugged, plugs restrained, and the manhole filled with water to top of manhole frame. A soaking period of up to one hour will be allowed if bypassing of the sewage is not required or has been provided. At the end of this optional soaking period, manhole shall be refilled with water and test begun. If water loss exceeds amount shown in the following table, manhole will have failed test. Repairs and adjustments necessary due to extenuating circumstances (i.e. pipe joint, liner, plug sealing) should be made. Retesting shall proceed until a satisfactory test is obtained. Maximum Allowable Loss is determined assuming a standard 4-foot diameter manhole.

<u>Depth of Manhole</u>	<u>Maximum Allowable Loss</u>
Under 8 feet deep	1 inch in 5 minutes
Over 8 feet deep	1/8 inch per foot of depth in 5 minutes

Limitations and considerations include recognizing exfiltration and vacuum testing may be impractical or cost-prohibitive for all manholes; therefore, use of either method is subject to the following limitations and considerations:

Complete Sealing: These methods are used only when the entire manhole has been sealed or rehabilitated. The lack of sealing or rehabilitation of some portions of manhole may prevent passage of either of these tests. Spot repairs and partial sealing or rehabilitation are therefore subject to infiltration and visual testing only.

Structural Condition: Structural condition of some manholes may be such the testing with these methods is impractical or destructive. The Owner's Representative and Contractor shall therefore deem as structurally sound, prior to testing using these methods, those manholes which have not been structurally lined.

5. A final visual observation shall be made by the Engineer and manufacturer's representative. Any deficiencies in the finished coating shall be marked and repaired according to the procedures set forth herein by the Manufacturer's Representative.
6. The system may be put back into non-severe operational service as soon as final observation has taken place. However, for severe corrosion duty such as high concentrations of acids, bases or solvents, 3 to 7 days and/or force cure by heat induction to the coated surfaces may be necessary prior to returning to service. Consult coating manufacturer for further details.

3.2 MANHOLE CHEMICAL GROUTING

- A. Chemical grouting may be used to seal random or isolated leaks of a brick or precast concrete manhole.
- B. Manhole grouting shall not be performed until repair of the manhole frame and grade rings or any other structural manhole repairs are complete.
- C. Preliminary Repairs
 1. Contractor shall cut and trim all roots within the manhole.
 2. Contractor shall seal all unsealed lifting holes, unsealed step holes, and voids larger than approximately 1/2 inch in thickness. All cracked or deteriorated material shall be removed from the area to be patched and replaced with a waterproof quick setting mortar in accordance with manufacturer's specifications.
 3. Contractor shall control all inflowing water through cracks, manhole joints, brick joints, pipe entrances, grade rings, and manhole frames.
- D. Temperature – Normal grouting operations shall be performed in accordance with manufacturer's recommendations.
- E. Testing – Visual Inspection – all leaking into manhole at chemical grout usage locations must be eliminated.

3.3 MANHOLE FRAME AND CHIMNEY SEAL - INTERIOR

- A. Manhole Frame and Chimney Seal – Interior product system shall be applied by an applicator/installer certified by manufacturer.
- B. Surface Preparation:
 1. All loose and protruding mortar and brick that would interfere with the seal's performance shall be removed. Any lips for gravel pan supports shall be cut off flush with casting.

2. Contractor shall verify compatibility of any patching materials or cement profiling materials, or manhole liner systems used with the sealing system and required cure time prior to installing seal system.
3. Preparation of the surface should include sandblasting (minimum of 70CFM) and an acetone wet wipe to ensure a clean surface as required by manufacture.
4. Active leaks (infiltration) must be corrected prior to installing the sealing system.
5. The substrate surface must be free of sand, loose debris, latencies, dust, oil, grease, or chemical contamination.
6. Ensure casting and structure surfaces are clean and dry where the primer is intended to adhere.
7. After allowing for proper drying of primer to occur, sealant may be applied by brush as evenly as possible over the application area.
 - a. The sealing system shall be applied to the entire interior of the adjustment area from the top 2-inches of the cone/top of the manhole, over the grade ring adjustment area, and up a minimum of 2-inches on to the inside of the casting frame. If the manhole has been relined prior to the seal installation, the seal shall cover a minimum of 12 vertical inches to cover the casting-cone interface.

C. Testing

1. Visual inspection – final seal system shall be completely free of pinholes or voids. The Contractor is to furnish the Engineer two (2) mirrors with extension handles that can be used to inspect sealant application to areas underneath frame without entry of manhole. These items will become the property of the Owner upon completion and at no additional cost of this item.

3.4 MANHOLE FRAME AND CHIMNEY SEAL – EXTERIOR AND ABOVE GRADE

- A. The sealing system shall be installed according to the manufacturer’s recommendations.
- B. Surface Preparation:
 1. Clean the flange of the casting frame and the top 5-inch area of the cone of the manhole with a wire brush and whisk broom. Both areas must be clean and dry.
 2. Apply the aerosol primer on the casting flange where the mastic on the inside top section will bond to the structure.
- C. Installation:
 1. Install the sealing band on the outside surface of the adjustment ring area covering all grade rings. The seal should be position with the L-shaped corner at the top of the manhole structure.

2. Remove the protective tape from the non-hardening butyl mastic located under the top section of the seal. Position the top section to lie flat on the base/flange of the frame.
3. Position the 2-inch bottom section of the seal just below the top of the concrete cone. Fold back the bottom mastic portion of the seal. Apply the aerosol primer on the top of the cone where the mastic will bond. Allow to dry and become tacky.
4. Remove the protective tape from the non-hardening butyl mastic located inside the bottom section. Fold the bottom of the seal back onto the structure and with a rubber hammer tap the seal's top and bottom mastic areas onto the structure.
5. Clean a 5-inch area on the cover with a brush. Position the inspection tab on the side of the casting frame and onto the cover. Remove the protective tape from the mastic on the free end of the inspection tab and fasten the inspection tape onto the cover tapping it into place with a rubber hammer.
6. Backfill around manhole to grade and as noted on the Contract Drawings.

3.5 MANHOLE INVERT REPAIR

- A. Plug influent lines into manhole. Bypass sewage as necessary. Clean manhole bottom of all water, sewage, debris, and all substances preventing concrete or mortar from bonding to the existing structure.
- B. Construct inverts and benches using concrete or brick and mortar. Dimensions shall conform to detail on the contract drawings. Newly constructed invert shall cure adequately before allowing flow through manhole. Any damage to the invert due to flow of sewage will be repaired at Contractor's expense.

3.6 HDPE MANHOLE INSERT

- A. Remove manhole cover and clean manhole rim or flange free of any dirt or debris to ensure accurate measurements.
- B. Locate the clear opening of the manhole diameter measurement and the outer edge of the manhole rim diameter measurement as per manufacturer's instruction. Coordinate with manufacturer regarding measurements, type of manhole frame and cover, and foundry of origin, if available.
- C. Install or ensure neoprene gasket is installed with adhesive backing on the underside of the insert rim.
- D. Install and fully seat the insert upon the manhole frame rim and replace cover.

3.7 MANHOLE FRAME AND/OR COVER REPLACEMENT AND ADJUSTMENT

- A. For manholes where frame and cover are to be replaced:

1. Remove existing frame and cover from manhole. Clean existing brick or precast manhole top of dirt and loose brick, mortar, or concrete.
 2. Adjust frame height as necessary and in accordance with the Contract Drawings by one of the following methods. For manholes where the adjustment is to be above grade, only precast concrete adjusting rings shall be used.
 - a. Place a minimum of 1/2 inch thick and 4 inches wide layer of mortar to receive the first course of brick. Joints between brick shall be completely filled and shall be smooth and free from surplus mortar on the inside of manhole. Continue with mortar and brick courses until appropriate grade is attained. Brickwork shall be plastered with 1/2 inch of mortar over the entire inside and outside. For square or rectangular structures, brick shall be laid in stretcher courses with a header course every sixth course. For round structures, brick shall be laid radially with every sixth course a stretcher course.
 - b. Place a minimum of 1/2 inch thick and 4 inches wide layer of mortar to receive the first precast concrete adjusting ring. Continue with mortar and adjusting ring courses until appropriate grade is attained. Precast concrete rings shall be plastered with 1/2 inch of mortar over the entire inside and outside.
 2. Set frame in 1/2-inch-thick layer of mortar and install cover in accordance with manufacturer's installation instructions.
- B. For manholes where cover only is to be replaced:
1. Remove existing cover from manhole. Clean existing frame of dirt and corrosion.
 2. Measure existing frame and gather dimensions appropriate for replacement cover.
 3. Replace the existing cover with a new approved solid, gasketed cover.

3.8 BYPASSING

- A. Bypassing of raw wastewater onto the ground or into a receiving stream is prohibited.
- B. Bypassing shall be accomplished with pumping equipment sufficient to maintain the flow of wastewater. Contractor shall provide pump, hoses, materials, and labor to operate and maintain the bypassing operation. A backup pump shall also be made available by the Contractor. Bypassing operations shall be reviewed and acceptable to the sewer system operator before being implemented.

END OF SECTION 02960

SECTION 02961

TEMPORARY SEWER BYPASS PUMPING OPERATIONS

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. The Contractor shall design and furnish all tools, supplies, materials, labor, equipment, power, and maintenance necessary for the installation, testing, placing into operation, maintaining, and monitoring of a temporary bypass pumping system for the purpose of diverting the existing sewer flows around work areas for the project. At no point during the setup, installation, operation, or demobilization of the temporary bypass pumping systems shall interruption of any pump stations and/or sewer collection systems be caused.
- B. The design, installation, operation, and monitoring of the temporary bypass pumping system shall be the Contractor's responsibility. The Contractor shall employ the services of a vendor who can demonstrate to the Owner and Engineer that it specializes in the design and operation of temporary bypass pumping systems. The vendor shall provide at least five (5) references of projects of a similar size and complexity as this project performed by the vendor's firm within the past ten years.
- C. The bypass system shall meet the requirements of all Federal, State, and Local codes and regulatory agencies having jurisdiction.
- D. Measurement and Payment: No separate payment shall be made for temporary bypass pumping operations. The cost of such operations shall be included in the appropriate unit price item.

1.2 DEFINITIONS

- A. "Interruption of pumping operations" is defined as any activity that will result in a change in the current method of operation. Contractor shall request such "interruption of pumping operations" from the Owner no less than ninety-six (96) hours in advance. The Owner may defer the request as allowed by Article 2.01 A. 4 of this Section.
- B. "Partial Utilization", "Substantial Completion", and "Warranty Period for Items in Continuous Service": Refer to the "Contract Documents" for definition.
- C. The terms "open, close, start, stop, operate, verify, energize, de-energize, transfer, switchover, etc" when used in conjunction with permanent equipment that is in-service or about to be placed in-service are understood to mean: Owner's operation or maintenance staff shall perform the operation upon written request from the Contractor.
- D. The term "operational test" refers to the period of specified duration that the installed system is tested to verify operational integrity of a system prior to placing the system in-service. Operational testing requires that representatives of the equipment manufacturers be on-site for timely identification and resolution of system issues.

- E. “Low Flow Period” refers to the time of day when the pump station flow rate reaches the diurnal minimum. It typically occurs between the hours of 3 AM and 7 AM.

1.3 SUBMITTALS

- A. Bypass Pumping Plan: The Contractor shall submit to the Engineer detailed Drawings and shop drawings outlining all provisions and precautions to be taken by the Contractor regarding the handling of existing wastewater flows. The plan will be signed and sealed by a Professional Engineer registered in the state of South Carolina for all bypassing operations necessary for taking a Town of Ridgeland pump station offline. The plan shall be specific and complete, including such items as schedules, locations, elevations, capacities of equipment, materials, connections, and all other incidental items necessary and/or required to insure proper protection of Owner facilities, including protection of the access and bypass pumping locations. No bypassing operations shall begin until all provisions and requirements have been reviewed and approved by the Owner and Engineer. The plan shall include, but is not limited to, the following details:

1. Detailed drawings showing all required equipment and staging areas for pumps within facility sites or right-of-way areas or other approved areas;
2. Plugging methods and types of plugs;
3. Number, size, material, location and method of installation of suction piping;
4. Number, size, material, method of installation and location of installation of discharge piping;
5. Bypass pump sizes, capacity, number of each size to be on site and power/fuel requirements;
6. Pump curves showing pump operating range are to be submitted;
7. Thrust and restraint block sizes and locations as necessary in accordance with manufacturer/supplier of LineStops, Insert Valves, and other equipment to be installed within piping, if any;
8. Sections showing suction and discharge pipe depth, embedment, select fill and special backfill, and any equipment necessary to maintain clearance for construction activities;
9. Method of noise control for each pump. Facilities are located within residential areas.
10. Any temporary pipe supports and anchoring required;
11. Design for access to bypass pumping locations indicated on the Drawings;
12. Selection of bypass pumping pipe size;
13. Schedule for installation of and maintenance of bypass pumping lines.

14. Emergency plan for adverse weather and flooding for various phases of the Work.
15. Contractors plan for providing continuous monitoring of the bypass pumping operations including qualifications of any onsite monitoring persons and specifications of any electronic monitoring operations. Automatic dialer shall be installed to notify emergency contacts.

B. Sequence of Construction Plan

1. Contractor shall submit the proposed Sequence of Construction to the Engineer for review and approval. The Sequence of Construction shall define work to be performed, including the following items:
 - a. Definition of the start date, duration and end date for each of the segments of the work.
 - b. For each segment of work, define activities to be performed by or witnessed by the Owner and date on which these activities are to be performed.
 - c. Scheduling/timing of manufacturer's field services, as specified.
2. Provide complete list of equipment and material that is required to perform each segment of work.

1.4 SPECIAL PRECAUTION

- A. The Contractor is notified that the bypass pumping operations are critical and must be maintained at all times. If any spills of raw wastewater occur due to the failure of the Contractor to maintain the temporary bypass pumping when needed, the Contractor shall be responsible for any fines levied on the Owner by the SCDES (formerly SCDHEC) or any other applicable agency.

PART 2 – PRODUCTS

2.1 PUMPING EQUIPMENT

A. General:

1. The noted project areas are critical parts of the Owner's sewer system and the flow conveyance must be kept in service at all times. It is essential to the operation of the existing wastewater system that there be no interruption in the conveyance of wastewater to and from any project work area throughout the duration of the project. To this end, the Contractor shall provide, maintain, operate, and monitor all temporary facilities such as dams, plugs, pumping equipment (both primary and back-up units as required), conduits, all necessary power/fuel, and all other labor and equipment necessary to intercept the wastewater flow before it reaches the point where it would interfere with

the construction work, carry it past the work and return it to the existing system downstream of the work.

2. It is the Contractor's responsibility to provide equipment that is adequate for the performance of the temporary bypassing operations under this Contract within the time specified. All equipment shall be kept in satisfactory operating condition, shall be capable of safely and efficiently performing the required operations, and shall be subject to review by the Owner's representative at any time within the duration of the Contract. All operations hereunder shall conform to the applicable requirements of the OSHA Standards for construction.
3. Should the Contractor fail to maintain the continuous operation of the bypass pumping system and operations, the Owner shall repair/operate the bypass pumping system to maintain station operation. Owner shall look to recover the costs for labor, materials, sewage hauling and any other activities required and costs incurred during operation/repair of the temporary bypass system from monies owed the Contractor for other portions of the project work.
4. Pump station operational requirements take precedence over Contractor activities. Therefore, interruption of pump station operations shall be coordinated and are subject to the operational requirements of the Owner. Contractor shall assume that any interruption of pumping system operations may be deferred by up to one week from the requested time due to operational constraints.
5. The Contractor shall provide for utilities and services for its own operations. The Contractor shall furnish, install and maintain all temporary utilities during the contract period including removal upon completion of the project work.
6. Pumps used shall be fully automatic self-priming units that do not require the use of foot-valves in the priming system.
7. The pumps shall be engine driven on skid bases or highway trailer with centralized lifting bracket and integral fuel tank. The pump shall be direct coupled to an electric start diesel engine.
8. All pumps used shall be constructed to allow dry running for long periods of time to accommodate the cyclical nature of the flows.
9. All pumps shall be High Pressure Solids Handling Self-Priming Pumps as manufactured by Thompson Pump & Manufacturing Co., Inc. in state of Florida, Godwin Pumps of America, Inc., or Engineer approved equal.
10. Furnish each pump with the necessary stop/start controls.
11. Contractor shall not be permitted to stop or impede the main flows under any circumstances except as otherwise defined and approved by Owner and Engineer under the sequence of construction. The Contractor shall maintain sewer flow around the work area in a manner that will not cause surcharging of sewers, damage to sewers and that will protect public and private property from damage and flooding.

12. The Contractor shall protect water resources, wetlands and other natural resources.
- B. Temporary Bypass Pumping Requirements: The Contractor shall be responsible for the construction of the temporary bypass facilities as described herein and indicated on the Drawings. Requirements for the bypass pumping system are as follows:
1. Bypass pumping system shall be operated 24 hours per day once put into operation until such time as new/rehabilitated sewer facilities are approved for operation by Owner and Engineer.
 2. Provide two pumps at each bypass pumping location, consisting of one duty pump and one standby pump. The standby pump shall be piped into the suction and discharge headers and shall be on-line and ready for use in the event it is needed. The two pumps combination shall consist of two sound attenuated, diesel driven pumpsets (lead, backup).
 3. Bypass pump shall each have a performance curve that meets or exceeds the performance curve for the required bypass operations at each bypass pumping location.
 - a. For sewer rehabilitation, all existing project gravity sewers are 8-inch or 10-inch. Additional information can be provided by Town and Engineer during construction.
 4. Contractor shall provide continuous monitoring of the bypass pumping operations whether by electronic monitoring operations or by personnel monitoring operations during entire period of active bypass operations to ensure continuous operation of the system. Automatic dialer shall be installed to notify emergency contacts.
 5. The bypass pumps shall be quiet models producing no more than 70 dBA at a distance of 23 feet.
 6. Provide all necessary pipeline plugs, LineStops, Insert Valves, pumps of adequate size to handle peak flows, and temporary suction and discharge piping and fittings to ensure that the total current flow capacity of pump station or sewer main can be safely diverted around the project work area while the facility is modified and/or not in operation.
 7. If removal or modification of any portion of the upstream manhole(s) is necessary to utilize as a suction location(s), contractor is responsible for securing the area and prohibiting public access to the manhole(s). Contractor shall restore the manhole(s) to pre-construction condition or as noted in the construction documents.
 8. The Contractor shall make all arrangements for temporary bypass pumping operations during the time when the pump station or sewer main is shut down for any reason. The bypass system must overcome any existing force main pressure on the discharge.

9. Discharge Piping shall be constructed of steel, ductile iron, or polyethylene pipe with positive, restrained joints. Under no circumstances will aluminum "irrigation" type piping or glued PVC pipe be allowed. Discharge hose will only be allowed in short sections and by specific permission from the Engineer.
10. Operation: The bypass pumps shall have variable capacity by controlling the speed of the diesel engine. Each pump shall have a separate control panel.
11. Provide vacuum and pressure gauges on the suction and discharge headers.
12. Provide controls to automatically start, stop, and vary the pump operations in accordance with the approved control sequence.
13. Control Sequence – Contractor shall coordinate with the Owner operations staff to determine appropriate set points and controls for temporary bypass pumping operations.

2.2 EMERGENCY RESPONSE

- A. Contractor shall provide technician(s) capable of maintaining and trouble- shooting the bypass system on-call in case of an emergency on a 24 hour basis to maintain or re-establish pump sets. Technician shall submit incident reports and turn them into the Owner within 24 hours of any incident.
- B. The Contractor and the Owner's Representative shall be linked by cell phone 24 hours a day during the course of the bypass operations. Any alarms shall initiate a call to the Contractor and the Owner. Contractor and Owner shall each have a minimum of three (3) individuals listed within the "calling tree". Starting with Contractor contacts, if the first contact does not confirm receipt of the alarm call, then the next contact shall be called until the alarm is either confirmed and/or all contacts are called. Owner's link into the alarm status is only for informational purposes. The Contractor shall be responsible for all bypass alarm conditions and shall be required to resolve the condition that is causing the alarm to occur.

PART 3 – EXECUTION

3.1 PREPARATION

- A. The Contractor shall be responsible for locating any existing utilities in the area where the Contractor selects to locate the bypass pumps and pipelines. The Contractor shall locate the bypass pipelines to minimize any disturbance to existing utilities and shall obtain approval of the pipeline locations from Owner and the Engineer. All costs associated with relocating utilities and obtaining all approvals shall be paid by the Contractor. Construction activities shall not be impeded by bypass piping.
- B. During bypass pumping operations, the Contractor shall protect the pump station, sewer mains, and force main from damage inflicted by the Contractor's equipment and operations. The Contractor shall be responsible for all physical damage to the sewer facilities caused by human or mechanical failure.

- C. During bypass pumping, do not allow sewage to be leaked, dumped, or spilled in or onto any area outside of the existing sanitary sewer system.
- D. In the event of accidental spill or overflow, immediately stop the discharge and take action to clean up and disinfect the spill. Promptly notify the Owner and Engineer so that required reporting can be made.
- E. In the event of accidental spill or overflow, the Contractor is responsible for any damages that may have occurred to public or private property including cleaning, disinfection, and other corrections to the satisfaction of the Engineer at no cost to the Owner.

3.2 INSTALLATION AND REMOVAL

- A. The Contractor shall pipe sections or make connections to the existing sewer and discharge forcemain and construct temporary bypass pumping structures only at the locations indicated on the Drawings or in the approved Bypass Pumping Plan, and as may be required to provide an adequate suction and discharge conduit, unless otherwise approved by the Owner and Engineer.
- B. As necessary, plugging or blocking of wastewater flows shall be performed with the use of approved plugs for gravity pipes and with the use of LineStops and/or Insert Valves on force mains which shall be installed by contractors approved by the Owner. When plugging or blocking is no longer needed for performance of the work, the plugs shall be removed in a manner that permits the wastewater flow to slowly return to normal without surge, surcharging, or causing other major disturbances downstream.
- C. The installation of the bypass pipelines is prohibited in all wetland or ditch areas.
- D. At the conclusion of the bypass pumping operations, when all of the modifications to the sewer facilities are complete, tested, and ready for operation, the Contractor shall demonstrate the new system in automatic mode for 72 hours. At the completion of the demonstration period, and upon receipt of Engineer's written approval, the Contractor shall remove all the piping and bypass pumping equipment, restore all property to pre-construction condition and restore all pavement.

3.3 QUALITY CONTROL AND MAINTENANCE

- A. Testing: Contractor shall perform leakage and pressure tests of the bypass pumping discharge piping using clean water prior to actual operation. The Engineer and Owner shall be given 24 hours notice prior to testing.
- B. Inspection: Contractor shall inspect the bypass pumping system a minimum of twice daily, typically at the beginning and end of the work day, to ensure that the system is working correctly.
- C. Maintenance Service: Contractor shall insure that the temporary bypass pumping system is properly maintained and a responsible operator shall inspect the bypass pumping equipment a minimum of once daily during all times when pumps are operating.

- D. Monitoring: The Contractor shall be responsible for monitoring the bypass operations 24 hours per day, 7 days per week. All electronic monitoring must be detailed in the comprehensive written Bypass Pumping Plan and approved by the Owner and Engineer.
- E. Extra Materials: Spare parts for pumps and piping shall be kept on site as required. Adequate hoisting equipment for each pump and accessories shall be maintained on the site. Adequate diesel fuel storage for pumps shall be provided to maintain constant operations of the pumps.

3.4 SEQUENCE OF CONSTRUCTION

- A. Contractor shall thoroughly familiarize itself with all constraints of maintaining operations of the sewer facilities. Contractor shall propose a Sequence of Construction incorporating these constraints and secure concurrence of the Owner and Engineer prior to starting work.
- B. The Contractor shall submit a construction plan and schedule, which details the interruptions to be made which the Contractor shall be fully responsible for. One week prior to connections being made to existing structures or pipes, a coordination meeting shall be held between the Contractor, Engineer, and Owner to discuss the approved construction plan.
- C. Schedule of construction, interconnecting details, and other revisions necessary for proper interfacing of the Work shall be subsequently modified by Contractor accounting for results of said coordination meeting. The Engineer and Owner shall be notified 24 hours prior to any actual interruptions or connections being made. No bypassing operations shall begin prior to securing the Owner's approval of respective connection plan and work schedule.
- D. Temporary Bypass Pumping System Requirements:
 - 1. Contractor shall provide air and vacuum release valve on suction piping to bleed off trapped air.
 - 2. Temporary bypass pump operations and equipment shall include installation of isolation and check valves.
 - 3. Install pressure gauge on pump discharge header and pressure and/or vacuum gauge on suction header. Gauges shall have isolation valves and diaphragm seals.
 - 4. For pump station improvements, demonstrate the bypass pumping system by running it in automatic mode for 72 hours for bypassing operations at pump stations. If the system operates successfully during this period, the existing pumps can be removed from service. If the system does not operate successfully, make repairs/modifications and restart the demonstration period.
 - 5. Provide temporary lighting in the yard for pump maintenance, service, and operation at night, as necessary.

END OF SECTION 02961

SECTION 02970
SANITARY SEWER CURED-IN-PLACE PIPE (CIPP)

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Rehabilitation of sanitary sewer by CIPP Method.
- B. Connect to existing manholes.
- C. Video observation.
- D. Equipment.
- E. Sewer service connection.
- F. Bypassing sewage.

1.2 RELATED SECTIONS

- A. Section 02640 – Sewer System Construction
- B. Section 02955 – Sewer Line Cleaning and CCTV Inspection
- C. Section 02960 – Sanitary Sewer Manhole Rehabilitation
- D. Section 02975 – Sanitary Sewer Pipe Bursting

1.3 OPTIONS

- A. The specifications describe several materials. Where manufacturers and models of equipment are named in the specifications, it is intended these are to describe quality and function required. **The Contractor may use equipment or materials of other manufacturers provided they are reviewed and accepted by Engineer and Owner as equivalent to those specified.**

1.4 REFERENCES (Latest Revision)

- A. ASTM D 790 – Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
- B. ASTM D 5813 – Cured-In-Place Thermosetting Resin Sewer Piping Systems.
- C. ASTM E 329 – Agencies Engaged in Construction Inspection, Testing, or Special Inspection.
- D. ASTM F 1216 – Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube.
- E. ASTM F 1743 – Rehabilitation of Existing Pipelines and Conduits by Pulled-in-Place

Installation of Cured-in-Place Thermosetting Resin Pipe. (CIPP)

1.5 MEASUREMENT AND PAYMENT

- A. Cured-in-Place Pipe – Measurements will be made between the centers of manholes or to other pipe ends. Payment will be made at the contract unit price per linear foot of cured-in-place pipe for each pipe diameter, and shall include cost of labor, material, equipment, cleaning, video re-observation at 11 months post construction, preparation of existing pipe, service lateral connection reinstatement, sewer bypassing operations, disposal of all debris/waste, and performance of all operations necessary to complete rehabilitation of all designated sewer pipes using cured-in-place pipe method.
- B. Traffic Control – Separate payment will not be made for traffic control operations necessary for the project. The cost of traffic control operations shall be included in the appropriate unit price item and shall include cost of all traffic operations necessary to adhere to the SCDOT standards and project SCDOT Encroachment Permit.

1.6 QUALITY ASSURANCE

- A. Contractor will furnish the Engineer and Owner a description of all material before ordering. The Engineer will review Contractor's submittals and provide in writing an acceptance or rejection of material.
- B. For a product to be considered, a minimum of 200,000 linear feet or 200 manhole-to-manhole line sections of successful wastewater collection system installations in the U.S. must be documented to satisfaction of Owner and Engineer. At least 50,000 linear feet of the product shall have been in successful service for a minimum of five years.
- C. For an installer to be considered, the installer must satisfy all insurance, financial, and bonding requirements of Owner, and must have had at least two (2) years active experience in commercial installation of product bid. In addition, the installer must have successfully installed at least 50,000 feet of product bid in wastewater collection systems. Acceptable documentation of these minimum installations must be submitted to the Owner and Engineer.
- D. Sewer rehabilitation products submitted for acceptance must provide a current (within last year) third party test results supporting the long-term performance and structural strength of product, and such data shall be satisfactory to Owner and Engineer. Test samples shall be prepared to simulate installation methods and trauma of the product. No product will be accepted without independent third-party testing verification.
- E. Devices, equipment, structures, and systems not designated by Engineer which the Contractor wishes to furnish shall be designed by either a Registered Professional Engineer or by someone Engineer accepts as qualified. If required, complete design calculations and assumptions shall be furnished to the Engineer or Owner before acceptance.
- F. Tests shall be taken by a testing laboratory operating in accordance with ASTM E329 and shall be acceptable to the Engineer prior to engagement. Mill certificates of tests on materials made by manufacturers will be accepted provided a manufacturer maintains an adequate testing laboratory, makes regularly scheduled tests which are spot checked by an outside laboratory, and furnishes satisfactory certificates with name of the one making test.

1.7 PRODUCT DELIVERY, STORAGE & HANDLING

- A. Material shall be unloaded in a manner avoiding damage and shall be stored where it will be protected and will not be hazardous to traffic. If stored on private property, Contractor shall obtain permission from the property owner and shall repair any damage caused by storage. Material shall be examined before installation and neither damaged nor deteriorated material shall be used in the work.

1.8 JOB CONDITIONS

- A. The installation of cured-in-place pipe must be coordinated with other work on site. Contractor shall replace or repair any materials or structures damaged through the course of its work.
- B. Contractor shall conform with all local, state, and federal regulations including those set forth by OSHA, RCRA and the EPA and any other applicable authorities.
- C. It is the responsibility of the Contractor to determine if field conditions are suitable for the work required, including soil conditions, prior to any cleaning, CIPP work, or any bypass pumping. Loose soils may be present near access points (including manholes), and it is the responsibility of the Contractor to prevent displacement of these sorts throughout the entire course of the work. In the event of any sinkholes, it is the responsibility of the Contractor to fully repair the area and restore the entire area to its previous condition.

1.9 SEQUENCING AND SCHEDULING

- A. Contractor shall arrange work so rehabilitated sewer lines and reinstated laterals are placed back in service as soon as reasonable after the cured-in-place pipe is installed.

1.10 ALTERNATIVES

- A. The intention of these specifications is to produce the best system for the Owner. If Contractor suggests alternate material, equipment or procedures will improve results at no additional cost, Engineer and Owner will examine the suggestion, and if it is accepted, it may be used. Basis upon which acceptance of an alternate will be given is its value to the Owner, and not for convenience of Contractor.

1.11 GUARANTEE

- A. Contractor shall guarantee the quality of materials, equipment, and workmanship for 12 months after acceptance of completed Project. Defects discovered during this period shall be repaired by Contractor at no cost to the Owner.
- B. Contractor shall re-video 20% of the cured-in-place rehabilitated pipeline between ten (10) and eleven (11) months from date of final acceptance. If more than 30% of repaired pipe shows failures, Contractor shall replace all of the cured-in-place pipe.

1.12 EXISTING UTILITIES

- A. All known Town of Ridgeland utility facilities are shown schematically on the

construction drawings and are not necessarily accurate in location as to plan or elevation. Utilities such as service lines or unknown facilities not shown will not relieve the Contractor of responsibility under this requirement. Contractor will be held responsible for cost of repairs to damaged underground facilities, even when such facilities are not shown on the drawings.

- B. The Contractor shall call for underground utility locations before starting work. Underground utilities location service can be contacted at (888) 721-7877 (SC) or 811.

1.13 TESTING

- A. Chemical Resistance – CIPP shall meet the chemical resistance requirements of ASTM F1216, Appendix X2. CIPP samples for testing shall be of tube and resin system similar to materials proposed for actual construction. It is required CIPP samples with and without plastic coating meet these chemical testing requirements.
- B. CIPP Field Samples – Contractor shall submit test results from field installations in the USA of same resin system and tube materials as proposed for actual installation. These test results must verify the CIPP physical properties specified in Paragraph 2.3 E have been achieved in previous field applications. Samples for this project shall be made and tested as described in the following paragraph.

CIPP samples shall be prepared and physical properties tested in accordance with ASTM F1216 or ASTM F1743, Section 8, using either method proposed. The flexural properties must meet or exceed values listed in Table 1 of applicable ASTM.

- C. Testing laboratory shall operate in accordance with ASTM E 329 and be acceptable to the Engineer.
- D. Testing laboratory and Project Engineer/Project Representative shall be given a minimum of 48 hours notice prior to taking any of the tests.
- E. Testing shall be the responsibility of the Contractor and shall be performed at Contractor's expense by a commercial testing laboratory operating in accordance with subparagraph C above.
- F. Test results shall be furnished to the Engineer prior to continuing with associated or subsequent work.

PART 2 – PRODUCTS

2.1 MANUFACTURER

- A. All tubing and resin used shall be manufactured by Insituform, or approved equal.

2.2 TUBE

- A. Tube – The tube shall consist of one or more layers of absorbent non-woven felt fabric and meet requirements of ASTM F1216 or ASTM F1743, Section 5. The tube shall be constructed to withstand installation pressures, have sufficient strength to bridge missing pipe, and stretch to fit irregular pipe sections.

1. The wet out tube shall have a uniform thickness when compressed at installation pressures and will meet or exceed the design thickness.
2. The tube shall be manufactured to a size when installed will tightly fit internal circumference and length of original pipe. Allowance should be made for circumferential stretching during inversion. Overlapped layers of felt in longitudinal seams causing lumps in the final product shall not be utilized.
3. The outside layer of tube (before wet out) shall be coated with an impermeable, flexible membrane containing resin, and facilitate monitoring of resin saturation during resin impregnation (wet out) procedure.
4. The tube shall be homogeneous across entire wall thickness containing no intermediate or encapsulated elastomeric layers. No material shall be included in the tube which may cause delamination in cured CIPP. No dry or unsaturated layers shall be evident.
5. Seams in tube shall be stronger than the non-seamed felt.
6. The outside of tube shall be marked for distance at regular intervals along its entire length, not to exceed five (5) feet. Such markings shall include the manufacturer's name or identifying symbol.

2.3 RESIN

- A. Resin – The resin system shall be a corrosion resistant polyester, vinyl ester, or epoxy and catalyst system. When properly cured within the tube composite, resin shall meet requirements of ASTM F1216, ASTM F1743, and ASTM D 5813, physical properties herein, and those being utilized in design of CIPP for this project. The resin shall produce CIPP complying with structural and chemical resistance requirements of this specification.
- B. A dye compatible with the resin and tube fabric shall be added to resin to facilitate monitoring of resin saturation during resin impregnation (wet out) procedure.

2.4 STRUCTURAL REQUIREMENTS

- A. The CIPP shall be designed as per ASTM F1216, Appendix X.1. CIPP design shall assume no bonding to the original pipe wall.
- B. Contractor must have performed long-term testing for flexural creep of the CIPP pipe material installed by its company. Such testing results are to be used to determine the Long-term, time dependent flexural modulus to be utilized in product design. This is a performance test of materials (tube and resin) and general workmanship of the installation and curing. A percentage of the instantaneous flexural modulus value (as measured by ASTM D-790 testing) will be used in design calculations for external buckling. The percentage, or long-term creep retention value utilized, will be verified by this testing. Values in excess of 50% will not be applied unless substantiated by qualified third-party test data. Materials utilized for the contracted project shall be of a quality equal to or better than materials used in long-term test with respect to initial flexural modulus used in design.
- C. The Enhancement Factor ‘K’ to be used in ‘Partially Deteriorated’ design conditions shall be assigned a value of 7. Application of Enhancement (K) Factors in excess of 7 shall be substantiated through independent test data.
- D. The layers of cured CIPP shall be uniformly bonded. It shall not be possible to separate any two layers with a probe or point of a knife blade, so layers separate cleanly, or probe or knife blade moves freely between the layers. If separation of layers occurs during testing of field samples, new samples will be cut from the work. Any reoccurrence may cause rejection of the work.
- E. The cured pipe material (CIPP) shall conform to the structural properties, as listed below.

MINIMUM PHYSICAL PROPERTIES

<u>Property</u>	<u>Test Method</u>	<u>Cured Composite min. per ASTM F1216</u>	<u>Cured Composite (400,000 psi Resin)</u>
Modulus of Elasticity	ASTM D-790 (short term)	250,000 psi	400,000 psi
Flexural Stress	ASTM D-790	4,500 psi	4,500 psi

- F. Required structural CIPP wall thickness shall be based as a minimum, on physical properties in Paragraph E and in accordance with design equations in appendix of ASTM F 1216, and the following design parameters:

Design Safety Factor	= <u>2.0</u>
Retention Factor for Long-Term Flexural Modulus to be used in Design <i>(as determined by Long-Term tests described in paragraph B)</i>	= <u>1% – 60%</u>
Ovality*	= <u>2%</u>

Enhancement Factor, K	= <u>See Paragraph C</u>
Groundwater Depth (above invert)*	= <u>ft.</u>
Soil Depth (above crown)*	= <u>ft.</u>
Soil Modulus**	= <u>PSI</u>
Soil Density**	= <u>120 pcf</u>
Live Load**	= <u>H20 Highway</u>
Design Condition (partially or fully deteriorated)***	= <u>***</u>

* Denotes information which can be provided here or in observation video recordings or project construction plans. Multiple line segments may require a table of values.

** Denotes information required only for fully deteriorated design conditions.

*** Based on review of video logs, conditions of pipeline can be fully or partially deteriorated.

(See ASTM F1216 Appendix.) The Engineer or Owner will be sole judge as to pipe conditions and parameters utilized in Design.

- G. Refer to the below tables for specific pipe section requirements for both partially deteriorated pipe and fully deteriorated pipe, based on pipe condition, depth, ovality, etc. as computed for conditions shown, using ASTM F 1216 design equations.

CIPP WALL THICKNESS PARTIALLY DETERIORATED DESIGN (PD)

		Required DR (D /			
		Ei = 250,000 psi		Ei = 400,000 psi	
		Ground Water Depth			
Ovality	Range of Depth to invert (feet)	50% Depth	Full Depth	50% Depth	Full Depth
2 % *	4 – 8	78	62	92	73
	8 – 12	69	55	80	64
	12 – 16	62	50	73	58
	16 – 20	58	46	68	54
	20 – 24	55	44	64	51
5 %	4 – 8	72	57	84	67
	8 – 12	63	50	73	58
	12 – 16	57	46	67	53
	16 – 20	53	42	62	49
	20 – 24	50	40	58	47
8 %	4 – 8	66	52	77	61
	8 – 12	58	46	67	54
	12 – 16	52	42	61	49
	16 – 20	49	39	57	45
	20 – 24	46	37	54	43

PD wall thickness varies with the height of groundwater above invert of host pipe. The table assumes height of groundwater equal to half or full depth to pipe invert. The table represents CIPP pipe wall thickness for a host pipe range of 8 to 48 inches. This is a guideline only. Specific calculations should

refer to ASTM F-1216, Appendix X.1.

FULLY DETERIORATED DESIGN (FD)

		Required DR (D /			
		Ei = 250,000 psi		Ei = 400,000 psi	
		Ground Water Depth			
Ovality	Range of Depth to invert (feet)	50% Depth	Full	50% Depth	Full
2 % *	4 – 8	49	43	58	51
	8 – 12	49	43	58	51
	12 – 16	44	39	52	46
	16 – 20	40	36	47	41
	20 – 24	37	33	44	38
5 %	4 – 8	41	37	48	43
	8 – 12	41	36	48	43
	12 – 16	37	33	44	38
	16 – 20	34	30	40	35
	20 – 24	31	27	37	32
8 %	4 – 8	35	31	40	36
	8 – 12	35	30	41	36
	12 – 16	31	27	37	32
	16 – 20	28	25	33	29
	20 – 24	26	23	31	27

FD wall thickness considers groundwater, soil, and live loads upon the CIPP pipe. The table assumes two heights of groundwater, 120-lbs/cu. ft. of soil density and an AASHTO H20 highway load. The table represents CIPP pipe wall thickness for a host pipe range of 8 to 48 inches. This is a guideline only. Specific calculations should refer to ASTM F-1216, Appendix X.1.

2.5 HYDRAULIC CAPACITY

- A. Overall, the hydraulic profile shall be maintained as large as possible. The CIPP shall have at least full flow capacity of original pipe before rehabilitation. Calculated capacities may be derived using a commonly accepted roughness coefficient for the existing pipe material taking into consideration its age and condition.

2.6 VIDEO EQUIPMENT

- A. Video equipment shall be in accordance with Section 02955, Sewer Line Cleaning and CCTV Inspection.

2.7 PRODUCT REVIEW

- A. Contractor shall provide the Engineer with a complete description of all products from source suppliers before ordering. The Engineer will review all products before they are

ordered by Contractor.

PART 3 – EXECUTION

3.1 CONSTRUCTION OBSERVATION

- A. The quality of CIPP installation shall be tested by Contractor under direction of Engineer. Engineer or Project Representative will have the right to require any portion of work be completed in their presence. However, if Contractor notifies the Engineer such work is scheduled and Engineer fails to appear within 48 hours, Contractor may proceed. All completed work and materials furnished shall be subject to review by the Engineer or Project Representative. All improper work shall be reconstructed. All materials not conforming to requirements of specifications shall be removed from the work upon notice being received from Engineer for rejection of such materials. Engineer shall have the right to mark rejected materials to distinguish them as such.

Contractor shall give the Project Engineer or Project Representative a minimum of 48 hours notice for all required observations or tests.

- B. Wall thickness of samples shall be determined as described in Paragraph 8.1.6 of ASTM F1743. Minimum wall thickness at any point shall not be less than 87½% of the design thickness as calculated in Paragraph 2.4 F of this document.
- C. Visual observation of the CIPP shall be in accordance with ASTM F1216 and ASTM F1743, Section 8.6.

3.2 INSTALLATION

- A. It is the responsibility of the Contractor to determine if field conditions are suitable for the work required, including soil conditions, prior to any cleaning, CIPP work, or any bypass pumping. Loose soils may be present near access points (including manholes), and it is the responsibility of the Contractor to prevent displacement of these sorts throughout the entire course of the work. In the event of any sinkholes, it is the responsibility of the Contractor to fully repair the area and restore the entire area to its previous condition.
- B. It shall be the responsibility of Owner to locate and designate all manhole access points open and accessible for work, and provide rights of access to these points. If a street must be closed to traffic because of the orientation of a sewer, Contractor shall institute actions necessary to do this for mutually agreed time period, in accordance with all South Carolina Department of Transportation (SCDOT) standards and project permits. Owner shall also provide free access to fire hydrants for cleaning, inversion and other work items requiring water. Contractor shall provide equipment, hoses, and backflow prevention for obtaining water from fire hydrants.
- C. Cleaning of Sewer Lines:
1. Cleaning of Sewer Lines shall be conducted in accordance with Section 02955, Sewer Line Cleaning and CCTV Inspection.

2. Contractor shall remove all internal debris out of the sewer line which will interfere with installation of CIPP. Contractor shall obtain a legal offsite disposal site for all debris removed from sewers during the cleaning operation. Any hazardous waste material encountered during this project will be considered as a changed condition. Contractor may also have the option to flush internal debris, with approval from Engineer and Owner, from the sewer down-stream, provided the waste is not hazardous or will not cause detriment to operations in any way to the existing wastewater collection and treatment systems.
- D. Bypassing Sewage – Contractor, when necessary, shall provide for the flow of sewage around section or sections of pipe designated for repair. Bypass shall be made by plugging a line at an existing upstream manhole and pumping the flow into a downstream manhole or adjacent system, as approved by Engineer and Owner. Pump and bypass lines shall be of adequate capacity and size to handle the flow. Owner shall require a detail of the bypass plan to be submitted for review and approval prior to any bypassing operations. One stand-by pump of equal capacity shall be provided during bypassing operations. Reference paragraph 3.5 of this section.
 - E. Observation of Pipelines – Shall be performed by experienced personnel trained in locating breaks, obstacles, and service connections by closed circuit television. Interior of the pipeline shall be carefully checked to determine location of any conditions preventing proper installation of CIPP into pipelines, and it shall be noted so these conditions can be corrected. A video and suitable log shall be kept for later reference by the Owner and Engineer.
 - F. Line Obstructions – It shall be the responsibility of Contractor to clear line of obstructions such as solids and roots preventing insertion of CIPP. If pre-installation observation reveals an obstruction such as a protruding service connection, dropped joint, or a collapse preventing the inversion process and it cannot be removed by conventional sewer cleaning equipment, Contractor shall make a point repair excavation to uncover and remove or repair obstruction. Such excavation shall be accepted in writing by the Engineer and Owner prior to commencement of work and shall be considered as a separate pay item.
 - G. Notification – Contractor shall make every effort to maintain service usage throughout duration of the project. In the event a sewer line or service lateral will be out of service, maximum amount of time of no service shall be eight (8) hours for any building or facility served by this section. Contractor is responsible for notifying the owner of the building or facility and informing when sewer will be off-line. Contractor shall also coordinate and inform the Owner and Engineer.
 - H. Installation procedures for CIPP shall conform to ASTM F1216 and the following requirements. The resin-impregnated tube shall be inverted into sewer by controlled steam or water pressure. Once inversion has started, the pressure required to hold tube tight against existing sewer shall be maintained between minimum and maximum pressures recommended by tube manufacturer until process is complete. Should pressure deviate from within the range of minimum and maximum pressures, installed tube shall be removed from existing sewer. The heat source shall be fitted with suitable monitors to gage temperature of steam or water. This gage shall be placed between impregnated tube and pipe invert at the termination point during cure. After initial cure is reached, the temperature shall be raised to post-cure temperatures recommended by resin manufacturer. Once curing

is complete, new pipe shall be cooled to a temperature below 100 degrees F before relieving the internal pressure. The finished pipe should be continuous over entire length of an inversion run and free of dry spots, lifts, and delaminations. If these conditions are present, remove and replace the CIPP.

- I. All service lateral connections covered by the CIPP are to be opened and reinstated without excavation using a hydraulic powered robotic cutting device, specifically designed for cutting CIPP. The lateral opening in CIPP shall be of same shape as original opening. If Contractor misses an opening with the cutter, tube shall be repaired at Contractor's expense.

3.3 FIELD TESTING

- A. After the existing sewer is completely repaired, internally check with television camera and video recording as required. Finished video recording shall be continuous over the entire length of sewer between two manholes.
- B. Defects, which may affect integrity or strength of pipe in the opinion of Engineer, shall be repaired or pipe replaced at Contractor's expense.
- C. For each inversion section, Contractor shall cut a sample from a section of cured CIPP at an intermediate manhole or termination point. Samples for each section shall be large enough to provide five specimens for flexural and tensile testing.

3.4 VIDEO OBSERVATION

- A. Video observation (C.C.T.V) of pipelines shall be performed in accordance with Section 02955, Sewer Line Cleaning and CCTV Inspection, by experienced personnel trained in locating breaks, obstacles, and service connections by closed circuit color television. Video observation shall include the following:
 1. Video recordings (post) to be submitted to the Engineer and Owner before final invoice.
 2. Video recordings to remain property of the Owner; Contractor to retain second copy for its use.
 3. All flows tributary to section of sewer being checked shall be completely by-passed around the section during observation if necessary.
 4. Provide post construction video recording upon completing reconstruction of each section of sewer with voice description and stationing of services. Data and stationing to be on video.
 5. Should any portion of video recordings be of inadequate quality or coverage, as determined by Owner or Engineer, Contractor will have the portion re-checked and video recorded at no additional expense to Owner.

3.5 BYPASSING SEWAGE

- A. Bypass Pumping – The Contractor shall provide diversion for cured-in-place pipe process.

A minimum of two (2) bypass pumping units (one (1) operating, one (1) standby) of equal capacity shall be present and ready to operate on site at all times while repair work is in progress. The pumps and bypass lines shall be of adequate capacity and size to handle all flows.

- B. Contractor shall be responsible for continuity of sanitary sewer service to each facility connected to the section of sewer during execution of work.
- C. If sewage backup occurs and enters buildings, the Contractor shall be responsible for clean-up, repair, property damage cost and claims, regulatory fines, and any required monitoring at no additional cost to Owner.

3.6 CLEAN-UP

- A. Upon acceptance of the installation work and testing, Contractor shall restore project area affected by operations, equal to prior conditions.

3.7 ACCEPTANCE OF PORTIONS OF THE WORK

- A. Owner reserves the right to accept and use any portion of work. Engineer shall have power to direct the Contractor's efforts regarding which the order of the rehabilitation segments.

END OF SECTION 02970

SECTION 02975
SANITARY SEWER PIPE BURSTING

PART 1 - GENERAL

1.1 SCOPE OF WORK: This specification addresses the installation of sewer mains by the pipe bursting method, including connecting to existing sewer mains, connecting to existing services or installing house connections. The Contractor will furnish all labor, equipment, materials, tools and appurtenances necessary or proper for the performance and completion of the contract. Inspection and payment will be by the method stipulated in the contract.

1.2 DEFINITIONS

- A. Pipe Bursting: Method of trenchless construction in which a bursting tool splits/fractures the existing pipe while simultaneously installing a new Polyethylene Pipe of the same size or larger using a Static or Pneumatic Pipe Bursting Technique.
- B. Engineer: Overall project engineer employed or retained by the Owner.
- C. Owner: Municipal utility authority, sewer district or private owner of the sewer system.
- D. Contractor: Firm engaged in the construction of underground utility lines and with demonstrated competency using pipe bursting methods for the installation of sewer pipelines.

1.3 RELATED SECTIONS

- A. Section 02640 – Sewer System Construction
- B. Section 02955 – Sewer Line Cleaning and CCTV Inspection
- C. Section 02960 – Sanitary Sewer Manhole Rehabilitation
- D. Section 02970 – Sanitary Sewer Cured in Place Pipe

1.4 OPTIONS

- A. The specifications describe several materials. Where manufacturers and models of equipment are named in the specifications, it is intended these are to describe quality and function required. **The Contractor may use equipment or materials of other manufacturers provided they are reviewed and accepted by Engineer and Owner as equivalent to those specified.**

1.5 REFERENCES (Latest Revision)

- A. ASTM F714 - Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based

on Outside Diameter

- B. ASTM D1248 - Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable
- C. ASTM D3350 - Standard Specification for Polyethylene Plastics Pipe and Fittings Materials
- D. AWWA C901 - Polyethylene (PE) Pressure Pipe and Tubing, $\frac{3}{4}$ inch (19 mm) through 3 inch (76 mm), for water service
- E. AWWA C906 – Polyethylene (PE) Pressure Pipe and Fittings, 4 Inch through 65 Inch (100 mm through 1,650 mm) for Waterworks
- F. ASTM D3035 - Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter
- G. ASTM E3261 - Butt Heat Fusion Polyethylene Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing
- H. ASTM F2620 - Standard Practice for Heat Fusion Joining of Polyethylene Pipe and Fittings.
- I. ASTM E 329 – Agencies Engaged in Construction Inspection, Testing, or Special Inspection.

1.6 MEASUREMENT AND PAYMENT

- A. Pipe Bursting – Measurements will be made between the centers of manholes or to other pipe ends. Payment will be made at the contract unit price per linear foot of pipe bursting for each pipe diameter, and shall include cost of labor, material, equipment, cleaning, pipe joining, video re-observation at 11 months post construction, preparation of existing pipe, sewer bypassing operations, piping installation and anchor and seal at manhole, repair of any damage to manholes, and performance of all operations necessary to complete rehabilitation of all designated sewer pipes using pipe bursting method.
- B. Sewer Lateral Reconnection – Measurement will be made for each sewer service lateral connection restored to the completed HDPE pipe burst main at the contract unit price per each. Such payment shall include cost of labor, material, and equipment to excavate and identify lateral, prepare for pipe bursting operations, install fitting for connection, restore connection between sewer lateral and gravity main, backfill and compact, and complete connection to restore operation.
- C. Traffic Control – Separate payment will not be made for traffic control operations necessary for the project. The cost of traffic control operations shall be included in the appropriate unit price item and shall include cost of all traffic operations necessary to adhere to the SCDOT standards and project SCDOT Encroachment Permit.

1.7 QUALITY ASSURANCE

- A. Contractor will furnish the Engineer and Owner a description of all material before ordering. The Engineer will review Contractor's submittals and provide in writing an acceptance or rejection of material.
- B. For a product to be considered, a minimum of 200,000 linear feet or 200 manhole-to-manhole line sections of successful wastewater collection system installations in the U.S. must be documented to satisfaction of Owner and Engineer. At least 50,000 linear feet of the product shall have been in successful service for a minimum of five (5) years.
- C. For an installer to be considered, the installer must satisfy all insurance, financial, and bonding requirements of Owner, and must have had at least two (2) years active experience in commercial installation of product bid. In addition, the installer must have successfully installed at least 50,000 feet of product bid in wastewater collection systems. Acceptable documentation of these minimum installations must be submitted to the Owner and Engineer.
- D. Devices, equipment, structures, and systems not designated by Engineer which the Contractor wishes to furnish shall be designed by either a Registered Professional Engineer or by someone Engineer accepts as qualified. If required, complete design calculations and assumptions shall be furnished to the Engineer or Owner before acceptance.
- E. Tests shall be taken by a testing laboratory operating in accordance with ASTM E329 and shall be acceptable to the Engineer prior to engagement. Mill certificates of tests on materials made by manufacturers will be accepted provided a manufacturer maintains an adequate testing laboratory, makes regularly scheduled tests which are spot checked by an outside laboratory, and furnishes satisfactory certificates with name of the one making test.
- F. Field Supervisory Personnel employed by the Pipe Bursting Contractor will have at least two (2) years of documented experience in the performance of the work and tasks as stated in the contract documents.

1.8 PRODUCT DELIVERY, STORAGE & HANDLING

- A. Material shall be unloaded in a manner avoiding damage and shall be stored where it will be protected and will not be hazardous to traffic. If stored on private property, Contractor shall obtain permission from the property owner and shall repair any damage caused by storage. Material shall be examined before installation and neither damaged nor deteriorated material shall be used in the work.

1.9 JOB CONDITIONS

- A. The installation of HDPE piping by pipe bursting method must be coordinated with other work on site. Contractor shall replace or repair any materials or structures damaged through the course of its work.

- B. Contractor shall conform with all local, state, and federal regulations including those set forth by OSHA, RCRA and the EPA and any other applicable authorities.
- C. It is the responsibility of the Contractor to determine if field conditions are suitable for the work required, including soil conditions, prior to any cleaning, pipe bursting work, or any bypass pumping. Loose soils may be present near access points (including manholes), and it is the responsibility of the Contractor to prevent displacement of these sorts throughout the entire course of the work. In the event of any sinkholes, it is the responsibility of the Contractor to fully repair the area and restore the entire area to its previous condition.

1.10 SEQUENCING AND SCHEDULING

- A. Contractor shall arrange work so rehabilitated sewer lines and reinstated laterals are placed back in service as soon as reasonable after the HDPE pipe is installed.

1.11 ALTERNATIVES

- A. The intention of these specifications is to produce the best system for the Owner. If Contractor suggests alternate material, equipment or procedures will improve results at no additional cost, Engineer and Owner will examine the suggestion, and if it is accepted, it may be used. Basis upon which acceptance of an alternate will be given is its value to the Owner, and not for convenience of Contractor.

1.12 GUARANTEE

- A. Contractor shall guarantee the quality of materials, equipment, and workmanship for 12 months after acceptance of completed Project. Defects discovered during this period shall be repaired by Contractor at no cost to the Owner.
- B. Contractor shall re-video 20% of the pipe burst installed pipeline between ten (10) and eleven (11) months from date of final acceptance. If more than 30% of repaired pipe shows failures, Contractor shall replace all of the pipe burst installed HDPE pipe.

1.13 EXISTING UTILITIES

- A. All known Town of Ridgeland utility facilities are shown schematically on the construction drawings and are not necessarily accurate in location as to plan or elevation. Utilities such as service lines or unknown facilities not shown will not relieve the Contractor of responsibility under this requirement. Contractor will be held responsible for cost of repairs to damaged underground facilities, even when such facilities are not shown on the drawings.
- B. The Contractor shall call for underground utility locations before starting work. Underground utilities location service can be contacted at (888) 721-7877 (SC) or 811.

1.14 SUBMITTALS

- A. The Contractor shall submit the following for review and approval:

1. Documentation showing that personnel have two (2) years of Pipe Bursting experience with a list of a minimum 50,000 LF installed by the company including three (3) sewer main projects similar or greater in scope and value to the project specified in the contract documents. Information for each supervisor and the company must include, but not be limited to, date of work, location, pipe information (i.e., length, diameter, depth of installation, pipe material, etc.), project owner information, (i.e., name, address, and telephone number, contact person).
2. Drawings and documents:
 - a. Shop drawings, catalog data, and manufacturer's technical data showing complete information on material composition, physical properties, and dimensions of new pipe and fittings. Include manufacturer's recommendations for handling, storage, and repair of pipe and fittings damaged.
 - b. Certifications of personnel involved in HDPE Butt Fusion Welding.

PART 2 - PRODUCTS

2.1 HDPE PIPE

- A. Polyethylene Plastic Pipe shall be High Density Polyethylene Pipe (HDPE) and meet applicable requirements of ASTM F714.
- B. HDPE pipe and fittings will be used in accordance with the material specifications. All additional appurtenances (manholes, tees, gaskets, etc.) will meet the material specifications. All pipe installed by pipe bursting will be joined by butt fusion, electro fusion, or full circle repair clamp as detailed in this Section.
- C. HDPE pipe will be produced from resins meeting the requirements of ASTM D1248, designation PE3408, ASTM D3350 cell classification PE345444C, and will meet the requirements of AWWA C901 and C906. HDPE pipe will meet the minimum stability requirements of ASTM D3350. Pipe will be legibly marked at intervals of no more than five feet with the manufacturer's name, trademark, pipe size, HDPE cell classification, appropriate legend such as SDR 19 or SDR 17, ASTM D3035, AWWA C901 or C906, date of manufacture and point of origin.
- D. All pipe shall be made of virgin material. No rework material except that obtained from the manufacturers own production of the same formulation shall be used.
- E. The pipe shall be homogeneous throughout and shall be free of visible cracks, holes, foreign material, blisters, or other deleterious faults.

- F. Pipe color shall be solid black unless otherwise specified in these contract documents.
- G. HDPE Pipe shall be Iron Pipe Size (IPS) unless otherwise specified in these contract documents.
- H. Dimension Ratios: The minimum wall thickness of the HDPE pipe shall meet the following;

Minimum DR

DR 19 or DR 17

2.2 PIPE JOINING FOR TERMINAL SECTIONS OF HDPE PIPE

- A. The polyethylene pipe shall be assembled and joined at the site using the butt-fusion method to provide a leak proof joint. Threaded or solvent-cement joints and connections are not permitted. All equipment and procedures used shall be in strict compliance with the manufacturer's recommendations. Fusing shall be accomplished by personnel certified as fusion technicians by a manufacturer of polyethylene pipe and/or fusing equipment.
- B. Terminal sections may also be joined by Electrofuse Couplings by Central Plastic Company, Friatec, or approved equal.

2.3 MATERIALS RELATED TO SEWER SERVICE CONNECTIONS

- A. Sewer service connections to the HDPE main may be made by Plastic Saddles with Stainless Steel Straps, by GPK or approved equal or Rubber Saddles with Stainless Steel Straps by Fernco Company, DFW, or approved equal.
- B. Sewer service connections to the main may also be made with Electrofusion Saddles by Central Plastics, Friatec, or approved equal.
- C. Sewer service connections to the main may also be made with Inserta Tees by Fowler Manufacturing.

2.4 MATERIALS FOR SEALING MANHOLES

- A. The annular space at each manhole shall be sealed with a water stop gasket by Fernco Company or approved equal and finished with a quick setting grout.

2.5 EQUIPMENT

- A. The pipe bursting unit shall be designed and manufactured to force its way through the existing line by fracturing the pipe and compressing the broken pieces into the surrounding soil as the equipment progresses. The bursting unit shall generate sufficient force to burst and compact the existing pipeline. In each case the pipe

bursting unit shall pull the polyethylene pipe with it as it moves forward.

PART 3 - EXECUTION

3.1 GENERAL

- A. Insertion and receiving points shall be existing manholes unless existing conditions are insufficient for equipment and piping. Any proposed insertion or receiving pits must be approved by Engineer and Owner.
- B. Insertion point shall be of sufficient length to allow the bursting head and new HDPE pipe to enter the host pipe at an angle that will maintain the grade of the existing sanitary sewer.
- C. Notification – Contractor shall make every effort to maintain service usage throughout duration of the project. In the event a sewer line or service lateral will be out of service, maximum amount of time of no service shall be eight (8) hours for any building or facility served by this section. Contractor is responsible for notifying the owner of the building or facility and informing when sewer will be off–line. Contractor shall also coordinate and inform the Owner and Engineer.

3.2 BYPASSING SEWAGE

- A. Bypass Pumping – The Contractor shall provide diversion for pipe bursting process. A minimum of two (2) bypass pumping units (one (1) operating, one (1) standby) of equal capacity shall be present and ready to operate on site at all times while repair work is in progress. The pumps and bypass lines shall be of adequate capacity and size to handle all flows. All costs for bypass pumping shall be incidental and are included in the pipe bid item(s).
- B. Contractor shall be responsible for continuity of sanitary sewer service to each facility connected to the section of sewer during execution of work.
- C. If sewage backup occurs and enters buildings, the Contractor shall be responsible for clean–up, repair, property damage cost and claims, regulatory fines, and any required monitoring at no additional cost to Owner.

3.3 PREPARATION

- A. All sewer service connections shall be located prior to pipe bursting the main by the Pre-Construction CCTV Inspection as required per Section 02955.
- B. If the Pre-Construction CCTV inspection reveals obstructions or pipe materials that will prevent the existing pipe from being pipe burst properly and cannot be removed by conventional cleaning equipment, a point repair will be made by the Contractor, with approval from the Owner/Engineer. Separate payment for this work will be made and it is not considered incidental to the pipe bursting process.
- C. If the Pre-Construction CCTV inspection reveals a significant sag or hump, a sag or

hump removal (point repair) will be made by the Contractor, with approval from the Owner/Engineer. Separate payment for this work will be made and it is not considered incidental to the pipe bursting process.

- D. Before any excavation is done for any purposes, the Contractor shall contact the appropriate One Call agency for determining field locations of existing utilities as described in paragraph 1.13.

3.4 INSERTION OF THE HDPE PIPE

- A. The polyethylene pipe shall be assembled and joined at the site using the butt-fusion method to provide a leak proof joint. Threaded or solvent-cement joints and connections are not permitted. All equipment and procedures used shall be in compliance with the manufacturer's recommendations. Fusing shall be accomplished by personnel certified as fusion technicians by a manufacturer of HDPE pipe and/or fusing equipment.
- B. The butt-fused joint shall be in true alignment and shall have uniform rollback beads resulting from the use of proper temperature and pressure. The joint shall be allowed adequate cooling time in accordance with fusion equipment manufacturer's instructions and recommendations before removal of pressure. The fused joint shall be watertight and shall have tensile strength equal to that of the pipe. All defective joints shall be cut out and replaced at the expense of the Contractor.
- C. Service connections to the HDPE pipe shall be made with materials submitted and approved in accordance with Paragraph 2. Products.
- D. An appropriate relaxation period shall be allowed prior to making service connections and connecting to manholes. The relaxation period shall be appropriate with and dependent upon site conditions, as determined by Contractor.
- E. If concrete encasements are encountered, a point repair shall be performed to excavate and break out concrete prior to the bursting operation to allow the steady and free passage of the pipe bursting head, with approval from the Owner/Engineer. Separate payment for this work will be made and it is not considered incidental to the pipe bursting process.
- F. The new HDPE pipe shall be inserted immediately behind the bursting head in accordance with the manufacturer's recommended procedures. The bursting tool shall be specifically designed and manufactured for the type of insertion process being used. It shall be utilized to guide and assist the bursting head during the operation. A pushing machine may be utilized to aid pipe insertion from the rear.
- G. New HDPE pipe shall extend a minimum of 6-inches into each manhole. The annular space shall be sealed at each manhole with a Water Stop Gasket (as described in Paragraph 2.4 and finished with a quick setting grout.

3.5 SERVICE RECONNECTIONS

- A. Service connections to the HDPE pipe shall be made with materials submitted and

approved in accordance with Paragraph 2.3. Services shall be reconnected so as to minimize disruption of service.

- B. After the new HDPE pipe has been installed and tested, the Contractor shall be responsible for reconnecting existing sewer services in the manner described in the bid form. All service lines shall match existing size or be the size indicated in the plans and specifications.

3.6 TESTING AND ACCEPTANCE

- A. After the new HDPE pipe is installed and all services are reconnected, the line shall be inspected by CCTV (Post-Construction CCTV).

- B. Video Observation

- 1. Video observation (C.C.T.V) of pipelines shall be performed in accordance with Section 02955, Sewer Line Cleaning and CCTV Inspection, by experienced personnel trained in locating breaks, obstacles, and service connections by closed circuit color television. Video observation shall include the following:

- a. Video recordings (post) to be submitted to the Engineer and Owner before final invoice.
- b. Video recordings to remain property of the Owner; Contractor to retain second copy for its use.
- c. All flows tributary to section of sewer being checked shall be completely by-passed around the section during observation if necessary.
- d. Provide post construction video recording upon completing reconstruction of each section of sewer with voice description and stationing of services. Data and stationing to be on video.
- e. Should any portion of video recordings be of inadequate quality or coverage, as determined by Owner or Engineer, Contractor will have the portion re-checked and video recorded at no additional expense to Owner.

END OF SECTION 02975

**SECTION 15045
PRESSURE TESTING**

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work:

1. This section specifies the leakage testing of pressure piping systems.
2. It is the intent of this specification section that all piping be pressure tested. At a minimum, the pipe shall be tested at 1.5 times the working pressure for a duration of two (2) hours, unless specified otherwise herein or in other specification Sections.
3. Measurement and payment of testing covered in this section is considered incidental to the cost of installation of the piping to be tested and such cost shall be included in the bid form pricing for the associated piping.

B. Test Pressures and Times: PVC, ductile iron, and stainless steel pipe for water, wastewater, or reclaimed water service mains shall be tested for a minimum of two (2) hours at 150 psi, unless otherwise required by Town.

C. HDPE Piping, if any, shall be pressure tested in accordance with the separate High-Density Polyethylene Pipe requirements.

D. The Contractor shall test pipelines installed under this Contract in accordance with these specifications prior to acceptance of the pipeline by the Town of Ridgeland or connecting pipeline to any existing pipeline or facility. All field tests shall be made in the presence of the Engineer and/or Town's Representative. Except as otherwise directed, all pipelines shall be tested.

All piping to operate under liquid pressure shall be tested in sections of approved length. For these tests, the Contractor shall furnish clean water, suitable temporary testing plugs or caps, and other necessary equipment, and all labor required. If the Contractor chooses to pressure test against an existing Town of Ridgeland main/valve, the Town of Ridgeland will not be responsible for failure of the pressure test due to the existing valve leaking. If positive test results cannot be obtained because the Town of Ridgeland valves will not hold the test pressures, the Contractor shall be required to disconnect from the Town of Ridgeland System and re-test independent of the Town of Ridgeland System and at the Contractor's expense.

E. Testing Records:

1. Provide record of each piping installation during the testing. These records shall include:
 - a. Date of test.
 - b. Identification of pipeline tested or retested.
 - c. Identification of pipeline material.
 - d. Identification of pipe section tested.
 - e. Test pressure.
 - f. Remarks: Leaks identified (type and location), types of repairs, or corrections made.

- g. Certification by Contractor that the leakage rate measured conformed to the specifications.
 - h. Signature of Town's representative witnessing pipe test.
- 2. Submit three (3) copies of the pressure test form to the Town's representative upon completion of the testing.

PART 2 – PRODUCTS

2.01 GENERAL:

- A. Testing fluid shall be water.
- B. The Contractor will use suitable pressure gauges, calibrated by an approved testing laboratory, with increments no greater than 2 psi. Gauges used shall be of such size that pressures tested will not register less than 10% nor more than 90% of the gauge capacity. Leakage and pressure testing shall be in accordance with AWWA C600 and as outlined below.

2.02 MATERIALS AND EQUIPMENT

- A. Provide pressure gauges, pipes, bulkheads, pumps, and meters to perform the hydrostatic testing.

PART 3 – EXECUTION

3.01 TESTING PREPARATION

- A. Pipes shall be in place and anchored before commencing pressure testing.
- B. Conduct hydrostatic tests on exposed and above ground piping after the piping has been installed and attached to the pipe supports, hangers, anchors, expansion joints, valves and meters.
- C. Before conducting hydrostatic tests, flush pipes with water to remove dirt and debris.
- D. Test new pipelines which are to be connected to existing pipelines by isolating the new line from the existing line by means of pipe caps, special flanges, or blind flanges. After the new line has been successfully tested and cleared by relevant regulatory agencies, remove caps or flanges and connect to the existing piping.
- E. Conduct hydrostatic tests on buried pipe after the trench has been completely backfilled. The pipe may be partially backfilled and the joints left exposed for inspection for an initial leakage test. Perform the final test, however, after completely backfilling and compacting the trench.

3.02 TESTING

- A. Unless it has already been done, the section of pipe to be tested shall be filled with water of approved quality and all air shall be expelled from the pipe. If blow offs or other outlets are not available at high points for releasing air, the Contractor shall make the necessary taps at such points and shall plug said holes after completion of the test.
- B. Hydrostatic testing shall consist of a combined pressure test and leakage test. Specified test pressures, based on the elevation of the highest point of the line or section under test, and corrected to the elevation of the test gauge, shall be applied by means of a pump connected to the pipe in a manner satisfactory to the Engineer. The pump, pipe connection and all necessary apparatus, shall be furnished by the Contractor and shall be subject to the approval of the Engineer. All valved sections shall be hydrostatic tested to

insure sealing (leak allowance) of all line valves.

1. All piping shall be pressure and leakage tested for a minimum of two hours duration at the test pressure noted in paragraph 1.01 for the relevant type of service. Pressure tests shall be conducted with a pressure loss of not more than 5 psi regardless of length being tested. No pipe will be accepted if pressure loss is greater than 5 psi regardless of leakage test results. All exposed pipe, fittings, valves and joints shall be examined carefully during the test. Any damaged or defective pipe, fittings or valves that are discovered following the pressure test shall be repaired or replaced with sound material and the test shall be repeated until it is satisfactory. Repairing, replacing and retesting shall be done at the Contractor's expense.
2. Leakage tests shall be conducted simultaneously with the pressure tests. At the end of the pressure test, the line will be pumped back to initial test pressure. The quantity of water used to repump the line shall be measured and compared to the limitations calculated using the leakage equation below. No pipe installation will be accepted if the leakage is greater than determined by the following formula which is applicable to DIP, PVC, or combination of both:

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

In which L is the allowable leakage in gallons per hour; S is the length of pipeline tested, in feet; D is the nominal diameter of the pipe, in inches; and P is the average test pressure during the leakage test, in pounds per square inch. If any test discloses leakage greater than that specified above, the Contractor shall, at its own expense, locate and repair the defective material and retest until the leakage is within the specified allowance.

In the event a section fails to pass the tests, the Contractor shall do everything necessary to locate, uncover (even to the extent of uncovering the entire section), and replace the defective pipe, valve, fitting or joint. Visible leaks shall be corrected regardless of total leakage. Lines which fail to meet these tests shall be retested as necessary until test requirements are complied with. All testing shall be performed at the Contractor's expense.

6. If, in the judgment of the Engineer, it is impracticable to follow the foregoing procedures exactly for any reason, modifications in the procedure shall be made with approval; but, in any event, the Contractor shall be responsible for the ultimate tightness of the piping within the above requirement. For water mains, re-disinfection shall be required if the line is de-pressurized for repairs prior to tying into the Town of Ridgeland system.

END OF SECTION 15045

**TOWN OF RIDGELAND
SEWER RESILIENCY IMPROVEMENTS –
GRAVITY SEWER REHABILITATION PROJECT**

APPENDIX A

**SCDOT ENCROACHMENT PERMIT FOR PART II SEWER REHABILITATION –
PERMIT NO. 267757**

**SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
Encroachment Permit**

Permit No : 267757

Permit Decision Date :

6/5/2023

Expiration Date : 4/15/2025

Extension Date : 4/15/2024

Type Permit : SEWER

Location:

<u>District</u>	<u>Work County</u>	<u>Type</u>	<u>Route</u>	<u>Aux</u>	<u>Begin MP</u>	<u>End MP</u>
6	Jasper, SC	US	17	None	29.019	28.591
6	Jasper, SC	US	278	None	19.177	19.024
6	Jasper, SC	S-	74	None	0.133	0.133
6	Jasper, SC	S-	66	None	0.135	0.009
6	Jasper, SC	S-	65	None	0.149	0.170
6	Jasper, SC	S-	65	None	0.001	0.163
6	Jasper, SC	S-	32	None	1.002	0.818
6	Jasper, SC	S-	59	None	0.352	0.412
6	Jasper, SC	SC	336	None	8.232	8.617
6	Jasper, SC	SC	336	None	8.617	8.467

Contact

Information

Applicant: TownofRidgeland

Phone:

Contact: Dennis E. Averkin

Address: PO Box 1119,

City: Ridgeland

State: SC

Zip: 29936

Comments

Within Town of Ridgeland: Jacob Smart Blvd, around Town Hall (3rd Ave, 2nd Ave, Floyd St, Town Square, Russell St, Weathersbee St), Green St, Wilson St, Main St and Grahamville Rd.De

Special

Provisions:

0002 - ALL REPAVING IS TO CONFORM TO STANDARD DEPARTMENT SPECIFICATIONS. THE ROAD, AT DROP INLETS, SHALL BE MILLED TO MAKE A SMOOTH TRANSITION WHEN PAVED. PAVEMENT WITH CURB AND/OR SIDEWALK WILL BE PAVED FULL DEPTH FROM OUTER EDGE TO GUTTER EDGE.

0003 - WHEN ROADS ARE RESURFACED, SHOULDERS SHALL BE REGRADED TO THE EDGE OF PAVEMENT TO CONFORM TO THE DEPARTMENT SPECIFICATIONS.

0004 - SCDOT SHALL BE NOTIFIED WHEN WORK DEFINED IN THE PERMIT STARTS AS WELL AS WHEN THE WORK IS COMPLETED. REFERENCE SHALL BE MADE BY PERMIT NUMBER.

0005 - APPLICANT SHALL PROVIDE TO THE DEPARTMENT THE OPPORTUNITY OF ATTENDING ANY PRE-CONSTRUCTION MEETING PRIOR TO THE BEGINNING OF WORK.

0106 - MANHOLES SHALL CONFORM TO THE ELEVATION OF THE EXISTING ROADWAY OR SHOULDER AND CONSTRUCTED IN ACCORDANCE WITH ACCEPTED PRACTICES.

0107 - TRENCH TO BE PROPERLY BACK-FILLED AND THOROUGHLY TAMPED. THE ENTIRE DISTURBED AREA SHALL BE RE-SHAPED AND DRESSED OUT IN A WORKMANSHIP LIKE MANNER.

0111 - OPEN CUTS AND/OR BELL HOLES WITHIN THE ROAD PAVEMENT SHALL BE CUT IN NEAT LINES AND REPAIRED.

0115 - WHERE PAVEMENT IS CUT THE WORK SHALL BE DONE IN CLEAR WEATHER WHEN TRAFFIC IS LIGHTEST. THERE SHALL BE NO TRENCH LEFT OPEN IN THE TRAVELED WAY WHEN WORK IS NOT IN PROGRESS.

0116 - PAVEMENT SHALL BE CUT TO NEAT LINES AND THE TRENCH BACK-FILLED USING FLOWABLE MATERIAL AND TAMPED IN 6" LAYERS TO 95% DENSITY.

0117 - OPEN TRENCHES SHALL BE COVERED WITH METAL PLATES WHEN THE PAVEMENT CANNOT BE RESTORED THE SAME DAY. PLATES SHALL BE MONITORED PERIODICALLY TO ENSURE THAT THE TRENCH IS PROPERLY COVERED.

0123 - ALL WORK PERFORMED IN CONNECTION WITH THIS PERMIT SHALL CONFORM TO THE SCDOT "A POLICY FOR ACCOMODATING UTILITIES ON HIGHWAY RIGHT-OF-WAY" MOST CURRENT EDITION.

0125 - ALL CROSSLINE PIPES ARE TO BE LOCATED AND FLAGGED PRIOR TO BEGINNING OPERATION.

0209 - DISTURBED VEGETATION SHALL BE RESEDED ACCORDING TO THE SPECIFICAION FOR HIGHWAY CONSTRUCTION.

0210 - ALL SIDEWALKS TO INCLUDE AT DRIVEWAY RADIUS SHALL MEET (ADAAG) AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES.

0302 - NO EXCAVATION SHALL BE LEFT OPEN ALONG HIGHWAY.

0304 - PAVEMENT MARKINGS ALTERED DURING THIS INSTALLATION SHALL BE RESTORED BY THE APPLICANT.

0305 - FLASHING ARROW BOARDS SHALL BE USED FOR ALL LANE CLOSURES ON PRIMARY ROUTES AND/OR ROADS WITH HIGH TRAFFIC VOLUMES.

0306 - TRAFFIC CONTROL, LIGHTS, SIGNS AND FLAG-MEN WILL BE FURNISHED BY APPLICANT AND WILL CONFORM TO PART VI OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

0310 - FIELD CHANGES, IF NECESSARY, MUST BE APPROVED IN WRITING BEFORE ACTUAL CONSTRUCTION OF PROPOSED CHANGES.

0318 - THE APPLICANT SHALL BE RESPONSIBLE FOR IMMEDIATE REMOVAL OF SUCH TRAFFIC HAZARDS AS MUD, DEBRIS, LOOSE STONE, AND TRASH AS MAY BE WASHED OR SPILLED ON THE TRAVELED ROADWAY AS A RESULT OF THE PROPOSED WORK.

9999 - See Attached for Additional Special Provisions

Fair, Arneshia S.

From: Fleming, Juleigh B.
Sent: Monday, April 15, 2024 10:18 AM
To: Rachel Perley
Cc: Angela Bryan; Healy, Michael P.; Fair, Arneshia S.
Subject: RE: Permit Extension Request (Permit No. 267757)

Hi Rachel;
Utility permits are issued out of the local maintenance office. I have copied Mike and Arneshia. They will be able to help you get an extension.

Thank you,

Juleigh B. Fleming, PE
District Permit Engineer

P 843-746-6722 E flemingjb@scdot.org

South Carolina Department of Transportation
6355 Fain Street, North Charleston, SC 29406



From: Rachel Perley <rperley@4weng.com>
Sent: Monday, April 15, 2024 10:14 AM
To: Fleming, Juleigh B. <FlemingJB@scdot.org>
Cc: Angela Bryan <abryan@4weng.com>
Subject: Permit Extension Request (Permit No. 267757)

***** This is an EXTERNAL email. Please do not click on a link or open any attachments unless you are confident it is from a trusted source. *****

Good morning, Juleigh

I would like to request a 1-year extension to the Town of Ridgeland Sewer Encroachment Permit (Permit No. 267757) that expires on 6/5/2024. Construction on the project was broken into phases after receipt of the permit which has delayed construction beyond the initial expiration date. However, the Town plans on completing construction on the sewer improvements within the next year. Please let me know if you have any questions or need any documentation to issue the permit extension.

Thanks,

Rachel Perley, EI
Associate Engineer
Four Waters Engineering, Inc.



cell
office
address
website

(561) 951-5795
(904) 414-2400 ext. 55
324 6th Avenue North
Jacksonville Beach, FL 32250
www.4WEng.com

**TOWN OF RIDGELAND
SEWER RESILIENCY IMPROVEMENTS –
GRAVITY SEWER REHABILITATION PROJECT**

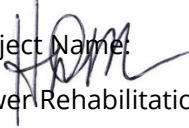
APPENDIX B

SCDHEC COASTAL ZONE CONSISTENCY DETERMINATION

REF #: HPN-8F47-58R0S; GCZC-2017-002



General Coastal Zone Consistency Determination

To: Dennis Averkin, Town of Ridgeland
From: Holli Dawn Martin, OCRM Coastal Zone Consistency Section
Project Name:  Town of Ridgeland Water and Sewer Resiliency Improvements, Part II: Gravity Sewer Rehabilitation
Site Location: North Perry Street, Ridgeland, Jasper County, SC
Ref #: HPN-8F47-58R0S; GCZC-2017-002
Date: October 24, 2022

The staff of the Office of Ocean and Coastal Resource Management (OCRM) reviewed the above referenced Coastal Zone Consistency project request for NPDES Stormwater Land Disturbance, Wastewater and Water permits associated with the improvements to water and sewer system with associated installation of pipes, manholes and sewer laterals. The total area of disturbance will be 0.19 acre project site.

We hereby certify the above referenced project meets the minimum standards for General Coastal Zone Consistency for Minor Project Impacts under GCZC-2017-002 subject to the following conditions and the policies of the South Carolina Coastal Zone Management Program provided the provided the following conditions are included in the permit and adhered to by the applicant.

Conditions for Minor Impact Projects

1. This GCZC does not preclude the applicant from obtaining necessary local, state and/or federal approvals for the development prior to work beginning.
2. This GCZC is conditioned upon the proper use of Best Management Practices (BMPs), which must be installed, inspected and maintained to retain sediment onsite and to protect any adjacent or downstream critical area, wetlands and waters through the life of the project. Upon completion of construction activities, all disturbed (includes undeveloped) areas, including those impacted for access, must be immediately stabilized. Once stabilization has occurred, all temporary construction BMPs must be properly removed and discarded.
3. Projects that are part of a LCP are authorized/granted coverage provided the consistency determination review for the development including its stormwater management drainage system has been approved under a previously authorized NPDES CGP Land Disturbance Permit (clearing and grading or site development). The development infrastructure, and site layout deemed consistent under the referenced NPDES Land Disturbance Permit's Stormwater Pollution Prevention Plan (SWPPP) remains unchanged from the time of

approval as referenced under Section 2.2.2.A of the current NPDES General Permit For Stormwater Discharges From Construction Activities, as well as, compliant with the S.C. Stormwater Management and Sediment Reduction Regulations (26 S.C. Code Ann. Regs. 72-300) and Chapter III, Section XIII, A, E, and D of the SCCZMP.

4. The project, as applicable, must be compliant with any MOA or Restrictive Covenants/Recorded plats for the project associated with previous Coastal Zone Consistency Determinations of any respective Bureau Permit. Proof of compliance must be included with the request narrative and shown on the lot construction plan sheet.
5. In the event that any historic or cultural resources and/or archaeological materials are found during the course of work, the applicant must notify the State Historic Preservation Office (SHPO) and the South Carolina Institute of Archaeology and Anthropology. Historic or cultural resources consist of those sites listed in the National Register of Historic Places and those sites that are eligible for the National Register. Archaeological materials consist of any items, fifty years old or older, which were made or used by man. These items include, but are not limited to, stone projectile points (arrowheads), ceramic sherds, bricks, worked wood, bone and stone, metal and glass objects, and human skeletal materials.
6. The applicant must continue to adhere to all conditions of any Coastal Zone Consistency Determinations of respective Bureau permits.
7. Project development must not result in adverse impacts through nonpoint stormwater runoff and/or point source water discharge on adjacent lands.
8. For land disturbance stabilization, the applicant is strongly encouraged to utilize ground cover, shrub and canopy species native to the coast of South Carolina in any landscaping plans to recover some of the lost ecosystem functions such as water and air quality protection, mitigation of heat island effects and restoration of coastal zone habitat. Low Impact Development and green infrastructure practices are also strongly recommended.
9. Sediment, erosion and water quality controls required by the current NPDES General Permit for Stormwater Discharges from Large and Small Construction Activities and the S.C. Stormwater Management and Sediment Reduction Regulations (26 S.C. Code Ann. Regs. 72-300, as amended, are satisfied by the project design and are correctly installed and maintained. Additional water quality measures specific to the eight coastal counties, as established in Chapter III, Section XIII, A, E, and D of the SCCZMP, as refined, being satisfied by the project design are applicable. Storage for these activities must be appropriate for the specific site
10. Sewage treatment facilities and transmission systems in the coastal zone must meet applicable Federal, State and local construction and water quality standards.
11. For Sewage Treatment, the project must be consistent with designated 208 Areawide Waste Treatment Management implementation agencies and other agencies with responsibility for implementing comprehensive plans affecting sewage treatment, to ensure that proposed

projects are compatible with growth and development plans and that alternative locations for sewage treatment facilities are considered.

12. Minor Project Impacts are not authorized/granted coverage in these instances:

- a. When the proposed construction activity is located in any areas identified as “Areas of Special Resource Significance” as detailed in Chapter III, Section XII of the SCCZMP, as refined, unless the area has been previously developed or concerns are negated by on-site characteristics. Areas of Special Resource Significance include (1) Barrier Islands, (2) Dune Areas (outside of the critical area), (3) Navigation Channels, (4) Public Open Spaces (5) Wetlands or areas known to be subject to hazards, including but not limited flooding and contaminated sites. Barrier Islands identified in this condition include undeveloped areas of barrier islands only. The development or redevelopment of single family residential lots are not included in this definition and are exempt. Public Open Spaces identified in this condition include recreationally open areas such as local parks. State Parks are currently identified as Geographic Areas of Particular Concern (GAPC) and are covered therein.
- b. When the proposed project may impacts areas identified as GAPCs as detailed in Chapter IV of the SCCZMP: Areas of Unique Natural Resource Value (1) Heritage Trust Sites (2) State Wildlife Preserves (3) State Parks (4) Scenic Rivers (5) Marine and Estuarine Sanctuaries (6) Shellfish Areas (7) Groundwater Resources (8) and Threatened and Endangered Species); Activities or Facilities Dependent on Coastal Location (1) State Ports (2) Navigation Channels (3) and Mining Operations; Areas of Special Historic, Archaeological or Cultural Significance (1) special historic (2) archaeological, or (3) culturally significant sites.

This determination shall serve as the DHEC OCRM State/Federal Coastal Zone Consistency Determination for the work described above. This determination **does not** serve as the final permitting decision and **does not** alleviate the applicant’s responsibility to obtain final authorizing State or Federal permit(s). Local government authorizations **may also** be required.